FINAL SUBMITTAL

VOLUME II OF II, APPENDICES E & F

ENERGY SAVINGS OPPORTUNITY SURVEY FORT MC PHERSON, GEORGIA

Prepared for

SAVANNAH DISTRICT
CORPS OF ENGINEERS
SAVANNAH, GEORGIA

Under

CONTRACT NO. DACA21-91-C-0097

September 1992

EMC No. 3105-000

E M C ENGINEERS, INC.
1950 Spectrum Circle
Suite B-312
Marietta, Georgia 30067
Phone (404) 952-3697

APPENDIX E

COMPUTER ENERGY SIMULATION BACKUP DATA

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

REPLY TO
ATTENTION OF: TR-I Library

17 Sep 1997

Based on SOW, these Energy Studies are unclassified/unlimited. Distribution A. Approved for public release.

Marie Wakefield,
Librarian Engineering

This report has been prepared at the request of the client, and the observations, conclusions, and recommendations contained herein constitute the opinions of E M C Engineers, Inc. In preparing this report, EMC has relied on some information supplied by the client, the client's employees, and others, which we gratefully acknowledge. Because no warranties were given with this source of information, E M C Engineers, Inc. cannot make certification or give assurances except as explicitly defined in this report.

TABLE OF CONTENTS

Section — Page

VOLUME I

List of Abbreviations ix

EXECUTIVE SUMMARY

1.0 INTRODUCTION
- 1.1 Authority for Study 1-1
- 1.2 Purpose of Study 1-1
- 1.3 Scope of Work 1-1
- 1.4 Organization of Submittal 1-2
- 1.5 Work Accomplished 1-2
- 1.6 Previous Utility Conservation Studies 1-6

2.0 UTILITY CONSUMPTION AND RATES
- 2.1 General 2-1
- 2.2 Utility Rates 2-1
  - 2.2.1 Electrical Rates 2-1
  - 2.2.2 Natural Gas Rates 2-2
  - 2.2.3 Water and Sewer Rates 2-3
- 2.3 Historical Consumption of Utilities 2-3
  - 2.3.1 Historical Electrical Energy Consumption 2-3
  - 2.3.2 Historical Natural Gas Consumption 2-6
- 2.4 Summary of Utilities 2-8
- 2.5 Basis for Economic Analysis 2-8
  - 2.5.1 ECIP Guidance 2-8
  - 2.5.2 Basis for Energy Cost Savings Benefits 2-9
  - 2.5.3 Basis for Labor and Material Costs 2-10
- 2.6 Demand Side Management 2-10

3.0 EVALUATION OF ENERGY CONSERVATION OPPORTUNITIES
- 3.1 General 3-1
- 3.2 ECOs Evaluated 3-1
- 3.3 Analysis Methodology 3-9
- 3.4 ECO Analysis 3-10
- 3.4.1 ECO 1 - Insulation 3-12
  - 3.4.1.1 - Insulate Walls and Roofs 3-12
  - 3.4.1.2 - Insulate Pipes and Ducts 3-17
- 3.4.2 ECO 2 - Insulated Windows 3-23
- 3.4.3 ECO 3 - Weatherstripping and Caulking 3-26
- 3.4.4 ECO 4 - Domestic Hot Water Temperature 3-30

TABLE OF CONTENTS (Continued)

Section Page

3.4.5 ECO 5 - Install High Efficiency Electric Motors 3-33
3.4.6 ECO 6 - Economizers 3-37
3.4.7 ECO 7 - Control Hot Water Circulation Pump 3-40
3.4.8 ECO 8 - Install Low-Flow Shower and Faucet Fixtures 3-43
3.4.9 ECO 9 - Heat Reclaim from Hot Refrigerant Gas 3-46
3.4.10 ECO 10 - Prevent Air Stratification 3-49
3.4.11 ECO 11 - Replace Street Lights 3-52
3.4.12 ECO 12 - Revise or Repair HVAC Controls 3-55
3.4.13 ECO 13 - Thermal Storage 3-60
3.4.14 ECO 14 - Radiant Heaters and Loading Dock Seals 3-62
3.4.14.1 - Radiant Heaters 3-62
3.4.14.2 - Loading Dock Seals 3-62
3.4.15 ECO 15 - Separate Light Switches 3-63
3.4.15 ECO 15 - Automatic Lighting Controls in Building 200 3-68
3.4.16 ECO 16 - Investigate Post Demand Usage 3-71
3.4.17 ECO 17 - Boiler Operation Schedule 3-81
3.4.18 ECO 18 - Replace Exit Sign Bulbs with Fluorescent Bulb Kit 3-82
3.4.19 ECO 19 - Previous Lighting Study Review 3-84
3.5 ECO Project Summary 3-87
3.6 Results 3-93

4.0 ENERGY CONSERVATION PROJECTS
4.1 Project Development 4-1
4.2 ECIP Projects 4-3
4.3 Non-ECIP Projects 4-6
4.3.1 QRIP Project 4-6
4.3.2 MCA Project 4-6
4.3.3 Low-Cost/No-Cost Project 4-6
4.4 Family Housing Project 4-6
4.5 NAF Projects 4-7
4.6 Other Energy Projects 4-9

5.0 SUMMARY AND RECOMMENDATIONS
5.1 Summary 5-1
5.1.1 ECOs Evaluated 5-1
5.1.2 Results 5-1
5.1.3 Energy Project Development 5-6
5.2 Recommendations 5-9

TABLE OF CONTENTS (Continued)

LIST OF APPENDICES

VOLUME I

A SCOPE OF WORK AND CONFIRMATION NOTICES
B UTILITY RATES AND HISTORICAL CALCULATIONS
C ECO BACKUP CALCULATIONS

C-1.1 WALL INSULATION
C-1.2 ROOF INSULATION
C-1.3 PIPE AND DUCT INSULATION
C-2 INSULATED GLASS
C-3 WEATHERSTRIPPING AND CAULKING
C-4 MEASURE HOT WATER TEMPERATURES
C-5 ELECTRIC MOTORS
C-6 ADD ECONOMIZERS
C-7 CONTROL HOT WATER CIRCULATION PUMPS
C-8 INSTALL LOW-FLOW SHOWER AND FAUCET FIXTURES
C-9 HEAT RECLAIM FOR HOT REFRIGERANT GAS
C-10 PREVENT AIR STRATIFICATION
C-11 REPLACE STREET LIGHTS
C-12 REVISE OR REPAIR HVAC CONTROLS
C-13 THERMAL STORAGE
C-14.1 LOADING DOCK SEALS
C-14.2 RADIANT HEATERS
C-15.1 BUILDING 200 LIGHTING CONTROLS
C-15.2 SEPARATE SWITCHES TO CONTROL LIGHTING
C-16 INVESTIGATE POST DEMAND USAGE
C-17 EVALUATE BOILER OPERATION
C-18 EXIT SIGN RETROFIT
C-19 LIGHTING UPGRADES
C-20 COMPUTER SIMULATION SUMMARIES

D ECO PROJECT BACKUP CALCULATIONS

D-1 ECIP PROJECT
D-2 QRIP PROJECT
D-3 FAMILY HOUSING PROJECT
D-4 NAF PROJECT
D-5 OTHER ENERGY PROJECTS

VOLUME II

E COMPUTER SIMULATIONS
F FIELD SURVEY NOTES

LIST OF TABLES

Table		Page
1-1	Scope of Work Summary	1-4
2-1	Electrical Energy Consumption	2-4
2-2	Natural Gas Consumption	2-6
2-3	FY91 Utility Usage and Cost Comparison	2-8
2-4	Uniform Present Worth Factors	2-9
3-1	Energy Conservation Opportunities List	3-2
3-2	Nonfeasible ECOs	3-3
3-3	Buildings Added	3-5
3-4	Building ECO Matrix	3-6
3-5	Computer Simulation Buildings	3-11
3-6	Wall Insulation	3-15
3-7	Roof Insulation	3-16
3-8	Duct and Pipe Recommended Thicknesses	3-20
3-9	Pipe Insulation	3-21
3-10	Duct Insulation	3-22
3-11	Insulated Windows	3-24
3-12	Weatherstripping and Caulking	3-28
3-13	Domestic Hot Water Temperature Measurements	3-31
3-14	Install High Efficiency Electric Motors	3-35
3-15	Economizers	3-39
3-16	Control Hot Water Circulation Pump	3-42
3-17	Install Low-Flow Shower and Faucet Fixtures	3-45
3-18	Heat Reclaim from Hot Refrigerant Gas	3-48
3-19	Prevent Air Stratification	3-51
3-20	Replace Street Lights	3-54
3-21	Revise or Repair HVAC Controls	3-58
3-22	Thermal Storage	3-61
3-23	Separate Light Switches	3-66
3-24	Automatic Lighting Controls in Building 200	3-70
3-25	FY91 Historical Electrical Demand - Fort McPherson	3-76
3-26	Demand Savings Comparison	3-79
3-27	FM Radio Control System	3-80
3-28	Replace Exit Sign Bulbs with Fluorescent Bulb Kit	3-83
3-29	Previous Lighting Study Review	3-86
3-30	Energy Conservation Opportunities List	3-88
3-31	Economic Summary of ECOs, Listed by ECO Number	3-89
3-32	Economic Summary of ECOs, Listed by SIR	3-91

LIST OF TABLES

Table		Page
4-1	ECIP Project Summary	4-5
4-2	NAF Economic Summary	4-8
4-3	Other Energy Projects Summary	4-10
5-1	Economic Summary of ECOs, Listed by ECO Number	5-2
5-2	Economic Summary of ECOs, Listed by SIR	5-4
5-3	Projects Economic Summary	5-8

LIST OF FIGURES

Figure		Page
2-1	Electrical Consumption	2-5
2-2	Natural Gas Consumption	2-7
3-1	FY91 Typical Hourly Demand, Summer - Fort McPherson	3-77
3-2	FY91 Typical Hourly Demand, Winter - Fort McPherson	3-78

LIST OF ABBREVIATIONS

ACH	-	air changes per hour
AAFES	-	Army Air Force Exchange Service
AHU	-	air handling unit
Bldg	-	building
cfm	-	cubic feet per minute
conf.	-	confirmation
DCU	-	digital control unit
DDC	-	direct digital control
DEH	-	Director of Engineering and Housing
DHW	-	domestic hot water
DX	-	direct expansion
ECIP	-	Energy Conservation Investment Program
ECO(s)	-	Energy Conservation Opportunity(ies)
ESOS	-	energy savings opportunity survey
F	-	Fahrenheit
FCU	-	fan coil unit
ft	-	foot, feet
FY	-	fiscal year
gpm	-	gallons per minute
hp	-	horsepower
HPS	-	high pressure sodium
hr	-	hour(s)
HW	-	hot water
in.	-	inch(es)
kVar	-	kilovolt amp reactive
kW	-	kilowatt, one thousand watts
kWh	-	kilowatt-hour, one thousand watthours
LAPS	-	lighting automation panels
LBH	-	pounds per hour
lbm	-	pounds mass
LCCID	-	Life Cycle Cost in Design
MBtu	-	British thermal units (thousand)
mcf	-	thousand cubic feet

LIST OF ABBREVIATIONS
(Continued)

MCA	-	Military Construction Army Program
MCP	-	Military Construction Program
NAF	-	non-appropriated funds
PRV	-	pressure reducing valve
psia	-	pounds per square inch, absolute
psig	-	pounds per square inch, gauge
QRIP	-	Quick Return on Investment Program
RCU	-	remote control unit
rpm	-	revolutions per minute
SES	-	Shared Energy Savings
SIOH	-	supervision, inspection, and overhead
SIR	-	Savings-to-Investment Ratio
SOW	-	Scope of Work
therm	-	100,000 Btus
UCS	-	utility control system
UPW	-	uniform present worth

BUILDING 27

E M C ENGINEERS, INC.

PROJECT: FORT McPHERSON & FORT GILLEM ESOS STUDY
LOCATION: FORT McPHERSON
ECO: Computer Simulation Summary

CLIENT CONTRACT NO: DACA21-91-C-0097
CLIENT PROJECT ENG: TERRY SEABROOK

EMC PROJECT: #3105.000
DATE: 10-APR-92
FILE: M027ECO.WK3
PREPARED BY: R. GERRANS
CHECKED BY:

Bldg: M027 **Area: 8,280 ft^2**

Run Description	Heating Gas Use (kBtu/yr)	Heating Electric Use (kWh/yr)	Cooling Electric Use (kWh/yr)	Fan Electric Use (kWh/yr)	Pump Electric Use (kWh/yr)	Lighting Electric Use (kWh/yr)	Recept. Electric Use (kWh/yr)	Total Electric Use (kWh/yr)	Peak Electric Demand (kW)	Total Gas Use (MBtu/yr)	Total Energy Use (MBtu/yr)
Baseline	38,225	793	14,952	27,682	4,544	12,510	12,421	72,902	26	38	287
ECO#2	51,128	933	15,590	27,682	4,544	12,510	12,421	73,679	27	51	303
Savings/(Loss)	(12,903)	(140)	(637)	0	0	0	0	(777)	(1)	(13)	(16)
ECO#3	37,667	792	14,951	27,682	4,544	12,510	12,421	72,900	26	38	286
Savings/(Loss)	557	1	2	0	0	0	0	2	0	1	1

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB 3105 000
SHEET NO. 1 OF 3
CALCULATED BY [illegible] DATE 2/21/92
CHECKED BY _____ DATE _____
SCALE _____

Computer Simulation - Bldg 027 Base Run

Bldg Type: Frame VOQ Area: 8,156 ft²
ECO: 3
Take all Bldgs: 022, 028, 104

Assumptions:

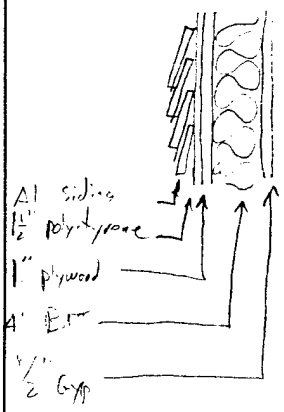
- 4 people / Apt w/ 5 apts occupied
- Infiltration = ½ ACH
- heating db = 72°F
- cooling db = 76°F
- Lights assume 50% diversity

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB 3105.000
SHEET NO. 2 OF 3
CALCULATED BY [illegible] DATE 2/21/92
CHECKED BY DATE
SCALE

Bldg 27 - Comp Sim

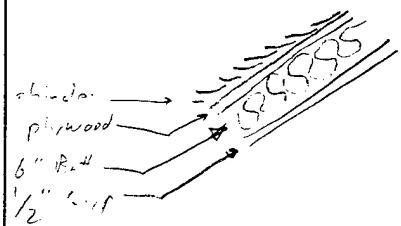
Wall U-Value - ASHRAE Table F22.4



Material	R-Value
Outside Surface (15 mph wind)	0.17
Aluminum Siding	0.61
1½" polystyrene	4.17
¾" plywood	1.25
4" batt Insulation	11.0
½" Gypsum board	0.45
Inside Surface (still air)	0.68
	18.33

$U = \frac{1}{R} = \frac{1}{18.33} = \boxed{0.054}$

Roof U-Value - ASHRAE Table F22.4



Material	R-Value
Outside Air (15 mph wind)	0.17
shingles (Asphalt)	0.44
½" Plywood	0.62
6" Batt Insulation	19.0
½" Gypsum	0.45
Inside Surface (still air)	0.68
	21.36

$U = \frac{1}{R} = \frac{1}{21.36} = \boxed{0.047}$

Window U-Value

- assuming: double Pane w/ ¼" air space - Type R
  Al. Frame
  U = 0.70 - ASHRAE Table F. 27.13

Internal shading: ASHRAE Table F 27.26

Blinds shading coefficient = 0.57

JOB 3105 000

SHEET NO. 3 OF 3

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

CALCULATED BY [signature] DATE 2/21/92

CHECKED BY ______ DATE ______

SCALE ______

Bldg 27 - Comp Ctr

People

5 apts at 4 people / apartment = **20 people**

sensible load: 250 Btuh/person
latent load: 200 Btuh/person

Lights - from plans

9500 Watts × 50% × $\frac{5}{6}$ Apts = **3958 Watts**

Misc Equipment -

per Apartment

Appliance	Watts	@ Peak
Refrigerator	200	200
Stove	1250	1250
Dishwasher	700	
Dryer	[illegible]	
Television	200	200
Misc	10	10
		1660 W/Apt

1.66 kW/Apt × 5 Apt = **8.3 kW**

Infiltration Calculation - use ½ Air Change per Hour (ACH) for design

$Q = L(A\Delta t + Bv^2)^{1/2}$

A - stack coefficient = 0.0313 - ASHRAE Table F23.7 - two-story house

B - wind coefficient = 0.0051 - ASHRAE Table F23.8 - heavy shielding

v - average wind speed = 12.65 mph

L - effective leakage area: ASHRAE Table F 23.3

8 - single doors - weatherstripped - $8(0.15 \frac{in}{ft^2})\left(\frac{33 \times 80}{144}\right) = 22$ in

58 - windows - double slider weatherstripped $58(0.037)\left(\frac{40 \times 54}{144}\right) = 32.2$ in

58 - win frame - wood wall, caulked - $58(0.004)\left(\frac{40 \times 54}{144}\right) = 3.5$ in

8 - door frame - wood wall, caulked - $8(0.004)\left(\frac{40 \times 54}{144}\right) = 0.5$ in

Sill Foundation - wall, caulked - $(0.04)(336) = 13.4$ in

71.6 in

heating (Average indoor, Average outdoor)

$\Delta t = 72°F - 55°F = 17°F$

$Q = 71.6(0.0313(17) + 0.0051(12.65)^2)^{1/2} = 83.7$ cfm

cooling (indoor, outdoor)

$\Delta t = 76°F - 88°F = 12°F$

$Q = 71.6(0.0313(12) + 0.0051(12.65)^2)^{1/2} = 78.2$ cfm

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • Germany

JOB _____
SHEET NO. _____ OF _____
CALCULATED BY _____ DATE _____
CHECKED BY _____ DATE _____
SCALE _____

Computer Simulation - Bldg 027, McPherson

Baseline (cont'd)

Pumps

CHW Pump = $\frac{(0.5\ HP)(.746\ kW/HP)(0.85\ load)}{0.764\ eff} = 0.41\ kW \times 4,380\ \frac{hrs}{yr} = 1,817.6\ kwh/yr$

HW Pump = $\frac{(0.75\ HP)(.746\ kW/HP)(0.85\ load)}{0.754\ eff} = 0.62\ kW \times 4,380\ \frac{hrs}{yr} = 2,726.5\ kwh/yr$

4,544 kwh/yr

Computer Simulation - Bldg 027, McPherson,

ECO #2 - Insulated Glass
Window U-Value - ASHRAE Table F.27.13

- Use single pane, wood frame, sliding to develop energy factor for takeoff buildings.

U = 0.90

Window Shading - ASHRAE Table F 27.25

- Use light blinds

=> 0.67

Window Area = 869 ft²

-note: Since ΔU was negative, losses were incurred ∴ For takeoff, energy losses converted to savings

Electric Savings

Total Electric Savings = 777 kWh/yr

Electric Savings = 0.89 kWh/ft²

Demand Savings

Peak Demand Savings = 1 kW

Demand Savings = 1.2×10^{-3} kW/ft²

Gas Savings

Total Gas Savings = 13 MBtuh

Gas Saving = 0.015 MBtuh/ft²

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____
SHEET NO. _____ OF _____
CALCULATED BY _____ DATE _____
CHECKED BY _____ DATE _____
SCALE _____

Computer Simulation - Bldg 027, McPherson

ECO #3 - Weather stripping + Caulking

Presently: - ASHRAE Table F 23.3

Windows: weather stripped + caulked, double sliding, wood wall
windows: 0.026 in^2/ft^2
frames: 0.004 in^2/ft^2

Doors: not weather stripped + caulked, single doors, wood walls
doors: 0.157 in^2/ft^2
frames: 0.024 in^2/ft^2

Improvement: weather strip + caulk doors
doors: 0.114 in^2/ft^2
frames: 0.004 in^2/ft^2

Calculation

$Q = L(A\Delta t + B v^2)^{1/2}$

A - stack coefficient = 0.0313 - two story - ASHRAE Table F 23.7
B - wind coefficient = 0.0051 - heavy shielding - ASHRAE Table F 23.8
v - average windspeed = 12.65 mph - average winter wind speed
$\Delta t = T_i - T_o = 72°F - 55°F = 17°F$ - average Δt in winter
L - effective length = Area * in^2/ft^2

Presently

58 - 40"x54" windows - 58(15)(0.026) = 22.62 in^2
58 - 40"x54" window frames - 58(15)(0.004) = 3.48 in^2
8 - 33"x80" doors - 8(18.3)(0.157) = 23.03 in^2
8 - 33"x80" door frames - 8(18.3)(0.024) = 3.52 in^2
52.65 in^2

$Q = 52.65(0.0313(17) + (0.0051)(12.65)^2)^{1/2}$
$Q = 61.1$ cfm

Improvement

doors - 8(18.3)(0.114) = 16.68 in^2
door frame - 8(18.3)(0.004) = 0.59 in^2
windows + frames = 26.10
43.37

$Q = 43.37(0.0313(17) + (0.0051)(12.65^2)^{1/2} = 50.4$ cfm

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB ____________________

SHEET NO. ________ OF ________

CALCULATED BY ________ DATE ________

CHECKED BY ________ DATE ________

SCALE ____________________

Computer Simulation   B'ldg 027 McPherson

ECU #3 (cont)

$\Delta cfm = 61.1 - 50.4 = 10.7$ cfm   - Delta cfm

Present; infiltration = 0.5 AC/H = 552 cfm

Improved; infiltration = 552 cfm - 10.7 cfm = **541 cfm**

Electric Savings

Total Electric savings = 2 kWh/yr

Electric Saving = **3.7×10^{-3}** kWh/cfm

Demand Savings

Peak Demand Savings = 0 kW/cfm

Gas Savings

Total Gas Savings = 0.56 MBtu/yr

Gas Savings = **0.052** MBtu/cfm

01 Card - Job Information

Project: FT MCPHERSON & FT GILLEM EEAP
Location: FT MCPHERSON, BLDG 027
Program User: R. GERRANS

-----CARD 08-- Climatic Information

Weather Code	Summer Clearness Number	Winter Clearness Number	Summer Design Dry Bulb	Summer Design Wet Bulb	Winter Design Dry Bulb	Building Orientation	Summer Ground Reflect	Winter Ground Reflect
ATLANTA								

-----CARD 09-- Load Simulation Periods

1st Month Cooling Simulation	Last Month Cooling Simulation	Peak Cooling Load Hr	1st Month Summer Period	Last Month Summer Period	1st Month Daylight Savings	Last Month Daylight Savings
MAY	OCT					

---------- Load Section Alternative #1 ----------

---- Load Alternative ----

Number	Description
1	BLDG M027, BASELINE

-----CARD 20-- General Room Parameters

Room Number	Zone Reference Number	Room Descrip	Floor Length	Floor Width	Const Type	Plenum Height	Acoustic Ceiling Resistance	Floor to Floor Height	Duplicate Floors Multiplier	Duplicate Rooms per Zone	Perimeter Depth
1	1	INTERIOR SPACE	138	60		2		10			

-----CARD 21-- Thermostat Parameters

Room Number	Cooling Room Design DB	Room Design RH	Cooling T'stat Driftpoint	Cooling T'stat Schedule	Heating Room Design DB	Heating T'stat Driftpoint	Heating T'stat Schedule	T'stat Location Flag	Mass / No. Hrs Average	Carpet On Floor
1	76			CLG	72		HTG			

-----CARD 22-- Roof Parameters ----------

Room Number	Roof Number	Roof Equal to Floor?	Roof Length	Roof Width	Roof U-Value	Const Type	Roof Direction	Roof Tilt	Roof Alpha
1	1	NO	138	34	.047	38			

-----CARD 24-- Wall Parameters ----------

Room Number	Wall Number	Wall Length	Wall Height	Wall U-Value	Wall Constuc Type	Wall Direction	Wall Tilt	Wall Alpha	Ground Reflectance Multiplier
M	1	30	20	.054	55	0			
1	1	30				0			
1	2	138				90			
1	3	30				180			
1	4	138				270			

-----CARD 25-- Wall/Glass Parameters ----------

Room Number	Wall Number	Glass Length	Glass Width	Pct Glass or No. of Windows	Glass U-Value	Shading Coefficient	External Shading Type	Internal Shading Type	Percent Solar to Ret. Air	Visible Transmittance	Inside Visible Reflectance
M	1	4.5	3.33	4	.70	.57					
1	1			4							
1	2			21			3				
1	3			5							
1	4			28			3				

-----CARD 26-- Schedules ----------

Room Number	People	Lights	Ventilation	Infiltration	Reheat Minimum	Cooling Fans	Heating Fan	Auxiliary Fan	Room Exhaust	Daylighting Controls
1	RESO	RESL	OFF	AVAIL		AVAIL				

-----CARD 27-- People and Lights ----------

Room Number	People Value	People Units	People Sensible	People Latent	Lighting Value	Lighting Units	Lighting Fixture Type	Ballast Factor	Percent Lights to Ret. Air	--- Daylighting --- Reference Point 1	Reference Point 2
1	20	PEOPLE	250	200	3958	WATTS					

-----CARD 28--- Miscellaneous Equipment ----------

Room Number	Misc Equipment Number	Equipment Descrip	Energy Consump Value	Energy Consump Units	Schedule Code	Energy Meter Code	Percent of Load Sensible	Percent Misc. Load to Room	Percent Misc. Sens to Ret. Air	Radiant Fraction	Optional Air Path
1	1	ELEC APPLIANCES	8.3	KW	RESE	ELEC					

-----CARD 29--- Room Airflows ----------

Room	Ventilation -----Cooling----- Value	Units	Ventilation -----Heating----- Value	Units	Infiltration -----Cooling----- Value	Units	Infiltration -----Heating----- Value	Units	--Reheat Minimum-- Value	Units
Number										
1					.5	ACH-HR	.5	ACH-HR		

-----CARD 30- Fan Airflows ----------

Room	Main ----Cooling---- Value	Units	Main ----Heating---- Value	Units	Auxiliary ----Cooling---- Value	Units	Auxiliary ----Heating---- Value	Units	--Room Exhaust-- Value	Units
Number										
1	10000	CFM	10000	CFM						

-----CARD 32-- Exposed Floor Parameters----------

Room Number	Exposed Floor Number	Slab Perimeter Length	Slab Loss Coefficient	Exposed Floor Area	Floor U-Value	Const Type	Temp Flag	Cooling Temp	Heating Temp	Adjacent Room No
1	1	336	.8							

-----CARD 33-- External Shading ----------

Shading Type	OVERHANG Glass Height	OVERHANG Height Above Glass	OVERHANG Projection Out	VERTICAL FINS Glass Width	VERTICAL FINS Projection Left	Left Projection Out	Right Projection Right	Right Projection Out	Adjacent Building Flag
3	13.67	-1.17	3.5						

---------- System Section Alternative #1 ----------

-----CARD 39-- System Alternative -----

Number	Description
1	BLDG M027, BASELINE

-----CARD 40--- System Type ----------

System Set Number	System Type	Ventil Deck Location	OPTIONAL VENTILATION SYSTEM Cooling SADBVh	Heating SADBVh	Cooling Schedule	Heating Schedule	Fan Static Pressure
1	FC						

-----CARD 41-- Zone Assignment ----------

System Set Number	Ref #1 Begin	Ref #1 End	Ref #2 Begin	Ref #2 End	Ref #3 Begin	Ref #3 End	Ref #4 Begin	Ref #4 End	Ref #5 Begin	Ref #5 End	Ref #6 Begin	Ref #6 End
1	1	1										

-----CARD 42--- Fan SP and Duct Parameters----------

System Set Number	Cool Fan SP	Heat Fan SP	Return Fan SP	Mn Exh Fan SP	Aux Fan SP	Rm Exh Fan SP	Cool Fan Mtr Loc	Return Fan Mtr Loc	Supply Duct Ht Gn	Supply Duct Loc	Return Air Path
1	.5						RETAIR			OTHER	ROOMDK

-----CARD 45--- Equipment Schedules ----------

System Set Number	Main Cooling Coil	Economizer	Direct Evap Coil	Indirect Evap Coil	Auxiliary Cooling Coil	Main Heating Coil	Main Preheat Coil	Reheat Coil	Mech. Humidity	Auxiliary Heating Coil
1	CLGC					HTGC				

---------- Equipment Section Alternative #1 ----------

-----CARD 59-- Equipment Description / TOD Schedules ----------

Alternative Number	Elec Consump Time of Day Schedule	Elec Demand Time of Day Schedule	Demand Limit Max KW	Alternative Description
1				BLDG M027, BASELINE

-----CARD 60--- Cooling Load Assignment----------

Load Asgn Ref	All Coil Loads To Cool Ref	Cooling Equipment Sizing	-Group 1- Begin	-Group 1- End	-Group 2- Begin	-Group 2- End	-Group 3- Begin	-Group 3- End	-Group 4- Begin	-Group 4- End	-Group 5- Begin	-Group 5- End	-Group 6- Begin	-Group 6- End	-Group 7- Begin	-Group 7- End	-Group 8- Begin	-Group 8- End	-Group 9- Begin	-Group 9- End
1	1	BLKPLANT	1	1																

-----CARD 62-- Cooling Equipment Parameters ----------

Cool Ref Num	Equip Code Name	Num Of Units	----------COOLING---------- --Capacity-- Value	Units	----Energy---- Value	Units	---------HEAT RECOVERY---------- --Capacity-- Value	Units	----Energy---- Value	Units	Seq Order Num	Seq Type	Demand Limit Number
1	EQ1113	1											

-----CARD 63-- Cooling Pumps and References ----------

Cool Ref Num	---CHILLED WATER---- Full Load Value	Full Load Units	-----CONDENSER------ Full Load Value	Full Load Units	---HT REC or AUX---- Full Load Value	Full Load Units	Switch-over Control	Cold Storage	Cooling Tower	Misc. Access.
1	.41	KW								

-----CARD 65-- Heating Load Assignment ----------

Load Assignment Reference	All Coil Loads To Heating Ref	-Group 1- Begin	End	-Group 2- Begin	End	-Group 3- Begin	End	-Group 4- Begin	End	-Group 5- Begin	End	-Group 6- Begin	End	-Group 7- Begin	End	-Group 8- Begin	End	-Group 9- Begin	End
1	1	1	1																

-----CARD 67-- Heating Equipment Parameters ----------

Heat Ref Number	Equip Code Name	Number Of Units	HW Pmp Full Ld Value	Units	Cap'y Value	Units	Energy Rate Value	Units	Seq Order Number	Switch over Control	Hot Strg	Misc. Acc.	Cogen	Demand Limit Number
1	EQ2001	1	.62	KW										

-----CARD 69-- Fan Equipment Parameters ----------

System Set Number	Cooling Fan	Heating Fan	Return Fan	Exhaust Fan	Auxiliary Supply	Room Exhaust	Optional Ventilation
1	EQ4371						

Utility Description Reference Table

Schedules:
AVAIL AVAILABLE (100%)
CLG COOLING TSTAT SCHEDULE
CLGC COOLING COIL SCHEDULE
HTG HEATING TSTAT SCHEDULE
HTGC HEATING COIL SCHEDULE
OFF ALWAYS OFF
RESE RESIDENCE EQUIPMENT SCHEDULE
RESL RESIDENCE LIGHTING SCHEDULE
RESO RESIDENCE OCCUPANCY SCHEDULE
System:
FC FAN COIL
Equipment:
Cooling:
EQ1113 AIR-CLD RECIP <15 TONS
Heating:
EQ2001 GAS FIRE TUBE HOT WATER
Fan:
EQ4371 FAN COIL SUPPLY FAN

Schedule Name: AVAIL
Project: AVAILABLE (100)
Location:
Client:
Program User:
Comments:

Starting Month: JAN Ending Month: HTG
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	100
24	

Schedule Name: CLG
Project: COOLING TSTAT SCHEDULE
Location:
Client:
Program User:
Comments:

Starting Month: JAN Ending Month: DEC
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Temperature
0	76
24	

Schedule Name: CLGC
Project: COOLING COIL SCHEDULE
Location:
Client:
Program User: R. GERRANS
Comments:

Starting Month: JAN Ending Month: APR
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	0
24	

Starting Month: MAY Ending Month: OCT
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	100
24	

Starting Month: NOV Ending Month: HTG
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	0
24	

Schedule Name: HTG
Project: HEATING TSTAT SCHEDULE
Location:
Client:
Program User:
Comments:

Starting Month: JAN Ending Month: DEC
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Temperature
0	72
24	

Schedule Name: HTGC
Project: HEATING COIL SCHEDULE
Location:
Client:
Program User: R. GERRANS
Comments:

Starting Month: JAN Ending Month: APR
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	100
24	

Starting Month: MAY Ending Month: OCT
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	0
24	

Starting Month: NOV Ending Month: HTG
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	100
24	

Schedule Name: OFF
Project: ALWAYS OFF
Location:
Client:
Program User:
Comments:

Starting Month: JAN Ending Month: HTG
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	0
24	

Schedule Name: RESE
Project: RESIDENCE EQUIPMENT SCHEDULE
Location:
Client:
Program User:
Comments:

Starting Month: JAN Ending Month: DEC
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	5
5	40
7	5
16	40
18	30
19	100
20	20
22	5
24	

Schedule Name: RESL
Project: RESIDENCE LIGHTING SCHEDULE
Location:
Client:
Program User:
Comments:

Starting Month: JAN Ending Month: DEC
Starting Day Type: DSGN Ending Day Type: WKDY

Hour	Util Percent
0	0
5	90
8	10
16	50
19	100
23	0
24	

Starting Month: JAN Ending Month: DEC
Starting Day Type: SAT Ending Day Type: SUN

Hour	Util Percent
0	0
7	50
9	20
16	50
19	100
23	0
24	

Schedule Name: RESO
Project: RESIDENCE OCCUPANCY SCHEDULE
Location:
Client:
Program User:
Comments:

Starting Month: JAN Ending Month: DEC
Starting Day Type: DSGN Ending Day Type: WKDY

Hour	Util Percent
0	40
8	20
16	100
20	60
23	40
24	

Starting Month: JAN Ending Month: DEC
Starting Day Type: SAT Ending Day Type: SUN

Hour	Util Percent
0	40
10	30
17	90
20	60
23	40
24	

****
****
**
** TRACE 600 ANALYSIS **
**
** by **
**
****
****

FT MCPHERSON & FT GILLEM EEAP
FT MCPHERSON, BLDG 027

R. GERRANS

Weather File Code:	ATLANTA.	
Location:	ATLANTA, GEORGIA	
Latitude:	33.0	(deg)
Longitude:	84.0	(deg)
Time Zone:	6	
Elevation:	1,005	(ft)
Barometric Pressure:	28.8	(in. Hg)
Summer Clearness Number:	0.90	
Winter Clearness Number:	0.90	
Summer Design Dry Bulb:	92	(F)
Summer Design Wet Bulb:	74	(F)
Winter Design Dry Bulb:	22	(F)
Summer Ground Relectance:	0.20	
Winter Ground Relectance:	0.20	
Air Density:	0.0731	(Lbm/cuft)
Air Specific Heat:	0.2444	(Btu/lbm/F)
Density-Specific Heat Prod:	1.0727	(Btu-min./hr/cuft/F)
Latent Heat Factor:	4,721.8	(Btu-min./hr/cuft)
Enthalpy Factor:	4.3883	(Lb-min./hr/cuft)

Design Simulation Period: May To October
System Simulation Period: January To December
Cooling Load Methodology: TETD/Time Averaging

Time/Date Program was Run: 19: 9:59 4/ 7/92
Dataset Name: M027-B .TM

AIRFLOW - ALTERNATIVE 1
BLDG M027, BASELINE

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

System Number	System Type	Main Outside Airflow (Cfm)	Main Cooling Airflow (Cfm)	Main Heating Airflow (Cfm)	Main Return Airflow (Cfm)	Main Exhaust Airflow (Cfm)	Auxil. Supply Airflow (Cfm)	Room Exhaust Airflow (Cfm)
1	FC	0	10,000	10,000	10,552	552	0	0
Totals		0	10,000	10,000	10,552	552	0	0

CAPACITY - ALTERNATIVE 1
BLDG M027, BASELINE

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

System Number	System Type	Cooling Main Sys. Capacity (Tons)	Cooling Aux. Sys. Capacity (Tons)	Cooling Opt. Vent Capacity (Tons)	Cooling Totals (Tons)	Heating Main Sys. Capacity (Btuh)	Heating Aux. Sys. Capacity (Btuh)	Heating Preheat Capacity (Btuh)	Heating Reheat Capacity (Btuh)	Heating Humidif. Capacity (Btuh)	Heating Opt. Vent Capacity (Btuh)	Heating Totals (Btuh)
1	FC	10.6	0.0	0.0	10.6	-98,036	0	0	0	0	0	-98,036
Totals		10.6	0.0	0.0	10.6	-98,036	0	0	0	0	0	-98,036

The building peaked at hour 17 month 6 with a capacity of 10.6 tons

ENGINEERING CHECKS - ALTERNATIVE 1
BLDG M027, BASELINE

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 Cfm/ Sq Ft	Cooling Cfm/ Ton	Cooling Sq Ft /Ton	Cooling Btuh/ Sq Ft	Heating Cfm/ Sq Ft	Heating Btuh/ Sq Ft	Floor Area Sq Ft
1	Main	FC	0.00	1.21	944.8	782.3	15.34	1.21	-11.84	8,280

System 1 Block FC - FAN COIL

	COOLING COIL PEAK					CLG SPACE PEAK			HEATING COIL PEAK		
Peaked at Time ==>		Mo/Hr: 6/17					Mo/Hr: 6/17			Mo/Hr: 13/ 1	
Outside Air ==>		OADB/WB/HR: 94/ 70/ 77.0					OADB: 94			OADB: 22	
Envelope Loads	Space Sens.+Lat. (Btuh)	Ret. Air Sensible (Btuh)	Ret. Air Latent (Btuh)	Net Total (Btuh)	Percnt Of Tot (%)	Space Sensible (Btuh)	Percnt Of Tot (%)	Space Peak Space Sens (Btuh)	Coil Peak Tot Sens (Btuh)	Percnt Of Tot (%)	
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	16,377		16,377	12.90	0	0.00	0	-9,918	10.12	
Glass Solar	44,326	0		44,326	34.90	44,326	36.58	0	0	0.00	
Glass Cond	11,134	0		11,134	8.77	11,134	9.19	-32,306	-32,306	32.95	
Wall Cond	12,290	3,126		15,416	12.14	12,290	10.14	-12,169	-15,433	15.74	
Partition	0			0	0.00	0	0.00	0	0	0.00	
Exposed Floor	0			0	0.00	0	0.00	-13,440	-13,440	13.71	
Infiltration	9,112			9,112	7.17	10,836	8.94	-29,606	-29,606	30.20	
Sub Total==>	76,861	19,503		96,364	75.87	78,585	64.85	-87,520	-100,702	102.72	
Internal Loads											
Lights	6,754	0		6,754	5.32	6,754	5.57	0	0	0.00	
People	9,000			9,000	7.09	5,000	4.13	0	0	0.00	
Misc	11,331	0	0	11,331	8.92	11,331	9.35	0	0	0.00	
Sub Total==>	27,085	0	0	27,085	21.33	23,085	19.05	0	0	0.00	
Ceiling Load	19,503	-19,503		0	0.00	19,503	16.10	-13,182	0	0.00	
Outside Air	0	0	0	0	0.00	0	0.00	0	0	0.00	
Sup. Fan Heat				2,667	2.10		0.00		2,667	-2.72	
Ret. Fan Heat		889		889	0.70		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==>	123,450	889	0	127,005	100.00	121,174	100.00	-100,702	-98,036	10	

COOLING COIL SELECTION

	Total Capacity (Tons)	Capacity (Mbh)	Sens Cap. (Mbh)	Coil Airfl (cfm)	Entering DB/WB/HR Deg F	Deg F	Grains	Leaving DB/WB/HR Deg F	Deg F	Grains
Main Clg	10.6	127.0	124.7	10,000	76.1	65.6	81.6	64.5	61.7	81.2
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
0										
Totals	10.6	127.0								

AREAS

	Gross Total	Glass (sf)	(%)
Floor	8,280		
Part	0		
ExFlr	336		
Roof	4,692		0
Wall	6,720	869	13

HEATING COIL SELECTION

	Capacity (Mbh)	Coil Airfl (cfm)	Ent Deg F	Lvg Deg F
Main Htg	-98.0	10,000	72.2	81.4
Aux Htg	0.0	0	0.0	0.0
Preheat	-0.0	10,000	72.2	64.7
Reheat	0.0	0	0.0	0.0
Humidif	0.0	0	0.0	0.0
Opt Vent	0.0	0	0.0	0.0
Total	-98.0			

AIRFLOWS (cfm)

Type	Cooling	Heating
Vent	0	0
Infil	552	552
Supply	10,000	10,000
Mincfm	0	0
Return	10,000	10,000
Exhaust	0	0
Rm Exh	0	0
Auxil	0	0

ENGINEERING CHECKS

Clg % OA	0.0
Clg Cfm/Sqft	1.21
Clg Cfm/Ton	944.84
Clg Sqft/Ton	782.33
Clg Btuh/Sqft	15.34
No. People	20
Htg % OA	0.0
Htg Cfm/SqFt	1.21
Htg Btuh/SqFt	-11.84

TEMPERATURES (F)

Type	Clg	Htg
SADB	64.7	81.4
Plenum	83.4	67.0
Return	76.0	72.0
Ret/OA	76.0	72.0
Runarnd	76.0	72.0
Fn MtrTD	0.1	0.0
Fn BldTD	0.1	0.0
Fn Frict	0.2	0.0

COOLING LOADS AT COIL PEAK - ALTERNATIVE 1
BLDG M027, BASELINE

AIRFLOW COOLING LOADS
(At time of Coil Peak)

Room Number	Description	Ventilation Airflow (Cfm)	Ventilation Sensible (Btuh)	Ventilation Latent (Btuh)	Optional Ventilation Airflow (Cfm)	Optional Ventilation Sensible (Btuh)	Optional Ventilation Latent (Btuh)	Bypass Airflow (Cfm)	Bypass Sensible (Btuh)	Bypass Latent (Btuh)	Ov/Undr Sizing (Btuh)
1	INTERIOR SPACE	0	0	0	0	0	0	0	0	0	0
Zone 1	Total/Ave.	0	0	0	0	0	0	0	0	0	0
Zone 1	Block	0	0	0	0	0	0	0	0	0	0
System 1	Total/Ave.	0	0	0	0	0	0	0	0	0	0
System 1	Block	0	0	0	0	0	0	0	0	0	0

HEATING LOADS AT COIL PEAK - ALTERNATIVE 1
BLDG M027, BASELINE

AIRFLOW HEATING LOADS
(At time of Coil Peak)

Room Number	Description	Ventilation Airflow (Cfm)	Ventilation Sensible (Btuh)	Op. Vent. Airflow (Cfm)	Op. Vent. Sensible (Btuh)	Reheat Airflow (Cfm)	Reheat Sensible (Btuh)	Humidif. Airflow (Cfm)	Humidif. Latent (Btuh)	Total (Btuh)
1	INTERIOR SPACE	0	0	0	0	0	0	0	0	0
Zone 1	Total/Ave.	0	0	0	0	0	0	0	0	0
Zone 1	Block	0	0	0	0	0	0	0	0	0
System 1	Total/Ave.	0	0	0	0	0	0	0	0	0
System 1	Block	0	0	0	0	0	0	0	0	0

COOLING AIRFLOW HEAT GAIN/LOSS - ALTERNATIVE 1
BLDG M027, BASELINE

AIRFLOW HEAT GAIN AND LOSS
(At time of Coil Peak)

Room Number	Description	Cooling: Duct Heat Pickup (Btuh)	Supply Fan Heat (Btuh)	Return Fan Heat (Btuh)	System Exhaust Heat Loss (Btuh)	Total (Btuh)	System Exhaust Airflow (Cfm)	Room Exhaust Airflow (Cfm)	Ducted Airflow (Cfm)	Plenum Airflow (Cfm)	Run Around Airflow (Cfm)	Corridr Airflow (Cfm)	System Return Airflow (Cfm)
1	INTERIOR SPACE	0	2,667	889	0	3,556	0	0	0	0	0	0	10,000
Zone 1	Total/Ave.	0	2,667	889	0	3,556	0	0	0	0	0	0	10,000
Zone 1	Block	0	2,667	889	0	3,556	0	0	0	0	0	0	10,000
System 1	Total/Ave.	0	2,667	889	0	3,556	0	0	0	0	0	0	10,000
System 1	Block	0	2,667	889	0	3,556	0	0	0	0	0	0	10,000

HEATING AIRFLOW HEAT GAIN/LOSS - ALTERNATIVE 1
BLDG M027, BASELINE

AIRFLOW HEAT GAIN AND LOSS
(At time of Coil Peak)

Room Number	Description	Heating: Supply Fan Heat (Btuh)	Return Fan Heat (Btuh)	System Exhaust Heat Loss (Btuh)	Total (Btuh)	System Exhaust Airflow (Cfm)	Room Exhaust Airflow (Cfm)	Ducted Airflow (Cfm)	Plenum Airflow (Cfm)	Run Around Airflow (Cfm)	Corridr Airflow (Cfm)	System Return Airflow (Cfm)
1	INTERIOR SPACE	2,667	0	0	2,667	0	0	0	0	0	0	10,000
Zone 1	Total/Ave.	2,667	0	0	2,667	0	0	0	0	0	0	10,000
Zone 1	Block	2,667	0	0	2,667	0	0	0	0	0	0	10,000
System 1	Total/Ave.	2,667	0	0	2,667	0	0	0	0	0	0	10,000
System 1	Block	2,667	0	0	2,667	0	0	0	0	0	0	10,000

ROOM PSYCHROMETRICS - ALTERNATIVE 1
BLDG M027, BASELINE

---------- P S Y C H R O M E T R I C S T A T E P O I N T S ----------

Room 1

	Dry Bulb (F)	Wet Bulb (F)	Relat. Humid. (%)	Humid. Ratio (GR)	Enthalpy (Btu/Lb)	Temp. Diff. (F)
Space	76.0	65.6	58.3	81.6	31.0	
Main System						
Return Air Heat Pickup						-0.1
Return Fan						0.1
Return Air	76.0	65.6	58.3	81.6	31.0	
Outdoor Air	94.3	70.3	30.6	77.0	34.8	
Return/Outdoor Air Mix	76.0	65.6	58.3	81.6	31.0	
Blow through Fan						0.1
Entering Coil	76.1	65.6	58.2	81.6	31.0	
Leaving Coil	64.5	61.8	86.2	81.6	28.2	
Draw Through Fan						0.0
Duct Frictional Heat						0.2
Supply Duct Heat Gain						0.0
Cold Deck Supply Air	64.7	61.8	85.7	81.6	28.2	
Supply Air	64.7	61.8	85.6	81.6	28.2	

Percent Outside Air	0.00	(%)
Sensible Heat Ratio (SHR)	0.982	
Percent Supply Air Bypassing Coil	0.00	(%)
Coil Airflow	10,000	(Cfm)

BUILDING U-VALUES - ALTERNATIVE 1
BLDG M027, BASELINE

---------- 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) Part.	ExFlr	Summr Skylt	Wintr Skylt	Roof	Summr Windo	Wintr Windo	Wall	Ceil.	Room Mass (lb/ sqft)	Room Capac. (Btu/ sqft/F)
1	INTERIOR SPACE	0.000	0.800	0.000	0.000	0.047	0.700	0.743	0.054	0.317	29.9	7.19
Zone 1	Total/Ave.	0.000	0.800	0.000	0.000	0.047	0.700	0.743	0.054	0.317	29.9	7.19
System 1	Total/Ave.	0.000	0.800	0.000	0.000	0.047	0.700	0.743	0.054	0.317	29.9	7.19
Building		0.000	0.800	0.000	0.000	0.047	0.700	0.743	0.054	0.317	29.9	7.19

BUILDING AREAS - ALTERNATIVE 1
BLDG M027, BASELINE

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	INTERIOR SPACE	1	1	8,280	8,280	0	336	0	0	4,692	869	13	5,851
Zone	1 Total/Ave.				8,280	0	336	0	0	4,692	869	13	5,851
System	1 Total/Ave.				8,280	0	336	0	0	4,692	869	13	5,851
Building					8,280	0	336	0	0	4,692	869	13	5,851

ASHRAE 90 ANALYSIS - ALTERNATIVE 1
BLDG M027, BASELINE

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

Overall Roof U-Value = 0.047 (Btu/Hr/Sq Ft/F)
Overall Wall U-Value = 0.138 (Btu/Hr/Sq Ft/F)
Overall Building U-Value = 0.100 (Btu/Hr/Sq Ft/F)

Roof Overall Thermal Transfer Value (OTTVr) = 2.44 (Btu/Hr/Sq Ft)
Wall Overall Thermal Transfer Value (OTTVw) = 12.51 (Btu/Hr/Sq Ft)

SYSTEM LOAD PROFILE - ALTERNATIVE 1
BLDG M027, BASELINE

Main System 1 FC FAN COIL

Percent Design Load	Cooling Load Cap. (Ton)	Cooling Load Hours (%)	Cooling Load Hours	Heating Load Capacity (Btuh)	Heating Load Hours (%)	Heating Load Hours	Cooling Airflow Cap. (Cfm)	Cooling Airflow Hours (%)	Cooling Airflow Hours	Heating Airflow Cap. (Cfm)	Heating Airflow Hours (%)	Heating Airflow Hours
0 - 5	0.5	5	161	-4,902	9	123	500.0	0	0	0.0	0	0
5 - 10	1.1	6	190	-9,804	10	139	1,000.0	0	0	0.0	0	0
10 - 15	1.6	8	225	-14,705	10	137	1,500.0	0	0	0.0	0	0
15 - 20	2.1	7	202	-19,607	20	262	2,000.0	0	0	0.0	0	0
20 - 25	2.6	11	336	-24,509	12	155	2,500.0	0	0	0.0	0	0
25 - 30	3.2	14	418	-29,411	6	74	3,000.0	0	0	0.0	0	0
30 - 35	3.7	12	350	-34,313	0	0	3,500.0	0	0	0.0	0	0
35 - 40	4.2	7	218	-39,214	8	109	4,000.0	0	0	0.0	0	0
40 - 45	4.8	6	180	-44,116	14	189	4,500.0	0	0	0.0	0	0
45 - 50	5.3	3	93	-49,018	11	149	5,000.0	0	0	0.0	0	0
50 - 55	5.8	6	188	-53,920	0	0	5,500.0	0	0	0.0	0	0
55 - 60	6.4	2	66	-58,821	0	0	6,000.0	0	0	0.0	0	0
60 - 65	6.9	9	266	-63,723	0	0	6,500.0	0	0	0.0	0	0
65 - 70	7.4	1	19	-68,625	0	0	7,000.0	0	0	0.0	0	0
70 - 75	7.9	2	51	-73,527	0	0	7,500.0	0	0	0.0	0	0
75 - 80	8.5	1	22	-78,429	0	0	8,000.0	0	0	0.0	0	0
80 - 85	9.0	0	0	-83,330	0	0	8,500.0	0	0	0.0	0	0
85 - 90	9.5	0	0	-88,232	0	0	9,000.0	0	0	0.0	0	0
90 - 95	10.1	0	0	-93,134	0	0	9,500.0	0	0	0.0	0	0
95 - 100	10.6	0	0	-98,036	0	0	10,000.0	100	8,760	0.0	0	0
Hours Off	0.0	0	5,775	0	0	7,423	0.0	0	0	0.0	0	8,760

SYSTEM TOTALS LOAD PROFILE - ALTERNATIVE 1
BLDG M027, BASELINE

SYSTEM LOAD PROFILE

System Totals

Percent Design Load	Cooling Load Cap. (Ton)	Cooling Load Hours (%)	Cooling Load Hours	Heating Load Capacity (Btuh)	Heating Load Hours (%)	Heating Load Hours	Cooling Airflow Cap. (Cfm)	Cooling Airflow Hours (%)	Cooling Airflow Hours	Heating Airflow Cap. (Cfm)	Heating Airflow Hours (%)	Heating Airflow Hours
0 - 5	0.5	5	161	-4,902	9	123	500.0	0	0	0.0	0	0
5 - 10	1.1	6	190	-9,804	10	139	1,000.0	0	0	0.0	0	0
10 - 15	1.6	8	225	-14,705	10	137	1,500.0	0	0	0.0	0	0
15 - 20	2.1	7	202	-19,607	20	262	2,000.0	0	0	0.0	0	0
20 - 25	2.6	11	336	-24,509	12	155	2,500.0	0	0	0.0	0	0
25 - 30	3.2	14	418	-29,411	6	74	3,000.0	0	0	0.0	0	0
30 - 35	3.7	12	350	-34,313	0	0	3,500.0	0	0	0.0	0	0
35 - 40	4.2	7	218	-39,214	8	109	4,000.0	0	0	0.0	0	0
40 - 45	4.8	6	180	-44,116	14	189	4,500.0	0	0	0.0	0	0
45 - 50	5.3	3	93	-49,018	11	149	5,000.0	0	0	0.0	0	0
50 - 55	5.8	6	188	-53,920	0	0	5,500.0	0	0	0.0	0	0
55 - 60	6.4	2	66	-58,821	0	0	6,000.0	0	0	0.0	0	0
60 - 65	6.9	9	266	-63,723	0	0	6,500.0	0	0	0.0	0	0
65 - 70	7.4	1	19	-68,625	0	0	7,000.0	0	0	0.0	0	0
70 - 75	7.9	2	51	-73,527	0	0	7,500.0	0	0	0.0	0	0
75 - 80	8.5	1	22	-78,429	0	0	8,000.0	0	0	0.0	0	0
80 - 85	9.0	0	0	-83,330	0	0	8,500.0	0	0	0.0	0	0
85 - 90	9.5	0	0	-88,232	0	0	9,000.0	0	0	0.0	0	0
90 - 95	10.1	0	0	-93,134	0	0	9,500.0	0	0	0.0	0	0
95 - 100	10.6	0	0	-98,036	0	0	10,000.0	100	8,760	0.0	0	0
Hours Off	0.0	0	5,775	0	0	7,423	0.0	0	0	0.0	0	8,760

BUILDING COOL-HEAT DEMAND - ALTERNATIVE 1
BLDG M027, BASELINE

January			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	33.4	30.4	-43,613	0.0	-14,410	0.0	-41,305	0.0	-41,305	0.0	-41,305	0.0
2	32.1	29.3	-45,525	0.0	-43,728	0.0	-43,717	0.0	-43,717	0.0	-43,717	0.0
3	31.7	29.3	-47,318	0.0	-44,620	0.0	-44,620	0.0	-44,620	0.0	-44,620	0.0
4	31.9	29.5	-47,878	0.0	-45,504	0.0	-45,504	0.0	-45,504	0.0	-45,504	0.0
5	32.6	30.3	-49,112	0.0	-45,870	0.0	-45,870	0.0	-45,870	0.0	-45,870	0.0
6	33.6	31.3	-27,066	0.0	-24,484	0.0	-36,642	0.0	-36,642	0.0	-24,484	0.0
7	35.0	32.6	-25,741	0.0	-22,614	0.0	-34,771	0.0	-34,771	0.0	-22,614	0.0
8	36.6	34.4	-10,741	0.0	-19,403	0.0	-24,806	0.0	-24,806	0.0	-19,403	0.0
9	38.5	36.3	-6,080	0.0	-22,289	0.0	-15,886	0.0	-15,886	0.0	-22,289	0.0
10	40.4	37.7	0	0.0	-15,086	0.0	-12,735	0.0	-12,735	0.0	-15,086	0.0
11	42.3	38.7	0	0.0	-14,500	0.0	-12,649	0.0	-12,649	0.0	-14,500	0.0
12	44.2	39.6	0	0.0	-13,928	0.0	-12,077	0.0	-12,077	0.0	-13,928	0.0
13	45.8	40.5	0	0.0	-9,635	0.0	-7,785	0.0	-7,785	0.0	-9,635	0.0
14	47.2	41.1	0	0.0	-4,605	0.0	-2,754	0.0	-2,754	0.0	-4,605	0.0
15	48.2	41.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
16	48.9	41.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
17	49.1	41.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
18	48.7	41.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
19	47.4	41.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
20	45.5	40.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
21	43.1	38.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
22	40.4	36.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
23	37.7	34.3	0	0.0	-17,917	0.0	-19,228	0.0	-19,228	0.0	-17,917	0.0
24	35.3	32.3	0	0.0	-39,202	0.0	-39,202	0.0	-39,202	0.0	-39,202	0.0

February			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	37.5	34.5	-43,554	0.0	0	0.0	-38,742	0.0	-38,742	0.0	-38,742	0.0
2	36.0	33.0	-45,406	0.0	-15,637	0.0	-41,166	0.0	-41,166	0.0	-41,166	0.0
3	34.7	31.8	-47,141	0.0	-42,793	0.0	-42,783	0.0	-42,783	0.0	-42,783	0.0
4	33.6	30.9	-47,641	0.0	-44,123	0.0	-44,123	0.0	-44,123	0.0	-44,123	0.0
5	32.8	30.1	-48,023	0.0	-45,665	0.0	-45,665	0.0	-45,665	0.0	-45,665	0.0
6	32.2	29.8	-25,773	0.0	-25,151	0.0	-37,308	0.0	-37,308	0.0	-25,151	0.0
7	32.1	29.6	-23,654	0.0	-23,850	0.0	-36,008	0.0	-36,008	0.0	-23,850	0.0
8	32.5	30.3	-615	0.0	-17,101	0.0	-22,505	0.0	-22,505	0.0	-17,101	0.0
9	33.9	31.6	-1,377	0.0	-24,726	0.0	-18,323	0.0	-18,323	0.0	-24,726	0.0
10	36.0	33.0	0	0.0	-22,878	0.0	-20,528	0.0	-20,528	0.0	-22,878	0.0
11	38.5	34.8	0	0.0	-22,646	0.0	-20,795	0.0	-20,795	0.0	-22,646	0.0
12	41.3	36.5	0	0.0	-19,131	0.0	-17,280	0.0	-17,280	0.0	-19,131	0.0
13	43.8	38.1	0	0.0	-15,378	0.0	-13,527	0.0	-13,527	0.0	-15,378	0.0
14	45.9	39.5	0	0.0	-8,662	0.0	-6,811	0.0	-6,811	0.0	-8,662	0.0
15	47.2	40.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
16	47.7	40.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
17	47.5	40.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
18	47.0	39.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
19	46.2	39.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
20	45.1	39.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
21	43.8	39.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
22	42.3	38.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
23	40.7	37.2	0	0.0	-7,167	0.0	-8,482	0.0	-8,482	0.0	-7,167	0.0
24	39.1	35.8	0	0.0	-36,052	0.0	-36,051	0.0	-36,051	0.0	-36,052	0.0

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

BUILDING COOL-HEAT DEMAND - ALTERNATIVE 1
BLDG M027, BASELINE

March			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	45.4	41.6	-27,658	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2	43.3	39.7	-29,894	0.0	0	0.0	0	0.0	0	0.0	0	0.0
3	41.6	38.6	-31,746	0.0	0	0.0	0	0.0	0	0.0	0	0.0
4	40.6	37.5	-33,276	0.0	0	0.0	0	0.0	0	0.0	0	0.0
5	40.2	37.3	-33,922	0.0	0	0.0	0	0.0	-22,153	0.0	-23,891	0.0
6	40.6	37.8	-11,876	0.0	0	0.0	0	0.0	-25,257	0.0	-13,098	0.0
7	41.6	39.0	0	0.0	0	0.0	0	0.0	-10,107	0.0	0	0.0
8	43.3	40.7	0	0.0	0	0.0	0	0.0	-7,653	0.0	0	0.0
9	45.4	42.5	0	0.0	0	0.0	0	0.0	-2,908	0.0	-9,312	0.0
10	47.9	44.3	0	0.0	0	0.0	0	0.0	-4,813	0.0	-7,164	0.0
11	50.6	45.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
12	53.3	46.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
13	55.8	48.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
14	58.0	49.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
15	59.6	50.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
16	60.7	50.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
17	61.0	50.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
18	60.7	50.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
19	59.6	50.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
20	58.0	50.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
21	55.8	49.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
22	53.3	47.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
23	50.6	45.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
24	47.9	43.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0

April			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	57.7	53.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2	55.9	52.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
3	54.2	51.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
4	52.9	50.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
5	51.9	49.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
6	51.2	49.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
7	51.0	49.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
8	51.6	49.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
9	53.3	50.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
10	55.9	51.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
11	59.0	53.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
12	62.4	55.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
13	65.5	57.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
14	68.1	59.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
15	69.8	60.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
16	70.4	60.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
17	70.2	60.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
18	69.5	60.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
19	68.5	59.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
20	67.2	59.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
21	65.5	59.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
22	63.7	58.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
23	61.7	57.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
24	59.7	55.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0

BUILDING COOL-HEAT DEMAND - ALTERNATIVE 1
BLDG M027, BASELINE

May			------ Design -----		----- Weekday -----		-----Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	66.6	62.3	0	10.6	0	0.0	0	0.0	0	0.0	0	0.0
2	64.5	60.4	0	10.6	0	0.0	0	0.0	0	0.0	0	0.0
3	62.7	59.1	0	10.6	0	0.0	0	0.0	0	0.0	0	0.0
4	61.2	58.1	0	7.3	0	0.0	0	0.0	0	0.0	0	0.0
5	60.0	57.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
6	59.3	56.6	0	2.2	0	0.0	0	0.0	0	0.0	0	0.0
7	59.0	56.5	0	4.4	0	0.0	0	0.0	0	0.0	0	0.0
8	59.5	56.6	0	4.2	0	0.8	0	0.0	0	0.0	0	0.7
9	60.9	56.6	0	3.7	0	0.7	0	0.0	0	0.0	0	0.7
10	63.0	57.2	0	3.9	0	1.3	0	1.1	0	1.1	0	1.3
11	65.7	58.1	0	4.0	0	1.4	0	1.6	0	1.6	0	1.4
12	68.7	59.8	0	4.5	0	1.8	0	1.9	0	1.9	0	1.8
13	71.7	61.6	0	4.9	0	2.3	0	2.4	0	2.4	0	2.3
14	74.5	63.4	0	6.0	0	3.2	0	3.4	0	3.4	0	3.2
15	76.6	64.8	0	7.1	0	4.3	0	4.4	0	4.4	0	4.3
16	78.0	65.6	0	7.6	0	4.1	0	4.3	0	4.3	0	4.1
17	78.5	65.6	0	9.0	0	5.9	0	5.6	0	5.6	0	5.9
18	78.2	65.8	0	7.4	0	5.0	0	5.0	0	5.0	0	5.0
19	77.5	65.6	0	4.1	0	3.1	0	3.1	0	3.1	0	3.1
20	76.3	66.1	0	5.6	0	4.9	0	4.8	0	4.8	0	4.9
21	74.8	67.2	0	2.8	0	2.4	0	2.4	0	2.4	0	2.4
22	73.0	66.4	0	2.3	0	2.0	0	2.0	0	2.0	0	2.0
23	70.9	65.4	0	1.6	0	1.4	0	1.4	0	1.4	0	1.4
24	68.7	64.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0

June			------ Design -----		----- Weekday -----		-----Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	73.0	67.9	0	0.9	0	0.3	0	0.4	0	0.4	0	0.4
2	71.2	66.1	0	0.9	0	0.0	0	0.0	0	0.0	0	0.0
3	69.7	65.2	0	0.8	0	0.0	0	0.0	0	0.0	0	0.0
4	68.5	64.3	0	0.6	0	0.0	0	0.0	0	0.0	0	0.0
5	67.8	64.2	0	0.6	0	0.0	0	0.0	0	0.0	0	0.0
6	67.6	64.2	0	4.2	0	1.5	0	0.5	0	0.5	0	1.5
7	68.1	64.8	0	5.7	0	3.3	0	2.3	0	2.3	0	3.5
8	69.4	65.7	0	5.5	0	2.9	0	2.5	0	2.5	0	3.0
9	71.6	66.2	0	5.0	0	2.3	0	2.9	0	2.9	0	2.3
10	74.2	67.2	0	5.1	0	3.2	0	3.6	0	3.6	0	3.3
11	77.2	68.5	0	5.2	0	3.3	0	3.5	0	3.5	0	3.3
12	80.2	70.0	0	5.9	0	3.7	0	4.0	0	4.0	0	3.8
13	82.8	70.8	0	6.4	0	4.2	0	4.4	0	4.4	0	4.2
14	85.0	71.6	0	7.7	0	5.5	0	5.7	0	5.7	0	5.5
15	86.3	72.3	0	8.8	0	6.6	0	6.8	0	6.8	0	6.6
16	86.8	72.1	0	9.2	0	6.4	0	6.5	0	6.5	0	6.4
17	86.6	71.7	0	10.6	0	8.1	0	7.6	0	7.6	0	8.1
18	85.8	71.5	0	9.9	0	6.9	0	6.8	0	6.8	0	6.9
19	84.7	71.2	0	5.5	0	4.3	0	4.3	0	4.3	0	4.3
20	83.2	71.5	0	6.9	0	6.8	0	6.7	0	6.7	0	6.8
21	81.4	71.7	0	4.1	0	3.3	0	3.3	0	3.3	0	3.3
22	79.3	71.4	0	3.6	0	2.9	0	2.9	0	2.9	0	2.9
23	77.2	70.5	0	2.8	0	2.2	0	2.2	0	2.2	0	2.2
24	75.1	69.1	0	1.3	0	0.7	0	0.7	0	0.7	0	0.7

BUILDING COOL-HEAT DEMAND - ALTERNATIVE 1
BLDG M027, BASELINE

July			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	72.0	69.3	0	1.2	0	0.2	0	0.3	0	0.3	0	0.3
2	70.5	68.0	0	0.9	0	0.0	0	0.0	0	0.0	0	0.0
3	69.4	67.1	0	0.8	0	0.0	0	0.0	0	0.0	0	0.0
4	68.5	66.4	0	0.7	0	0.0	0	0.0	0	0.0	0	0.0
5	67.9	66.0	0	0.6	0	0.0	0	0.0	0	0.0	0	0.0
6	67.7	65.9	0	3.8	0	1.2	0	0.0	0	0.0	0	1.4
7	68.1	66.3	0	5.8	0	3.5	0	2.8	0	2.8	0	4.1
8	69.1	67.3	0	5.6	0	3.1	0	3.1	0	3.1	0	3.4
9	70.8	68.0	0	4.8	0	2.3	0	3.2	0	3.2	0	2.5
10	72.9	69.1	0	5.1	0	3.2	0	3.5	0	3.5	0	3.2
11	75.2	70.5	0	5.2	0	3.2	0	3.4	0	3.4	0	3.2
12	77.5	71.7	0	5.8	0	3.6	0	3.8	0	3.8	0	3.6
13	79.6	72.7	0	6.4	0	4.0	0	4.2	0	4.2	0	4.0
14	81.3	73.5	0	7.5	0	5.0	0	5.2	0	5.2	0	5.0
15	82.3	73.7	0	8.6	0	6.1	0	6.4	0	6.4	0	6.1
16	82.7	73.5	0	9.1	0	6.2	0	6.4	0	6.4	0	6.2
17	82.5	73.1	0	10.6	0	7.8	0	7.3	0	7.3	0	7.8
18	82.0	72.6	0	9.0	0	6.5	0	6.4	0	6.4	0	6.5
19	81.1	73.2	0	5.0	0	3.9	0	3.9	0	3.9	0	3.9
20	79.9	73.8	0	6.8	0	6.7	0	6.6	0	6.6	0	6.7
21	78.5	73.9	0	3.8	0	3.0	0	3.0	0	3.0	0	3.0
22	76.9	73.1	0	3.3	0	2.9	0	2.9	0	2.9	0	2.9
23	75.2	71.9	0	2.6	0	2.2	0	2.2	0	2.2	0	2.2
24	73.5	70.8	0	1.3	0	0.5	0	0.5	0	0.5	0	0.5

August			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	72.7	70.2	0	1.2	0	0.2	0	0.3	0	0.3	0	0.3
2	71.2	69.0	0	0.9	0	0.0	0	0.0	0	0.0	0	0.0
3	69.9	68.0	0	0.7	0	0.0	0	0.0	0	0.0	0	0.0
4	68.8	67.1	0	0.6	0	0.0	0	0.0	0	0.0	0	0.0
5	68.0	66.6	0	0.5	0	0.0	0	0.0	0	0.0	0	0.0
6	67.5	66.2	0	2.9	0	0.9	0	0.0	0	0.0	0	1.0
7	67.3	66.1	0	5.7	0	3.4	0	2.1	0	2.1	0	3.8
8	67.8	66.5	0	5.6	0	2.9	0	2.8	0	2.8	0	3.2
9	69.1	67.0	0	4.9	0	2.1	0	3.0	0	3.0	0	2.2
10	71.2	67.8	0	5.3	0	2.9	0	3.4	0	3.4	0	3.0
11	73.8	68.7	0	5.4	0	2.9	0	3.3	0	3.3	0	3.0
12	76.5	70.0	0	5.7	0	3.3	0	3.5	0	3.5	0	3.3
13	79.1	71.2	0	6.4	0	4.2	0	4.4	0	4.4	0	4.2
14	81.1	72.6	0	7.6	0	5.4	0	5.6	0	5.6	0	5.4
15	82.5	73.6	0	8.8	0	6.6	0	6.8	0	6.8	0	6.6
16	83.0	73.7	0	9.1	0	5.4	0	5.6	0	5.6	0	5.4
17	82.8	73.5	0	10.5	0	7.7	0	7.2	0	7.2	0	7.7
18	82.3	73.5	0	7.6	0	5.7	0	5.6	0	5.6	0	5.7
19	81.5	73.1	0	4.8	0	3.8	0	3.8	0	3.8	0	3.8
20	80.4	73.7	0	6.8	0	6.5	0	6.4	0	6.4	0	6.5
21	79.1	74.9	0	3.7	0	3.0	0	3.0	0	3.0	0	3.0
22	77.6	73.9	0	3.3	0	2.9	0	2.9	0	2.9	0	2.9
23	76.0	72.7	0	2.6	0	2.3	0	2.3	0	2.3	0	2.3
24	74.3	71.3	0	1.3	0	0.6	0	0.6	0	0.6	0	0.6

BUILDING COOL-HEAT DEMAND - ALTERNATIVE 1
BLDG M027, BASELINE

September			------ Design -----		----- Weekday -----		-----Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	69.8	66.1	0	0.5	0	0.0	0	0.0	0	0.0	0	0.0
2	68.0	64.5	0	0.3	0	0.0	0	0.0	0	0.0	0	0.0
3	66.3	63.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
4	64.9	61.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
5	63.9	61.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
6	63.2	61.0	0	1.6	0	0.0	0	0.0	0	0.0	0	0.0
7	63.0	60.8	0	4.1	0	0.0	0	0.0	0	0.0	0	0.0
8	63.4	61.4	0	4.5	0	1.8	0	0.0	0	0.0	0	1.8
9	64.7	61.8	0	4.2	0	1.4	0	1.3	0	1.3	0	1.4
10	66.6	62.1	0	4.4	0	1.5	0	1.7	0	1.7	0	1.5
11	69.1	62.9	0	4.5	0	2.2	0	2.4	0	2.4	0	2.2
12	71.8	63.7	0	4.8	0	2.3	0	2.5	0	2.5	0	2.3
13	74.5	65.5	0	5.6	0	3.2	0	3.3	0	3.3	0	3.2
14	77.0	67.1	0	7.1	0	4.3	0	4.4	0	4.4	0	4.3
15	78.9	68.2	0	8.1	0	4.5	0	4.6	0	4.6	0	4.5
16	80.2	68.6	0	8.0	0	4.4	0	4.6	0	4.6	0	4.4
17	80.6	68.5	0	8.5	0	5.7	0	5.5	0	5.5	0	5.8
18	80.4	68.9	0	5.0	0	3.8	0	3.7	0	3.7	0	3.8
19	79.7	70.0	0	4.1	0	3.1	0	3.1	0	3.1	0	3.1
20	78.7	71.2	0	5.6	0	5.5	0	5.4	0	5.4	0	5.5
21	77.3	71.6	0	3.0	0	2.5	0	2.5	0	2.5	0	2.5
22	75.6	70.5	0	2.6	0	2.4	0	2.4	0	2.4	0	2.4
23	73.7	69.4	0	1.9	0	1.8	0	1.8	0	1.8	0	1.8
24	71.8	67.7	0	0.5	0	0.2	0	0.2	0	0.2	0	0.2

October			------ Design -----		----- Weekday -----		-----Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	54.8	51.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2	52.9	49.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
3	51.2	48.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
4	49.8	47.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
5	48.8	46.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
6	48.2	45.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
7	47.9	45.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
8	48.5	46.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
9	50.3	47.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
10	52.9	48.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
11	56.2	49.9	0	0.7	0	0.0	0	0.0	0	0.0	0	0.0
12	59.6	51.5	0	2.6	0	0.0	0	0.0	0	0.0	0	0.0
13	62.9	53.5	0	3.6	0	0.0	0	0.0	0	0.0	0	0.0
14	65.5	55.2	0	4.8	0	0.0	0	0.0	0	0.0	0	0.0
15	67.3	56.3	0	5.6	0	0.0	0	0.0	0	0.0	0	0.0
16	67.9	56.6	0	5.4	0	0.0	0	0.0	0	0.0	0	0.0
17	67.7	56.4	0	4.2	0	1.8	0	1.2	0	1.2	0	2.0
18	67.0	56.6	0	2.8	0	1.8	0	1.7	0	1.7	0	1.8
19	66.0	57.6	0	1.8	0	1.2	0	1.2	0	1.2	0	1.2
20	64.6	57.9	0	3.4	0	3.1	0	3.1	0	3.1	0	3.1
21	62.9	57.3	0	0.9	0	0.8	0	0.8	0	0.8	0	0.8
22	61.0	56.0	0	0.5	0	0.6	0	0.6	0	0.6	0	0.6
23	59.0	54.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
24	56.9	53.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0

BUILDING COOL-HEAT DEMAND - ALTERNATIVE 1
BLDG M027, BASELINE

November			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	48.7	45.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2	46.9	44.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
3	45.5	42.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
4	44.6	41.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
5	44.4	42.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
6	44.8	42.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
7	45.9	43.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
8	47.8	46.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
9	50.2	48.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
10	52.9	49.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
11	55.8	51.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
12	58.5	52.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
13	60.9	52.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
14	62.8	53.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
15	64.0	53.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
16	64.4	53.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
17	64.1	53.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
18	63.2	53.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
19	61.8	54.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
20	60.0	53.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
21	57.9	52.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
22	55.6	51.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
23	53.2	49.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
24	50.8	47.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0

December			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	37.5	35.3	0	0.0	0	0.0	-39,738	0.0	-39,738	0.0	-39,738	0.0
2	37.1	35.1	0	0.0	0	0.0	-41,349	0.0	-41,349	0.0	-41,349	0.
3	37.4	35.5	0	0.0	-16,183	0.0	-41,685	0.0	-41,685	0.0	-41,685	0.0
4	38.1	36.2	0	0.0	-40,233	0.0	-40,223	0.0	-40,223	0.0	-40,223	0.0
5	39.3	37.6	-37,979	0.0	-40,353	0.0	-40,353	0.0	-40,353	0.0	-40,353	0.0
6	40.9	39.2	-17,118	0.0	-15,957	0.0	-28,114	0.0	-28,114	0.0	-15,957	0.0
7	42.7	41.2	-16,907	0.0	-15,050	0.0	-27,208	0.0	-27,208	0.0	-15,050	0.0
8	44.7	43.1	-1,503	0.0	-9,031	0.0	-14,434	0.0	-14,434	0.0	-9,031	0.0
9	46.8	45.3	0	0.0	-10,119	0.0	-3,716	0.0	-3,716	0.0	-10,119	0.0
10	48.8	47.0	0	0.0	-5,763	0.0	-3,413	0.0	-3,413	0.0	-5,763	0.0
11	50.7	48.1	0	0.0	-4,593	0.0	-2,742	0.0	-2,742	0.0	-4,593	0.0
12	52.2	48.8	0	0.0	-3,295	0.0	-1,444	0.0	-1,444	0.0	-3,295	0.0
13	53.4	49.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
14	54.1	49.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
15	54.4	48.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
16	54.0	48.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
17	53.0	47.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
18	51.4	46.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
19	49.3	45.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
20	47.0	43.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
21	44.5	41.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
22	42.2	39.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
23	40.1	37.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
24	38.5	36.2	0	0.0	-17,593	0.0	-15,939	0.0	-15,939	0.0	-17,593	0.0

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M027, BASELINE

M O N T H L Y E N E R G Y C O N S U M P T I O N

Month	ELEC On Peak (kWh)	DEMAND On Peak (kW)	GAS On Peak (Therm)	GAS DMND On Peak (Thrm/hr)
Jan	5,071	15	154	1
Feb	4,561	15	136	1
March	4,524	15	6	0
April	4,321	15	0	0
May	6,666	24	0	0
June	8,119	27	0	0
July	8,144	26	0	0
Aug	8,063	26	0	0
Sept	6,739	24	0	0
Oct	4,970	21	0	0
Nov	4,321	15	0	0
Dec	4,898	15	86	1
Total	70,398	27	382	1

Building Energy Consumption = 33,634 (Btu/Sq Ft/Year)
Source Energy Consumption = 91,922 (Btu/Sq Ft/Year)

Floor Area = 8,280 (Sq Ft)

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M027, BASELINE

EQUIPMENT ENERGY CONSUMPTION

Ref Num	Equip Code	Monthly Consumption Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	1061	958	1069	1025	1065	1034	1056	1069	1025	1065	1025	1056	12,510
	PK	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
1	MISC LD													
	ELEC	1055	953	1055	1021	1055	1021	1055	1055	1021	1055	1021	1055	12,421
	PK	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3
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	EQ1113	AIR-CLD RECIP <15 TONS												
	ELEC	0	0	0	0	1635	2966	2870	2779	1817	334	0	0	12,401
	PK	0.0	0.0	0.0	0.0	12.4	15.0	14.5	14.5	11.4	6.7	0.0	0.0	15.0
1	EQ5203	CONDENSER FANS												
	ELEC	0	0	0	0	221	397	390	374	246	33	0	0	1,660
	PK	0.0	0.0	0.0	0.0	1.6	1.9	1.9	1.9	1.5	1.0	0.0	0.0	1.9
1	EQ5001	CHILLED WATER PUMP C.V.												
	ELEC	0	0	0	0	196	246	244	251	205	76	0	0	1,218
	PK	0.0	0.0	0.0	0.0	0.4	0.4	0.4	0.4	0.4	0.4	0.0	0.0	0.4
1	EQ5313	CONTROLS												
	ELEC	0	0	0	0	143	180	178	184	150	56	0	0	891
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3
1	EQ4371	FAN COIL SUPPLY FAN												
	ELEC	2351	2124	2351	2275	2351	2275	2351	2351	2275	2351	2275	2351	27,682
	PK	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M027, BASELINE

1	EQ2001		GAS FIRE TUBE HOT WATER										
	GAS	154	136	6	0	0	0	0	0	0	0	86	382
	PK	0.6	0.6	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.6
1	EQ5020		HEAT WATER CIRC. PUMP C.V.										
	ELEC	308	268	25	0	0	0	0	0	0	0	222	822
	PK	0.6	0.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.6
1	EQ5240		BOILER FORCED DRAFT FAN										
	ELEC	49	42	4	0	0	0	0	0	0	0	35	130
	PK	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
1	EQ5307		BOILER CONTROLS										
	ELEC	248	216	20	0	0	0	0	0	0	0	179	663
	PK	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5

UTILITY PEAK CHECKSUMS - ALTERNATIVE 1
BLDG M027, BASELINE

---------- 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 26.5 (kW)
Yearly Time of Peak 20 (hr) 6 (mo)

Hour 20 Month 6

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Percnt Of Tot (%)
Cooling Equipment				
1	EQ1113	AIR-CLD RECIP <15 TONS	11.1	41.86
Sub Total			11.1	41.86
Sub Total			0.0	0.00
Air Moving Equipment				
1		SUMMATION OF FAN ELECTRICAL DEMAND	3.2	11.92
Sub Total			3.2	11.92
Sub Total			0.0	0.00
Miscellaneous				
Lights			4.0	14.93
Base Utilities			0.0	0.00
Misc Equipment			8.3	31.30
Sub Total			12.3	46.23
Grand Total			26.5	100.00

CALIFORNIA TITLE 24 COMPLIANCE - ALTERNATIVE 1
BLDG M027, BASELINE

CALIFORNIA TITLE 24 COMPLIANCE REPORT

Weather Name	ATLANTA.
Gross Conditioned Floor Area (sqft).....	8,280
ACM Multiplier	1.025

E N E R G Y U S E S U M M A R Y

	ELEC (kWh/yr)	GAS (kBtu/yr)	PERCENT OF TOTAL ENERGY (%)	TOTAL SOURCE ENERGY (kBtu/yr)	ADJUSTED UNIT SOURCE ENERGY (kBtu/yr-sf)
Primary Heating	793.0	38,224.6	14.7	48,356.7	6.0
Primary Cooling					
Compressor	12,401.1	0.0	15.2	126,988.0	15.7
Tower/Cond Fans	1,660.2	0.0	2.0	17,000.3	2.1
Condenser Pump	0.0	0.0	0.0	0.0	0.0
Other Accessories	891.0	0.0	1.1	9,123.9	1.1
Auxiliary					
Supply Fans	27,681.6	0.0	33.9	283,460.2	35.1
Circulation Pumps	2,039.8	0.0	2.5	20,887.8	2.6
Base Utilities	0.0	0.0	0.0	0.0	0.0
Subtotal	29,721.4	0.0	36.4	304,348.0	37.7
Lighting	12,510.1	0.0	15.3	128,103.2	15.5
Receptacle	12,420.9	0.0	15.2	127,190.8	15.4
Domestic Hot Water	0.0	0.0	0.0	0.0	0.0
Cogeneration	0.0	0.0	0.0	0.0	0.0
Totals	70,397.7	38,224.6	100.0	761,110.9	93.4

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M027, ECO #2

M O N T H L Y E N E R G Y C O N S U M P T I O N

Month	ELEC On Peak (kWh)	DEMAND On Peak (kW)	GAS On Peak (Therm)	GAS DMND On Peak (Thrm/hr)
Jan	5,222	15	196	1
Feb	4,657	15	174	1
March	4,578	15	15	0
April	4,321	15	0	0
May	6,765	24	0	0
June	8,397	28	0	0
July	8,371	27	0	0
Aug	8,271	27	0	0
Sept	6,849	24	0	0
Oct	4,904	20	0	0
Nov	4,375	15	8	0
Dec	5,004	15	119	1
Total	71,715	28	511	1

Building Energy Consumption = 35,736 (Btu/Sq Ft/Year)
Source Energy Consumption = 95,191 (Btu/Sq Ft/Year)

Floor Area = 8,280 (Sq Ft)

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M027, ECO #2

EQUIPMENT ENERGY CONSUMPTION

Ref Num	Equip Code	Monthly Consumption Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	1061	958	1069	1025	1065	1034	1056	1069	1025	1065	1025	1056	12,510
	PK	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
1	MISC LD													
	ELEC	1055	953	1055	1021	1055	1021	1055	1055	1021	1055	1021	1055	12,421
	PK	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3
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	EQ1113	AIR-CLD RECIP <15 TONS												
	ELEC	0	0	0	0	1700	3166	3024	2929	1895	266	0	0	12,980
	PK	0.0	0.0	0.0	0.0	13.8	16.7	16.1	15.7	12.4	7.5	0.0	0.0	16.7
1	EQ5203	CONDENSER FANS												
	ELEC	0	0	0	0	231	423	411	394	258	26	0	0	1,743
	PK	0.0	0.0	0.0	0.0	1.7	2.1	2.1	2.0	1.6	1.1	0.0	0.0	2.1
1	EQ5001	CHILLED WATER PUMP C.V.												
	ELEC	0	0	0	0	227	298	295	295	234	88	0	0	1,437
	PK	0.0	0.0	0.0	0.0	0.5	0.5	0.5	0.5	0.5	0.5	0.0	0.0	0.5
1	EQ5313	CONTROLS												
	ELEC	0	0	0	0	137	180	178	178	141	53	0	0	867
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3
1	EQ4371	FAN COIL SUPPLY FAN												
	ELEC	2351	2124	2351	2275	2351	2275	2351	2351	2275	2351	2275	2351	27,682
	PK	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M027, ECO #2

1	EQ2001		GAS FIRE TUBE HOT WATER										
	GAS	196	174	15	0	0	0	0	0	0	0	8	119	511
	PK	0.7	0.7	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.6	0.7
1	EQ5020		HEAT WATER CIRC. PUMP C.V.										
	ELEC	416	343	57	0	0	0	0	0	0	0	30	298	1,144
	PK	0.7	0.7	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.7	0.7
1	EQ5240		BOILER FORCED DRAFT FAN										
	ELEC	60	50	8	0	0	0	0	0	0	0	4	43	166
	PK	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
1	EQ5307		BOILER CONTROLS										
	ELEC	279	230	38	0	0	0	0	0	0	0	20	200	767
	PK	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5	0.5

UTILITY PEAK CHECKSUMS - ALTERNATIVE 1
BLDG M027, ECO #2

UTILITY PEAK CHECKSUMS

Utility ELECTRIC DEMAND

Peak Value 28.1 (kW)
Yearly Time of Peak 17 (hr) 6 (mo)

Hour 17 Month 6

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Percnt Of Tot (%)
Cooling Equipment				
1	EQ1113	AIR-CLD RECIP <15 TONS	19.6	69.86
Sub Total			19.6	69.86
Sub Total			0.0	0.00
Air Moving Equipment				
1		SUMMATION OF FAN ELECTRICAL DEMAND	3.2	11.26
Sub Total			3.2	11.26
Sub Total			0.0	0.00
Miscellaneous				
Lights			2.0	7.05
Base Utilities			0.0	0.00
Misc Equipment			3.3	11.83
Sub Total			5.3	18.88
Grand Total			28.1	100.00

CALIFORNIA TITLE 24 COMPLIANCE - ALTERNATIVE 1
BLDG M027, ECO #2

CALIFORNIA TITLE 24 COMPLIANCE REPORT

Weather Name ..... ATLANTA.
Gross Conditioned Floor Area (sqft)..... 8,280
ACM Multiplier 1.025

E N E R G Y U S E S U M M A R Y

	ELEC (kWh/yr)	GAS (kBtu/yr)	PERCENT OF TOTAL ENERGY (%)	TOTAL SOURCE ENERGY (kBtu/yr)	ADJUSTED UNIT SOURCE ENERGY (kBtu/yr-sf)
Primary Heating	932.6	51,127.3	18.4	63,368.3	7.8
Primary Cooling					
Compressor	12,979.7	0.0	15.0	132,912.9	16.5
Tower/Cond Fans	1,742.8	0.0	2.0	17,846.2	2.2
Condenser Pump	0.0	0.0	0.0	0.0	0.0
Other Accessories	867.0	0.0	1.0	8,878.1	1.1
Auxiliary					
Supply Fans	27,681.6	0.0	31.9	283,460.2	35.1
Circulation Pumps	2,580.6	0.0	3.0	26,425.7	3.3
Base Utilities	0.0	0.0	0.0	0.0	0.0
Subtotal	30,262.2	0.0	34.9	309,885.9	38.4
Lighting	12,510.1	0.0	14.4	128,103.2	15.5
Receptacle	12,420.9	0.0	14.3	127,190.8	15.4
Domestic Hot Water	0.0	0.0	0.0	0.0	0.0
Cogeneration	0.0	0.0	0.0	0.0	0.0
Totals	71,715.4	51,127.3	100.0	788,185.4	96.8

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M027, ECO #3

M O N T H L Y E N E R G Y C O N S U M P T I O N

Month	ELEC On Peak (kWh)	DEMAND On Peak (kW)	GAS On Peak (Therm)	GAS DMND On Peak (Thrm/hr)
Jan	5,133	15	153	1
Feb	4,615	15	134	1
March	4,529	15	6	0
April	4,321	15	0	0
May	6,712	24	0	0
June	8,167	27	0	0
July	8,191	26	0	0
Aug	8,112	26	0	0
Sept	6,784	24	0	0
Oct	4,991	21	0	0
Nov	4,321	15	0	0
Dec	4,943	15	85	0
Total	70,821	27	377	1

Building Energy Consumption = 33,741 (Btu/Sq Ft/Year)
Source Energy Consumption = 92,374 (Btu/Sq Ft/Year)

Floor Area = 8,280 (Sq Ft)

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M027, ECO #3

EQUIPMENT ENERGY CONSUMPTION

Ref Num	Equip Code	Monthly Consumption Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	1061	958	1069	1025	1065	1034	1056	1069	1025	1065	1025	1056	12,510
	PK	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
1	MISC LD													
	ELEC	1055	953	1055	1021	1055	1021	1055	1055	1021	1055	1021	1055	12,421
	PK	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3
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	EQ1113	AIR-CLD RECIP <15 TONS												
	ELEC	0	0	0	0	1639	2963	2866	2776	1818	338	0	0	12,400
	PK	0.0	0.0	0.0	0.0	12.4	15.0	14.5	14.4	11.4	6.7	0.0	0.0	15.0
1	EQ5203	CONDENSER FANS												
	ELEC	0	0	0	0	221	396	389	374	246	33	0	0	1,660
	PK	0.0	0.0	0.0	0.0	1.6	1.9	1.9	1.9	1.5	1.0	0.0	0.0	1.9
1	EQ5001	CHILLED WATER PUMP C.V.												
	ELEC	0	0	0	0	238	298	295	304	249	92	0	0	1,476
	PK	0.0	0.0	0.0	0.0	0.5	0.5	0.5	0.5	0.5	0.5	0.0	0.0	0.5
1	EQ5313	CONTROLS												
	ELEC	0	0	0	0	143	180	178	184	150	56	0	0	891
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3
1	EQ4371	FAN COIL SUPPLY FAN												
	ELEC	2351	2124	2351	2275	2351	2275	2351	2351	2275	2351	2275	2351	27,682
	PK	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M027, ECO #3

1	EQ2001		GAS FIRE TUBE HOT WATER										
	GAS	153	134	6	0	0	0	0	0	0	0	85	377
	PK	0.6	0.6	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.6
1	EQ5020		HEAT WATER CIRC. PUMP C.V.										
	ELEC	370	322	30	0	0	0	0	0	0	0	267	989
	PK	0.7	0.7	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.7
1	EQ5240		BOILER FORCED DRAFT FAN										
	ELEC	48	42	4	0	0	0	0	0	0	0	35	129
	PK	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
1	EQ5307		BOILER CONTROLS										
	ELEC	248	216	20	0	0	0	0	0	0	0	179	663
	PK	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5

UTILITY PEAK CHECKSUMS - ALTERNATIVE 1
BLDG M027, ECO #3

---------- 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 26.6 (kW)
Yearly Time of Peak 20 (hr) 6 (mo)

Hour 20 Month 6

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Percnt Of Tot (%)
Cooling Equipment				
1	EQ1113	AIR-CLD RECIP <15 TONS	11.2	42.01
Sub Total			11.2	42.01
Sub Total			0.0	0.00
Air Moving Equipment				
1		SUMMATION OF FAN ELECTRICAL DEMAND	3.2	11.88
Sub Total			3.2	11.88
Sub Total			0.0	0.00
Miscellaneous				
Lights			4.0	14.89
Base Utilities			0.0	0.00
Misc Equipment			8.3	31.22
Sub Total			12.3	46.10
Grand Total			26.6	100.00

CALIFORNIA TITLE 24 COMPLIANCE - ALTERNATIVE 1
BLDG M027, ECO #3

CALIFORNIA TITLE 24 COMPLIANCE REPORT

Weather Name	ATLANTA.
Gross Conditioned Floor Area (sqft)	8,280
ACM Multiplier	1.025

E N E R G Y U S E S U M M A R Y

	ELEC (kWh/yr)	GAS (kBtu/yr)	PERCENT OF TOTAL ENERGY (%)	TOTAL SOURCE ENERGY (kBtu/yr)	ADJUSTED UNIT SOURCE ENERGY (kBtu/yr-sf)
Primary Heating	792.2	37,667.2	14.5	47,762.0	5.9
Primary Cooling					
Compressor	12,400.2	0.0	15.1	126,978.4	15.7
Tower/Cond Fans	1,659.5	0.0	2.0	16,993.4	2.1
Condenser Pump	0.0	0.0	0.0	0.0	0.0
Other Accessories	891.0	0.0	1.1	9,123.9	1.1
Auxiliary					
Supply Fans	27,681.6	0.0	33.8	283,460.2	35.1
Circulation Pumps	2,465.3	0.0	3.0	25,244.6	3.1
Base Utilities	0.0	0.0	0.0	0.0	0.0
Subtotal	30,146.9	0.0	36.8	308,704.8	38.2
Lighting	12,510.1	0.0	15.3	128,103.2	15.5
Receptacle	12,420.9	0.0	15.2	127,190.8	15.4
Domestic Hot Water	0.0	0.0	0.0	0.0	0.0
Cogeneration	0.0	0.0	0.0	0.0	0.0
Totals	70,820.8	37,667.2	100.0	764,856.4	93.9

BUILDING 60

E M C ENGINEERS, INC.

PROJECT: FORT McPHERSON & FORT GILLEM ESOS STUDY
LOCATION: FORT McPHERSON
ECO: Computer Simulation Summary

CLIENT CONTRACT NO: DACA21-91-C-0097
CLIENT PROJECT ENG: TERRY SEABROOK

EMC PROJECT: #3105.000
DATE: 10-APR-92
FILE: M060ECO.WK3
PREPARED BY: R. GERRANS
CHECKED BY:

Bldg: M060 **Area: 20,856 ft^2**

Run Description	Heating Gas Use (kBtu/yr)	Heating Electric Use (kWh/yr)	Cooling Electric Use (kWh/yr)	Fan Electric Use (kWh/yr)	Pump Electric Use (kWh/yr)	Lighting Electric Use (kWh/yr)	Recept. Electric Use (kWh/yr)	Total Electric Use (kWh/yr)	Peak Electric Demand (kW)	Total Gas Use (MBtu/yr)	Total Energy Use (Mbtu/yr)
Baseline	534,362	3,570	50,115	63,955	22,803	25,412	45,045	210,900	88	534	1,254
ECO#2	432,898	3,140	49,003	63,955	22,803	25,412	45,045	209,358	86	433	1,147
Savings/(Loss)	101,464	430	1,112	0	0	0	0	1,542	2	101	107
ECO#3	516,436	3,445	49,754	63,955	22,803	25,412	45,045	210,413	87	516	1,234
Savings/(Loss)	17,926	126	361	0	0	0	0	487	1	18	20
ECO#12	450,478	3,101	36,635	63,955	21,056	25,412	45,045	195,204	83	450	1,117
Savings/(Loss)	83,884	469	13,480	0	1,747	0	0	15,696	5	84	137
ECO#13	534,362	3,570	59,514	63,955	22,803	25,412	45,045	220,299	66	534	1,286
Savings/(Loss)	0	0	(9,399)	0	0	0	0	(9,399)	22	0	(32)
ECO#15	540,173	3,576	49,501	63,955	22,803	22,618	45,045	207,497	87	540	1,248
Savings/(Loss)	(5,811)	(6)	614	0	0	2,794	0	3,402	1	(6)	6

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB 3105.000
SHEET NO. 1 OF 3
CALCULATED BY Rmgs DATE 2/21/92
CHECKED BY _____ DATE _____
SCALE _____

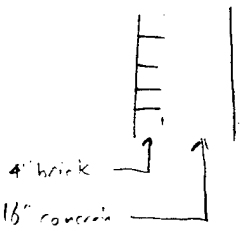
Computer Simulation - Bldg 060, Barracks
Bldg Type: Brick Housing Area: 41,252 ft²
ECO 2, 3, 12, 13
Take off bldgs: 040, 056, 058, 062

Assumptions

- occupancy = 48 people
- Infiltration: summer - 1½ Ach
  winter = 1½ ACH
- heating db = 72°F
- cooling db = 76°F
- Lighting: assume 75% diversity and 48/72 % occupancy

Comp Sim - Bldg #10

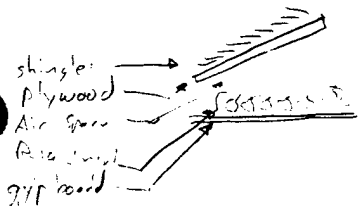
WALL U-Value - ASHRAE Table F 22.4



Material	R-Value
Outside Surface	0.17
4" brick - face	1.24
16" concrete	1.60
Inside Surface	0.68
	3.69

$U = \frac{1}{3.69} = \boxed{0.27}$

Roof U-Value - ASHRAE Table F 22.4



Material	R-Value
Out side Surface	0.17
Shingles (Asphalt)	0.44
½" Plywood	0.62
Air Space	1.24
Insulation - R 19	19.0
5/8" Gypboard	0.56
Inside Surface	0.62
	22.65

$U = \frac{1}{22.65} = \boxed{0.044}$

Window U-Value - ASHRAE Table F 27.13
- single Pane, wood frame Type R
$\boxed{U = 0.90}$

- Internal shading - ASHRAE Table F 27.25
white drapes ⇒ coefficient $\boxed{0.67}$

People

48 Rooms @ 1 person / room = $\boxed{48 \text{ People}}$ - observed average occupancy.

sensible : 250 Btuh/person
latent : 200 Btuh/person

Lights - From ECO #15

$(75\%)\left(\frac{48}{71}\right)$ 15,858 w = $\boxed{8,040 \text{ W}}$

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB 3105.000
SHEET NO. 3 OF 3
CALCULATED BY [illegible] DATE 2/21/92
CHECKED BY ______ DATE ______
SCALE ______

Comp. Calc. Bldg. 050 [illegible]

Misc loads - [illegible]

Equip/room	Watts	Q (kw)
Stereo	200	
TV	200	48(200)
Refrig	75	48(75)
coffee pot	260	48(260)
microwave	65	
Misc	10	48(10)
[illegible]		
3 [illegible]	375	3(375)
3 [illegible]	750	3(750)
3 water cooler	100	6(100)
		30.1 kw

Infiltration

- Assume 1½ ACH for heating + ½ ACH for cooling
- for room 3

$Q = L(A\Delta t + Bv^2)^{1/2}$

A - Stack coefficient = 0.0313 - ASHRAE Table F 23.7
B - Wind coefficient = 0.0051 - ASHRAE Table F 23.8
v - wind velocity = 12.65 mph
L - effective leakage area:

door; double door [illegible]	(.13)(315)	= 41.0 in²
door frame, masonry caulked	(.072)(315)	= 22.7 in²
window, [illegible] not weatherstripped	(0.052)(2,717)	= 141.3 in²
[illegible] frame, masonry, caulked	(0.093)(2,717)	= 252.7 in²
[illegible] Foundation not caulked	(0.19)(698)	= 132.6 in²
		590.3 in²

heating $\Delta t = 72 - 53 = 19°F$

$Q = 590.3(0.0313(19) + 0.0051(12.65)^2)^{1/2} = 701$ cfm

cooling $\Delta t = 88 - 76 = 12°F$

$Q = 590.3(0.0313(12) + 0.0051(12.65)^2)^{1/2} = 644$ cfm

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • Germany

JOB _____

SHEET NO. _____ OF _____

CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____

SCALE _____

Computer Simulation Bldg 060, McPherson

Baseline (result)

Pumps

DTW Pump = 10 HP for 3 [illegible] = 3.? HP

(0.85 bhp) $\frac{3.? \text{ HP} * (0.746 \text{ kW/HP})}{0.812 \text{ eff}}$ = 2.6 kw * 8,760 hr/yr = 22,803 kWh/yr

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____
SHEET NO. _____ OF _____
CALCULATED BY _____ DATE _____
CHECKED BY _____ DATE _____
SCALE _____

Computer Simulation Bldg. 860, McPherson

ECO #2 - Insulated Glass

Window U-Value - ASHRAE Table = 27.13
- use double pane, wood frame, sliding
U = 0.54

Window Shading - ASHRAE Table F 27.26
- light blinds
⇒ 0.56

window Area = 2,717 ft²

Electric Savings
Total Electric Savings = 1,542 KWh/yr
Electric Savings/ft² = 0.57 KWh/ft²

Demand Savings
Peak Demand Savings = 2 KW
Demand Savings/ft² = 7.4×10^{-4} KW/ft²

Gas Savings
Total Gas Savings = 101.5 MBtu/yr
Gas Savings/ft² = 0.037 MBtu/ft²

JOB

SHEET NO. OF

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

CALCULATED BY DATE

CHECKED BY DATE

SCALE

Computer Simulation - Bldg 050, Ft. McPherson

ECO # 3 - Weatherstripping + Caulking

Presently - ASHRAE Table F 23.3

windows: not w.s/c, single sliding, mason wall 152 - 73" x 37"

window: 0.052 in^2/ft^2

frame: 0.093 in^2/ft^2

Doors: not w.s/c, double, mason wall 9 - 30" x 84"

door: 0.16 in^2/ft^2

frame: 0.072 in^2/ft^2

Improvement: w.s/c doors + windows

windows: 0.026 in^2/ft^2

frame: 0.019 in^2/ft^2

door: 0.114 in^2/ft^2

frame: 0.004 in^2/ft^2

Calculation

$Q = L(A\Delta t + B v^2)^{1/2}$

A - stack coefficient = 0.0313 - Two story ASHRAE Table F 23.7

B - wind coefficient = 0.0051 - heavy shielding ASHRAE Table F 23.8

v - average wind velocity = 12.65 mph - avg winter

Δt = 72°F - 55°F = 17°F - avg winter

L - effective length = Area * (in^2/ft^2)

Present

windows: (0.052)(2,717) = 141.3

frame: (0.093)(2,717) = 252.7

door: (0.16)(157.5) = 25.2

frame: (0.072)(157.5) = 11.3

430.5 in^2

$Q = 430.5(0.0313(17) + 0.0051(12.65)^2)^{1/2}$

Q = 500 cfm

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____
SHEET NO. _____ OF _____
CALCULATED BY _____ DATE _____
CHECKED BY _____ DATE _____
SCALE _____

Computer Simulation - Bldg 050, Ft McPherson (ECO #3 - cont)

Improved

windows	(0.026)(2,700) =	70.6
frame	(0.019)(2,700) =	51.6
door	(0.114)(157.5) =	18.0
frame	(0.004)(157.5) =	0.6
		140.8 in²

$Q = 140.8(0.03)(17) + 0.005(12.65)^2)^{1/2}$

$Q = 164$ cfm

$\Delta Q = 500 - 164 = 336$ cfm

Present design ventilation = 1.5 ACH = 4,171 cfm

Improved 4,171 − 336 = **3,835 cfm**

Electric Savings

Total Electric Savings = 487 kWh/yr

Electric Savings/Δcfm = **1.4** kwh/Δcfm

Demand Savings

Peak Demand Savings = 1 kW

Demand Savings/Δcfm = **3.0×10^{-3}** kW/Δcfm

Gas Savings

Total Gas Savings = 17.9 MBtu/yr

Gas Savings/Δcfm = **0.053** MBtu/yr

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____
SHEET NO. _____ OF _____
CALCULATED BY _____ DATE _____
CHECKED BY _____ DATE _____
SCALE _____

Computer Simulation Bldg 060, McPherson

ECO #12 - HVAC Controls

- Temp Setpoint: 70°F - heating - 78°F - cooling
- Turn pump off [illegible], between heating + cooling seasons

Pump Savings

- Assume 4 wks/yr = 672 hrs/yr

savings = 2.6 kw * 672 hrs/yr = 1747 kWh/yr

Electric Savings

Total Electric Savings = 15,696 kWh/yr

Demand Savings

Peak Demand Savings = 5 kw

Gas Savings

Total Gas Savings = 34 MBtu/yr

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____

SHEET NO. _____ OF _____

CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____

SCALE _____

Computer Simulation — Billy Geo. McPherson

ECO #13 - Thermal Storage

Tank discharge : 12 00 - 16 00 M-Sun

Tank charge : 00:00 - 06.00

Tank capacity: 111.1 Ton-Hr - From Trace 600 for August Design Cooling

Chiller capacity: 18.5 Tons ⇒ Use 20 Ton

Demand Savings

kW/ton for cooling chiller = 1.278

Tons used at Peak = 16.9 Tons

Demand Savings = 16.9 × 1.278 = 21.6 = **22** kW

Electric Loss

Total Electric Loss = **9,399** kWh/yr

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____

SHEET NO. _____ OF _____

CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____

SCALE _____

Computer Simulation Bldg 050, McPherson

ECO #15 - Lighting Control

Lighting Reduction

Present = 8040 W

reduce 11 %

reduced = 7,156 W

Reduced kWh = 2,794 kWh/yr

Electric Factor

Reduced electric use = cooling - heating = 614 - 6 = 608 kWh

Electric Savings/kWh = 0.22 kWh/kWh

Gas Factor

Increased gas use = 5.8 MBtu/yr

Gas increased/kWh = 2.1×10^{-5} MBtu/kWh

01 Card - Job Information

Project: FT MCPHERSON & FT GILLEM EEAP
Location: FT MCPHERSON, BLDG 060
Program User: R. GERRANS

-----CARD 08-- Climatic Information

Weather Code	Summer Clearness Number	Winter Clearness Number	Summer Design Dry Bulb	Summer Design Wet Bulb	Winter Design Dry Bulb	Building Orientation	Summer Ground Reflect	Winter Ground Reflect
ATLANTA								

-----CARD 09-- Load Simulation Periods

1st Month Cooling Simulation	Last Month Cooling Simulation	Peak Cooling Load Hr	1st Month Summer Period	Last Month Summer Period	1st Month Daylight Savings	Last Month Daylight Savings
MAY	OCT					

---------- Load Section Alternative #1 ----------

---- Load Alternative ----

Number	Description
1	BLDG. M060, BASELINE

-----CARD 20-- General Room Parameters

Room Number	Zone Reference Number	Room Descrip	Floor Length	Floor Width	Const Type	Plenum Height	Acoustic Ceiling Resistance	Floor to Floor Height	Duplicate Floors Multiplier	Duplicate Rooms per Zone	Perimeter Depth
1	1	INTERIOR	316	66		2		10			

-----CARD 21-- Thermostat Parameters

Room Number	Cooling Room Design DB	Room Design RH	Cooling T'stat Driftpoint	Cooling T'stat Schedule	Heating Room Design DB	Heating T'stat Driftpoint	Heating T'stat Schedule	T'stat Location Flag	Mass / No. Hrs Average	Carpet On Floor
1	76			CLG	72		HTG			

-----CARD 22-- Roof Parameters ----------

Room Number	Roof Number	Roof Equal to Floor?	Roof Length	Roof Width	Roof U-Value	Const Type	Roof Direction	Roof Tilt	Roof Alpha
1	1	NO	316	43	.044	38			

-----CARD 24-- Wall Parameters ----------

Room Number	Wall Number	Wall Length	Wall Height	Wall U-Value	Wall Constuc Type	Wall Direction	Wall Tilt	Wall Alpha	Ground Reflectance Multiplier
M	1		25	.27	66				
1	1	316				0			
1	2	33				90			
1	3	316				180			
1	4	33				270			

-----CARD 25-- Wall/Glass Parameters ----------

Room Number	Wall Number	Glass Length	Glass Width	Pct Glass or No. of Windows	Glass U-Value	Shading Coefficient	External Shading Type	Internal Shading Type	Percent Solar to Ret. Air	Visible Transmittance	Inside Visible Reflectance
M	1	6.5	2.75		.9	.67					
1	1			72			3				
1	2			4							
1	3			72			3				
1	4			4							

-----CARD 26-- Schedules ----------

Room Number	People	Lights	Ventilation	Infiltration	Reheat Minimum	Cooling Fans	Heating Fan	Auxiliary Fan	Room Exhaust	Daylighting Controls
1	RESO	RESL	OFF	AVAIL		AVAIL				

-----CARD 27-- People and Lights ----------

Room Number	People Value	People Units	People Sensible	People Latent	Lighting Value	Lighting Units	Lighting Fixture Type	Ballast Factor	Percent Lights to Ret. Air	--- Daylighting ---- Reference Point 1	Reference Point 2
1	48	PEOPLE	250	200	8040	WATTS					

-----CARD 28--- Miscellaneous Equipment ----------

Room Number	Misc Equipment Number	Equipment Descrip	Energy Consump Value	Energy Consump Units	Schedule Code	Energy Meter Code	Percent of Load Sensible	Percent Misc. Load to Room	Percent Misc. Sens to Ret. Air	Radiant Fraction	Optional Air Path
1	1	MISC	30.1	KW	RESE	ELEC					

-----CARD 29--- Room Airflows ----------

Room	Ventilation -----Cooling----- Value	Units	Ventilation -----Heating----- Value	Units	Infiltration -----Cooling----- Value	Units	Infiltration -----Heating----- Value	Units	--Reheat Minimum-- Value	Units
Number										
1					1.5	ACH-HR	1.5	ACH-HR		

-----CARD 32-- Exposed Floor Parameters----------

Room Number	Exposed Floor Number	-----Slab------ Perimeter Length	Loss Coefficient	Exposed Floor---------- Floor Area	Floor U-Value	Const Type	Temp Flag	Cooling Temp	Heating Temp	Adjacent Room No
1	1	698	.8							

-----CARD 33-- External Shading ----------

Shading Type	Glass Height	OVERHANG--------- Height Above Glass	Projection Out	VERTICAL FINS---------- Glass Width	Projection Left	Left Projection Out	Projection Right	Right Projection Out	Adjacent Building Flag
3	6.5	1	8						

---------- System Section Alternative #1 ----------

-----CARD 39-- System Alternative -----

Number	Description
1	BLDG M060, BASELINE

-----CARD 40--- System Type ----------

System Set Number	System Type	OPTIONAL VENTILATION SYSTEM---------- Ventil Deck Location	Cooling SADBVh	Heating SADBVh	Cooling Schedule	Heating Schedule	Fan Static Pressure
1	FC						

-----CARD 41-- Zone Assignment ----------

System Set Number	Ref #1 Begin	Ref #1 End	Ref #2 Begin	Ref #2 End	Ref #3 Begin	Ref #3 End	Ref #4 Begin	Ref #4 End	Ref #5 Begin	Ref #5 End	Ref #6 Begin	Ref #6 End
1	1	1										

-----CARD 42--- Fan SP and Duct Parameters----------

System Set Number	Cool Fan SP	Heat Fan SP	Return Fan SP	Mn Exh Fan SP	Aux Fan SP	Rm Exh Fan SP	Cool Fan Mtr Loc	Return Fan Mtr Loc	Supply Duct Ht Gn	Supply Duct Loc	Return Air Path
1	.5						RETAIR			OTHER	ROOMDK

-----CARD 45--- Equipment Schedules ----------

System Set Number	Main Cooling Coil	Economizer	Direct Evap Coil	Indirect Evap Coil	Auxiliary Cooling Coil	Main Heating Coil HTGC	Main Preheat Coil	Reheat Coil	Mech. Humidity	Auxiliary Heating Coil
1	CLGC									

---------- Equipment Section Alternative #1 ----------

-----CARD 59-- Equipment Description / TOD Schedules ----------

Alternative Number	Elec Consump Time of Day Schedule	Elec Demand Time of Day Schedule	Demand Limit Max KW	Alternative Description
1				BLDG M060, BASELINE

-----CARD 60--- Cooling Load Assignment----------

Load Asgn Ref	All Coil Loads To Cool Ref	Cooling Equipment Sizing	-Group 1- Begin	End	-Group 2- Begin End	-Group 3- Begin End	-Group 4- Begin End	-Group 5- Begin End	-Group 6- Begin End	-Group 7- Begin End	-Group 8- Begin End	-Group 9- Begin End
1	1	BLKPLANT	1	1								

-----CARD 62-- Cooling Equipment Parameters ----------

Cool Equip Ref Num	Equip Code Name	Num Of Units	----------COOLING---------- --Capacity-- Value	Units	----Energy---- Value	Units	---------HEAT RECOVERY---------- --Capacity-- Value	Units	----Energy---- Value	Units	Seq Order Num	Seq Type	Demand Limit Number
1	EQ1100S	1											

-----CARD 63-- Cooling Pumps and References ----------

Cool Ref Num	---CHILLED WATER---- Full Load Value	Full Load Units	-----CONDENSER------ Full Load Value	Full Load Units	---HT REC or AUX---- Full Load Value	Full Load Units	Switch-over Control	Cold Storage	Cooling Tower	Misc. Access.
1	2.6	KW								

-----CARD 65-- Heating Load Assignment ----------

Load Assignment Reference	All Coil Loads To Heating Ref	-Group 1- Begin	End	-Group 2- Begin End	-Group 3- Begin End	-Group 4- Begin End	-Group 5- Begin End	-Group 6- Begin End	-Group 7- Begin End	-Group 8- Begin End	-Group 9- Begin End
1	1	1	1								

-----CARD 67-- Heating Equipment Parameters ----------

Heat Ref Number	Equip Code Name	Number Of Units	HW Pmp Full Ld Value	Units	Cap'y Value	Units	Energy Rate Value	Units	Seq Order Number	Switch over Control	Hot Strg	Misc. Acc.	Cogen	Demand Limit Number
1	EQ2001	1	2.6	KW										

-----CARD 69-- Fan Equipment Parameters ----------

System Set Number	Cooling Fan	Heating Fan	Return Fan	Exhaust Fan	Auxiliary Supply	Room Exhaust	Optional Ventilation
1	EQ4371						

Utility Description Reference Table

Schedules:
AVAIL AVAILABLE (100%)
CLG COOLING TSTAT SCHEDULE
CLGC COOLING COIL SCHEDULE
HTG HEATING TSTAT SCHEDULE
HTGC HEATING COIL SCHEDULE
OFF ALWAYS OFF
RESE RESIDENCE EQUIPMENT SCHEDULE
RESL RESIDENCE LIGHTING SCHEDULE
RESO RESIDENCE OCCUPANCY SCHEDULE
System:
FC FAN COIL
Equipment:
Cooling:
EQ1100S AIR-CLD RECIP 25-45 TONS
Heating:
EQ2001 GAS FIRE TUBE HOT WATER
Fan:
EQ4371 FAN COIL SUPPLY FAN

Schedule Name: AVAIL
Project: AVAILABLE (100)
Location:
Client:
Program User:
Comments:

Starting Month: JAN Ending Month: HTG
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	100
24	

Schedule Name: CLG
Project: COOLING TSTAT SCHEDULE
Location:
Client:
Program User:
Comments:

Starting Month: JAN Ending Month: DEC
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Temperature
0	76
24	

Schedule Name: CLGC
Project: COOLING COIL SCHEDULE
Location:
Client:
Program User: R. GERRANS
Comments:

Starting Month: JAN Ending Month: APR
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	0
24	

Starting Month: MAY Ending Month: OCT
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	100
24	

Starting Month: NOV Ending Month: HTG
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	0
24	

Schedule Name: HTG
Project: HEATING TSTAT SCHEDULE
Location:
Client:
Program User:
Comments:

Starting Month: JAN Ending Month: DEC
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Temperature
0	72
24	

Schedule Name: HTGC
Project: HEATING COIL SCHEDULE
Location:
Client:
Program User: R. GERRANS
Comments:

Starting Month: JAN Ending Month: APR
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	100
24	

Starting Month: MAY Ending Month: OCT
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	0
24	

Starting Month: NOV Ending Month: HTG
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	100
24	

Schedule Name: OFF
Project: ALWAYS OFF
Location:
Client:
Program User:
Comments:

Starting Month: JAN Ending Month: HTG
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	0
24	

Schedule Name: RESE
Project: RESIDENCE EQUIPMENT SCHEDULE
Location:
Client:
Program User:
Comments:

Starting Month: JAN Ending Month: DEC
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	5
5	40
7	5
16	40
18	30
19	100
20	20
22	5
24	

Schedule Name: RESL
Project: RESIDENCE LIGHTING SCHEDULE
Location:
Client:
Program User:
Comments:

Starting Month: JAN Ending Month: DEC
Starting Day Type: DSGN Ending Day Type: WKDY

Hour	Util Percent
0	0
5	90
8	10
16	50
19	100
23	0
24	

Starting Month: JAN Ending Month: DEC
Starting Day Type: SAT Ending Day Type: SUN

Hour	Util Percent
0	0
7	50
9	20
16	50
19	100
23	0
24	

Schedule Name: RESO
Project: RESIDENCE OCCUPANCY SCHEDULE
Location:
Client:
Program User:
Comments:

Starting Month: JAN Ending Month: DEC
Starting Day Type: DSGN Ending Day Type: WKDY

Hour	Util Percent
0	40
8	20
16	100
20	60
23	40
24	

Starting Month: JAN Ending Month: DEC
Starting Day Type: SAT Ending Day Type: SUN

Hour	Util Percent
0	40
10	30
17	90
20	60
23	40
24	

****
****
**
** TRACE 600 ANALYSIS **
**
** by **
**
****
****

FT MCPHERSON & FT GILLEM EEAP
FT MCPHERSON, BLDG 060

R. GERRANS

Weather File Code:	ATLANTA.	
Location:	ATLANTA, GEORGIA	
Latitude:	33.0	(deg)
Longitude:	84.0	(deg)
Time Zone:	6	
Elevation:	1,005	(ft)
Barometric Pressure:	28.8	(in. Hg)
Summer Clearness Number:	0.90	
Winter Clearness Number:	0.90	
Summer Design Dry Bulb:	92	(F)
Summer Design Wet Bulb:	74	(F)
Winter Design Dry Bulb:	22	(F)
Summer Ground Relectance:	0.20	
Winter Ground Relectance:	0.20	
Air Density:	0.0731	(Lbm/cuft)
Air Specific Heat:	0.2444	(Btu/lbm/F)
Density-Specific Heat Prod:	1.0727	(Btu-min./hr/cuft/F)
Latent Heat Factor:	4,721.8	(Btu-min./hr/cuft)
Enthalpy Factor:	4.3883	(Lb-min./hr/cuft)

Design Simulation Period: May To October
System Simulation Period: January To December
Cooling Load Methodology: TETD/Time Averaging

Time/Date Program was Run: 20:29:23 4/ 7/92
Dataset Name: M060-B .TM

AIRFLOW - ALTERNATIVE 1
BLDG. M060, BASELINE

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

System Number	System Type	Main Outside Airflow (Cfm)	Main Cooling Airflow (Cfm)	Main Heating Airflow (Cfm)	Main Return Airflow (Cfm)	Main Exhaust Airflow (Cfm)	Auxil. Supply Airflow (Cfm)	Room Exhaust Airflow (Cfm)
1	FC	0	23,104	23,104	27,275	4,171	0	0
Totals		0	23,104	23,104	27,275	4,171	0	0

CAPACITY - ALTERNATIVE 1
BLDG. M060, BASELINE

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

System Number	System Type	Cooling Main Sys. Capacity (Tons)	Cooling Aux. Sys. Capacity (Tons)	Cooling Opt. Vent Capacity (Tons)	Cooling Totals (Tons)	Heating Main Sys. Capacity (Btuh)	Heating Aux. Sys. Capacity (Btuh)	Heating Preheat Capacity (Btuh)	Heating Reheat Capacity (Btuh)	Heating Humidif. Capacity (Btuh)	Heating Opt. Vent Capacity (Btuh)	Heating Totals (Btuh)
1	FC	34.0	0.0	0.0	34.0	-591,757	0	0	0	0	0	-591,757
Totals		34.0	0.0	0.0	34.0	-591,757	0	0	0	0	0	-591,757

The building peaked at hour 17 month 8 with a capacity of 34.0 tons

ENGINEERING CHECKS - ALTERNATIVE 1
BLDG. M060, BASELINE

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 Cfm/ Sq Ft	Cooling Cfm/ Ton	Cooling Sq Ft /Ton	Cooling Btuh/ Sq Ft	Heating Cfm/ Sq Ft	Heating Btuh/ Sq Ft	Floor Area Sq Ft
1	Main	FC	0.00	1.11	680.4	614.2	19.54	1.11	-28.37	20,856

System 1 Block FC - FAN COIL

	********** COOLING COIL PEAK **********					*	********** CLG SPACE PEAK **********		*	********** HEATING COIL PEAK **********		
Peaked at Time ==>		Mo/Hr: 8/17				*	Mo/Hr: 6/17		*		Mo/Hr: 13/ 1	
Outside Air ==>		OADB/WB/HR: 91/ 73/ 98.0				*	OADB: 94		*		OADB: 22	
	Space Sens.+Lat.	Ret. Air Sensible	Ret. Air Latent	Net Total	Percnt Of Tot	*	Space Sensible	Percnt Of Tot	*	Space Peak Space Sens	Coil Peak Tot Sens	Percnt Of Tot
Envelope Loads	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)	*	(Btuh)	(%)	*	(Btuh)	(Btuh)	(%)
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	39,579		39,579	9.71	*	0	0.00	*	0	-24,243	4.10
Glass Solar	43,472	0		43,472	10.67	*	59,774	16.58	*	0	0	0.00
Glass Cond	35,946	0		35,946	8.82	*	44,749	12.41	*	-132,046	-132,046	22.31
Wall Cond	50,088	8,668		58,756	14.42	*	54,034	14.99	*	-151,781	-189,990	32.11
Partition	0			0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	*	0	0.00	*	-27,920	-27,920	4.72
Infiltration	145,093			145,093	35.61	*	81,881	22.72	*	-223,718	-223,718	37.81
Sub Total==>	274,598	48,247		322,845	79.23	*	240,438	66.70	*	-535,465	-597,918	101.04
Internal Loads						*			*			
Lights	13,720	0		13,720	3.37	*	13,720	3.81	*	0	0	0.00
People	21,600			21,600	5.30	*	12,000	3.33	*	0	0	0.00
Misc	41,093	0	0	41,093	10.08	*	41,093	11.40	*	0	0	0.00
Sub Total==>	76,413	0	0	76,413	18.75	*	66,813	18.54	*	0	0	0.00
Ceiling Load	48,247	-48,247		0	0.00	*	53,216	14.76	*	-62,453	0	0.00
Outside Air	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				6,161	1.51	*		0.00	*		6,161	-1.04
Ret. Fan Heat		2,054		2,054	0.50	*		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==>	399,258	2,054	0	407,473	100.00	*	360,467	100.00	*	-597,918	-591,757	10

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

	Total Capacity (Tons)	Capacity (Mbh)	Sens Cap. (Mbh)	Coil Airfl (cfm)	Entering DB/WB/HR Deg F	Deg F	Grains	Leaving DB/WB/HR Deg F	Deg F	Grains
Main Clg	34.0	407.5	318.6	23,104	76.1	63.2	69.8	61.3	57.4	67.2
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
0										
Totals	34.0	407.5								

----------AREAS----------

	Gross Total	Glass (sf)	(%)
Floor	20,856		
Part	0		
ExFlr	698		
Roof	13,588		0
Wall	17,450	2,717	16

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

	Capacity (Mbh)	Coil Airfl (cfm)	Ent Deg F	Lvg Deg F
Main Htg	-591.8	23,104	72.2	96.1
Aux Htg	0.0	0	0.0	0.0
Preheat	-0.0	23,104	72.2	61.5
Reheat	0.0	0	0.0	0.0
Humidif	0.0	0	0.0	0.0
Opt Vent	0.0	0	0.0	0.0
Total	-591.8			

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

Type	Cooling	Heating
Vent	0	0
Infil	4,171	4,171
Supply	23,104	23,104
Mincfm	0	0
Return	23,104	23,104
Exhaust	0	0
Rm Exh	0	0
Auxil	0	0

--ENGINEERING CHECKS--

Clg % OA	0.0
Clg Cfm/Sqft	1.11
Clg Cfm/Ton	680.40
Clg Sqft/Ton	614.21
Clg Btuh/Sqft	19.54
No. People	48
Htg % OA	0.0
Htg Cfm/SqFt	1.11
Htg Btuh/SqFt	-28.37

--TEMPERATURES (F)---

Type	Clg	Htg
SADB	61.5	96.1
Plenum	83.3	62.5
Return	76.0	72.0
Ret/OA	76.0	72.0
Runarnd	76.0	72.0
Fn MtrTD	0.1	0.0
Fn BldTD	0.1	0.0
Fn Frict	0.2	0.0

COOLING LOADS AT COIL PEAK - ALTERNATIVE 1
BLDG. M060, BASELINE

AIRFLOW COOLING LOADS
(At time of Coil Peak)

Room Number	Description	Ventilation Airflow (Cfm)	Ventilation Sensible (Btuh)	Ventilation Latent (Btuh)	Optional Ventilation Airflow (Cfm)	Optional Ventilation Sensible (Btuh)	Optional Ventilation Latent (Btuh)	Bypass Airflow (Cfm)	Bypass Sensible (Btuh)	Bypass Latent (Btuh)	Ov/Undr Sizing (Btuh)
1	INTERIOR	0	0	0	0	0	0	0	0	0	0
Zone 1	Total/Ave.	0	0	0	0	0	0	0	0	0	0
Zone 1	Block	0	0	0	0	0	0	0	0	0	0
System 1	Total/Ave.	0	0	0	0	0	0	0	0	0	0
System 1	Block	0	0	0	0	0	0	0	0	0	0

HEATING LOADS AT COIL PEAK - ALTERNATIVE 1
BLDG. M060, BASELINE

AIRFLOW HEATING LOADS
(At time of Coil Peak)

Room Number	Description	Ventilation Airflow (Cfm)	Ventilation Sensible (Btuh)	Op. Vent. Airflow (Cfm)	Op. Vent. Sensible (Btuh)	Reheat Airflow (Cfm)	Reheat Sensible (Btuh)	Humidif. Airflow (Cfm)	Humidif. Latent (Btuh)	Total (Btuh)
1	INTERIOR	0	0	0	0	0	0	0	0	0
Zone 1	Total/Ave.	0	0	0	0	0	0	0	0	0
Zone 1	Block	0	0	0	0	0	0	0	0	0
System 1	Total/Ave.	0	0	0	0	0	0	0	0	0
System 1	Block	0	0	0	0	0	0	0	0	0

COOLING AIRFLOW HEAT GAIN/LOSS - ALTERNATIVE 1
BLDG. M060, BASELINE

A I R F L O W H E A T G A I N A N D L O S S
(At time of Coil Peak)

Room Number	Description	Cooling: Duct Heat Pickup (Btuh)	Supply Fan Heat (Btuh)	Return Fan Heat (Btuh)	System Exhaust Heat Loss (Btuh)	Total (Btuh)	System Exhaust Airflow (Cfm)	Room Exhaust Airflow (Cfm)	Ducted Airflow (Cfm)	Plenum Airflow (Cfm)	Run Around Airflow (Cfm)	Corridr Airflow (Cfm)	System Return Airflow (Cfm)
1	INTERIOR	0	6,161	2,054	0	8,215	0	0	0	0	0	0	23,104
Zone 1	Total/Ave.	0	6,161	2,054	0	8,215	0	0	0	0	0	0	23,104
Zone 1	Block	0	6,161	2,054	0	8,215	0	0	0	0	0	0	23,104
System 1	Total/Ave.	0	6,161	2,054	0	8,215	0	0	0	0	0	0	23,104
System 1	Block	0	6,161	2,054	0	8,215	0	0	0	0	0	0	23,104

HEATING AIRFLOW HEAT GAIN/LOSS - ALTERNATIVE 1
BLDG. M060, BASELINE

A I R F L O W H E A T G A I N A N D L O S S
(At time of Coil Peak)

Room Number	Description	Heating: Supply Fan Heat (Btuh)	Return Fan Heat (Btuh)	System Exhaust Heat Loss (Btuh)	Total (Btuh)	System Exhaust Airflow (Cfm)	Room Exhaust Airflow (Cfm)	Ducted Airflow (Cfm)	Plenum Airflow (Cfm)	Run Around Airflow (Cfm)	Corridr Airflow (Cfm)	System Return Airflow (Cfm)
1	INTERIOR	6,161	0	0	6,161	0	0	0	0	0	0	23,104
Zone 1	Total/Ave.	6,161	0	0	6,161	0	0	0	0	0	0	23,104
Zone 1	Block	6,161	0	0	6,161	0	0	0	0	0	0	23,104
System 1	Total/Ave.	6,161	0	0	6,161	0	0	0	0	0	0	23,104
System 1	Block	6,161	0	0	6,161	0	0	0	0	0	0	23,104

ROOM PSYCHROMETRICS - ALTERNATIVE 1
BLDG. M060, BASELINE

---------- P S Y C H R O M E T R I C S T A T E P O I N T S ----------

Room 1

	Dry Bulb (F)	Wet Bulb (F)	Relat. Humid. (%)	Humid. Ratio (GR)	Enthalpy (Btu/Lb)	Temp. Diff. (F)
Space	76.0	63.2	50.0	69.8	29.2	
Main System						
Return Air Heat Pickup						-0.1
Return Fan						0.1
Return Air	76.0	63.2	50.0	69.8	29.2	
Outdoor Air	90.7	72.9	43.4	98.0	37.2	
Return/Outdoor Air Mix	76.0	63.2	50.0	69.8	29.2	
Blow through Fan						0.1
Entering Coil	76.1	63.2	49.9	69.8	29.2	
Leaving Coil	61.3	57.7	81.2	68.3	25.3	
Draw Through Fan						0.0
Duct Frictional Heat						0.2
Supply Duct Heat Gain						0.0
Cold Deck Supply Air	61.5	57.7	80.6	68.3	25.4	
Supply Air	61.5	57.7	80.6	68.3	25.4	

Percent Outside Air	0.00	(%)
Sensible Heat Ratio (SHR)	0.924	
Percent Supply Air Bypassing Coil	0.00	(%)
Coil Airflow	23,104	(Cfm)

BUILDING U-VALUES - ALTERNATIVE 1
BLDG. M060, BASELINE

---------- 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) Part.	ExFlr	Summr Skylt	Wintr Skylt	Roof	Summr Windo	Wintr Windo	Wall	Ceil.	Room Mass (lb/ sqft)	Room Capac. (Btu/ sqft/F)
1	INTERIOR	0.000	0.800	0.000	0.000	0.044	0.900	0.973	0.270	0.317	124.6	26.14
Zone 1	Total/Ave.	0.000	0.800	0.000	0.000	0.044	0.900	0.973	0.270	0.317	124.6	26.14
System 1	Total/Ave.	0.000	0.800	0.000	0.000	0.044	0.900	0.973	0.270	0.317	124.6	26.14
Building		0.000	0.800	0.000	0.000	0.044	0.900	0.973	0.270	0.317	124.6	26.14

BUILDING AREAS - ALTERNATIVE 1
BLDG. M060, BASELINE

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

Room Number	Description	Number of Duplicate Flr	Number of Duplicate 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	INTERIOR	1	1	20,856	20,856	0	698	0	0	13,588	2,717	16	14,733
Zone	1 Total/Ave.				20,856	0	698	0	0	13,588	2,717	16	14,733
System	1 Total/Ave.				20,856	0	698	0	0	13,588	2,717	16	14,733
Building					20,856	0	698	0	0	13,588	2,717	16	14,733

ASHRAE 90 ANALYSIS - ALTERNATIVE 1
BLDG. M060, BASELINE

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

Overall Roof U-Value = 0.044 (Btu/Hr/Sq Ft/F)
Overall Wall U-Value = 0.368 (Btu/Hr/Sq Ft/F)
Overall Building U-Value = 0.226 (Btu/Hr/Sq Ft/F)

Roof Overall Thermal Transfer Value (OTTVr) = 2.25 (Btu/Hr/Sq Ft)
Wall Overall Thermal Transfer Value (OTTVw) = 15.08 (Btu/Hr/Sq Ft)

SYSTEM LOAD PROFILE - ALTERNATIVE 1
BLDG M060, BASELINE

Main System 1 FC FAN COIL

Percent Design Load	Cooling Load Cap. (Ton)	Cooling Load Hours (%)	Cooling Load Hours	Heating Load Capacity (Btuh)	Heating Load Hours (%)	Heating Load Hours	Cooling Airflow Cap. (Cfm)	Cooling Airflow Hours (%)	Cooling Airflow Hours	Heating Airflow Cap. (Cfm)	Heating Airflow Hours (%)	Heating Airflow Hours
0 - 5	1.7	9	263	-29,588	4	140	1,155.2	0	0	0.0	0	0
5 - 10	3.4	8	231	-59,176	9	308	2,310.4	0	0	0.0	0	0
10 - 15	5.1	11	307	-88,764	12	403	3,465.6	0	0	0.0	0	0
15 - 20	6.8	8	213	-118,351	14	446	4,620.8	0	0	0.0	0	0
20 - 25	8.5	11	295	-147,939	16	519	5,776.0	0	0	0.0	0	0
25 - 30	10.2	9	266	-177,527	16	520	6,931.2	0	0	0.0	0	0
30 - 35	11.9	10	277	-207,115	10	319	8,086.3	0	0	0.0	0	0
35 - 40	13.6	5	154	-236,703	15	500	9,241.5	0	0	0.0	0	0
40 - 45	15.3	7	185	-266,291	4	115	10,396.7	0	0	0.0	0	0
45 - 50	17.0	6	176	-295,879	0	0	11,551.9	0	0	0.0	0	0
50 - 55	18.7	5	130	-325,466	0	0	12,707.1	0	0	0.0	0	0
55 - 60	20.4	4	110	-355,054	0	0	13,862.3	0	0	0.0	0	0
60 - 65	22.1	3	81	-384,642	0	0	15,017.5	0	0	0.0	0	0
65 - 70	23.8	1	22	-414,230	0	0	16,172.7	0	0	0.0	0	0
70 - 75	25.5	2	62	-443,818	0	0	17,327.9	0	0	0.0	0	0
75 - 80	27.2	1	30	-473,406	0	0	18,483.1	0	0	0.0	0	0
80 - 85	28.9	0	0	-502,994	0	0	19,638.3	0	0	0.0	0	0
85 - 90	30.6	0	0	-532,581	0	0	20,793.5	0	0	0.0	0	0
90 - 95	32.3	0	0	-562,169	0	0	21,948.7	0	0	0.0	0	0
95 - 100	34.0	0	0	-591,757	0	0	23,103.8	100	8,760	0.0	0	0
Hours Off	0.0	0	5,958	0	0	5,490	0.0	0	0	0.0	0	8,760

SYSTEM TOTALS LOAD PROFILE - ALTERNATIVE 1
BLDG M060, BASELINE

---------- S Y S T E M L O A D P R O F I L E ----------

System Totals

Percent Design Load	Cooling Load Cap. (Ton)	Cooling Load Hours (%)	Cooling Load Hours	Heating Load Capacity (Btuh)	Heating Load Hours (%)	Heating Load Hours	Cooling Airflow Cap. (Cfm)	Cooling Airflow Hours (%)	Cooling Airflow Hours	Heating Airflow Cap. (Cfm)	Heating Airflow Hours (%)	Heating Airflow Hours
0 - 5	1.7	9	263	-29,588	4	140	1,155.2	0	0	0.0	0	0
5 - 10	3.4	8	231	-59,176	9	308	2,310.4	0	0	0.0	0	0
10 - 15	5.1	11	307	-88,764	12	403	3,465.6	0	0	0.0	0	0
15 - 20	6.8	8	213	-118,351	14	446	4,620.8	0	0	0.0	0	0
20 - 25	8.5	11	295	-147,939	16	519	5,776.0	0	0	0.0	0	0
25 - 30	10.2	9	266	-177,527	16	520	6,931.2	0	0	0.0	0	0
30 - 35	11.9	10	277	-207,115	10	319	8,086.3	0	0	0.0	0	0
35 - 40	13.6	5	154	-236,703	15	500	9,241.5	0	0	0.0	0	0
40 - 45	15.3	7	185	-266,291	4	115	10,396.7	0	0	0.0	0	0
45 - 50	17.0	6	176	-295,879	0	0	11,551.9	0	0	0.0	0	0
50 - 55	18.7	5	130	-325,466	0	0	12,707.1	0	0	0.0	0	0
55 - 60	20.4	4	110	-355,054	0	0	13,862.3	0	0	0.0	0	0
60 - 65	22.1	3	81	-384,642	0	0	15,017.5	0	0	0.0	0	0
65 - 70	23.8	1	22	-414,230	0	0	16,172.7	0	0	0.0	0	0
70 - 75	25.5	2	62	-443,818	0	0	17,327.9	0	0	0.0	0	0
75 - 80	27.2	1	30	-473,406	0	0	18,483.1	0	0	0.0	0	0
80 - 85	28.9	0	0	-502,994	0	0	19,638.3	0	0	0.0	0	0
85 - 90	30.6	0	0	-532,581	0	0	20,793.5	0	0	0.0	0	0
90 - 95	32.3	0	0	-562,169	0	0	21,948.7	0	0	0.0	0	0
95 - 100	34.0	0	0	-591,757	0	0	23,103.8	100	8,760	0.0	0	0
Hours Off	0.0	0	5,958	0	0	5,490	0.0	0	0	0.0	0	8,760

BUILDING COOL-HEAT DEMAND - ALTERNATIVE 1
BLDG M060, BASELINE

January			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	33.4	30.4	-234,890	0.0	-220,060	0.0	-220,060	0.0	-220,060	0.0	-220,060	0.0
2	32.1	29.3	-245,647	0.0	-226,166	0.0	-226,166	0.0	-226,166	0.0	-226,166	0.0
3	31.7	29.3	-255,510	0.0	-231,499	0.0	-231,499	0.0	-231,499	0.0	-231,499	0.0
4	31.9	29.5	-258,996	0.0	-229,008	0.0	-229,008	0.0	-229,008	0.0	-229,008	0.0
5	32.6	30.3	-266,621	0.0	-242,951	0.0	-242,951	0.0	-242,951	0.0	-242,951	0.0
6	33.6	31.3	-205,430	0.0	-185,491	0.0	-210,188	0.0	-210,188	0.0	-185,491	0.0
7	35.0	32.6	-203,100	0.0	-179,044	0.0	-203,741	0.0	-203,741	0.0	-179,044	0.0
8	36.6	34.4	-165,266	0.0	-178,632	0.0	-189,610	0.0	-189,610	0.0	-178,632	0.0
9	38.5	36.3	-129,313	0.0	-179,826	0.0	-166,452	0.0	-166,452	0.0	-179,826	0.0
10	40.4	37.7	-111,513	0.0	-167,005	0.0	-161,864	0.0	-161,864	0.0	-167,005	0.0
11	42.3	38.7	-103,651	0.0	-166,814	0.0	-162,866	0.0	-162,866	0.0	-166,814	0.0
12	44.2	39.6	-92,997	0.0	-168,686	0.0	-164,738	0.0	-164,738	0.0	-168,686	0.0
13	45.8	40.5	-68,392	0.0	-156,797	0.0	-152,853	0.0	-152,853	0.0	-156,797	0.0
14	47.2	41.1	-35,816	0.0	-146,892	0.0	-142,945	0.0	-142,945	0.0	-146,892	0.0
15	48.2	41.6	-15,766	0.0	-134,895	0.0	-130,952	0.0	-130,952	0.0	-134,895	0.0
16	48.9	41.8	-33,482	0.0	-122,678	0.0	-118,734	0.0	-118,734	0.0	-122,678	0.0
17	49.1	41.9	-60,168	0.0	-116,172	0.0	-124,575	0.0	-124,575	0.0	-116,172	0.0
18	48.7	41.9	-93,879	0.0	-116,663	0.0	-117,861	0.0	-117,861	0.0	-116,663	0.0
19	47.4	41.7	-116,941	0.0	-125,698	0.0	-126,896	0.0	-126,896	0.0	-125,698	0.0
20	45.5	40.5	-45,346	0.0	-36,415	0.0	-37,613	0.0	-37,613	0.0	-36,415	0.0
21	43.1	38.9	-148,814	0.0	-139,155	0.0	-139,155	0.0	-139,155	0.0	-139,155	0.0
22	40.4	36.7	-158,918	0.0	-148,298	0.0	-148,298	0.0	-148,298	0.0	-148,298	0.0
23	37.7	34.3	-187,322	0.0	-174,189	0.0	-174,189	0.0	-174,189	0.0	-174,189	0.0
24	35.3	32.3	-224,136	0.0	-216,279	0.0	-216,279	0.0	-216,279	0.0	-216,279	0.0

February			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	37.5	34.5	-234,445	0.0	-225,235	0.0	-225,235	0.0	-225,235	0.0	-225,235	0.0
2	36.0	33.0	-244,753	0.0	-238,609	0.0	-238,609	0.0	-238,609	0.0	-238,609	0.0
3	34.7	31.8	-254,166	0.0	-235,227	0.0	-235,227	0.0	-235,227	0.0	-235,227	0.0
4	33.6	30.9	-257,207	0.0	-243,646	0.0	-243,646	0.0	-243,646	0.0	-243,646	0.0
5	32.8	30.1	-264,832	0.0	-251,608	0.0	-251,608	0.0	-251,608	0.0	-251,608	0.0
6	32.2	29.8	-204,086	0.0	-195,554	0.0	-220,247	0.0	-220,247	0.0	-195,554	0.0
7	32.1	29.6	-199,053	0.0	-202,189	0.0	-226,886	0.0	-226,886	0.0	-202,189	0.0
8	32.5	30.3	-163,357	0.0	-203,491	0.0	-214,469	0.0	-214,469	0.0	-203,491	0.0
9	33.9	31.6	-153,369	0.0	-212,339	0.0	-198,961	0.0	-198,961	0.0	-212,339	0.0
10	36.0	33.0	-141,264	0.0	-221,075	0.0	-215,933	0.0	-215,933	0.0	-221,075	0.0
11	38.5	34.8	-145,087	0.0	-236,287	0.0	-232,340	0.0	-232,340	0.0	-236,287	0.0
12	41.3	36.5	-127,403	0.0	-223,787	0.0	-219,843	0.0	-219,843	0.0	-223,787	0.0
13	43.8	38.1	-107,053	0.0	-215,925	0.0	-211,981	0.0	-211,981	0.0	-215,925	0.0
14	45.9	39.5	-81,529	0.0	-196,977	0.0	-193,029	0.0	-193,029	0.0	-196,977	0.0
15	47.2	40.4	-49,394	0.0	-162,537	0.0	-158,594	0.0	-158,594	0.0	-162,537	0.0
16	47.7	40.6	-51,744	0.0	-161,127	0.0	-157,184	0.0	-157,184	0.0	-161,127	0.0
17	47.5	40.2	-32,509	0.0	-118,564	0.0	-126,962	0.0	-126,962	0.0	-118,564	0.0
18	47.0	39.8	-93,804	0.0	-148,752	0.0	-149,950	0.0	-149,950	0.0	-148,752	0.0
19	46.2	39.9	-118,023	0.0	-149,871	0.0	-151,069	0.0	-151,069	0.0	-149,871	0.0
20	45.1	39.7	-50,567	0.0	-63,804	0.0	-65,002	0.0	-65,002	0.0	-63,804	0.0
21	43.8	39.2	-148,906	0.0	-147,408	0.0	-147,408	0.0	-147,408	0.0	-147,408	0.0
22	42.3	38.3	-164,043	0.0	-147,429	0.0	-147,429	0.0	-147,429	0.0	-147,429	0.0
23	40.7	37.2	-187,771	0.0	-178,827	0.0	-178,827	0.0	-178,827	0.0	-178,827	0.0
24	39.1	35.8	-229,615	0.0	-214,993	0.0	-214,993	0.0	-214,993	0.0	-214,993	0.0

BUILDING COOL-HEAT DEMAND - ALTERNATIVE 1
BLDG M060, BASELINE

March			------ Design -----		----- Weekday -----		-----Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	45.4	41.6	-132,358	0.0	-62,156	0.0	-154,276	0.0	-154,276	0.0	-154,276	0.0
2	43.3	39.7	-143,560	0.0	-163,319	0.0	-163,319	0.0	-163,319	0.0	-163,319	0.0
3	41.6	38.6	-155,120	0.0	-166,506	0.0	-166,506	0.0	-166,506	0.0	-166,506	0.0
4	40.6	37.5	-159,501	0.0	-171,057	0.0	-171,057	0.0	-171,057	0.0	-171,057	0.0
5	40.2	37.3	-167,126	0.0	-172,921	0.0	-172,921	0.0	-172,921	0.0	-172,921	0.0
6	40.6	37.8	-105,930	0.0	-117,736	0.0	-142,433	0.0	-142,433	0.0	-117,736	0.0
7	41.6	39.0	-78,118	0.0	-108,696	0.0	-133,389	0.0	-133,389	0.0	-108,696	0.0
8	43.3	40.7	-72,144	0.0	-122,803	0.0	-133,781	0.0	-133,781	0.0	-122,803	0.0
9	45.4	42.5	-62,564	0.0	-143,860	0.0	-130,482	0.0	-130,482	0.0	-143,860	0.0
10	47.9	44.3	-51,224	0.0	-152,961	0.0	-147,816	0.0	-147,816	0.0	-152,961	0.0
11	50.6	45.5	-21,011	0.0	-120,906	0.0	-116,962	0.0	-116,962	0.0	-120,906	0.0
12	53.3	46.8	0	0.0	-97,690	0.0	-93,746	0.0	-93,746	0.0	-97,690	0.0
13	55.8	48.5	0	0.0	-79,632	0.0	-75,688	0.0	-75,688	0.0	-79,632	0.0
14	58.0	49.6	0	0.0	-62,398	0.0	-58,450	0.0	-58,450	0.0	-62,398	0.0
15	59.6	50.3	0	0.0	-60,263	0.0	-56,320	0.0	-56,320	0.0	-60,263	0.0
16	60.7	50.9	0	0.0	-65,151	0.0	-61,208	0.0	-61,208	0.0	-65,151	0.0
17	61.0	50.9	0	0.0	-14,680	0.0	-23,083	0.0	-23,083	0.0	-14,680	0.0
18	60.7	50.7	0	0.0	-34,868	0.0	-36,066	0.0	-36,066	0.0	-34,868	0.0
19	59.6	50.7	0	0.0	-52,181	0.0	-53,379	0.0	-53,379	0.0	-52,181	0.0
20	58.0	50.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
21	55.8	49.4	0	0.0	-23,711	0.0	-24,892	0.0	-24,892	0.0	-23,711	0.0
22	53.3	47.8	0	0.0	-70,364	0.0	-70,364	0.0	-70,364	0.0	-70,364	0.0
23	50.6	45.9	0	0.0	-96,883	0.0	-96,883	0.0	-96,883	0.0	-96,883	0.0
24	47.9	43.8	0	0.0	-136,093	0.0	-136,093	0.0	-136,093	0.0	-136,093	0.0

April			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	57.7	53.9	-22,213	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2	55.9	52.7	-29,185	0.0	0	0.0	0	0.0	0	0.0	0	0.0
3	54.2	51.3	-39,048	0.0	0	0.0	0	0.0	0	0.0	0	0.0
4	52.9	50.2	-48,462	0.0	0	0.0	0	0.0	0	0.0	0	0.0
5	51.9	49.6	-50,608	0.0	0	0.0	0	0.0	0	0.0	-43,470	0.0
6	51.2	49.2	0	0.0	0	0.0	0	0.0	0	0.0	-27,887	0.0
7	51.0	49.3	0	0.0	0	0.0	0	0.0	0	0.0	-15,974	0.0
8	51.6	49.9	0	0.0	0	0.0	0	0.0	0	0.0	-38,582	0.0
9	53.3	50.6	0	0.0	0	0.0	0	0.0	-30,063	0.0	-66,495	0.0
10	55.9	51.8	0	0.0	0	0.0	0	0.0	-35,205	0.0	-40,346	0.0
11	59.0	53.4	0	0.0	0	0.0	0	0.0	-14,035	0.0	-17,979	0.0
12	62.4	55.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
13	65.5	57.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
14	68.1	59.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
15	69.8	60.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
16	70.4	60.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
17	70.2	60.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
18	69.5	60.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
19	68.5	59.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
20	67.2	59.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
21	65.5	59.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
22	63.7	58.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
23	61.7	57.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
24	59.7	55.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0

BUILDING COOL-HEAT DEMAND - ALTERNATIVE 1
BLDG M060, BASELINE

May			Design		Weekday		Saturday		Sunday		Monday	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	66.6	62.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2	64.5	60.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
3	62.7	59.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
4	61.2	58.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
5	60.0	57.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
6	59.3	56.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
7	59.0	56.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
8	59.5	56.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
9	60.9	56.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
10	63.0	57.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
11	65.7	58.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
12	68.7	59.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
13	71.7	61.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
14	74.5	63.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
15	76.6	64.8	0	6.2	0	0.0	0	0.0	0	0.0	0	0.0
16	78.0	65.6	0	18.2	0	1.1	0	0.0	0	0.0	0	0.0
17	78.5	65.6	0	21.7	0	11.2	0	9.5	0	9.5	0	11.2
18	78.2	65.8	0	19.7	0	10.5	0	10.4	0	10.4	0	10.5
19	77.5	65.6	0	13.6	0	7.0	0	6.9	0	6.9	0	7.0
20	76.3	66.1	0	18.8	0	13.4	0	13.3	0	13.3	0	13.4
21	74.8	67.2	0	10.2	0	5.0	0	5.0	0	5.0	0	5.0
22	73.0	66.4	0	8.7	0	4.2	0	4.2	0	4.2	0	4.2
23	70.9	65.4	0	6.5	0	1.9	0	1.9	0	1.9	0	1.9
24	68.7	64.0	0	2.9	0	0.0	0	0.0	0	0.0	0	0.0

June			Design		Weekday		Saturday		Sunday		Monday	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	73.0	67.9	0	8.7	0	3.3	0	3.7	0	3.7	0	3.7
2	71.2	66.1	0	9.2	0	3.1	0	3.3	0	3.3	0	3.3
3	69.7	65.2	0	8.8	0	1.9	0	2.0	0	2.0	0	2.0
4	68.5	64.3	0	8.0	0	0.9	0	1.0	0	1.0	0	1.0
5	67.8	64.2	0	7.8	0	0.4	0	0.5	0	0.5	0	0.5
6	67.6	64.2	0	16.4	0	7.7	0	5.7	0	5.7	0	7.8
7	68.1	64.8	0	17.9	0	8.3	0	6.2	0	6.2	0	8.3
8	69.4	65.7	0	16.8	0	5.6	0	4.8	0	4.8	0	5.7
9	71.6	66.2	0	17.2	0	5.2	0	6.3	0	6.3	0	5.2
10	74.2	67.2	0	20.1	0	8.8	0	9.5	0	9.5	0	8.9
11	77.2	68.5	0	23.6	0	11.2	0	11.7	0	11.7	0	11.3
12	80.2	70.0	0	26.8	0	13.7	0	14.2	0	14.2	0	13.7
13	82.8	70.8	0	28.9	0	16.5	0	16.9	0	16.9	0	16.5
14	85.0	71.6	0	30.4	0	18.2	0	18.6	0	18.6	0	18.2
15	86.3	72.3	0	31.0	0	19.3	0	19.7	0	19.7	0	19.3
16	86.8	72.1	0	29.3	0	17.8	0	18.2	0	18.2	0	17.8
17	86.6	71.7	0	33.9	0	22.8	0	21.5	0	21.5	0	22.8
18	85.8	71.5	0	29.9	0	21.5	0	21.3	0	21.3	0	21.5
19	84.7	71.2	0	21.5	0	15.7	0	15.5	0	15.5	0	15.7
20	83.2	71.5	0	29.5	0	26.3	0	26.1	0	26.1	0	26.3
21	81.4	71.7	0	18.1	0	11.2	0	11.2	0	11.2	0	11.2
22	79.3	71.4	0	17.0	0	11.8	0	11.8	0	11.8	0	11.8
23	77.2	70.5	0	14.4	0	8.9	0	8.9	0	8.9	0	8.9
24	75.1	69.1	0	11.2	0	4.9	0	4.9	0	4.9	0	4.9

BUILDING COOL-HEAT DEMAND - ALTERNATIVE 1
BLDG M060, BASELINE

July			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	72.0	69.3	0	10.4	0	2.9	0	3.3	0	3.3	0	3.3
2	70.5	68.0	0	8.7	0	1.8	0	2.1	0	2.1	0	2.1
3	69.4	67.1	0	8.2	0	1.5	0	1.6	0	1.6	0	1.6
4	68.5	66.4	0	7.4	0	0.7	0	0.7	0	0.7	0	0.7
5	67.9	66.0	0	7.3	0	0.7	0	0.8	0	0.8	0	0.8
6	67.7	65.9	0	15.3	0	7.3	0	5.2	0	5.2	0	7.8
7	68.1	66.3	0	18.1	0	8.3	0	6.3	0	6.3	0	8.6
8	69.1	67.3	0	16.2	0	5.4	0	4.7	0	4.7	0	5.4
9	70.8	68.0	0	16.0	0	4.5	0	5.9	0	5.9	0	4.5
10	72.9	69.1	0	19.6	0	8.0	0	8.7	0	8.7	0	8.0
11	75.2	70.5	0	22.9	0	10.1	0	10.6	0	10.6	0	10.1
12	77.5	71.7	0	25.7	0	12.1	0	12.5	0	12.5	0	12.1
13	79.6	72.7	0	28.4	0	14.5	0	14.9	0	14.9	0	14.5
14	81.3	73.5	0	29.0	0	16.5	0	16.9	0	16.9	0	16.5
15	82.3	73.7	0	29.7	0	17.0	0	17.4	0	17.4	0	17.0
16	82.7	73.5	0	27.7	0	16.1	0	16.6	0	16.6	0	16.1
17	82.5	73.1	0	32.0	0	20.9	0	19.5	0	19.5	0	20.9
18	82.0	72.6	0	28.4	0	19.4	0	19.2	0	19.2	0	19.4
19	81.1	73.2	0	20.7	0	14.5	0	14.3	0	14.3	0	14.5
20	79.9	73.8	0	30.0	0	25.0	0	24.8	0	24.8	0	25.0
21	78.5	73.9	0	16.3	0	10.2	0	10.2	0	10.2	0	10.2
22	76.9	73.1	0	16.4	0	11.9	0	11.9	0	11.9	0	11.9
23	75.2	71.9	0	13.8	0	8.3	0	8.3	0	8.3	0	8.3
24	73.5	70.8	0	9.8	0	4.5	0	4.5	0	4.5	0	4.5

August			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	72.7	70.2	0	12.2	0	2.9	0	3.5	0	3.5	0	3.5
2	71.2	69.0	0	8.9	0	2.0	0	2.3	0	2.3	0	2.3
3	69.9	68.0	0	8.1	0	1.5	0	1.7	0	1.7	0	1.7
4	68.8	67.1	0	7.3	0	0.7	0	0.8	0	0.8	0	0.8
5	68.0	66.6	0	7.1	0	0.0	0	0.0	0	0.0	0	0.0
6	67.5	66.2	0	12.7	0	5.8	0	3.5	0	3.5	0	6.0
7	67.3	66.1	0	16.8	0	7.5	0	5.2	0	5.2	0	7.7
8	67.8	66.5	0	14.9	0	4.2	0	3.4	0	3.4	0	4.3
9	69.1	67.0	0	16.1	0	3.5	0	4.8	0	4.8	0	3.6
10	71.2	67.8	0	19.7	0	5.8	0	6.5	0	6.5	0	5.9
11	73.8	68.7	0	22.4	0	7.8	0	8.2	0	8.2	0	7.8
12	76.5	70.0	0	24.7	0	10.2	0	10.7	0	10.7	0	10.2
13	79.1	71.2	0	26.6	0	13.8	0	14.2	0	14.2	0	13.8
14	81.1	72.6	0	28.0	0	15.6	0	16.1	0	16.1	0	15.6
15	82.5	73.6	0	29.2	0	16.9	0	17.4	0	17.4	0	16.9
16	83.0	73.7	0	27.3	0	14.8	0	15.2	0	15.2	0	14.8
17	82.8	73.5	0	31.3	0	20.7	0	19.4	0	19.4	0	20.7
18	82.3	73.5	0	26.3	0	17.3	0	17.2	0	17.2	0	17.3
19	81.5	73.1	0	21.4	0	14.2	0	14.0	0	14.0	0	14.2
20	80.4	73.7	0	29.6	0	24.8	0	24.6	0	24.6	0	24.8
21	79.1	74.9	0	17.2	0	10.9	0	10.9	0	10.9	0	10.9
22	77.6	73.9	0	16.8	0	12.1	0	12.1	0	12.1	0	12.1
23	76.0	72.7	0	13.7	0	9.6	0	9.6	0	9.6	0	9.6
24	74.3	71.3	0	9.7	0	4.6	0	4.6	0	4.6	0	4.6

BUILDING COOL-HEAT DEMAND - ALTERNATIVE 1
BLDG M060, BASELINE

September			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	69.8	66.1	0	7.1	0	0.0	0	0.0	0	0.0	0	0.0
2	68.0	64.5	0	5.2	0	0.0	0	0.0	0	0.0	0	0.0
3	66.3	63.0	0	4.7	0	0.0	0	0.0	0	0.0	0	0.0
4	64.9	61.9	0	3.9	0	0.0	0	0.0	0	0.0	0	0.0
5	63.9	61.3	0	3.3	0	0.0	0	0.0	0	0.0	0	0.0
6	63.2	61.0	0	8.4	0	0.0	0	0.0	0	0.0	0	0.0
7	63.0	60.8	0	11.4	0	0.0	0	0.0	0	0.0	0	0.0
8	63.4	61.4	0	11.6	0	0.0	0	0.0	0	0.0	0	0.0
9	64.7	61.8	0	11.8	0	0.0	0	0.0	0	0.0	0	0.0
10	66.6	62.1	0	13.0	0	0.0	0	0.0	0	0.0	0	0.0
11	69.1	62.9	0	15.6	0	0.0	0	0.0	0	0.0	0	0.0
12	71.8	63.7	0	18.1	0	4.2	0	1.8	0	1.8	0	4.2
13	74.5	65.5	0	20.1	0	6.9	0	7.2	0	7.2	0	6.9
14	77.0	67.1	0	21.4	0	8.4	0	8.7	0	8.7	0	8.4
15	78.9	68.2	0	23.5	0	9.2	0	9.6	0	9.6	0	9.2
16	80.2	68.6	0	21.8	0	9.2	0	9.5	0	9.5	0	9.2
17	80.6	68.5	0	23.7	0	13.3	0	12.3	0	12.3	0	13.3
18	80.4	68.9	0	19.0	0	11.4	0	11.2	0	11.2	0	11.4
19	79.7	70.0	0	16.4	0	10.0	0	9.8	0	9.8	0	10.0
20	78.7	71.2	0	22.6	0	20.2	0	20.0	0	20.0	0	20.2
21	77.3	71.6	0	13.4	0	7.7	0	7.7	0	7.7	0	7.7
22	75.6	70.5	0	12.5	0	8.5	0	8.5	0	8.5	0	8.5
23	73.7	69.4	0	10.1	0	5.5	0	5.5	0	5.5	0	5.5
24	71.8	67.7	0	6.9	0	1.4	0	1.4	0	1.4	0	1.4

October			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	54.8	51.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2	52.9	49.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
3	51.2	48.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
4	49.8	47.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
5	48.8	46.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
6	48.2	45.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
7	47.9	45.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
8	48.5	46.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
9	50.3	47.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
10	52.9	48.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
11	56.2	49.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
12	59.6	51.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
13	62.9	53.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
14	65.5	55.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
15	67.3	56.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
16	67.9	56.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
17	67.7	56.4	0	5.5	0	0.0	0	0.0	0	0.0	0	0.0
18	67.0	56.6	0	5.6	0	0.0	0	0.0	0	0.0	0	0.0
19	66.0	57.6	0	3.5	0	0.0	0	0.0	0	0.0	0	0.0
20	64.6	57.9	0	8.9	0	0.0	0	0.0	0	0.0	0	0.0
21	62.9	57.3	0	0.5	0	0.0	0	0.0	0	0.0	0	0.0
22	61.0	56.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
23	59.0	54.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
24	56.9	53.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0

BUILDING COOL-HEAT DEMAND - ALTERNATIVE 1
BLDG M060, BASELINE

November			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	48.7	45.7	-591,757	0.0	0	0.0	-108,684	0.0	-108,684	0.0	-108,684	0.0
2	46.9	44.1	-98,422	0.0	0	0.0	-117,220	0.0	-117,220	0.0	-117,220	0.0
3	45.5	42.8	-103,925	0.0	0	0.0	-113,518	0.0	-113,518	0.0	-113,518	0.0
4	44.6	41.9	-113,339	0.0	0	0.0	-127,586	0.0	-127,586	0.0	-127,586	0.0
5	44.4	42.0	-115,485	0.0	0	0.0	-132,969	0.0	-132,969	0.0	-132,969	0.0
6	44.8	42.7	-59,773	0.0	0	0.0	-106,704	0.0	-106,704	0.0	-82,007	0.0
7	45.9	43.9	-49,352	0.0	-45,492	0.0	-98,617	0.0	-98,617	0.0	-73,920	0.0
8	47.8	46.0	0	0.0	-56,557	0.0	-67,535	0.0	-67,535	0.0	-56,557	0.0
9	50.2	48.0	0	0.0	-59,240	0.0	-45,862	0.0	-45,862	0.0	-59,240	0.0
10	52.9	49.9	0	0.0	-52,019	0.0	-46,873	0.0	-46,873	0.0	-52,019	0.0
11	55.8	51.1	0	0.0	-58,217	0.0	-54,273	0.0	-54,273	0.0	-58,217	0.0
12	58.5	52.0	0	0.0	-48,936	0.0	-44,993	0.0	-44,993	0.0	-48,936	0.0
13	60.9	52.5	0	0.0	-23,836	0.0	-19,892	0.0	-19,892	0.0	-23,836	0.0
14	62.8	53.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
15	64.0	53.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
16	64.4	53.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
17	64.1	53.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
18	63.2	53.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
19	61.8	54.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
20	60.0	53.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
21	57.9	52.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
22	55.6	51.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
23	53.2	49.5	0	0.0	-38,046	0.0	-40,159	0.0	-40,159	0.0	-38,046	0.0
24	50.8	47.6	0	0.0	-94,636	0.0	-94,636	0.0	-94,636	0.0	-94,636	0.0

December			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	37.5	35.3	-176,631	0.0	-204,531	0.0	-204,531	0.0	-204,531	0.0	-204,531	0.0
2	37.1	35.1	-187,388	0.0	-207,593	0.0	-207,593	0.0	-207,593	0.0	-207,593	0.0
3	37.4	35.5	-191,773	0.0	-214,868	0.0	-214,868	0.0	-214,868	0.0	-214,868	0.0
4	38.1	36.2	-200,737	0.0	-209,519	0.0	-209,519	0.0	-209,519	0.0	-209,519	0.0
5	39.3	37.6	-208,362	0.0	-204,269	0.0	-204,269	0.0	-204,269	0.0	-204,269	0.0
6	40.9	39.2	-147,171	0.0	-138,934	0.0	-163,627	0.0	-163,627	0.0	-138,934	0.0
7	42.7	41.2	-144,837	0.0	-141,759	0.0	-166,460	0.0	-166,460	0.0	-141,759	0.0
8	44.7	43.1	-97,465	0.0	-123,763	0.0	-134,737	0.0	-134,737	0.0	-123,763	0.0
9	46.8	45.3	-62,789	0.0	-116,413	0.0	-103,035	0.0	-103,035	0.0	-116,413	0.0
10	48.8	47.0	-45,330	0.0	-100,655	0.0	-95,510	0.0	-95,510	0.0	-100,655	0.0
11	50.7	48.1	-33,765	0.0	-102,207	0.0	-98,264	0.0	-98,264	0.0	-102,207	0.0
12	52.2	48.8	-13,203	0.0	-93,584	0.0	-89,640	0.0	-89,640	0.0	-93,584	0.0
13	53.4	49.2	0	0.0	-86,412	0.0	-82,469	0.0	-82,469	0.0	-86,412	0.0
14	54.1	49.2	0	0.0	-66,903	0.0	-62,959	0.0	-62,959	0.0	-66,903	0.0
15	54.4	48.9	0	0.0	-60,775	0.0	-56,832	0.0	-56,832	0.0	-60,775	0.0
16	54.0	48.2	0	0.0	-77,352	0.0	-73,409	0.0	-73,409	0.0	-77,352	0.0
17	53.0	47.3	0	0.0	-78,783	0.0	-87,182	0.0	-87,182	0.0	-78,783	0.0
18	51.4	46.3	0	0.0	-81,013	0.0	-82,211	0.0	-82,211	0.0	-81,013	0.0
19	49.3	45.4	-15,375	0.0	-91,808	0.0	-93,006	0.0	-93,006	0.0	-91,808	0.0
20	47.0	43.5	0	0.0	-12,005	0.0	-13,203	0.0	-13,203	0.0	-12,005	0.0
21	44.5	41.5	-74,894	0.0	-113,501	0.0	-113,501	0.0	-113,501	0.0	-113,501	0.0
22	42.2	39.3	-100,660	0.0	-125,740	0.0	-125,740	0.0	-125,740	0.0	-125,740	0.0
23	40.1	37.6	-130,311	0.0	-150,387	0.0	-150,387	0.0	-150,387	0.0	-150,387	0.0
24	38.5	36.2	-166,323	0.0	-188,765	0.0	-188,765	0.0	-188,765	0.0	-188,765	0.0

BUILDING TEMPERATURE PROFILES - ALTERNATIVE 1
BLDG M060, BASELINE

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)	Room Number 1
Max. Temp.	76.0
Mo./Hr.	5 15
Day Type	1
	Number of Hours
Above 100	0
95 - 100	0
90 - 95	0
85 - 90	0
80 - 85	0
75 - 80	3,723
70 - 75	5,037
65 - 70	0
60 - 65	0
55 - 60	0
50 - 55	0
Below 50	0
Min. Temp.	70.4
Mo./Hr.	10 12
Day Type	5

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M060, BASELINE

M O N T H L Y E N E R G Y C O N S U M P T I O N

Month	ELEC On Peak (kWh)	DEMAND On Peak (kW)	GAS On Peak (Therm)	GAS DMND On Peak (Thrm/hr)
Jan	14,159	49	1,496	3
Feb	12,789	49	1,548	3
March	14,062	45	871	2
April	11,200	45	17	1
May	15,392	76	0	0
June	26,763	88	0	0
July	26,580	88	0	0
Aug	25,884	88	0	0
Sept	19,019	80	0	0
Oct	11,421	67	0	0
Nov	12,348	45	295	7
Dec	14,150	49	1,117	3
Total	203,767	88	5,344	7

Building Energy Consumption = 58,967 (Btu/Sq Ft/Year)
Source Energy Consumption = 127,017 (Btu/Sq Ft/Year)

Floor Area = 20,856 (Sq Ft)

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M060, BASELINE

EQUIPMENT ENERGY CONSUMPTION

Ref Num	Equip Code	Monthly Consumption Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	2155	1946	2172	2082	2164	2100	2146	2172	2082	2164	2082	2146	25,412
	PK	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
1	MISC LD													
	ELEC	3826	3455	3826	3702	3826	3702	3826	3826	3702	3826	3702	3826	45,045
	PK	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1
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	EQ1100S	AIR-CLD RECIP 25-45 TONS												
	ELEC	0	0	0	0	3054	12642	12063	11446	6352	0	0	0	45,556
	PK	0.0	0.0	0.0	0.0	29.1	43.1	39.7	39.1	31.8	17.7	0.0	0.0	43.1
1	EQ5200	CONDENSER FANS												
	ELEC	0	0	0	0	236	1061	1000	941	494	0	0	0	3,731
	PK	0.0	0.0	0.0	0.0	2.8	4.4	4.1	4.0	3.1	1.0	0.0	0.0	4.4
1	EQ5001	CHILLED WATER PUMP C.V.												
	ELEC	0	0	0	0	611	1794	1895	1854	1014	0	0	0	7,168
	PK	0.0	0.0	0.0	0.0	2.6	2.6	2.6	2.6	2.6	2.6	0.0	0.0	2.6
1	EQ5303	CONTROLS												
	ELEC	0	0	0	0	70	207	219	214	117	0	0	0	827
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3
1	EQ4371	FAN COIL SUPPLY FAN												
	ELEC	5432	4906	5432	5257	5432	5257	5432	5432	5257	5432	5257	5432	63,955
	PK	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M060, BASELINE

1	EQ2001			GAS FIRE TUBE HOT WATER									
	GAS	1496	1548	871	17	0	0	0	0	0	0	295	1117	5,344
	PK	3.2	3.2	2.1	0.8	0.0	0.0	0.0	0.0	0.0	0.0	7.1	2.6	7.1
1	EQ5020			HEAT WATER CIRC. PUMP C.V.									
	ELEC	1934	1747	1854	112	0	0	0	0	0	0	920	1934	8,502
	PK	2.6	2.6	2.6	2.6	0.0	0.0	0.0	0.0	0.0	0.0	2.6	2.6	2.6
1	EQ5240			BOILER FORCED DRAFT FAN									
	ELEC	440	398	422	25	0	0	0	0	0	0	209	440	1,935
	PK	0.6	0.6	0.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.6	0.6
1	EQ5307			BOILER CONTROLS									
	ELEC	372	336	356	22	0	0	0	0	0	0	177	372	1,635
	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

UTILITY PEAK CHECKSUMS - ALTERNATIVE 1
BLDG M060, BASELINE

UTILITY PEAK CHECKSUMS

Utility ELECTRIC DEMAND

Peak Value 88.4 (kW)
Yearly Time of Peak 20 (hr) 6 (mo)

Hour 20 Month 6

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Percnt Of Tot (%)
Cooling Equipment				
1	EQ1100S	AIR-CLD RECIP 25-45 TONS	42.9	48.57
Sub Total			42.9	48.57
Sub Total			0.0	0.00
Air Moving Equipment				
1		SUMMATION OF FAN ELECTRICAL DEMAND	7.3	8.26
Sub Total			7.3	8.26
Sub Total			0.0	0.00
Miscellaneous				
Lights			8.0	9.10
Base Utilities			0.0	0.00
Misc Equipment			30.1	34.07
Sub Total			38.1	43.17
Grand Total			88.4	100.00

CALIFORNIA TITLE 24 COMPLIANCE - ALTERNATIVE 1
BLDG M060, BASELINE

CALIFORNIA TITLE 24 COMPLIANCE REPORT

Weather Name ..... ATLANTA.
Gross Conditioned Floor Area (sqft)..... 20,856
ACM Multiplier 1.025

E N E R G Y U S E S U M M A R Y

	ELEC (kWh/yr)	GAS (kBtu/yr)	PERCENT OF TOTAL ENERGY (%)	TOTAL SOURCE ENERGY (kBtu/yr)	ADJUSTED UNIT SOURCE ENERGY (kBtu/yr-sf)
Primary Heating	3,570.0	534,361.8	44.4	599,043.5	29.4
Primary Cooling					
Compressor	45,556.4	0.0	12.6	466,498.8	22.9
Tower/Cond Fans	3,731.3	0.0	1.0	38,208.4	1.9
Condenser Pump	0.0	0.0	0.0	0.0	0.0
Other Accessories	827.1	0.0	0.2	8,469.5	0.4
Auxiliary					
Supply Fans	63,955.1	0.0	17.7	654,901.7	32.2
Circulation Pumps	15,670.2	0.0	4.3	160,463.3	7.9
Base Utilities	0.0	0.0	0.0	0.0	0.0
Subtotal	79,625.3	0.0	22.1	815,365.0	40.1
Lighting	25,412.0	0.0	7.1	260,219.7	12.5
Receptacle	45,044.6	0.0	12.5	461,258.2	22.1
Domestic Hot Water	0.0	0.0	0.0	0.0	0.0
Cogeneration	0.0	0.0	0.0	0.0	0.0
Totals	203,766.8	534,361.8	100.0	2,649,063.0	129.3

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M060, ECO#2

M O N T H L Y E N E R G Y C O N S U M P T I O N

Month	ELEC On Peak (kWh)	DEMAND On Peak (kW)	GAS On Peak (Therm)	GAS DMND On Peak (Thrm/hr)
Jan	12,193	46	1,251	3
Feb	11,013	46	1,305	3
March	12,101	45	683	2
April	11,041	45	0	0
May	15,141	72	0	0
June	24,326	84	0	0
July	24,185	84	0	0
Aug	23,604	83	0	0
Sept	18,102	76	0	0
Oct	11,421	64	0	0
Nov	11,314	45	175	1
Dec	12,151	45	915	2
Total	186,593	84	4,329	3

Building Energy Consumption = 51,292 (Btu/Sq Ft/Year)
Source Energy Consumption = 113,464 (Btu/Sq Ft/Year)

Floor Area = 20,856 (Sq Ft)

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M060, ECO#2

EQUIPMENT ENERGY CONSUMPTION

Ref Num	Equip Code	Monthly Consumption Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	2155	1946	2172	2082	2164	2100	2146	2172	2082	2164	2082	2146	25,412
	PK	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
1	MISC LD													
	ELEC	3826	3455	3826	3702	3826	3702	3826	3826	3702	3826	3702	3826	45,045
	PK	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1
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	EQ1100S	AIR-CLD RECIP 25-45 TONS												
	ELEC	0	0	0	0	3378	12040	11592	11042	6421	0	0	0	44,474
	PK	0.0	0.0	0.0	0.0	27.0	39.1	36.8	36.4	29.0	17.1	0.0	0.0	39.1
1	EQ5200	CONDENSER FANS												
	ELEC	0	0	0	0	262	1010	967	909	498	0	0	0	3,647
	PK	0.0	0.0	0.0	0.0	2.7	4.0	3.8	3.8	2.9	1.2	0.0	0.0	4.0
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	EQ5303	CONTROLS												
	ELEC	0	0	0	0	80	216	223	223	141	0	0	0	883
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3
1	EQ4371	FAN COIL SUPPLY FAN												
	ELEC	5432	4906	5432	5257	5432	5257	5432	5432	5257	5432	5257	5432	63,956
	PK	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M060, ECO#2

1	EQ2001	GAS FIRE TUBE HOT WATER											
	GAS	1251	1305	683	0	0	0	0	0	0	175	915	4,329
	PK	2.8	2.8	1.7	0.5	0.0	0.0	0.0	0.0	0.0	1.3	2.2	2.8
1	EQ5020	HEAT WATER CIRC. PUMP C.V.											
	ELEC	9	8	8	0	0	0	0	0	0	3	9	37
	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	EQ5240	BOILER FORCED DRAFT FAN											
	ELEC	399	361	343	0	0	0	0	0	0	140	383	1,625
	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
1	EQ5307	BOILER CONTROLS											
	ELEC	372	336	320	0	0	0	0	0	0	130	356	1,514
	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

UTILITY PEAK CHECKSUMS - ALTERNATIVE 1
BLDG M060, ECO#2

---------- 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 83.7 (kW)
Yearly Time of Peak 20 (hr) 6 (mo)

Hour 20 Month 6

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Percnt Of Tot (%)
Cooling Equipment				
1	EQ1100S	AIR-CLD RECIP 25-45 TONS	38.2	45.68
Sub Total			38.2	45.68
Sub Total			0.0	0.00
Air Moving Equipment				
1		SUMMATION OF FAN ELECTRICAL DEMAND	7.3	8.73
Sub Total			7.3	8.73
Sub Total			0.0	0.00
Miscellaneous				
Lights			8.0	9.61
Base Utilities			0.0	0.00
Misc Equipment			30.1	35.98
Sub Total			38.1	45.59
Grand Total			83.7	100.00

CALIFORNIA TITLE 24 COMPLIANCE - ALTERNATIVE 1
BLDG M060, ECO#2

CALIFORNIA TITLE 24 COMPLIANCE REPORT

Weather Name ..... ATLANTA.
Gross Conditioned Floor Area (sqft)..... 20,856
ACM Multiplier 1.025

E N E R G Y U S E S U M M A R Y

	ELEC (kWh/yr)	GAS (kBtu/yr)	PERCENT OF TOTAL ENERGY (%)	TOTAL SOURCE ENERGY (kBtu/yr)	ADJUSTED UNIT SOURCE ENERGY (kBtu/yr-sf)
Primary Heating	3,139.8	432,898.1	41.5	487,834.2	24.0
Primary Cooling					
Compressor	44,473.5	0.0	14.2	455,409.8	22.4
Tower/Cond Fans	3,646.6	0.0	1.2	37,341.7	1.8
Condenser Pump	0.0	0.0	0.0	0.0	0.0
Other Accessories	883.2	0.0	0.3	9,044.0	0.4
Auxiliary					
Supply Fans	63,955.6	0.0	20.4	654,907.0	32.2
Circulation Pumps	37.4	0.0	0.0	382.8	0.0
Base Utilities	0.0	0.0	0.0	0.0	0.0
Subtotal	63,993.0	0.0	20.4	655,289.8	32.2
Lighting	25,412.0	0.0	8.1	260,219.7	12.5
Receptacle	45,044.6	0.0	14.4	461,258.2	22.1
Domestic Hot Water	0.0	0.0	0.0	0.0	0.0
Cogeneration	0.0	0.0	0.0	0.0	0.0
Totals	186,592.8	432,898.1	100.0	2,366,397.2	115.4

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M060, ECO#3

---------- M O N T H L Y E N E R G Y C O N S U M P T I O N ----------

Month	ELEC On Peak (kWh)	DEMAND On Peak (kW)	GAS On Peak (Therm)	GAS DMND On Peak (Thrm/hr)
Jan	12,221	47	1,460	3
Feb	11,039	47	1,508	3
March	12,205	45	832	2
April	11,072	45	10	1
May	14,944	73	0	0
June	24,744	85	0	0
July	24,493	85	0	0
Aug	23,877	84	0	0
Sept	18,050	77	0	0
Oct	11,421	64	0	0
Nov	11,409	45	270	6
Dec	12,178	45	1,085	3
Total	187,653	85	5,164	6

Building Energy Consumption = 55,471 (Btu/Sq Ft/Year) Floor Area = 20,856 (Sq Ft)
Source Energy Consumption = 118,200 (Btu/Sq Ft/Year)

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M060, ECO#3

1	EQ2001		GAS FIRE TUBE HOT WATER										
	GAS	1460	1508	832	10	0	0	0	0	0	0	270	1085	5,164
	PK	3.1	3.0	2.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	6.1	2.5	6.1
1	EQ5020		HEAT WATER CIRC. PUMP C.V.										
	ELEC	10	9	9	0	0	0	0	0	0	0	4	9	42
	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	427	386	409	16	0	0	0	0	0	0	194	409	1,841
	PK	0.6	0.6	0.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.6	0.6
1	EQ5307		BOILER CONTROLS										
	ELEC	372	336	356	14	0	0	0	0	0	0	169	356	1,604
	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

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M060, ECO#3

EQUIPMENT ENERGY CONSUMPTION

Ref Num	Equip Code	Monthly Consumption Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	2155	1946	2172	2082	2164	2100	2146	2172	2082	2164	2082	2146	25,412
	PK	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
1	MISC LD													
	ELEC	3826	3455	3826	3702	3826	3702	3826	3826	3702	3826	3702	3826	45,045
	PK	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1
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	
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	EQ1100S	AIR-CLD RECIP 25-45 TONS												
	ELEC	0	0	0	0	3200	12433	11880	11305	6389	0	0	0	45,207
	PK	0.0	0.0	0.0	0.0	28.5	41.7	38.7	38.1	30.9	17.4	0.0	0.0	41.7
1	EQ5200	CONDENSER FANS												
	ELEC	0	0	0	0	248	1045	986	929	497	0	0	0	3,706
	PK	0.0	0.0	0.0	0.0	2.8	4.3	4.0	3.9	3.0	1.2	0.0	0.0	4.3
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	EQ5303	CONTROLS												
	ELEC	0	0	0	0	74	207	223	214	123	0	0	0	841
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3
1	EQ4371	FAN COIL SUPPLY FAN												
	ELEC	5432	4906	5432	5257	5432	5257	5432	5432	5257	5432	5257	5432	63,956
	PK	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3

UTILITY PEAK CHECKSUMS - ALTERNATIVE 1
BLDG M060, ECO#3

---------- 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 84.9 (kW)
Yearly Time of Peak 20 (hr) 6 (mo)

Hour 20 Month 6

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Percnt Of Tot (%)
Cooling Equipment				
1	EQ1100S	AIR-CLD RECIP 25-45 TONS	39.5	46.50
Sub Total			39.5	46.50
Sub Total			0.0	0.00
Air Moving Equipment				
1		SUMMATION OF FAN ELECTRICAL DEMAND	7.3	8.60
Sub Total			7.3	8.60
Sub Total			0.0	0.00
Miscellaneous				
Lights			8.0	9.47
Base Utilities			0.0	0.00
Misc Equipment			30.1	35.44
Sub Total			38.1	44.91
Grand Total			84.9	100.00

CALIFORNIA TITLE 24 COMPLIANCE - ALTERNATIVE 1
BLDG M060, ECO#3

CALIFORNIA TITLE 24 COMPLIANCE REPORT

Weather Name ..... ATLANTA.
Gross Conditioned Floor Area (sqft)..... 20,856
ACM Multiplier 1.025

E N E R G Y U S E S U M M A R Y

	ELEC (kWh/yr)	GAS (kBtu/yr)	PERCENT OF TOTAL ENERGY (%)	TOTAL SOURCE ENERGY (kBtu/yr)	ADJUSTED UNIT SOURCE ENERGY (kBtu/yr-sf)
Primary Heating	3,444.5	516,435.6	45.7	578,888.3	28.5
Primary Cooling					
Compressor	45,206.7	0.0	13.3	462,917.8	22.8
Tower/Cond Fans	3,705.7	0.0	1.1	37,946.8	1.9
Condenser Pump	0.0	0.0	0.0	0.0	0.0
Other Accessories	841.5	0.0	0.2	8,617.0	0.4
Auxiliary					
Supply Fans	63,955.6	0.0	18.9	654,907.0	32.2
Circulation Pumps	42.3	0.0	0.0	433.5	0.0
Base Utilities	0.0	0.0	0.0	0.0	0.0
Subtotal	63,997.9	0.0	18.9	655,340.5	32.2
Lighting	25,412.0	0.0	7.5	260,219.7	12.5
Receptacle	45,044.6	0.0	13.3	461,258.2	22.1
Domestic Hot Water	0.0	0.0	0.0	0.0	0.0
Cogeneration	0.0	0.0	0.0	0.0	0.0
Totals	187,653.1	516,435.6	100.0	2,465,188.3	120.3

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M060, ECO #12

M O N T H L Y E N E R G Y C O N S U M P T I O N

Month	ELEC On Peak (kWh)	DEMAND On Peak (kW)	GAS On Peak (Therm)	GAS DMND On Peak (Thrm/hr)
Jan	14,141	49	1,344	3
Feb	12,773	49	1,406	3
March	13,678	45	658	2
April	11,041	45	0	0
May	12,846	68	0	0
June	23,967	83	0	0
July	23,314	84	0	0
Aug	22,489	83	0	0
Sept	16,145	77	0	0
Oct	11,421	45	0	0
Nov	11,635	45	130	1
Dec	14,019	45	966	2
Total	187,471	84	4,505	3

Building Energy Consumption = 52,278 (Btu/Sq Ft/Year) Floor Area = 20,856 (Sq Ft)
Source Energy Consumption = 114,782 (Btu/Sq Ft/Year)

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M060, ECO #12

EQUIPMENT ENERGY CONSUMPTION

Ref Num	Equip Code	Monthly Consumption Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	2155	1946	2172	2082	2164	2100	2146	2172	2082	2164	2082	2146	25,412
	PK	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
1	MISC LD													
	ELEC	3826	3455	3826	3702	3826	3702	3826	3826	3702	3826	3702	3826	45,045
	PK	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1
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.
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	EQ1100S	AIR-CLD RECIP 25-45 TONS												
	ELEC	0	0	0	0	1023	10224	9331	8634	4008	0	0	0	33,219
	PK	0.0	0.0	0.0	0.0	18.2	37.9	35.9	35.1	28.0	0.0	0.0	0.0	37.9
1	EQ5200	CONDENSER FANS												
	ELEC	0	0	0	0	81	857	781	717	313	0	0	0	2,749
	PK	0.0	0.0	0.0	0.0	1.6	3.9	3.7	3.6	2.7	0.0	0.0	0.0	3.9
1	EQ5001	CHILLED WATER PUMP C.V.												
	ELEC	0	0	0	0	289	1638	1612	1531	702	0	0	0	5,772
	PK	0.0	0.0	0.0	0.0	2.6	2.6	2.6	2.6	2.6	0.0	0.0	0.0	2.6
1	EQ5303	CONTROLS												
	ELEC	0	0	0	0	33	189	186	177	81	0	0	0	666
	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	EQ4371	FAN COIL SUPPLY FAN												
	ELEC	5432	4906	5432	5257	5432	5257	5432	5432	5257	5432	5257	5432	63,956
	PK	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M060, ECO #12

1	EQ2001			GAS FIRE TUBE HOT WATER									
	GAS	1344	1406	658	0	0	0	0	0	0	0	130	966	4,505
	PK	2.9	2.9	1.9	0.3	0.0	0.0	0.0	0.0	0.0	0.0	1.4	2.4	2.9
1	EQ5020			HEAT WATER CIRC. PUMP C.V.									
	ELEC	1934	1747	1594	0	0	0	0	0	0	0	421	1854	7,550
	PK	2.6	2.6	2.6	2.6	0.0	0.0	0.0	0.0	0.0	0.0	2.6	2.6	2.6
1	EQ5240			BOILER FORCED DRAFT FAN									
	ELEC	423	382	348	0	0	0	0	0	0	0	92	405	1,649
	PK	0.6	0.6	0.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.6	0.6
1	EQ5307			BOILER CONTROLS									
	ELEC	372	336	306	0	0	0	0	0	0	0	81	356	1,452
	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

UTILITY PEAK CHECKSUMS - ALTERNATIVE 1
BLDG M060, ECO #12

---------- 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 83.6 (kW)
Yearly Time of Peak 20 (hr) 7 (mo)

Hour 20 Month 7

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Percnt Of Tot (%)
Cooling Equipment				
1	EQ1100S	AIR-CLD RECIP 25-45 TONS	38.1	45.62
Sub Total			38.1	45.62
Sub Total			0.0	0.00
Air Moving Equipment				
1		SUMMATION OF FAN ELECTRICAL DEMAND	7.3	8.74
Sub Total			7.3	8.74
Sub Total			0.0	0.00
Miscellaneous				
Lights			8.0	9.62
Base Utilities			0.0	0.00
Misc Equipment			30.1	36.02
Sub Total			38.1	45.64
Grand Total			83.6	100.00

CALIFORNIA TITLE 24 COMPLIANCE - ALTERNATIVE 1
BLDG M060, ECO #12

CALIFORNIA TITLE 24 COMPLIANCE REPORT

Weather Name ..... ATLANTA.
Gross Conditioned Floor Area (sqft)..... 20,856
ACM Multiplier 1.025

E N E R G Y U S E S U M M A R Y

	ELEC (kWh/yr)	GAS (kBtu/yr)	PERCENT OF TOTAL ENERGY (%)	TOTAL SOURCE ENERGY (kBtu/yr)	ADJUSTED UNIT SOURCE ENERGY (kBtu/yr-sf)
Primary Heating	3,101.4	450,478.1	42.3	505,946.3	24.9
Primary Cooling					
Compressor	33,219.4	0.0	10.4	340,167.9	16.7
Tower/Cond Fans	2,749.4	0.0	0.9	28,153.9	1.4
Condenser Pump	0.0	0.0	0.0	0.0	0.0
Other Accessories	666.0	0.0	0.2	6,819.9	0.3
Auxiliary					
Supply Fans	63,955.6	0.0	20.0	654,907.0	32.2
Circulation Pumps	13,322.4	0.0	4.2	136,421.8	6.7
Base Utilities	0.0	0.0	0.0	0.0	0.0
Subtotal	77,278.0	0.0	24.2	791,328.8	38.9
Lighting	25,412.0	0.0	8.0	260,219.7	12.5
Receptacle	45,044.6	0.0	14.1	461,258.2	22.1
Domestic Hot Water	0.0	0.0	0.0	0.0	0.0
Cogeneration	0.0	0.0	0.0	0.0	0.0
Totals	187,471.0	450,478.1	100.0	2,393,894.5	116.8

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M060, ECO#13

M O N T H L Y E N E R G Y C O N S U M P T I O N

Month	ELEC On Peak (kWh)	DEMAND On Peak (kW)	GAS On Peak (Therm)	GAS DMND On Peak (Thrm/hr)
Jan	14,902	49	1,496	3
Feb	13,471	49	1,548	3
March	14,817	45	871	2
April	11,931	45	17	1
May	16,954	82	0	0
June	28,136	94	0	0
July	27,799	93	0	0
Aug	27,304	93	0	0
Sept	19,796	86	0	0
Oct	12,182	75	0	0
Nov	13,079	45	295	7
Dec	14,905	49	1,117	3
Total	215,274	94	5,344	7

Building Energy Consumption = 60,850 (Btu/Sq Ft/Year) Floor Area = 20,856 (Sq Ft)
Source Energy Consumption = 132,667 (Btu/Sq Ft/Year)

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M060, ECO#13

EQUIPMENT ENERGY CONSUMPTION

Ref Num	Equip Code	Monthly Consumption Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	2155	1946	2172	2082	2164	2100	2146	2172	2082	2164	2082	2146	25,412
	PK	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
1	MISC LD													
	ELEC	3826	3455	3826	3702	3826	3702	3826	3826	3702	3826	3702	3826	45,045
	PK	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1
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	EQ1100S	AIR-CLD RECIP 25-45 TONS												
	ELEC	0	0	0	0	3390	10783	10235	9658	4810	0	0	0	38,875
	PK	0.0	0.0	0.0	0.0	35.1	48.2	44.9	44.4	37.3	25.7	0.0	0.0	48.2
1	EQ5200	CONDENSER FANS												
	ELEC	0	0	0	0	243	803	757	710	356	0	0	0	2,869
	PK	0.0	0.0	0.0	0.0	3.0	6.5	4.2	4.2	3.3	1.0	0.0	0.0	6.5
1	EQ5001	CHILLED WATER PUMP C.V.												
	ELEC	0	0	0	0	564	1435	1451	1451	702	0	0	0	5,603
	PK	0.0	0.0	0.0	0.0	2.6	2.6	2.6	2.6	2.6	2.6	0.0	0.0	2.6
1	EQ5303	CONTROLS												
	ELEC	0	0	0	0	65	166	167	167	81	0	0	0	646
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3
2	EQ1750	AIR-CLD CTV ICE-CHILL H2O												
	ELEC	609	561	621	601	1098	3544	3428	3542	2506	627	601	621	18,358
	PK	9.2	9.2	9.2	9.2	22.4	22.4	23.2	23.1	22.4	22.4	9.2	9.2	23.2

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M060, ECO#13

2	EQ5205			CONDENSER FANS										
	ELEC	10	9	10	10	12	16	16	17	14	10	10	10	144
	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
2	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
2	EQ5309			CONTROLS										
	ELEC	124	112	124	120	160	330	341	329	286	124	120	124	2,294
	PK	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
1	EQ4371			FAN COIL SUPPLY FAN										
	ELEC	5432	4906	5432	5257	5432	5257	5432	5432	5257	5432	5257	5432	63,956
	PK	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3
1	EQ2001			GAS FIRE TUBE HOT WATER										
	GAS	1496	1548	871	17	0	0	0	0	0	0	295	1117	5,344
	PK	3.2	3.2	2.1	0.8	0.0	0.0	0.0	0.0	0.0	0.0	7.1	2.6	7.1
1	EQ5020			HEAT WATER CIRC. PUMP C.V.										
	ELEC	1934	1747	1854	112	0	0	0	0	0	0	920	1934	8,502
	PK	2.6	2.6	2.6	2.6	0.0	0.0	0.0	0.0	0.0	0.0	2.6	2.6	2.6
1	EQ5240			BOILER FORCED DRAFT FAN										
	ELEC	440	398	422	25	0	0	0	0	0	0	209	440	1,935
	PK	0.6	0.6	0.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.6	0.6
1	EQ5307			BOILER CONTROLS										
	ELEC	372	336	356	22	0	0	0	0	0	0	177	372	1,63
	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

UTILITY PEAK CHECKSUMS - ALTERNATIVE 1
BLDG M060, ECO#13

---------- 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 93.8 (kW)
Yearly Time of Peak 20 (hr) 6 (mo)

Hour 20 Month 6

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Percnt Of Tot (%)
Cooling Equipment				
1	EQ1100S	AIR-CLD RECIP 25-45 TONS	48.4	51.55
Sub Total			48.4	51.55
Sub Total			0.0	0.00
Air Moving Equipment				
1		SUMMATION OF FAN ELECTRICAL DEMAND	7.3	7.78
Sub Total			7.3	7.78
Sub Total			0.0	0.00
Miscellaneous				
Lights			8.0	8.57
Base Utilities			0.0	0.00
Misc Equipment			30.1	32.09
Sub Total			38.1	40.66
Grand Total			93.8	100.00

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M060, ECO#13

---- B U I L D I N G C O O L I N G D E M A N D S A N D T H E R M A L S T O R A G E ----

January

	Design		Design			
Hour	Design OADB (F)	Design OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	42.7	35.4	0.0	0.0	0.0	110
2	41.8	34.7	0.0	2.2	3.6	111
3	41.1	34.4	0.0	0.0	0.0	110
4	40.6	34.0	0.0	2.2	3.6	111
5	40.4	34.0	0.0	0.0	0.0	110
6	40.8	34.4	0.0	2.2	3.6	111
7	41.6	35.0	0.0	0.0	0.0	110
8	43.2	36.5	0.0	2.2	3.6	111
9	45.5	38.5	0.0	0.0	0.0	111
10	48.1	40.4	0.0	0.0	0.0	111
11	51.0	42.2	0.0	0.0	0.0	111
12	53.8	43.8	0.0	0.0	0.0	111
13	55.9	45.0	0.0	0.0	0.0	110
14	57.3	45.5	0.0	0.0	0.0	109
15	57.8	45.6	0.0	0.0	0.0	108
16	57.3	44.8	0.0	0.0	0.0	107
17	56.1	43.9	0.0	0.0	0.0	107
18	54.2	42.7	0.0	0.0	0.0	107
19	51.9	41.6	0.0	0.0	0.0	107
20	49.6	40.2	0.0	0.0	0.0	107
21	47.7	39.1	0.0	0.0	0.0	107
22	46.0	37.9	0.0	0.0	0.0	107
23	44.6	36.8	0.0	0.0	0.0	107
24	43.6	36.1	0.0	0.0	0.0	107

			Weekday				Saturday			
Hour	Typical OADB (F)	Typical OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	33.4	30.4	0.0	5.4	8.5	111	0.0	6.5	9.2	111
2	32.1	29.3	0.0	0.0	0.0	110	0.0	0.0	0.0	110
3	31.7	29.3	0.0	2.2	3.6	111	0.0	2.2	3.6	111
4	31.9	29.5	0.0	0.0	0.0	110	0.0	0.0	0.0	110
5	32.6	30.3	0.0	2.2	3.6	111	0.0	2.2	3.6	111
6	33.6	31.3	0.0	0.0	0.0	110	0.0	0.0	0.0	110
7	35.0	32.6	0.0	2.2	3.6	111	0.0	2.2	3.6	111
8	36.6	34.4	0.0	0.0	0.0	110	0.0	0.0	0.0	110
9	38.5	36.3	0.0	0.0	0.0	110	0.0	0.0	0.0	110
10	40.4	37.7	0.0	0.0	0.0	110	0.0	0.0	0.0	110
11	42.3	38.7	0.0	0.0	0.0	110	0.0	0.0	0.0	110
12	44.2	39.6	0.0	0.0	0.0	110	0.0	0.0	0.0	110
13	45.8	40.5	0.0	0.0	0.0	109	0.0	0.0	0.0	109
14	47.2	41.1	0.0	0.0	0.0	108	0.0	0.0	0.0	108
15	48.2	41.6	0.0	0.0	0.0	107	0.0	0.0	0.0	107

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M060, ECO#13

			Weekday				Saturday			
	Typical		Cooling	Chiller	Chiller	Storage	Cooling	Chiller	Chiller	Storage
	OADB	OAWB	Load	Load	Demand	Capacity	Load	Load	Demand	Capacity
Hour	(F)	(F)	(Ton)	(Ton)	(kW)	(Ton-Hr)	(Ton)	(Ton)	(kW)	(Ton-Hr)
16	48.9	41.8	0.0	0.0	0.0	106	0.0	0.0	0.0	106
17	49.1	41.9	0.0	0.0	0.0	106	0.0	0.0	0.0	106
18	48.7	41.9	0.0	0.0	0.0	106	0.0	0.0	0.0	106
19	47.4	41.7	0.0	0.0	0.0	106	0.0	0.0	0.0	106
20	45.5	40.5	0.0	0.0	0.0	106	0.0	0.0	0.0	106
21	43.1	38.9	0.0	0.0	0.0	106	0.0	0.0	0.0	106
22	40.4	36.7	0.0	0.0	0.0	106	0.0	0.0	0.0	106
23	37.7	34.3	0.0	0.0	0.0	106	0.0	0.0	0.0	106
24	35.3	32.3	0.0	0.0	0.0	106	0.0	0.0	0.0	106

			Sunday				Monday			
	Typical		Cooling	Chiller	Chiller	Storage	Cooling	Chiller	Chiller	Storage
	OADB	OAWB	Load	Load	Demand	Capacity	Load	Load	Demand	Capacity
Hour	(F)	(F)	(Ton)	(Ton)	(kW)	(Ton-Hr)	(Ton)	(Ton)	(kW)	(Ton-Hr)
1	33.4	30.4	0.0	6.5	9.2	111	0.0	6.5	9.2	111
2	32.1	29.3	0.0	0.0	0.0	110	0.0	0.0	0.0	110
3	31.7	29.3	0.0	2.2	3.6	111	0.0	2.2	3.6	111
4	31.9	29.5	0.0	0.0	0.0	110	0.0	0.0	0.0	110
5	32.6	30.3	0.0	2.2	3.6	111	0.0	2.2	3.6	111
6	33.6	31.3	0.0	0.0	0.0	110	0.0	0.0	0.0	110
7	35.0	32.6	0.0	2.2	3.6	111	0.0	2.2	3.6	111
8	36.6	34.4	0.0	0.0	0.0	110	0.0	0.0	0.0	110
9	38.5	36.3	0.0	0.0	0.0	110	0.0	0.0	0.0	110
10	40.4	37.7	0.0	0.0	0.0	110	0.0	0.0	0.0	110
11	42.3	38.7	0.0	0.0	0.0	110	0.0	0.0	0.0	110
12	44.2	39.6	0.0	0.0	0.0	110	0.0	0.0	0.0	110
13	45.8	40.5	0.0	0.0	0.0	109	0.0	0.0	0.0	109
14	47.2	41.1	0.0	0.0	0.0	108	0.0	0.0	0.0	108
15	48.2	41.6	0.0	0.0	0.0	107	0.0	0.0	0.0	107
16	48.9	41.8	0.0	0.0	0.0	106	0.0	0.0	0.0	106
17	49.1	41.9	0.0	0.0	0.0	106	0.0	0.0	0.0	106
18	48.7	41.9	0.0	0.0	0.0	106	0.0	0.0	0.0	106
19	47.4	41.7	0.0	0.0	0.0	106	0.0	0.0	0.0	106
20	45.5	40.5	0.0	0.0	0.0	106	0.0	0.0	0.0	106
21	43.1	38.9	0.0	0.0	0.0	106	0.0	0.0	0.0	106
22	40.4	36.7	0.0	0.0	0.0	106	0.0	0.0	0.0	106
23	37.7	34.3	0.0	0.0	0.0	106	0.0	0.0	0.0	106
24	35.3	32.3	0.0	0.0	0.0	106	0.0	0.0	0.0	106

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M060, ECO#13

---- B U I L D I N G C O O L I N G D E M A N D S A N D T H E R M A L S T O R A G E ----

February

			Design			
	Design		Cooling	Chiller	Chiller	Storage
	OADB	OAWB	Load	Load	Demand	Capacity
Hour	(F)	(F)	(Ton)	(Ton)	(kW)	(Ton-Hr)
1	42.8	35.6	0.0	6.5	9.2	111
2	42.0	34.9	0.0	0.0	0.0	110
3	41.4	34.5	0.0	2.2	3.6	111
4	41.0	34.2	0.0	0.0	0.0	110
5	40.8	34.0	0.0	2.2	3.6	111
6	41.1	34.4	0.0	0.0	0.0	110
7	41.9	35.0	0.0	2.2	3.6	111
8	43.3	36.5	0.0	0.0	0.0	110
9	45.3	38.2	0.0	0.0	0.0	110
10	47.7	39.5	0.0	0.0	0.0	110
11	50.3	41.3	0.0	0.0	0.0	110
12	52.8	42.5	0.0	0.0	0.0	110
13	54.7	43.4	0.0	0.0	0.0	109
14	55.9	44.0	0.0	0.0	0.0	108
15	56.4	44.2	0.0	0.0	0.0	107
16	55.9	43.6	0.0	0.0	0.0	106
17	54.8	42.6	0.0	0.0	0.0	106
18	53.1	41.4	0.0	0.0	0.0	106
19	51.1	40.4	0.0	0.0	0.0	106
20	49.1	39.4	0.0	0.0	0.0	106
21	47.4	38.5	0.0	0.0	0.0	106
22	45.8	37.6	0.0	0.0	0.0	106
23	44.5	36.9	0.0	0.0	0.0	106
24	43.6	36.1	0.0	0.0	0.0	106

			Weekday				Saturday			
	Typical		Cooling	Chiller	Chiller	Storage	Cooling	Chiller	Chiller	Storage
	OADB	OAWB	Load	Load	Demand	Capacity	Load	Load	Demand	Capacity
Hour	(F)	(F)	(Ton)	(Ton)	(kW)	(Ton-Hr)	(Ton)	(Ton)	(kW)	(Ton-Hr)
1	37.5	34.5	0.0	6.5	9.2	111	0.0	6.5	9.2	111
2	36.0	33.0	0.0	0.0	0.0	110	0.0	0.0	0.0	110
3	34.7	31.8	0.0	2.2	3.6	111	0.0	2.2	3.6	111
4	33.6	30.9	0.0	0.0	0.0	110	0.0	0.0	0.0	110
5	32.8	30.1	0.0	2.2	3.6	111	0.0	2.2	3.6	111
6	32.2	29.8	0.0	0.0	0.0	110	0.0	0.0	0.0	110
7	32.1	29.6	0.0	2.2	3.6	111	0.0	2.2	3.6	111
8	32.5	30.3	0.0	0.0	0.0	110	0.0	0.0	0.0	110
9	33.9	31.6	0.0	0.0	0.0	110	0.0	0.0	0.0	110
10	36.0	33.0	0.0	0.0	0.0	110	0.0	0.0	0.0	110
11	38.5	34.8	0.0	0.0	0.0	110	0.0	0.0	0.0	110
12	41.3	36.5	0.0	0.0	0.0	110	0.0	0.0	0.0	110
13	43.8	38.1	0.0	0.0	0.0	109	0.0	0.0	0.0	109
14	45.9	39.5	0.0	0.0	0.0	108	0.0	0.0	0.0	108
15	47.2	40.4	0.0	0.0	0.0	107	0.0	0.0	0.0	107

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M060, ECO#13

			Weekday				Saturday			
	Typical		Cooling	Chiller	Chiller	Storage	Cooling	Chiller	Chiller	Storage
	OADB	OAWB	Load	Load	Demand	Capacity	Load	Load	Demand	Capacity
Hour	(F)	(F)	(Ton)	(Ton)	(kW)	(Ton-Hr)	(Ton)	(Ton)	(kW)	(Ton-Hr)
16	47.7	40.6	0.0	0.0	0.0	106	0.0	0.0	0.0	106
17	47.5	40.2	0.0	0.0	0.0	106	0.0	0.0	0.0	106
18	47.0	39.8	0.0	0.0	0.0	106	0.0	0.0	0.0	106
19	46.2	39.9	0.0	0.0	0.0	106	0.0	0.0	0.0	106
20	45.1	39.7	0.0	0.0	0.0	106	0.0	0.0	0.0	106
21	43.8	39.2	0.0	0.0	0.0	106	0.0	0.0	0.0	106
22	42.3	38.3	0.0	0.0	0.0	106	0.0	0.0	0.0	106
23	40.7	37.2	0.0	0.0	0.0	106	0.0	0.0	0.0	106
24	39.1	35.8	0.0	0.0	0.0	106	0.0	0.0	0.0	106

			Sunday				Monday			
	Typical		Cooling	Chiller	Chiller	Storage	Cooling	Chiller	Chiller	Storage
	OADB	OAWB	Load	Load	Demand	Capacity	Load	Load	Demand	Capacity
Hour	(F)	(F)	(Ton)	(Ton)	(kW)	(Ton-Hr)	(Ton)	(Ton)	(kW)	(Ton-Hr)
1	37.5	34.5	0.0	6.5	9.2	111	0.0	6.5	9.2	111
2	36.0	33.0	0.0	0.0	0.0	110	0.0	0.0	0.0	110
3	34.7	31.8	0.0	2.2	3.6	111	0.0	2.2	3.6	111
4	33.6	30.9	0.0	0.0	0.0	110	0.0	0.0	0.0	110
5	32.8	30.1	0.0	2.2	3.6	111	0.0	2.2	3.6	111
6	32.2	29.8	0.0	0.0	0.0	110	0.0	0.0	0.0	110
7	32.1	29.6	0.0	2.2	3.6	111	0.0	2.2	3.6	111
8	32.5	30.3	0.0	0.0	0.0	110	0.0	0.0	0.0	110
9	33.9	31.6	0.0	0.0	0.0	110	0.0	0.0	0.0	110
10	36.0	33.0	0.0	0.0	0.0	110	0.0	0.0	0.0	110
11	38.5	34.8	0.0	0.0	0.0	110	0.0	0.0	0.0	110
12	41.3	36.5	0.0	0.0	0.0	110	0.0	0.0	0.0	110
13	43.8	38.1	0.0	0.0	0.0	109	0.0	0.0	0.0	109
14	45.9	39.5	0.0	0.0	0.0	108	0.0	0.0	0.0	108
15	47.2	40.4	0.0	0.0	0.0	107	0.0	0.0	0.0	107
16	47.7	40.6	0.0	0.0	0.0	106	0.0	0.0	0.0	106
17	47.5	40.2	0.0	0.0	0.0	106	0.0	0.0	0.0	106
18	47.0	39.8	0.0	0.0	0.0	106	0.0	0.0	0.0	106
19	46.2	39.9	0.0	0.0	0.0	106	0.0	0.0	0.0	106
20	45.1	39.7	0.0	0.0	0.0	106	0.0	0.0	0.0	106
21	43.8	39.2	0.0	0.0	0.0	106	0.0	0.0	0.0	106
22	42.3	38.3	0.0	0.0	0.0	106	0.0	0.0	0.0	106
23	40.7	37.2	0.0	0.0	0.0	106	0.0	0.0	0.0	106
24	39.1	35.8	0.0	0.0	0.0	106	0.0	0.0	0.0	106

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M060, ECO#13

---- B U I L D I N G C O O L I N G D E M A N D S A N D T H E R M A L S T O R A G E ----

March

	Design		Design			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	51.8	42.9	0.0	6.5	9.2	111
2	50.8	42.1	0.0	0.0	0.0	110
3	50.0	41.8	0.0	2.2	3.6	111
4	49.3	41.1	0.0	0.0	0.0	110
5	49.1	41.1	0.0	2.2	3.6	111
6	49.5	41.6	0.0	0.0	0.0	110
7	50.6	42.7	0.0	2.2	3.6	111
8	52.5	44.3	0.0	0.0	0.0	110
9	55.2	46.4	0.0	0.0	0.0	110
10	58.3	48.5	0.0	0.0	0.0	110
11	61.8	50.3	0.0	0.0	0.0	110
12	65.1	51.9	0.0	0.0	0.0	110
13	67.6	53.4	0.0	0.0	0.0	109
14	69.3	53.9	0.0	0.0	0.0	108
15	69.9	53.8	0.0	0.0	0.0	107
16	69.3	53.1	0.0	0.0	0.0	106
17	67.8	51.8	0.0	0.0	0.0	106
18	65.6	50.2	0.0	0.0	0.0	106
19	62.9	48.9	0.0	0.0	0.0	106
20	60.2	47.7	0.0	0.0	0.0	106
21	57.9	46.5	0.0	0.0	0.0	106
22	55.8	45.3	0.0	0.0	0.0	106
23	54.1	44.4	0.0	0.0	0.0	106
24	52.9	43.7	0.0	0.0	0.0	106

	Typical		Weekday				Saturday			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	45.4	41.6	0.0	6.5	9.2	111	0.0	6.5	9.2	111
2	43.3	39.7	0.0	0.0	0.0	110	0.0	0.0	0.0	110
3	41.6	38.6	0.0	2.2	3.6	111	0.0	2.2	3.6	111
4	40.6	37.5	0.0	0.0	0.0	110	0.0	0.0	0.0	110
5	40.2	37.3	0.0	2.2	3.6	111	0.0	2.2	3.6	111
6	40.6	37.8	0.0	0.0	0.0	110	0.0	0.0	0.0	110
7	41.6	39.0	0.0	2.2	3.6	111	0.0	2.2	3.6	111
8	43.3	40.7	0.0	0.0	0.0	110	0.0	0.0	0.0	110
9	45.4	42.5	0.0	0.0	0.0	110	0.0	0.0	0.0	110
10	47.9	44.3	0.0	0.0	0.0	110	0.0	0.0	0.0	110
11	50.6	45.5	0.0	0.0	0.0	110	0.0	0.0	0.0	110
12	53.3	46.8	0.0	0.0	0.0	110	0.0	0.0	0.0	110
13	55.8	48.5	0.0	0.0	0.0	109	0.0	0.0	0.0	109
14	58.0	49.6	0.0	0.0	0.0	108	0.0	0.0	0.0	108
15	59.6	50.3	0.0	0.0	0.0	107	0.0	0.0	0.0	107

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M060, ECO#13

	Typical		Weekday				Saturday			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
16	60.7	50.9	0.0	0.0	0.0	106	0.0	0.0	0.0	106
17	61.0	50.9	0.0	0.0	0.0	106	0.0	0.0	0.0	106
18	60.7	50.7	0.0	0.0	0.0	106	0.0	0.0	0.0	106
19	59.6	50.7	0.0	0.0	0.0	106	0.0	0.0	0.0	106
20	58.0	50.5	0.0	0.0	0.0	106	0.0	0.0	0.0	106
21	55.8	49.4	0.0	0.0	0.0	106	0.0	0.0	0.0	106
22	53.3	47.8	0.0	0.0	0.0	106	0.0	0.0	0.0	106
23	50.6	45.9	0.0	0.0	0.0	106	0.0	0.0	0.0	106
24	47.9	43.8	0.0	0.0	0.0	106	0.0	0.0	0.0	106

	Typical		Sunday				Monday			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	45.4	41.6	0.0	6.5	9.2	111	0.0	6.5	9.2	111
2	43.3	39.7	0.0	0.0	0.0	110	0.0	0.0	0.0	110
3	41.6	38.6	0.0	2.2	3.6	111	0.0	2.2	3.6	111
4	40.6	37.5	0.0	0.0	0.0	110	0.0	0.0	0.0	110
5	40.2	37.3	0.0	2.2	3.6	111	0.0	2.2	3.6	111
6	40.6	37.8	0.0	0.0	0.0	110	0.0	0.0	0.0	110
7	41.6	39.0	0.0	2.2	3.6	111	0.0	2.2	3.6	111
8	43.3	40.7	0.0	0.0	0.0	110	0.0	0.0	0.0	110
9	45.4	42.5	0.0	0.0	0.0	110	0.0	0.0	0.0	110
10	47.9	44.3	0.0	0.0	0.0	110	0.0	0.0	0.0	110
11	50.6	45.5	0.0	0.0	0.0	110	0.0	0.0	0.0	110
12	53.3	46.8	0.0	0.0	0.0	110	0.0	0.0	0.0	110
13	55.8	48.5	0.0	0.0	0.0	109	0.0	0.0	0.0	109
14	58.0	49.6	0.0	0.0	0.0	108	0.0	0.0	0.0	108
15	59.6	50.3	0.0	0.0	0.0	107	0.0	0.0	0.0	107
16	60.7	50.9	0.0	0.0	0.0	106	0.0	0.0	0.0	106
17	61.0	50.9	0.0	0.0	0.0	106	0.0	0.0	0.0	106
18	60.7	50.7	0.0	0.0	0.0	106	0.0	0.0	0.0	106
19	59.6	50.7	0.0	0.0	0.0	106	0.0	0.0	0.0	106
20	58.0	50.5	0.0	0.0	0.0	106	0.0	0.0	0.0	106
21	55.8	49.4	0.0	0.0	0.0	106	0.0	0.0	0.0	106
22	53.3	47.8	0.0	0.0	0.0	106	0.0	0.0	0.0	106
23	50.6	45.9	0.0	0.0	0.0	106	0.0	0.0	0.0	106
24	47.9	43.8	0.0	0.0	0.0	106	0.0	0.0	0.0	106

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M060, ECO#13

---- B U I L D I N G C O O L I N G D E M A N D S A N D T H E R M A L S T O R A G E ----

April

			Design			
Hour	Design OADB (F)	Design OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	62.6	52.5	0.0	6.5	9.2	111
2	61.6	52.1	0.0	0.0	0.0	110
3	60.9	51.6	0.0	2.2	3.6	111
4	60.3	51.2	0.0	0.0	0.0	110
5	60.1	51.3	0.0	2.2	3.6	111
6	60.5	51.9	0.0	0.0	0.0	110
7	61.4	53.0	0.0	2.2	3.6	111
8	63.2	54.5	0.0	0.0	0.0	110
9	65.7	55.8	0.0	0.0	0.0	110
10	68.6	57.1	0.0	0.0	0.0	110
11	71.9	58.6	0.0	0.0	0.0	110
12	75.0	60.3	0.0	0.0	0.0	110
13	77.4	61.5	0.0	0.0	0.0	109
14	78.9	62.2	0.0	0.0	0.0	108
15	79.5	62.5	0.0	0.0	0.0	107
16	78.9	61.8	0.0	0.0	0.0	106
17	77.5	60.3	0.0	0.0	0.0	106
18	75.4	59.1	0.0	0.0	0.0	106
19	72.9	57.3	0.0	0.0	0.0	106
20	70.4	56.5	0.0	0.0	0.0	106
21	68.2	55.7	0.0	0.0	0.0	106
22	66.3	55.0	0.0	0.0	0.0	106
23	64.7	54.0	0.0	0.0	0.0	106
24	63.6	53.2	0.0	0.0	0.0	106

			Weekday				Saturday			
Hour	Typical OADB (F)	Typical OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	57.7	53.9	0.0	6.5	9.2	111	0.0	6.5	9.2	111
2	55.9	52.7	0.0	0.0	0.0	110	0.0	0.0	0.0	110
3	54.2	51.3	0.0	2.2	3.6	111	0.0	2.2	3.6	111
4	52.9	50.2	0.0	0.0	0.0	110	0.0	0.0	0.0	110
5	51.9	49.6	0.0	2.2	3.6	111	0.0	2.2	3.6	111
6	51.2	49.2	0.0	0.0	0.0	110	0.0	0.0	0.0	110
7	51.0	49.3	0.0	2.2	3.6	111	0.0	2.2	3.6	111
8	51.6	49.9	0.0	0.0	0.0	110	0.0	0.0	0.0	110
9	53.3	50.6	0.0	0.0	0.0	110	0.0	0.0	0.0	110
10	55.9	51.8	0.0	0.0	0.0	110	0.0	0.0	0.0	110
11	59.0	53.4	0.0	0.0	0.0	110	0.0	0.0	0.0	110
12	62.4	55.6	0.0	0.0	0.0	110	0.0	0.0	0.0	110
13	65.5	57.7	0.0	0.0	0.0	109	0.0	0.0	0.0	109
14	68.1	59.4	0.0	0.0	0.0	108	0.0	0.0	0.0	108
15	69.8	60.7	0.0	0.0	0.0	107	0.0	0.0	0.0	107

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M060, ECO#13

			Weekday				Saturday			
Hour	Typical OADB (F)	Typical OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
16	70.4	60.9	0.0	0.0	0.0	106	0.0	0.0	0.0	106
17	70.2	60.2	0.0	0.0	0.0	106	0.0	0.0	0.0	106
18	69.5	60.1	0.0	0.0	0.0	106	0.0	0.0	0.0	106
19	68.5	59.4	0.0	0.0	0.0	106	0.0	0.0	0.0	106
20	67.2	59.7	0.0	0.0	0.0	106	0.0	0.0	0.0	106
21	65.5	59.3	0.0	0.0	0.0	106	0.0	0.0	0.0	106
22	63.7	58.8	0.0	0.0	0.0	106	0.0	0.0	0.0	106
23	61.7	57.3	0.0	0.0	0.0	106	0.0	0.0	0.0	106
24	59.7	55.6	0.0	0.0	0.0	106	0.0	0.0	0.0	106

			Sunday				Monday			
Hour	Typical OADB (F)	Typical OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	57.7	53.9	0.0	6.5	9.2	111	0.0	6.5	9.2	111
2	55.9	52.7	0.0	0.0	0.0	110	0.0	0.0	0.0	110
3	54.2	51.3	0.0	2.2	3.6	111	0.0	2.2	3.6	111
4	52.9	50.2	0.0	0.0	0.0	110	0.0	0.0	0.0	110
5	51.9	49.6	0.0	2.2	3.6	111	0.0	2.2	3.6	111
6	51.2	49.2	0.0	0.0	0.0	110	0.0	0.0	0.0	110
7	51.0	49.3	0.0	2.2	3.6	111	0.0	2.2	3.6	111
8	51.6	49.9	0.0	0.0	0.0	110	0.0	0.0	0.0	110
9	53.3	50.6	0.0	0.0	0.0	110	0.0	0.0	0.0	110
10	55.9	51.8	0.0	0.0	0.0	110	0.0	0.0	0.0	110
11	59.0	53.4	0.0	0.0	0.0	110	0.0	0.0	0.0	110
12	62.4	55.6	0.0	0.0	0.0	110	0.0	0.0	0.0	110
13	65.5	57.7	0.0	0.0	0.0	109	0.0	0.0	0.0	109
14	68.1	59.4	0.0	0.0	0.0	108	0.0	0.0	0.0	108
15	69.8	60.7	0.0	0.0	0.0	107	0.0	0.0	0.0	107
16	70.4	60.9	0.0	0.0	0.0	106	0.0	0.0	0.0	106
17	70.2	60.2	0.0	0.0	0.0	106	0.0	0.0	0.0	106
18	69.5	60.1	0.0	0.0	0.0	106	0.0	0.0	0.0	106
19	68.5	59.4	0.0	0.0	0.0	106	0.0	0.0	0.0	106
20	67.2	59.7	0.0	0.0	0.0	106	0.0	0.0	0.0	106
21	65.5	59.3	0.0	0.0	0.0	106	0.0	0.0	0.0	106
22	63.7	58.8	0.0	0.0	0.0	106	0.0	0.0	0.0	106
23	61.7	57.3	0.0	0.0	0.0	106	0.0	0.0	0.0	106
24	59.7	55.6	0.0	0.0	0.0	106	0.0	0.0	0.0	106

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M060, ECO#13

---- B U I L D I N G C O O L I N G D E M A N D S A N D T H E R M A L S T O R A G E ----

May

			Design			
	Design		Cooling	Chiller	Chiller	Storage
	OADB	OAWB	Load	Load	Demand	Capacity
Hour	(F)	(F)	(Ton)	(Ton)	(kW)	(Ton-Hr)
1	70.8	59.3	0.0	6.5	9.2	111
2	69.8	58.5	0.0	0.0	0.0	110
3	69.0	58.2	0.0	2.2	3.6	111
4	68.4	58.1	0.0	0.0	0.0	110
5	68.2	58.0	0.0	2.2	3.6	111
6	68.6	58.5	0.0	0.0	0.0	110
7	69.6	59.5	0.0	2.2	3.6	111
8	71.3	60.6	0.0	0.0	0.0	110
9	73.9	61.5	0.0	0.0	0.0	110
10	76.8	62.7	0.0	0.0	0.0	110
11	80.1	63.9	0.0	0.0	0.0	110
12	83.2	65.4	0.0	0.0	0.0	110
13	85.6	66.5	0.0	0.0	0.0	109
14	87.1	67.1	0.0	0.0	0.0	108
15	87.7	67.2	6.2	0.0	0.0	100
16	87.1	66.5	18.2	0.0	0.0	81
17	85.8	65.1	0.0	0.0	0.0	81
18	83.6	63.9	0.0	0.0	0.0	81
19	81.1	62.4	0.0	0.0	0.0	81
20	78.6	61.6	0.0	0.0	0.0	81
21	76.4	61.8	0.0	0.0	0.0	81
22	74.5	60.9	0.0	0.0	0.0	81
23	72.9	60.3	0.0	0.0	0.0	81
24	71.7	59.9	0.0	0.0	0.0	81

			Weekday				Saturday			
	Typical		Cooling	Chiller	Chiller	Storage	Cooling	Chiller	Chiller	Storage
	OADB	OAWB	Load	Load	Demand	Capacity	Load	Load	Demand	Capacity
Hour	(F)	(F)	(Ton)	(Ton)	(kW)	(Ton-Hr)	(Ton)	(Ton)	(kW)	(Ton-Hr)
1	66.6	62.3	0.0	20.0	22.4	100	0.0	6.5	9.2	111
2	64.5	60.4	0.0	11.6	13.3	111	0.0	0.0	0.0	110
3	62.7	59.1	0.0	0.0	0.0	110	0.0	2.2	3.6	111
4	61.2	58.1	0.0	2.2	3.6	111	0.0	0.0	0.0	110
5	60.0	57.1	0.0	0.0	0.0	110	0.0	2.2	3.6	111
6	59.3	56.6	0.0	2.2	3.6	111	0.0	0.0	0.0	110
7	59.0	56.5	0.0	0.0	0.0	110	0.0	2.2	3.6	111
8	59.5	56.6	0.0	2.2	3.6	111	0.0	0.0	0.0	110
9	60.9	56.6	0.0	0.0	0.0	111	0.0	0.0	0.0	110
10	63.0	57.2	0.0	0.0	0.0	111	0.0	0.0	0.0	110
11	65.7	58.1	0.0	0.0	0.0	111	0.0	0.0	0.0	110
12	68.7	59.8	0.0	0.0	0.0	111	0.0	0.0	0.0	110
13	71.7	61.6	0.0	0.0	0.0	110	0.0	0.0	0.0	109
14	74.5	63.4	0.0	0.0	0.0	109	0.0	0.0	0.0	108
15	76.6	64.8	0.0	0.0	0.0	108	0.0	0.0	0.0	107

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M060, ECO#13

			Weekday				Saturday			
	Typical		Cooling	Chiller	Chiller	Storage	Cooling	Chiller	Chiller	Storage
	OADB	OAWB	Load	Load	Demand	Capacity	Load	Load	Demand	Capacity
Hour	(F)	(F)	(Ton)	(Ton)	(kW)	(Ton-Hr)	(Ton)	(Ton)	(kW)	(Ton-Hr)
16	78.0	65.6	1.1	0.0	0.0	106	0.0	0.0	0.0	106
17	78.5	65.6	0.0	0.0	0.0	106	0.0	0.0	0.0	106
18	78.2	65.8	0.0	0.0	0.0	106	0.0	0.0	0.0	106
19	77.5	65.6	0.0	0.0	0.0	106	0.0	0.0	0.0	106
20	76.3	66.1	0.0	0.0	0.0	106	0.0	0.0	0.0	106
21	74.8	67.2	0.0	0.0	0.0	106	0.0	0.0	0.0	106
22	73.0	66.4	0.0	0.0	0.0	106	0.0	0.0	0.0	106
23	70.9	65.4	0.0	0.0	0.0	106	0.0	0.0	0.0	106
24	68.7	64.0	0.0	0.0	0.0	106	0.0	0.0	0.0	106

			Sunday				Monday			
	Typical		Cooling	Chiller	Chiller	Storage	Cooling	Chiller	Chiller	Storage
	OADB	OAWB	Load	Load	Demand	Capacity	Load	Load	Demand	Capacity
Hour	(F)	(F)	(Ton)	(Ton)	(kW)	(Ton-Hr)	(Ton)	(Ton)	(kW)	(Ton-Hr)
1	66.6	62.3	0.0	6.5	9.2	111	0.0	6.5	9.2	111
2	64.5	60.4	0.0	0.0	0.0	110	0.0	0.0	0.0	110
3	62.7	59.1	0.0	2.2	3.6	111	0.0	2.2	3.6	111
4	61.2	58.1	0.0	0.0	0.0	110	0.0	0.0	0.0	110
5	60.0	57.1	0.0	2.2	3.6	111	0.0	2.2	3.6	111
6	59.3	56.6	0.0	0.0	0.0	110	0.0	0.0	0.0	110
7	59.0	56.5	0.0	2.2	3.6	111	0.0	2.2	3.6	111
8	59.5	56.6	0.0	0.0	0.0	110	0.0	0.0	0.0	110
9	60.9	56.6	0.0	0.0	0.0	110	0.0	0.0	0.0	110
10	63.0	57.2	0.0	0.0	0.0	110	0.0	0.0	0.0	110
11	65.7	58.1	0.0	0.0	0.0	110	0.0	0.0	0.0	110
12	68.7	59.8	0.0	0.0	0.0	110	0.0	0.0	0.0	110
13	71.7	61.6	0.0	0.0	0.0	109	0.0	0.0	0.0	109
14	74.5	63.4	0.0	0.0	0.0	108	0.0	0.0	0.0	108
15	76.6	64.8	0.0	0.0	0.0	107	0.0	0.0	0.0	107
16	78.0	65.6	0.0	0.0	0.0	106	0.0	0.0	0.0	106
17	78.5	65.6	0.0	0.0	0.0	106	0.0	0.0	0.0	106
18	78.2	65.8	0.0	0.0	0.0	106	0.0	0.0	0.0	106
19	77.5	65.6	0.0	0.0	0.0	106	0.0	0.0	0.0	106
20	76.3	66.1	0.0	0.0	0.0	106	0.0	0.0	0.0	106
21	74.8	67.2	0.0	0.0	0.0	106	0.0	0.0	0.0	106
22	73.0	66.4	0.0	0.0	0.0	106	0.0	0.0	0.0	106
23	70.9	65.4	0.0	0.0	0.0	106	0.0	0.0	0.0	106
24	68.7	64.0	0.0	0.0	0.0	106	0.0	0.0	0.0	106

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M060, ECO#13

---- B U I L D I N G C O O L I N G D E M A N D S A N D T H E R M A L S T O R A G E ----

June

	Design		Design			
Hour	Design OADB (F)	Design OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	79.5	66.2	0.0	6.5	9.5	111
2	78.5	65.3	0.0	0.0	0.0	110
3	77.7	65.1	0.0	2.2	3.7	111
4	77.2	64.8	0.0	0.0	0.0	110
5	77.0	65.1	0.0	2.2	3.7	111
6	77.4	65.6	0.0	0.0	0.0	110
7	78.3	66.5	0.0	2.2	3.7	111
8	80.0	67.7	0.0	0.0	0.0	110
9	82.5	68.3	0.0	0.0	0.0	110
10	85.4	69.5	0.0	0.0	0.0	110
11	88.7	70.8	0.0	0.0	0.0	110
12	91.8	72.2	0.0	0.0	0.0	110
13	94.1	72.6	28.9	0.0	0.0	80
14	95.6	72.9	30.4	0.0	0.0	49
15	96.2	72.9	31.0	0.0	0.0	17
16	95.6	72.0	29.3	0.0	0.0	0
17	94.3	70.8	0.0	0.0	0.0	0
18	92.1	69.7	0.0	0.0	0.0	0
19	89.6	68.3	0.0	0.0	0.0	0
20	87.1	67.7	0.0	0.0	0.0	0
21	85.0	67.5	0.0	0.0	0.0	0
22	83.1	67.3	0.0	0.0	0.0	0
23	81.6	66.8	0.0	0.0	0.0	0
24	80.4	66.3	0.0	0.0	0.0	0

			Weekday				Saturday			
Hour	Typical OADB (F)	Typical OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	73.0	67.9	0.0	20.0	22.4	20	0.0	20.0	22.4	56
2	71.2	66.1	0.0	20.0	22.4	40	0.0	20.0	22.4	75
3	69.7	65.2	0.0	20.0	22.4	59	0.0	20.0	22.4	94
4	68.5	64.3	0.9	20.0	22.4	78	0.0	17.6	19.5	111
5	67.8	64.2	0.4	20.0	22.4	97	0.5	0.0	0.0	110
6	67.6	64.2	0.0	15.3	16.9	111	0.0	2.7	4.4	111
7	68.1	64.8	0.0	0.0	0.0	110	0.0	0.0	0.0	110
8	69.4	65.7	0.0	2.2	3.6	111	0.0	2.2	3.6	111
9	71.6	66.2	0.0	0.0	0.0	111	0.0	0.0	0.0	111
10	74.2	67.2	0.0	0.0	0.0	111	0.0	0.0	0.0	111
11	77.2	68.5	0.0	0.0	0.0	111	0.0	0.0	0.0	111
12	80.2	70.0	0.0	0.0	0.0	111	0.0	0.0	0.0	111
13	82.8	70.8	16.5	0.0	0.0	94	16.9	0.0	0.0	93
14	85.0	71.6	18.2	0.0	0.0	74	18.6	0.0	0.0	74
15	86.3	72.3	19.3	0.0	0.0	54	19.7	0.0	0.0	53

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M060, ECO#13

			Weekday				Saturday			
	Typical		Cooling	Chiller	Chiller	Storage	Cooling	Chiller	Chiller	Storage
	OADB	OAWB	Load	Load	Demand	Capacity	Load	Load	Demand	Capacity
Hour	(F)	(F)	(Ton)	(Ton)	(kW)	(Ton-Hr)	(Ton)	(Ton)	(kW)	(Ton-Hr)
16	86.8	72.1	17.8	0.0	0.0	36	18.2	0.0	0.0	34
17	86.6	71.7	0.0	0.0	0.0	36	0.0	0.0	0.0	34
18	85.8	71.5	0.0	0.0	0.0	36	0.0	0.0	0.0	34
19	84.7	71.2	0.0	0.0	0.0	36	0.0	0.0	0.0	34
20	83.2	71.5	0.0	0.0	0.0	36	0.0	0.0	0.0	34
21	81.4	71.7	0.0	0.0	0.0	36	0.0	0.0	0.0	34
22	79.3	71.4	0.0	0.0	0.0	36	0.0	0.0	0.0	34
23	77.2	70.5	0.0	0.0	0.0	36	0.0	0.0	0.0	34
24	75.1	69.1	0.0	0.0	0.0	36	0.0	0.0	0.0	34

			Sunday				Monday			
	Typical		Cooling	Chiller	Chiller	Storage	Cooling	Chiller	Chiller	Storage
	OADB	OAWB	Load	Load	Demand	Capacity	Load	Load	Demand	Capacity
Hour	(F)	(F)	(Ton)	(Ton)	(kW)	(Ton-Hr)	(Ton)	(Ton)	(kW)	(Ton-Hr)
1	73.0	67.9	0.0	20.0	22.4	54	0.0	20.0	22.4	54
2	71.2	66.1	0.0	20.0	22.4	73	0.0	20.0	22.4	73
3	69.7	65.2	0.0	20.0	22.4	93	0.0	20.0	22.4	93
4	68.5	64.3	0.0	19.4	21.6	111	0.0	19.4	21.6	111
5	67.8	64.2	0.5	0.0	0.0	110	0.5	0.0	0.0	110
6	67.6	64.2	0.0	2.7	4.4	111	0.0	2.7	4.4	111
7	68.1	64.8	0.0	0.0	0.0	110	0.0	0.0	0.0	110
8	69.4	65.7	0.0	2.2	3.6	111	0.0	2.2	3.6	111
9	71.6	66.2	0.0	0.0	0.0	111	0.0	0.0	0.0	111
10	74.2	67.2	0.0	0.0	0.0	111	0.0	0.0	0.0	111
11	77.2	68.5	0.0	0.0	0.0	111	0.0	0.0	0.0	111
12	80.2	70.0	0.0	0.0	0.0	111	0.0	0.0	0.0	111
13	82.8	70.8	16.9	0.0	0.0	93	16.5	0.0	0.0	94
14	85.0	71.6	18.6	0.0	0.0	74	18.2	0.0	0.0	74
15	86.3	72.3	19.7	0.0	0.0	53	19.3	0.0	0.0	54
16	86.8	72.1	18.2	0.0	0.0	34	17.8	0.0	0.0	36
17	86.6	71.7	0.0	0.0	0.0	34	0.0	0.0	0.0	36
18	85.8	71.5	0.0	0.0	0.0	34	0.0	0.0	0.0	36
19	84.7	71.2	0.0	0.0	0.0	34	0.0	0.0	0.0	36
20	83.2	71.5	0.0	0.0	0.0	34	0.0	0.0	0.0	36
21	81.4	71.7	0.0	0.0	0.0	34	0.0	0.0	0.0	36
22	79.3	71.4	0.0	0.0	0.0	34	0.0	0.0	0.0	36
23	77.2	70.5	0.0	0.0	0.0	34	0.0	0.0	0.0	36
24	75.1	69.1	0.0	0.0	0.0	34	0.0	0.0	0.0	36

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M060, ECO#13

---- B U I L D I N G C O O L I N G D E M A N D S A N D T H E R M A L S T O R A G E ----

July

	Design		Design			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	78.9	67.7	0.0	20.0	23.2	56
2	78.2	67.2	0.0	20.0	23.0	75
3	77.6	66.8	0.0	20.0	22.9	94
4	77.1	66.6	0.0	17.6	19.9	111
5	77.0	66.6	0.0	0.0	0.0	110
6	77.3	66.9	0.0	2.2	3.7	111
7	78.0	67.6	0.0	0.0	0.0	110
8	79.4	68.8	0.0	2.2	3.8	111
9	81.3	69.6	0.0	0.0	0.0	111
10	83.6	70.7	0.0	0.0	0.0	111
11	86.1	72.2	0.0	0.0	0.0	111
12	88.5	73.3	0.0	0.0	0.0	111
13	90.3	74.0	28.4	0.0	0.0	82
14	91.5	74.3	29.0	0.0	0.0	52
15	92.0	74.0	29.7	0.0	0.0	22
16	91.5	73.2	27.7	0.0	0.0	0
17	90.5	72.1	0.0	0.0	0.0	0
18	88.8	70.8	0.0	0.0	0.0	0
19	86.9	70.4	0.0	0.0	0.0	0
20	84.9	70.2	0.0	0.0	0.0	0
21	83.3	70.0	0.0	0.0	0.0	0
22	81.8	69.4	0.0	0.0	0.0	0
23	80.6	68.7	0.0	0.0	0.0	0
24	79.7	68.4	0.0	0.0	0.0	0

	Typical		Weekday				Saturday			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	72.0	69.3	0.0	20.0	22.4	20	0.0	20.0	22.4	63
2	70.5	68.0	0.0	20.0	22.4	40	0.0	20.0	22.4	83
3	69.4	67.1	0.0	20.0	22.4	59	0.0	20.0	22.4	102
4	68.5	66.4	0.7	20.0	22.4	78	0.7	11.2	12.8	111
5	67.9	66.0	0.7	20.0	22.4	97	0.8	0.0	0.0	109
6	67.7	65.9	0.0	15.4	17.0	111	0.0	3.0	4.9	111
7	68.1	66.3	0.0	0.0	0.0	110	0.0	0.0	0.0	110
8	69.1	67.3	0.0	2.2	3.6	111	0.0	2.2	3.6	111
9	70.8	68.0	0.0	0.0	0.0	111	0.0	0.0	0.0	111
10	72.9	69.1	0.0	0.0	0.0	111	0.0	0.0	0.0	111
11	75.2	70.5	0.0	0.0	0.0	111	0.0	0.0	0.0	111
12	77.5	71.7	0.0	0.0	0.0	111	0.0	0.0	0.0	111
13	79.6	72.7	14.5	0.0	0.0	96	14.9	0.0	0.0	95
14	81.3	73.5	16.5	0.0	0.0	78	16.9	0.0	0.0	77
15	82.3	73.7	17.0	0.0	0.0	60	17.4	0.0	0.0	59

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M060, ECO#13

			Weekday				Saturday			
	Typical		Cooling	Chiller	Chiller	Storage	Cooling	Chiller	Chiller	Storage
	OADB	OAWB	Load	Load	Demand	Capacity	Load	Load	Demand	Capacity
Hour	(F)	(F)	(Ton)	(Ton)	(kW)	(Ton-Hr)	(Ton)	(Ton)	(kW)	(Ton-Hr)
16	82.7	73.5	16.1	0.0	0.0	44	16.6	0.0	0.0	42
17	82.5	73.1	0.0	0.0	0.0	44	0.0	0.0	0.0	42
18	82.0	72.6	0.0	0.0	0.0	44	0.0	0.0	0.0	42
19	81.1	73.2	0.0	0.0	0.0	44	0.0	0.0	0.0	42
20	79.9	73.8	0.0	0.0	0.0	44	0.0	0.0	0.0	42
21	78.5	73.9	0.0	0.0	0.0	44	0.0	0.0	0.0	42
22	76.9	73.1	0.0	0.0	0.0	44	0.0	0.0	0.0	42
23	75.2	71.9	0.0	0.0	0.0	44	0.0	0.0	0.0	42
24	73.5	70.8	0.0	0.0	0.0	44	0.0	0.0	0.0	42

			Sunday				Monday			
	Typical		Cooling	Chiller	Chiller	Storage	Cooling	Chiller	Chiller	Storage
	OADB	OAWB	Load	Load	Demand	Capacity	Load	Load	Demand	Capacity
Hour	(F)	(F)	(Ton)	(Ton)	(kW)	(Ton-Hr)	(Ton)	(Ton)	(kW)	(Ton-Hr)
1	72.0	69.3	0.0	20.0	22.4	61	0.0	20.0	22.4	61
2	70.5	68.0	0.0	20.0	22.4	81	0.0	20.0	22.4	81
3	69.4	67.1	0.0	20.0	22.4	100	0.0	20.0	22.4	100
4	68.5	66.4	0.7	12.9	14.4	111	0.7	12.9	14.4	111
5	67.9	66.0	0.8	0.0	0.0	109	0.8	0.0	0.0	109
6	67.7	65.9	0.0	3.0	4.9	111	0.0	3.0	4.9	111
7	68.1	66.3	0.0	0.0	0.0	110	0.0	0.0	0.0	110
8	69.1	67.3	0.0	2.2	3.6	111	0.0	2.2	3.6	111
9	70.8	68.0	0.0	0.0	0.0	111	0.0	0.0	0.0	111
10	72.9	69.1	0.0	0.0	0.0	111	0.0	0.0	0.0	111
11	75.2	70.5	0.0	0.0	0.0	111	0.0	0.0	0.0	111
12	77.5	71.7	0.0	0.0	0.0	111	0.0	0.0	0.0	111
13	79.6	72.7	14.9	0.0	0.0	95	14.5	0.0	0.0	96
14	81.3	73.5	16.9	0.0	0.0	77	16.5	0.0	0.0	78
15	82.3	73.7	17.4	0.0	0.0	59	17.0	0.0	0.0	60
16	82.7	73.5	16.6	0.0	0.0	42	16.1	0.0	0.0	44
17	82.5	73.1	0.0	0.0	0.0	42	0.0	0.0	0.0	44
18	82.0	72.6	0.0	0.0	0.0	42	0.0	0.0	0.0	44
19	81.1	73.2	0.0	0.0	0.0	42	0.0	0.0	0.0	44
20	79.9	73.8	0.0	0.0	0.0	42	0.0	0.0	0.0	44
21	78.5	73.9	0.0	0.0	0.0	42	0.0	0.0	0.0	44
22	76.9	73.1	0.0	0.0	0.0	42	0.0	0.0	0.0	44
23	75.2	71.9	0.0	0.0	0.0	42	0.0	0.0	0.0	44
24	73.5	70.8	0.0	0.0	0.0	42	0.0	0.0	0.0	44

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M060, ECO#13

---- B U I L D I N G C O O L I N G D E M A N D S A N D T H E R M A L S T O R A G E ----

August

	Design		Design			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	78.6	67.6	0.0	20.0	23.1	63
2	77.9	67.2	0.0	20.0	23.0	83
3	77.2	66.9	0.0	20.0	22.8	102
4	76.8	66.6	0.0	10.4	12.4	111
5	76.6	66.7	0.0	0.0	0.0	110
6	76.9	67.1	0.0	2.2	3.7	111
7	77.7	67.8	0.0	0.0	0.0	110
8	79.1	69.0	0.0	2.2	3.7	111
9	81.2	70.0	0.0	0.0	0.0	111
10	83.5	70.9	0.0	0.0	0.0	111
11	86.2	71.8	0.0	0.0	0.0	111
12	88.7	72.7	0.0	0.0	0.0	111
13	90.6	73.2	26.6	0.0	0.0	83
14	91.8	73.8	28.0	0.0	0.0	55
15	92.3	74.0	29.2	0.0	0.0	25
16	91.8	73.3	27.3	0.0	0.0	0
17	90.7	72.4	0.0	0.0	0.0	0
18	89.0	71.4	0.0	0.0	0.0	0
19	87.0	70.1	0.0	0.0	0.0	0
20	84.9	69.8	0.0	0.0	0.0	0
21	83.2	70.3	0.0	0.0	0.0	0
22	81.6	69.3	0.0	0.0	0.0	0
23	80.4	68.5	0.0	0.0	0.0	0
24	79.4	67.9	0.0	0.0	0.0	0

	Typical		Weekday				Saturday			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	72.7	70.2	0.0	20.0	22.4	20	0.0	20.0	22.4	66
2	71.2	69.0	0.0	20.0	22.4	40	0.0	20.0	22.4	85
3	69.9	68.0	0.0	20.0	22.4	59	0.0	20.0	22.4	105
4	68.8	67.1	0.7	20.0	22.4	78	0.8	8.4	10.5	111
5	68.0	66.6	0.0	20.0	22.4	97	0.0	0.0	0.0	110
6	67.5	66.2	0.0	14.8	16.3	111	0.0	2.2	3.6	111
7	67.3	66.1	0.0	0.0	0.0	110	0.0	0.0	0.0	110
8	67.8	66.5	0.0	2.2	3.6	111	0.0	2.2	3.6	111
9	69.1	67.0	0.0	0.0	0.0	111	0.0	0.0	0.0	111
10	71.2	67.8	0.0	0.0	0.0	111	0.0	0.0	0.0	111
11	73.8	68.7	0.0	0.0	0.0	111	0.0	0.0	0.0	111
12	76.5	70.0	0.0	0.0	0.0	111	0.0	0.0	0.0	111
13	79.1	71.2	13.8	0.0	0.0	96	14.2	0.0	0.0	96
14	81.1	72.6	15.6	0.0	0.0	80	16.1	0.0	0.0	79
15	82.5	73.6	16.9	0.0	0.0	62	17.4	0.0	0.0	61

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M060, ECO#13

	Typical		Weekday				Saturday			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
16	83.0	73.7	14.8	0.0	0.0	47	15.2	0.0	0.0	45
17	82.8	73.5	0.0	0.0	0.0	47	0.0	0.0	0.0	45
18	82.3	73.5	0.0	0.0	0.0	47	0.0	0.0	0.0	45
19	81.5	73.1	0.0	0.0	0.0	47	0.0	0.0	0.0	45
20	80.4	73.7	0.0	0.0	0.0	47	0.0	0.0	0.0	45
21	79.1	74.9	0.0	0.0	0.0	47	0.0	0.0	0.0	45
22	77.6	73.9	0.0	0.0	0.0	47	0.0	0.0	0.0	45
23	76.0	72.7	0.0	0.0	0.0	47	0.0	0.0	0.0	45
24	74.3	71.3	0.0	0.0	0.0	47	0.0	0.0	0.0	45

	Typical		Sunday				Monday			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	72.7	70.2	0.0	20.0	22.4	64	0.0	20.0	22.4	64
2	71.2	69.0	0.0	20.0	22.4	84	0.0	20.0	22.4	84
3	69.9	68.0	0.0	20.0	22.4	103	0.0	20.0	22.4	103
4	68.8	67.1	0.8	10.1	11.9	111	0.8	10.1	11.9	111
5	68.0	66.6	0.0	0.0	0.0	110	0.0	0.0	0.0	110
6	67.5	66.2	0.0	2.2	3.6	111	0.0	2.2	3.6	111
7	67.3	66.1	0.0	0.0	0.0	110	0.0	0.0	0.0	110
8	67.8	66.5	0.0	2.2	3.6	111	0.0	2.2	3.6	111
9	69.1	67.0	0.0	0.0	0.0	111	0.0	0.0	0.0	111
10	71.2	67.8	0.0	0.0	0.0	111	0.0	0.0	0.0	111
11	73.8	68.7	0.0	0.0	0.0	111	0.0	0.0	0.0	111
12	76.5	70.0	0.0	0.0	0.0	111	0.0	0.0	0.0	111
13	79.1	71.2	14.2	0.0	0.0	96	13.8	0.0	0.0	96
14	81.1	72.6	16.1	0.0	0.0	79	15.6	0.0	0.0	80
15	82.5	73.6	17.4	0.0	0.0	61	16.9	0.0	0.0	62
16	83.0	73.7	15.2	0.0	0.0	45	14.8	0.0	0.0	47
17	82.8	73.5	0.0	0.0	0.0	45	0.0	0.0	0.0	47
18	82.3	73.5	0.0	0.0	0.0	45	0.0	0.0	0.0	47
19	81.5	73.1	0.0	0.0	0.0	45	0.0	0.0	0.0	47
20	80.4	73.7	0.0	0.0	0.0	45	0.0	0.0	0.0	47
21	79.1	74.9	0.0	0.0	0.0	45	0.0	0.0	0.0	47
22	77.6	73.9	0.0	0.0	0.0	45	0.0	0.0	0.0	47
23	76.0	72.7	0.0	0.0	0.0	45	0.0	0.0	0.0	47
24	74.3	71.3	0.0	0.0	0.0	45	0.0	0.0	0.0	47

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M060, ECO#13

---- B U I L D I N G C O O L I N G D E M A N D S A N D T H E R M A L S T O R A G E ----

September

	Design		Design			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	74.6	63.1	0.0	20.0	22.4	66
2	73.7	62.4	0.0	20.0	22.4	85
3	73.0	61.9	0.0	20.0	22.4	105
4	72.4	61.7	0.0	7.6	9.9	111
5	72.3	61.8	0.0	0.0	0.0	110
6	72.6	62.5	0.0	2.2	3.6	111
7	73.5	63.2	0.0	0.0	0.0	110
8	75.1	64.8	0.0	2.2	3.6	111
9	77.4	65.9	0.0	0.0	0.0	111
10	80.0	66.8	0.0	0.0	0.0	111
11	83.0	67.8	0.0	0.0	0.0	111
12	85.8	68.5	0.0	0.0	0.0	111
13	87.9	69.7	20.1	0.0	0.0	90
14	89.3	70.2	21.4	0.0	0.0	68
15	89.9	70.1	23.5	0.0	0.0	43
16	89.3	69.1	21.8	0.0	0.0	21
17	88.1	67.8	0.0	0.0	0.0	21
18	86.2	66.8	0.0	0.0	0.0	21
19	83.9	66.5	0.0	0.0	0.0	21
20	81.6	66.3	0.0	0.0	0.0	21
21	79.7	66.1	0.0	0.0	0.0	21
22	77.9	65.0	0.0	0.0	0.0	21
23	76.5	64.4	0.0	0.0	0.0	21
24	75.4	63.6	0.0	0.0	0.0	21

	Typical		Weekday				Saturday			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	69.8	66.1	0.0	20.0	22.4	41	0.0	20.0	22.4	92
2	68.0	64.5	0.0	20.0	22.4	61	0.0	20.0	22.4	111
3	66.3	63.0	0.0	20.0	22.4	80	0.0	1.4	2.3	111
4	64.9	61.9	0.0	20.0	22.4	99	0.0	0.0	0.0	110
5	63.9	61.3	0.0	12.9	14.5	111	0.0	2.2	3.6	111
6	63.2	61.0	0.0	0.0	0.0	110	0.0	0.0	0.0	110
7	63.0	60.8	0.0	2.2	3.6	111	0.0	2.2	3.6	111
8	63.4	61.4	0.0	0.0	0.0	110	0.0	0.0	0.0	110
9	64.7	61.8	0.0	0.0	0.0	110	0.0	0.0	0.0	110
10	66.6	62.1	0.0	0.0	0.0	110	0.0	0.0	0.0	110
11	69.1	62.9	0.0	0.0	0.0	110	0.0	0.0	0.0	110
12	71.8	63.7	0.0	0.0	0.0	110	0.0	0.0	0.0	110
13	74.5	65.5	6.9	0.0	0.0	102	7.2	0.0	0.0	102
14	77.0	67.1	8.4	0.0	0.0	93	8.7	0.0	0.0	92
15	78.9	68.2	9.2	0.0	0.0	82	9.6	0.0	0.0	81

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M060, ECO#13

	Typical		Weekday				Saturday			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
16	80.2	68.6	9.2	0.0	0.0	72	9.5	0.0	0.0	71
17	80.6	68.5	0.0	0.0	0.0	72	0.0	0.0	0.0	71
18	80.4	68.9	0.0	0.0	0.0	72	0.0	0.0	0.0	71
19	79.7	70.0	0.0	0.0	0.0	72	0.0	0.0	0.0	71
20	78.7	71.2	0.0	0.0	0.0	72	0.0	0.0	0.0	71
21	77.3	71.6	0.0	0.0	0.0	72	0.0	0.0	0.0	71
22	75.6	70.5	0.0	0.0	0.0	72	0.0	0.0	0.0	71
23	73.7	69.4	0.0	0.0	0.0	72	0.0	0.0	0.0	71
24	71.8	67.7	0.0	0.0	0.0	72	0.0	0.0	0.0	71

	Typical		Sunday				Monday			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	69.8	66.1	0.0	20.0	22.4	90	0.0	20.0	22.4	90
2	68.0	64.5	0.0	20.0	22.4	110	0.0	20.0	22.4	110
3	66.3	63.0	0.0	2.7	4.4	111	0.0	2.7	4.4	111
4	64.9	61.9	0.0	0.0	0.0	110	0.0	0.0	0.0	110
5	63.9	61.3	0.0	2.2	3.6	111	0.0	2.2	3.6	111
6	63.2	61.0	0.0	0.0	0.0	110	0.0	0.0	0.0	110
7	63.0	60.8	0.0	2.2	3.6	111	0.0	2.2	3.6	111
8	63.4	61.4	0.0	0.0	0.0	110	0.0	0.0	0.0	110
9	64.7	61.8	0.0	0.0	0.0	110	0.0	0.0	0.0	110
10	66.6	62.1	0.0	0.0	0.0	110	0.0	0.0	0.0	110
11	69.1	62.9	0.0	0.0	0.0	110	0.0	0.0	0.0	110
12	71.8	63.7	0.0	0.0	0.0	110	0.0	0.0	0.0	110
13	74.5	65.5	7.2	0.0	0.0	102	6.9	0.0	0.0	102
14	77.0	67.1	8.7	0.0	0.0	92	8.4	0.0	0.0	93
15	78.9	68.2	9.6	0.0	0.0	81	9.2	0.0	0.0	82
16	80.2	68.6	9.5	0.0	0.0	71	9.2	0.0	0.0	72
17	80.6	68.5	0.0	0.0	0.0	71	0.0	0.0	0.0	72
18	80.4	68.9	0.0	0.0	0.0	71	0.0	0.0	0.0	72
19	79.7	70.0	0.0	0.0	0.0	71	0.0	0.0	0.0	72
20	78.7	71.2	0.0	0.0	0.0	71	0.0	0.0	0.0	72
21	77.3	71.6	0.0	0.0	0.0	71	0.0	0.0	0.0	72
22	75.6	70.5	0.0	0.0	0.0	71	0.0	0.0	0.0	72
23	73.7	69.4	0.0	0.0	0.0	71	0.0	0.0	0.0	72
24	71.8	67.7	0.0	0.0	0.0	71	0.0	0.0	0.0	72

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M060, ECO#13

---- B U I L D I N G C O O L I N G D E M A N D S A N D T H E R M A L S T O R A G E ----

October

	Design		Design			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	59.5	50.0	0.0	20.0	22.4	92
2	58.5	49.3	0.0	20.0	22.4	111
3	57.7	48.8	0.0	1.4	2.3	111
4	57.1	48.5	0.0	0.0	0.0	110
5	56.9	48.3	0.0	2.2	3.6	111
6	57.3	48.7	0.0	0.0	0.0	110
7	58.3	49.7	0.0	2.2	3.6	111
8	60.1	51.3	0.0	0.0	0.0	110
9	62.7	52.9	0.0	0.0	0.0	110
10	65.7	54.4	0.0	0.0	0.0	110
11	69.1	55.5	0.0	0.0	0.0	110
12	72.3	56.7	0.0	0.0	0.0	110
13	74.7	57.8	0.0	0.0	0.0	109
14	76.3	58.6	0.0	0.0	0.0	108
15	76.9	58.7	0.0	0.0	0.0	107
16	76.3	58.0	0.0	0.0	0.0	106
17	74.9	57.0	0.0	0.0	0.0	106
18	72.7	56.0	0.0	0.0	0.0	106
19	70.1	55.5	0.0	0.0	0.0	106
20	67.5	54.7	0.0	0.0	0.0	106
21	65.3	53.6	0.5	0.0	0.0	105
22	63.3	52.4	0.0	0.0	0.0	105
23	61.7	51.5	0.0	0.0	0.0	105
24	60.5	50.7	0.0	0.0	0.0	105

	Typical		Weekday				Saturday			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	54.8	51.3	0.0	7.0	9.5	111	0.0	6.5	9.2	111
2	52.9	49.6	0.0	0.0	0.0	110	0.0	0.0	0.0	110
3	51.2	48.2	0.0	2.2	3.6	111	0.0	2.2	3.6	111
4	49.8	47.2	0.0	0.0	0.0	110	0.0	0.0	0.0	110
5	48.8	46.2	0.0	2.2	3.6	111	0.0	2.2	3.6	111
6	48.2	45.7	0.0	0.0	0.0	110	0.0	0.0	0.0	110
7	47.9	45.6	0.0	2.2	3.6	111	0.0	2.2	3.6	111
8	48.5	46.2	0.0	0.0	0.0	110	0.0	0.0	0.0	110
9	50.3	47.3	0.0	0.0	0.0	110	0.0	0.0	0.0	110
10	52.9	48.7	0.0	0.0	0.0	110	0.0	0.0	0.0	110
11	56.2	49.9	0.0	0.0	0.0	110	0.0	0.0	0.0	110
12	59.6	51.5	0.0	0.0	0.0	110	0.0	0.0	0.0	110
13	62.9	53.5	0.0	0.0	0.0	109	0.0	0.0	0.0	109
14	65.5	55.2	0.0	0.0	0.0	108	0.0	0.0	0.0	108
15	67.3	56.3	0.0	0.0	0.0	107	0.0	0.0	0.0	107

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M060, ECO#13

	Typical		Weekday				Saturday			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
16	67.9	56.6	0.0	0.0	0.0	106	0.0	0.0	0.0	106
17	67.7	56.4	0.0	0.0	0.0	106	0.0	0.0	0.0	106
18	67.0	56.6	0.0	0.0	0.0	106	0.0	0.0	0.0	106
19	66.0	57.6	0.0	0.0	0.0	106	0.0	0.0	0.0	106
20	64.6	57.9	0.0	0.0	0.0	106	0.0	0.0	0.0	106
21	62.9	57.3	0.0	0.0	0.0	106	0.0	0.0	0.0	106
22	61.0	56.0	0.0	0.0	0.0	106	0.0	0.0	0.0	106
23	59.0	54.8	0.0	0.0	0.0	106	0.0	0.0	0.0	106
24	56.9	53.0	0.0	0.0	0.0	106	0.0	0.0	0.0	106

	Typical		Sunday				Monday			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	54.8	51.3	0.0	6.5	9.2	111	0.0	6.5	9.2	111
2	52.9	49.6	0.0	0.0	0.0	110	0.0	0.0	0.0	110
3	51.2	48.2	0.0	2.2	3.6	111	0.0	2.2	3.6	111
4	49.8	47.2	0.0	0.0	0.0	110	0.0	0.0	0.0	110
5	48.8	46.2	0.0	2.2	3.6	111	0.0	2.2	3.6	111
6	48.2	45.7	0.0	0.0	0.0	110	0.0	0.0	0.0	110
7	47.9	45.6	0.0	2.2	3.6	111	0.0	2.2	3.6	111
8	48.5	46.2	0.0	0.0	0.0	110	0.0	0.0	0.0	110
9	50.3	47.3	0.0	0.0	0.0	110	0.0	0.0	0.0	110
10	52.9	48.7	0.0	0.0	0.0	110	0.0	0.0	0.0	110
11	56.2	49.9	0.0	0.0	0.0	110	0.0	0.0	0.0	110
12	59.6	51.5	0.0	0.0	0.0	110	0.0	0.0	0.0	110
13	62.9	53.5	0.0	0.0	0.0	109	0.0	0.0	0.0	109
14	65.5	55.2	0.0	0.0	0.0	108	0.0	0.0	0.0	108
15	67.3	56.3	0.0	0.0	0.0	107	0.0	0.0	0.0	107
16	67.9	56.6	0.0	0.0	0.0	106	0.0	0.0	0.0	106
17	67.7	56.4	0.0	0.0	0.0	106	0.0	0.0	0.0	106
18	67.0	56.6	0.0	0.0	0.0	106	0.0	0.0	0.0	106
19	66.0	57.6	0.0	0.0	0.0	106	0.0	0.0	0.0	106
20	64.6	57.9	0.0	0.0	0.0	106	0.0	0.0	0.0	106
21	62.9	57.3	0.0	0.0	0.0	106	0.0	0.0	0.0	106
22	61.0	56.0	0.0	0.0	0.0	106	0.0	0.0	0.0	106
23	59.0	54.8	0.0	0.0	0.0	106	0.0	0.0	0.0	106
24	56.9	53.0	0.0	0.0	0.0	106	0.0	0.0	0.0	106

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M060, ECO#13

---- B U I L D I N G C O O L I N G D E M A N D S A N D T H E R M A L S T O R A G E ----

November

	Design		Design			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	56.0	47.2	0.0	6.5	9.2	111
2	55.0	46.4	0.0	0.0	0.0	110
3	54.2	45.8	0.0	2.2	3.6	111
4	53.6	45.2	0.0	0.0	0.0	110
5	53.4	45.3	0.0	2.2	3.6	111
6	53.8	45.9	0.0	0.0	0.0	110
7	54.8	46.9	0.0	2.2	3.6	111
8	56.6	48.7	0.0	0.0	0.0	110
9	59.2	50.6	0.0	0.0	0.0	110
10	62.2	52.6	0.0	0.0	0.0	110
11	65.6	54.1	0.0	0.0	0.0	110
12	68.8	55.3	0.0	0.0	0.0	110
13	71.2	55.7	0.0	0.0	0.0	109
14	72.8	56.3	0.0	0.0	0.0	108
15	73.4	56.2	0.0	0.0	0.0	107
16	72.8	55.6	0.0	0.0	0.0	106
17	71.4	54.6	0.0	0.0	0.0	106
18	69.2	53.6	0.0	0.0	0.0	106
19	66.6	53.0	0.0	0.0	0.0	106
20	64.0	51.7	0.0	0.0	0.0	106
21	61.8	50.7	0.0	0.0	0.0	106
22	59.8	49.6	0.0	0.0	0.0	106
23	58.2	48.7	0.0	0.0	0.0	106
24	57.0	48.0	0.0	0.0	0.0	106

	Typical		Weekday				Saturday			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	48.7	45.7	0.0	6.5	9.2	111	0.0	6.5	9.2	111
2	46.9	44.1	0.0	0.0	0.0	110	0.0	0.0	0.0	110
3	45.5	42.8	0.0	2.2	3.6	111	0.0	2.2	3.6	111
4	44.6	41.9	0.0	0.0	0.0	110	0.0	0.0	0.0	110
5	44.4	42.0	0.0	2.2	3.6	111	0.0	2.2	3.6	111
6	44.8	42.7	0.0	0.0	0.0	110	0.0	0.0	0.0	110
7	45.9	43.9	0.0	2.2	3.6	111	0.0	2.2	3.6	111
8	47.8	46.0	0.0	0.0	0.0	110	0.0	0.0	0.0	110
9	50.2	48.0	0.0	0.0	0.0	110	0.0	0.0	0.0	110
10	52.9	49.9	0.0	0.0	0.0	110	0.0	0.0	0.0	110
11	55.8	51.1	0.0	0.0	0.0	110	0.0	0.0	0.0	110
12	58.5	52.0	0.0	0.0	0.0	110	0.0	0.0	0.0	110
13	60.9	52.5	0.0	0.0	0.0	109	0.0	0.0	0.0	109
14	62.8	53.4	0.0	0.0	0.0	108	0.0	0.0	0.0	108
15	64.0	53.8	0.0	0.0	0.0	107	0.0	0.0	0.0	107

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M060, ECO#13

	Typical		Weekday				Saturday			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
16	64.4	53.9	0.0	0.0	0.0	106	0.0	0.0	0.0	106
17	64.1	53.7	0.0	0.0	0.0	106	0.0	0.0	0.0	106
18	63.2	53.7	0.0	0.0	0.0	106	0.0	0.0	0.0	106
19	61.8	54.2	0.0	0.0	0.0	106	0.0	0.0	0.0	106
20	60.0	53.6	0.0	0.0	0.0	106	0.0	0.0	0.0	106
21	57.9	52.7	0.0	0.0	0.0	106	0.0	0.0	0.0	106
22	55.6	51.2	0.0	0.0	0.0	106	0.0	0.0	0.0	106
23	53.2	49.5	0.0	0.0	0.0	106	0.0	0.0	0.0	106
24	50.8	47.6	0.0	0.0	0.0	106	0.0	0.0	0.0	106

	Typical		Sunday				Monday			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	48.7	45.7	0.0	6.5	9.2	111	0.0	6.5	9.2	111
2	46.9	44.1	0.0	0.0	0.0	110	0.0	0.0	0.0	110
3	45.5	42.8	0.0	2.2	3.6	111	0.0	2.2	3.6	111
4	44.6	41.9	0.0	0.0	0.0	110	0.0	0.0	0.0	110
5	44.4	42.0	0.0	2.2	3.6	111	0.0	2.2	3.6	111
6	44.8	42.7	0.0	0.0	0.0	110	0.0	0.0	0.0	110
7	45.9	43.9	0.0	2.2	3.6	111	0.0	2.2	3.6	111
8	47.8	46.0	0.0	0.0	0.0	110	0.0	0.0	0.0	110
9	50.2	48.0	0.0	0.0	0.0	110	0.0	0.0	0.0	110
10	52.9	49.9	0.0	0.0	0.0	110	0.0	0.0	0.0	110
11	55.8	51.1	0.0	0.0	0.0	110	0.0	0.0	0.0	110
12	58.5	52.0	0.0	0.0	0.0	110	0.0	0.0	0.0	110
13	60.9	52.5	0.0	0.0	0.0	109	0.0	0.0	0.0	109
14	62.8	53.4	0.0	0.0	0.0	108	0.0	0.0	0.0	108
15	64.0	53.8	0.0	0.0	0.0	107	0.0	0.0	0.0	107
16	64.4	53.9	0.0	0.0	0.0	106	0.0	0.0	0.0	106
17	64.1	53.7	0.0	0.0	0.0	106	0.0	0.0	0.0	106
18	63.2	53.7	0.0	0.0	0.0	106	0.0	0.0	0.0	106
19	61.8	54.2	0.0	0.0	0.0	106	0.0	0.0	0.0	106
20	60.0	53.6	0.0	0.0	0.0	106	0.0	0.0	0.0	106
21	57.9	52.7	0.0	0.0	0.0	106	0.0	0.0	0.0	106
22	55.6	51.2	0.0	0.0	0.0	106	0.0	0.0	0.0	106
23	53.2	49.5	0.0	0.0	0.0	106	0.0	0.0	0.0	106
24	50.8	47.6	0.0	0.0	0.0	106	0.0	0.0	0.0	106

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M060, ECO#13

---- B U I L D I N G C O O L I N G D E M A N D S A N D T H E R M A L S T O R A G E ----

December

	Design		Design			
Hour	Design OADB (F)	Design OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	48.2	40.8	0.0	6.5	9.2	111
2	47.3	40.2	0.0	0.0	0.0	110
3	46.6	39.7	0.0	2.2	3.6	111
4	46.1	39.3	0.0	0.0	0.0	110
5	45.9	39.4	0.0	2.2	3.6	111
6	46.3	39.7	0.0	0.0	0.0	110
7	47.1	40.6	0.0	2.2	3.6	111
8	48.7	42.0	0.0	0.0	0.0	110
9	50.9	44.0	0.0	0.0	0.0	110
10	53.5	46.1	0.0	0.0	0.0	110
11	56.5	48.0	0.0	0.0	0.0	110
12	59.2	49.7	0.0	0.0	0.0	110
13	61.3	50.8	0.0	0.0	0.0	109
14	62.7	51.4	0.0	0.0	0.0	108
15	63.2	51.4	0.0	0.0	0.0	107
16	62.7	50.7	0.0	0.0	0.0	106
17	61.5	49.7	0.0	0.0	0.0	106
18	59.6	48.5	0.0	0.0	0.0	106
19	57.3	47.6	0.0	0.0	0.0	106
20	55.1	45.9	0.0	0.0	0.0	106
21	53.2	44.6	0.0	0.0	0.0	106
22	51.5	43.1	0.0	0.0	0.0	106
23	50.1	42.2	0.0	0.0	0.0	106
24	49.0	41.5	0.0	0.0	0.0	106

			Weekday				Saturday			
Hour	Typical OADB (F)	Typical OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	37.5	35.3	0.0	6.5	9.2	111	0.0	6.5	9.2	111
2	37.1	35.1	0.0	0.0	0.0	110	0.0	0.0	0.0	110
3	37.4	35.5	0.0	2.2	3.6	111	0.0	2.2	3.6	111
4	38.1	36.2	0.0	0.0	0.0	110	0.0	0.0	0.0	110
5	39.3	37.6	0.0	2.2	3.6	111	0.0	2.2	3.6	111
6	40.9	39.2	0.0	0.0	0.0	110	0.0	0.0	0.0	110
7	42.7	41.2	0.0	2.2	3.6	111	0.0	2.2	3.6	111
8	44.7	43.1	0.0	0.0	0.0	110	0.0	0.0	0.0	110
9	46.8	45.3	0.0	0.0	0.0	110	0.0	0.0	0.0	110
10	48.8	47.0	0.0	0.0	0.0	110	0.0	0.0	0.0	110
11	50.7	48.1	0.0	0.0	0.0	110	0.0	0.0	0.0	110
12	52.2	48.8	0.0	0.0	0.0	110	0.0	0.0	0.0	110
13	53.4	49.2	0.0	0.0	0.0	109	0.0	0.0	0.0	109
14	54.1	49.2	0.0	0.0	0.0	108	0.0	0.0	0.0	108
15	54.4	48.9	0.0	0.0	0.0	107	0.0	0.0	0.0	107

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M060, ECO#13

	Typical		Weekday				Saturday			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
16	54.0	48.2	0.0	0.0	0.0	106	0.0	0.0	0.0	106
17	53.0	47.3	0.0	0.0	0.0	106	0.0	0.0	0.0	106
18	51.4	46.3	0.0	0.0	0.0	106	0.0	0.0	0.0	106
19	49.3	45.4	0.0	0.0	0.0	106	0.0	0.0	0.0	106
20	47.0	43.5	0.0	0.0	0.0	106	0.0	0.0	0.0	106
21	44.5	41.5	0.0	0.0	0.0	106	0.0	0.0	0.0	106
22	42.2	39.3	0.0	0.0	0.0	106	0.0	0.0	0.0	106
23	40.1	37.6	0.0	0.0	0.0	106	0.0	0.0	0.0	106
24	38.5	36.2	0.0	0.0	0.0	106	0.0	0.0	0.0	106

	Typical		Sunday				Monday			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	37.5	35.3	0.0	6.5	9.2	111	0.0	6.5	9.2	111
2	37.1	35.1	0.0	0.0	0.0	110	0.0	0.0	0.0	110
3	37.4	35.5	0.0	2.2	3.6	111	0.0	2.2	3.6	111
4	38.1	36.2	0.0	0.0	0.0	110	0.0	0.0	0.0	110
5	39.3	37.6	0.0	2.2	3.6	111	0.0	2.2	3.6	111
6	40.9	39.2	0.0	0.0	0.0	110	0.0	0.0	0.0	110
7	42.7	41.2	0.0	2.2	3.6	111	0.0	2.2	3.6	111
8	44.7	43.1	0.0	0.0	0.0	110	0.0	0.0	0.0	110
9	46.8	45.3	0.0	0.0	0.0	110	0.0	0.0	0.0	110
10	48.8	47.0	0.0	0.0	0.0	110	0.0	0.0	0.0	110
11	50.7	48.1	0.0	0.0	0.0	110	0.0	0.0	0.0	110
12	52.2	48.8	0.0	0.0	0.0	110	0.0	0.0	0.0	110
13	53.4	49.2	0.0	0.0	0.0	109	0.0	0.0	0.0	109
14	54.1	49.2	0.0	0.0	0.0	108	0.0	0.0	0.0	108
15	54.4	48.9	0.0	0.0	0.0	107	0.0	0.0	0.0	107
16	54.0	48.2	0.0	0.0	0.0	106	0.0	0.0	0.0	106
17	53.0	47.3	0.0	0.0	0.0	106	0.0	0.0	0.0	106
18	51.4	46.3	0.0	0.0	0.0	106	0.0	0.0	0.0	106
19	49.3	45.4	0.0	0.0	0.0	106	0.0	0.0	0.0	106
20	47.0	43.5	0.0	0.0	0.0	106	0.0	0.0	0.0	106
21	44.5	41.5	0.0	0.0	0.0	106	0.0	0.0	0.0	106
22	42.2	39.3	0.0	0.0	0.0	106	0.0	0.0	0.0	106
23	40.1	37.6	0.0	0.0	0.0	106	0.0	0.0	0.0	106
24	38.5	36.2	0.0	0.0	0.0	106	0.0	0.0	0.0	106

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

CALIFORNIA TITLE 24 COMPLIANCE - ALTERNATIVE 1
BLDG M060, ECO#13

CALIFORNIA TITLE 24 COMPLIANCE REPORT

Weather Name ..... ATLANTA.
Gross Conditioned Floor Area (sqft)..... 20,856
ACM Multiplier 1.025

E N E R G Y U S E S U M M A R Y

	ELEC (kWh/yr)	GAS (kBtu/yr)	PERCENT OF TOTAL ENERGY (%)	TOTAL SOURCE ENERGY (kBtu/yr)	ADJUSTED UNIT SOURCE ENERGY (kBtu/yr-sf)
Primary Heating	3,570.0	534,361.6	43.1	599,043.2	29.4
Primary Cooling					
Compressor	57,232.8	0.0	15.4	586,065.5	28.8
Tower/Cond Fans	3,013.5	0.0	0.8	30,858.3	1.5
Condenser Pump	0.0	0.0	0.0	0.0	0.0
Other Accessories	2,940.5	0.0	0.8	30,110.8	1.5
Auxiliary					
Supply Fans	63,955.6	0.0	17.2	654,907.0	32.2
Circulation Pumps	14,105.0	0.0	3.8	144,435.6	7.1
Base Utilities	0.0	0.0	0.0	0.0	0.0
Subtotal	78,060.6	0.0	21.0	799,342.6	39.3
Lighting	25,412.0	0.0	6.8	260,219.7	12.5
Receptacle	45,044.6	0.0	12.1	461,258.2	22.1
Domestic Hot Water	0.0	0.0	0.0	0.0	0.0
Cogeneration	0.0	0.0	0.0	0.0	0.0
Totals	215,274.1	534,361.6	100.0	2,766,898.0	135.1

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M060, ECO#15

MONTHLY ENERGY CONSUMPTION

Month	ELEC On Peak (kWh)	DEMAND On Peak (kW)	GAS On Peak (Therm)	GAS DMND On Peak (Thrm/hr)
Jan	11,998	46	1,505	3
Feb	10,837	46	1,557	3
March	11,979	45	884	2
April	10,865	45	21	1
May	14,413	72	0	0
June	24,624	84	0	0
July	24,332	84	0	0
Aug	23,669	84	0	0
Sept	17,646	76	0	0
Oct	11,183	63	0	0
Nov	11,204	45	307	7
Dec	11,990	46	1,127	3
Total	184,740	84	5,402	7

Building Energy Consumption = 56,132 (Btu/Sq Ft/Year)
Source Energy Consumption = 117,968 (Btu/Sq Ft/Year)

Floor Area = 20,856 (Sq Ft)

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M060, ECO#15

EQUIPMENT ENERGY CONSUMPTION

Ref Num	Equip Code	Monthly Consumption Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	1918	1732	1934	1853	1926	1869	1910	1934	1853	1926	1853	1910	22,618
	PK	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2
1	MISC LD													
	ELEC	3826	3455	3826	3702	3826	3702	3826	3826	3702	3826	3702	3826	45,045
	PK	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1
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
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	EQ1100S	AIR-CLD RECIP 25-45 TONS												
	ELEC	0	0	0	0	2938	12538	11955	11333	6232	0	0	0	44,995
	PK	0.0	0.0	0.0	0.0	29.0	42.9	39.5	38.9	31.7	17.5	0.0	0.0	42.9
1	EQ5200	CONDENSER FANS												
	ELEC	0	0	0	0	227	1051	990	931	485	0	0	0	3,684
	PK	0.0	0.0	0.0	0.0	2.8	4.4	4.1	4.0	3.1	0.9	0.0	0.0	4.4
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	EQ5303	CONTROLS												
	ELEC	0	0	0	0	65	207	219	214	117	0	0	0	822
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3
1	EQ4371	FAN COIL SUPPLY FAN												
	ELEC	5432	4906	5432	5257	5432	5257	5432	5432	5257	5432	5257	5432	63,956
	PK	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M060, ECO#15

1	EQ2001		GAS FIRE TUBE HOT WATER										
	GAS	1505	1557	884	21	0	0	0	0	0	0	307	1127	5,402
	PK	3.2	3.2	2.1	0.8	0.0	0.0	0.0	0.0	0.0	0.0	7.1	2.6	7.1
1	EQ5020		HEAT WATER CIRC. PUMP C.V.										
	ELEC	10	9	10	1	0	0	0	0	0	0	5	10	45
	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	440	398	422	28	0	0	0	0	0	0	209	440	1,938
	PK	0.6	0.6	0.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.6	0.6
1	EQ5307		BOILER CONTROLS										
	ELEC	372	336	356	24	0	0	0	0	0	0	177	372	1,638
	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

UTILITY PEAK CHECKSUMS - ALTERNATIVE 1
BLDG M060, ECO#15

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 84.5 (kW)
Yearly Time of Peak 20 (hr) 6 (mo)

Hour 20 Month 6

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Percnt Of Tot (%)
Cooling Equipment				
1	EQ1100S	AIR-CLD RECIP 25-45 TONS	39.9	47.26
Sub Total			39.9	47.26
Sub Total			0.0	0.00
Air Moving Equipment				
1		SUMMATION OF FAN ELECTRICAL DEMAND	7.3	8.64
Sub Total			7.3	8.64
Sub Total			0.0	0.00
Miscellaneous				
Lights			7.2	8.47
Base Utilities			0.0	0.00
Misc Equipment			30.1	35.63
Sub Total			37.3	44.10
Grand Total			84.5	100.00

CALIFORNIA TITLE 24 COMPLIANCE - ALTERNATIVE 1
BLDG M060, ECO#15

CALIFORNIA TITLE 24 COMPLIANCE REPORT

Weather Name ..... ATLANTA.
Gross Conditioned Floor Area (sqft)..... 20,856
ACM Multiplier 1.025

E N E R G Y U S E S U M M A R Y

	ELEC (kWh/yr)	GAS (kBtu/yr)	PERCENT OF TOTAL ENERGY (%)	TOTAL SOURCE ENERGY (kBtu/yr)	ADJUSTED UNIT SOURCE ENERGY (kBtu/yr-sf)
Primary Heating	3,575.5	540,173.1	47.2	605,216.6	29.7
Primary Cooling					
Compressor	44,995.3	0.0	13.1	460,753.3	22.6
Tower/Cond Fans	3,684.2	0.0	1.1	37,726.2	1.9
Condenser Pump	0.0	0.0	0.0	0.0	0.0
Other Accessories	821.7	0.0	0.2	8,414.2	0.4
Auxiliary					
Supply Fans	63,955.6	0.0	18.6	654,907.0	32.2
Circulation Pumps	44.6	0.0	0.0	456.4	0.0
Base Utilities	0.0	0.0	0.0	0.0	0.0
Subtotal	64,000.2	0.0	18.7	655,363.5	32.2
Lighting	22,618.0	0.0	6.6	231,608.7	11.1
Receptacle	45,044.6	0.0	13.1	461,258.2	22.1
Domestic Hot Water	0.0	0.0	0.0	0.0	0.0
Cogeneration	0.0	0.0	0.0	0.0	0.0
Totals	184,739.5	540,173.1	100.0	2,460,340.7	120.1

BUILDING 100

E M C ENGINEERS, INC.

PROJECT: FORT McPHERSON & FORT GILLEM ESOS STUDY
LOCATION: FORT McPHERSON

ECO: Computer Simulation Summary

CLIENT CONTRACT NO: DACA21-91-C-0097
CLIENT PROJECT ENG: TERRY SEABROOK

EMC PROJECT: #3105.000
DATE: 10-APR-92
FILE: M100ECO.WK3
PREPARED BY: R. GERRANS
CHECKED BY:

Bldg: M100 **Area: 7,393 ft^2**

Run Description	Heating Gas Use (kBtu/yr)	Heating Electric Use (kWh/yr)	Cooling Electric Use (kWh/yr)	Fan Electric Use (kWh/yr)	Pump Electric Use (kWh/yr)	Lighting Electric Use (kWh/yr)	Recept. Electric Use (kWh/yr)	Total Electric Use (kWh/yr)	Peak Electric Demand (kW)	Total Gas Use (MBtu/yr)	Total Energy Use (MBtu/yr)
Baseline	8,311	691	22,050	82,003	1,212	21,272	17,993	145,221	41	8	504
ECO#1 – Wall	19,616	748	23,581	82,003	1,212	21,272	17,993	146,809	41	20	521
Savings/(Loss)	(11,305)	(57)	(1,531)	0	0	0	0	(1,588)	0	(11)	(17)
ECO#1 – Roof	17,513	726	23,974	82,003	1,212	21,272	17,993	147,180	41	18	520
Savings/(Loss)	(9,202)	(35)	(1,924)	0	0	0	0	(1,959)	0	(9)	(16)
ECO#2	9,011	691	22,089	82,003	1,212	21,272	17,993	145,259	41	9	505
Savings/(Loss)	(700)	0	(38)	0	0	0	0	(38)	0	(1)	(1)
ECO#3	8,186	678	22,040	82,003	1,212	21,272	17,993	145,198	41	8	504
Savings/(Loss)	125	13	10	0	0	0	0	23	0	0	0
ECO#12	8,127	161	6,023	28,616	60	21,272	17,993	74,125	36	8	261
Savings/(Loss)	184	530	16,027	53,387	1,152	0	0	71,096	5	0	243
ECO#15	10,150	847	20,341	82,003	1,212	13,186	17,993	135,582	41	10	473
Savings/(Loss)	(1,839)	(156)	1,710	0	0	8,086	0	9,639	0	(2)	31

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB 3105.000

SHEET NO. 1 OF

CALCULATED BY [illegible] DATE [illegible]

CHECKED BY DATE

SCALE

Computer Simulation - Bldg 100 [illegible]

[illegible] Brick Admin Area = [illegible] ft²

ECO. 3, 12 For Takeoff: [illegible]

Take off Bldg: 04, 04[illegible], 05[illegible], [illegible], [illegible], [illegible], 112, 114, 115, [illegible], 113, 120

121, 122, 124, 126

Assumptions

- Occupancy - Upstairs 1[illegible] people
  Basement: [illegible] people
- [illegible]
- Misc loads - [illegible] 5 [illegible]/ft²
  Basement [illegible] ft²
- Infiltration Upstairs ½ ACH
  Basement: ¼ ACH
- [illegible]
- Cooling dB - 76°F

Comments

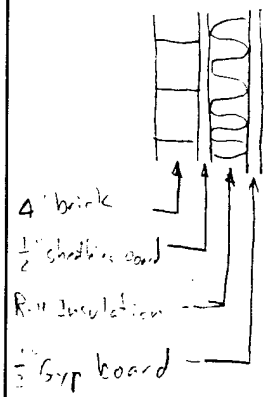
- no OA available

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB 3105 000
SHEET NO. 2 OF
CALCULATED BY RMM DATE 2/25/82
CHECKED BY DATE
SCALE

Comp Sim Rev '82

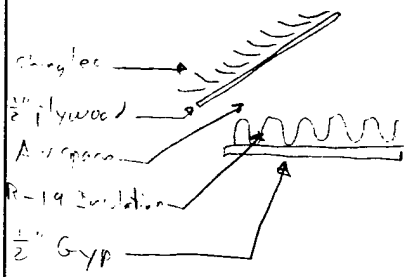
Wall U-Value - ASHRAE Table F22.4



Material	R-Value
Outside Surface (15 mph wind)	0.17
4" brick	1.24
½" sheathing board	1.32
R-11 Insulation	11.0
½" Gypsum	0.45
Inside Surface (still air)	0.68
	14.86

$U = \frac{1}{R} = \frac{1}{14.86} = \boxed{0.067}$

Roof U-Value - ASHRAE Table F 22.4



Material	R
Outside Surface (15 mph)	0.17
shingles	0.44
½" Plywood	0.62
Air Space	1.24
R-19 Insulation	19.0
½" Gyp Board	0.45
Inside Surface (still air)	0.62
	22.54

$U = \frac{1}{22.54} = \boxed{0.044}$

Basement Wall U-Value - ASHRAE Table F25.3

- no insulation

ft below grade	U-Value / ft length
1st	0.41
2nd	0.22
3rd	0.155
4th	0.119
5th	0.096
6th	0.079
7th	0.069

$\boxed{1.15 \text{ BTUh/Ft} \cdot ^\circ F}$

- for simulation input wall height = 1.0 ft + U = 1.15

Comp Sim. Bldg 100

Window U-Value - ASHRAE Table F 27.13
- Double pane, metal frame, Type R
- Assume ½" air space thermal break
⇒ U = 0.70

Indoor Shading - ASHRAE Table F 27.26
- Blinds
⇒ 0.58

Basement Floor - ASHRAE Table F 25.4
- shortest width of house = 32 ft. ±
- Depth below grade = 7 ft
U = 0.021 Btuh/ft² °F

People

Room 1 - Upstairs
- Normal occupancy: 18 people - From field survey

Room 2 Basement
- Normal occupancy: 1 person - from field survey

Heat Gain - ASHRAE Table F 26.3
Sensible: 250 Btuh/person
Latent: 200 Btuh/person

Lights

Room 1 Upstairs - From plans
6,312 W

Room 2 Basement
4,110 W - from plans
- assume only 33% on ⇒ 1,370 W

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB 3105.000

SHEET NO. 4 OF

CALCULATED BY [illegible] DATE 2/25/[illegible]

CHECKED BY DATE

SCALE

Comp'[illegible] [illegible] = 100

Misc load.

Room 1

- no survey data
- use 5 Btu/ft²

Room 2

- no survey data
- use 1 Btu/ft²

Infiltration

Room 1

- For [illegible] Assume 1/3 ACH

- [illegible] Eq #3:

$Q = L(A\Delta t + Bv^2)^{1/2}$

A - stack coefficient - 0.0156 - ASHRAE Table F 23.7

B - wind coefficient - 0.0039 ASHRAE Table F 23.8

v - wind velocity = 12.65 mph

L - Effective leakage area:

- window, double slider, weatherstripped (0.037)(23)(5.25) = 10.64
- window frame, mason wall, caulked (0.019)(23)(5.25) = 5.46
- door, single weatherstripped (0.114)(1)(3·6.67) = 2.28
- door, single, not weatherstripped (0.157)(1)(3·6.67) = 3.14
- door frame, mason wall, caulked (0.019)(2)(3·6.67) = 0.76

22.28 in²

heating

$\Delta t = 72 - 53 = 19°F$ (T_i, T_o)

$Q = 22.28(0.0156(19) + 0.0039(12.65)^2)^{1/2} = 21.4$ cfm

cooling

$\Delta t = 88 - 76 = 12°F$ (T_o, T_i)

$Q = 22.28(0.0156(12) + 0.0039(12.65)^2)^{1/2} = 20.1$ cfm

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB 3105.000

SHEET NO. 5 OF

CALCULATED BY [illegible] DATE 2/25/[illegible]

CHECKED BY DATE

SCALE

[illegible]

[illegible]

[illegible]

→ for [illegible] [illegible]

For ECO #[illegible]

L :

- door single [illegible] weatherstripped [illegible] = 7.28
- door frame, masonry wall caulked [illegible] = 0.76

8.04 in²

heating

Q = 8.04 ([illegible] 0.56 (10) + 0.0039 ([illegible] 2.65)²)^½ = 7.7 cfm

cooling

Q = 8.04 ([illegible] (12) + 0.00[illegible] [illegible] .55[illegible]) = 7.2 cfm

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • Germany

JOB ______

SHEET NO. ______ OF ______

CALCULATED BY ______ DATE ______

CHECKED BY ______ DATE ______

SCALE ______

Computer Simulation — Bldg 100, McPherson

Baseline (cont)

HW Pump: $\frac{(\frac{1}{3}\ hp)(0.746\ [illegible])}{(0.764\ eff)}$ = 0.33 kW × 4380 $\frac{hrs}{yr}$ = **1,212** kwh/yr

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____
SHEET NO. _____ OF _____
CALCULATED BY _____ DATE _____
CHECKED BY _____ DATE _____
SCALE _____

Computer Simulation Bldg 100, McPherson

ECO #1 - Wall Insulation

Wall U-Value - ASHRAE Table F 22.4
- Remove full wall insulation to develop energy factor for take off building.

R = 3.86
U = 0.26

original U-Value = 0.067
Wall Area = 2,939 ft²
original UA = 196.9
improved UA = 764.1
ΔUA = -567.2

Electric Savings

Total Electric Savings = -1,588 kWh/yr
Electric Savings/ΔUA = 2.8 kWh/ΔUA

Demand Savings

Peak Demand Savings = -0 kW/ΔUA

Gas Savings

Total Gas Savings = -11.3 MBtu/yr
Gas Savings/ΔUA = 0.020 MBtu/ΔUA

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____
SHEET NO. _____ OF _____
CALCULATED BY _____ DATE _____
CHECKED BY _____ DATE _____
SCALE _____

Computer Simulation Bldg 100, McPherson

ECO #1 - Roof Insulation

Roof U-Value - ASHRAE Table F 22.4
Remove R-19 Roof insulation to develop energy factor for take off buildings

R = 3.54
U = 0.29

Roof Area = 4,688 ft²
original U = 0.044
original UA = 206.3
new UA = 1,312.6
Delta UA = -1,106.4

Electric Savings

Total Electric Savings = -1,959 kWh/yr
Electric savings/ΔUA = 1.77 kWh/UA

Demand Savings

Peak Demand Savings = 0 kW/UA

Gas Savings

Total Gas Savings = -9.20 MBtu/yr
Gas Savings/ΔUA = 0.0083 MBtu/UA

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____
SHEET NO. _____ OF _____
CALCULATED BY _____ DATE _____
CHECKED BY _____ DATE _____
SCALE _____

Computer Simulation Bldg 100, McPherson

ECO #2 - Insulated Glass

Window U-Value - ASHRAE Table F 27.13
- Single pane, Al frame, Type R - to develop energy factor for takeoff buildings

U = 1.09

Window Shading - ASHRAE Table F 27.25
- Light blinds

⇒ 0.67

Window Area = 288 ft²

Electric Savings

Total Electric Savings = 38 kWh/yr

Electric Savings / ft² = 0.13 kWh/yr/ft²

Demand Savings

Peak Demand Savings = 0 kW

Gas Savings

Total Gas Savings = 0.700 MBtu/yr

Gas Savings / ft² = 0.0024 MBtu/yr/ft²

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____
SHEET NO. _____ OF _____
CALCULATED BY _____ DATE _____
CHECKED BY _____ DATE _____
SCALE _____

Computer Simulation — Bldg 100, McPherson

ECO #3 - Weatherstripping + Caulking

$Q = L(A\Delta t + BV^2)^{1/2}$

A - stack coefficient = 0.0156 - one story ASHRAE Table F 23.7

B - wind coefficient = 0.0039 - medium shelter ASHRAE Table F 23.8

V - design wind velocity = 12.65 mph

Δt = 72°F - 55°F = 17°F

L - effective Area = Area * (crack/area) - ASHRAE Table F 23.3

Present

windows: w.s./c, double-hung, masonry wall - 23 - 5'×2.5'

window: 0.037

frame: 0.019

door: w.s./c, single, masonry wall 1 - 3'×6⅔'

door: 0.114

frame: 0.0143

door: not w.s./c, single, masonry wall 1 - 3'×6⅔', 2 - 3'×6⅔'

door: 0.157

frame: 0.072

Improvement

door: w.s./c, single, masonry wall - see above

Proposed

Proposed

window:	(0.037)(287.5)	= 10.6
frame:	(0.019)(287.5)	= 5.5
door-1:	(0.114)(20)	= 2.3
frame:	(0.0143)(20)	= 0.3
door-2:	(0.157)(20)	= 3.1
frame:	(0.072)(20)	= 1.4
		23.2

$Q = 23.2(0.0156(17) + 0.0039(12.65)^2)^{1/2}$

Q = 22 cfm

JOB
SHEET NO. OF

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

CALCULATED BY DATE
CHECKED BY DATE
SCALE

Computer Simulation   Bldg 100, Mc Pherson   ECO #3 (cont)

Room 1 (cont)

Improved

door: (0.114)(20) = 2.3
frame: (0.0143)(20) = 0.3
Unimproved: = 18.7
21.3

$Q = 21.3(0.0156(17) + 0.0039(12.65)^2)^{1/2}$

$Q = 20$ cfm

Δcfm = 22 - 20 = 2 cfm

- for simulation, assume ½ ACH = 293 cfm

improved = 293 - 2 = **291 cfm**

Room 2

Present

door: (0.157)(40) = 6.3
frame: (0.072)(40) = 2.9
9.2

$Q = 9.2(0.0156(17) + 0.0039(12.65)^2)^{1/2}$

$Q = 9$ cfm

Improved

door: (0.114)(40) = 4.6
frame: (0.0143)(40) = 0.6
5.2

$Q = 5.9(0.0156(17) + 0.0039(12.65)^2)^{1/2}$

$Q = 6$ cfm

Δcfm = 9 - 6 = 3 cfm

- for simulation assume ¼ ACH = 131 cfm
- improved = 131 - 3 = **128 cfm**

Total Delta cfm

2 + 3 = **5 cfm**

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____

SHEET NO. _____ OF _____

CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____

SCALE _____

Computer Simulation Bldg 100, McPherson

ECO # 3 (cont'd)

Electric Savings

Total Electric Savings = 23 kWh/yr

Electric Savings/dd = 4.6 kWh/yr/dd

Demand Savings

Peak Demand Savings = 0 kW

Gas Savings

Total Gas Savings = 0.125 MBtu/yr

Gas Savings/dd = 0.025 MBtu/yr/dd

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____
SHEET NO. _____ OF _____
CALCULATED BY _____ DATE _____
CHECKED BY _____ DATE _____
SCALE _____

Computer Simulation Bldg 100, McPherson

ECO #12 – HVAC Controls

- Setback thermostats + change setpoints to 78°F Cooling + 70°F Heating
- Turn off fans with timeclock
- Reset deck temperature for demand
- Turn off pump w/ timeclock + cycle with load

Electric Savings

Total Electric Savings = 71,096 kWh/yr

Demand Savings

Peak Demand Savings = 5 kW

Gas Savings

Total Gas Savings 0.18 MMBtu/yr

Pumps + Fan Schedule

- On 06:00 – 18:00 M-F, otherwise off

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____
SHEET NO. _____ OF _____
CALCULATED BY _____ DATE _____
CHECKED BY _____ DATE _____
SCALE _____

Computer Simulation Bldg 100, McPherson

ECO # 15 - Lighting Reduction

Lighting Reduction

reduction = 38%

Rm	Increase (w)	Reduced (w)
1	6,312	3,913
2	1,370	849

kWh Reduction = 8,086 kWh

Electric Factor

Reduced Electric Use = cooling - heating = 1,710 - 156 = 1554 kWh/yr

Electric savings / lighting kWh = [0.19] KWh/KWh

Gas Factor

Increased Gas Use = 1.8 MBtu/yr

Gas increase / lighting kWh = [2.2×10^{-4}] MBtu/kWh

01 Card - Job Information

Project: FT MCPHERSON & FT GILLEM EEAP
Location: FT MCPHERSON, BLDG 100
Program User: R. GERRANS

-----CARD 08-- Climatic Information

Weather Code	Summer Clearness Number	Winter Clearness Number	Summer Design Dry Bulb	Summer Design Wet Bulb	Winter Design Dry Bulb	Building Orientation	Summer Ground Reflect	Winter Ground Reflect
ATLANTA								

-----CARD 09-- Load Simulation Periods

1st Month Cooling Simulation	Last Month Cooling Simulation	Peak Cooling Load Hr	1st Month Summer Period	Last Month Summer Period	1st Month Daylight Savings	Last Month Daylight Savings
MAY	OCT					

---------- Load Section Alternative #1 ----------

---- Load Alternative ----

Number	Description
1	BLDG M100, BASELINE

-----CARD 20-- General Room Parameters

Room Number	Zone Reference Number	Room Descrip	Floor Length	Floor Width	Const Type	Plenum Height	Acoustic Ceiling Resistance	Floor to Floor Height	Duplicate Floors Multiplier	Duplicate Rooms per Zone	Perimeter Depth
1	1	UPSTAIRS	114.33	32.33		1.5		11			
2	2	BASEMENT	114.33	32.33		1.5		10			

-----CARD 21-- Thermostat Parameters

Room Number	Cooling Room Design DB	Room Design RH	Cooling T'stat Driftpoint	Cooling T'stat Schedule	Heating Room Design DB	Heating T'stat Driftpoint	Heating T'stat Schedule	T'stat Location Flag	Mass / No. Hrs Average	Carpet On Floor
1	76			CLG	72		HTG			
2	76			CLG	72		HTG			

-----CARD 22-- Roof Parameters ----------

Room Number	Roof Number	Roof Equal to Floor?	Roof Length	Roof Width	Roof U-Value	Const Type	Roof Direction	Roof Tilt	Roof Alpha
1	1	NO	114.33	41	.044	38	90	55	.9

-----CARD 24-- Wall Parameters ----------

Room Number	Wall Number	Wall Length	Wall Height	Wall U-Value	Wall Constuc Type	Wall Direction	Wall Tilt	Wall Alpha	Ground Reflectance Multiplier
M1	1		11	.067	79				
1	1	32.33				0			
1	2	114.33				90			
1	3	32.33				180			
1	4	114.33				270			
M2	1		1.0	1.15	91				
2	1	32.33				0			
2	2	114.33				90			
2	3	32.33				180			
2	4	114.33				270			

-----CARD 25-- Wall/Glass Parameters ----------

Room Number	Wall Number	Glass Length	Glass Width	Pct Glass or No. of Windows	Glass U-Value	Shading Coefficient	External Shading Type	Internal Shading Type	Percent Solar to Ret. Air	Visible Transmittance	Inside Visible Reflectance
M1	1	5	2.5		.7	.58					
1	1			3							
1	2			9							
1	3			2							
1	4			9							

-----CARD 26-- Schedules ----------

Room Number	People	Lights	Ventilation	Infiltration	Reheat Minimum	Cooling Fans	Heating Fan	Auxiliary Fan	Room Exhaust	Daylighting Controls
M1	ADMPPL	ADMLGTEQ	OFF	AVAIL		AVAIL				

-----CARD 27-- People and Lights ----------

Room Number	People Value	People Units	People Sensible	People Latent	Lighting Value	Lighting Units	Lighting Fixture Type	Ballast Factor	Percent Lights to Ret. Air	--- Daylighting --- Reference Point 1	Reference Point 2
1	18	PEOPLE	250	200	6312	WATTS					
2	1	PEOPLE	250	200	1370	WATTS					

-----CARD 28--- Miscellaneous Equipment ----------

Room Number	Misc Equipment Number	Equipment Descrip	Energy Consump Value	Energy Consump Units	Schedule Code	Energy Meter Code	Percent of Load Sensible	Percent Misc. Load to Room	Percent Misc. Sens to Ret. Air	Radiant Fraction	Optional Air Path
1	1	MISC EQUIP	5	BTUH-SF	ADMLGTEQ	ELEC					
2	1	MISC EQUIP	1	BTUH-SF	ADMLGTEQ	ELEC					

-----CARD 29--- Room Airflows ----------

Room	Ventilation Cooling Value	Ventilation Cooling Units	Ventilation Heating Value	Ventilation Heating Units	Infiltration Cooling Value	Infiltration Cooling Units	Infiltration Heating Value	Infiltration Heating Units	Reheat Minimum Value	Reheat Minimum Units
1					.5	ACH-HR	.5	ACH-HR		
2					.25	ACH-HR	.25	ACH-HR		

-----CARD 30- Fan Airflows ----------

Room Number	Main Cooling Value	Main Cooling Units	Main Heating Value	Main Heating Units	Auxiliary Cooling Value	Auxiliary Cooling Units	Auxiliary Heating Value	Auxiliary Heating Units	Room Exhaust Value	Room Exhaust Units
1									1045	CFM
2	1740	CFM								

-----CARD 32-- Exposed Floor Parameters----------

Room Number	Exposed Floor Number	Slab Perimeter Length	Slab Loss Coefficient	Exposed Floor Area	Exposed Floor U-Value	Exposed Floor Const Type	Exposed Floor Temp Flag	Cooling Temp	Heating Temp	Adjacent Room No
2	1	3696	.021							

---------- System Section Alternative #1 ----------

-----CARD 39-- System Alternative -----

Number	Description
1	BLDG M100, BASELINE

-----CARD 40--- System Type ----------

System Set Number	System Type	Ventil Deck Location	Cooling SADBVh	Heating SADBVh	Cooling Schedule	Heating Schedule	Fan Static Pressure
			OPTIONAL VENTILATION SYSTEM				
1	SZ						
2	SZ						

-----CARD 41-- Zone Assignment ----------

System Set Number	Ref #1 Begin	Ref #1 End	Ref #2 Begin	Ref #2 End	Ref #3 Begin	Ref #3 End	Ref #4 Begin	Ref #4 End	Ref #5 Begin	Ref #5 End	Ref #6 Begin	Ref #6 End
1	1	1										
2	2	2										

-----CARD 42--- Fan SP and Duct Parameters----------

System Set Number	Cool Fan SP	Heat Fan SP	Return Fan SP	Mn Exh Fan SP	Aux Fan SP	Rm Exh Fan SP	Cool Fan Mtr Loc	Return Fan Mtr Loc	Supply Duct Ht Gn	Supply Duct Loc	Return Air Path
1	2.5					1.0	SUPPLY			OTHER	CORRIDOR
2	2.5						SUPPLY			OTHER	DUCTED

-----CARD 45--- Equipment Schedules ----------

System Set Number	Main Cooling Coil	Economizer	Direct Evap Coil	Indirect Evap Coil	Auxiliary Cooling Coil	Main Heating Coil	Main Preheat Coil	Reheat Coil	Mech. Humidity	Auxiliary Heating Coil
1	CLGC					HTGC				
2	CLGC					HTGC				

---------- Equipment Section Alternative #1 ----------

-----CARD 59-- Equipment Description / TOD Schedules ----------

Alternative Number	Elec Consump Time of Day Schedule	Elec Demand Time of Day Schedule	Demand Limit Max KW	Alternative Description
1				BLDG M100, BASELINE

-----CARD 60--- Cooling Load Assignment----------

Load Asgn Ref	All Coil Loads To Cool Ref	Cooling Equipment Sizing	-Group 1- Begin	-Group 1- End	-Group 2- Begin	-Group 2- End	-Group 3- Begin	-Group 3- End	-Group 4- Begin	-Group 4- End	-Group 5- Begin	-Group 5- End	-Group 6- Begin	-Group 6- End	-Group 7- Begin	-Group 7- End	-Group 8- Begin	-Group 8- End	-Group 9- Begin	-Group 9- End
1	1	BLKPLANT	1	2																

-----CARD 62-- Cooling Equipment Parameters ----------

Cool Ref Num	Equip Code Name	Num Of Units	COOLING --Capacity-- Value	COOLING --Capacity-- Units	COOLING ----Energy---- Value	COOLING ----Energy---- Units	HEAT RECOVERY --Capacity-- Value	HEAT RECOVERY --Capacity-- Units	HEAT RECOVERY ----Energy---- Value	HEAT RECOVERY ----Energy---- Units	Seq Order Num	Seq Type	Demand Limit Number
1	EQ1161	1											

-----CARD 65-- Heating Load Assignment ----------

Load Assignment Reference	All Coil Loads To Heating Ref	-Group 1- Begin	End	-Group 2- Begin	End	-Group 3- Begin	End	-Group 4- Begin	End	-Group 5- Begin	End	-Group 6- Begin	End	-Group 7- Begin	End	-Group 8- Begin	End	-Group 9- Begin	End
1	1	1	2																

-----CARD 67-- Heating Equipment Parameters ----------

Heat Ref Number	Equip Code Name	Number Of Units	HW Pmp Full Ld Value	Units	Cap'y Value	Units	Energy Rate Value	Units	Seq Order Number	Switch over Control	Hot Strg	Misc. Acc.	Cogen	Demand Limit Number
1	EQ2001	1	.28	KW	250	MBH								

-----CARD 69-- Fan Equipment Parameters ----------

System Set Number	Cooling Fan	Heating Fan	Return Fan	Exhaust Fan	Auxiliary Supply	Room Exhaust	Optional Ventilation
1	EQ4003					EQ4372	
2	EQ4003						

Utility Description Reference Table

Schedules:
ADMLGTEQ ADMIN LIGHTING AND EQUIPMENT
ADMPPL ADMIN PEOPLE SCHEDULE
AVAIL AVAILABLE (100%)
CLG COOLING TSTAT SCHEDULE
CLGC COOLING COIL SCHEDULE
HTG HEATING TSTAT SCHEDULE
HTGC HEATING COIL SCHEDULE
OFF ALWAYS OFF
System:
SZ SINGLE ZONE
Equipment:
Cooling:
EQ1161 AIR-CLD COND COMP <15 TONS
Heating:
EQ2001 GAS FIRE TUBE HOT WATER
Fan:
EQ4003 FC CENTRIF. FAN C.V.
EQ4372 UNIT VENTILATOR FAN

Schedule Name: ADMLGTEQ
Project: ADMIN LIGHTING AND EQUIPMENT SC
Location:
Client:
Program User:
Comments: OFFICE LIGHTING

Starting Month: JAN Ending Month: DEC
Starting Day Type: DSGN Ending Day Type: WKDY

Hour	Util Percent
0	5
7	80
8	100
12	80
13	100
16	80
17	40
18	5
24	

Starting Month: JAN Ending Month: DEC
Starting Day Type: SAT Ending Day Type: SUN

Hour	Util Percent
0	5
24	

Schedule Name: ADMPPL
Project: ADMIN PEOPLE SCHEDULE
Location:
Client:
Program User: D JONES
Comments: OFFICE PEOPLE SCHEDULE

Starting Month: JAN Ending Month: DEC
Starting Day Type: DSGN Ending Day Type: WKDY

Hour	Util Percent
0	0
7	50
8	100
11	80
12	40
13	80
14	100
16	70
17	30
18	0
24	

Starting Month: JAN Ending Month: DEC
Starting Day Type: SAT Ending Day Type: SUN

Hour	Util Percent
0	0
24	

Schedule Name: AVAIL
Project: AVAILABLE (100)
Location:
Client:
Program User:
Comments:

Starting Month: JAN Ending Month: HTG
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	100
24	

Schedule Name: CLG
Project: COOLING TSTAT SCHEDULE
Location:
Client:
Program User:
Comments:

Starting Month: JAN Ending Month: DEC
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Temperature
0	76
24	

Schedule Name: CLGC
Project: COOLING COIL SCHEDULE
Location:
Client:
Program User: R. GERRANS
Comments:

Starting Month: JAN Ending Month: APR
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	0
24	

Starting Month: MAY Ending Month: OCT
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	100
24	

Starting Month: NOV Ending Month: HTG
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	0
24	

Schedule Name: HTG
Project: HEATING TSTAT SCHEDULE
Location:
Client:
Program User:
Comments:

Starting Month: JAN Ending Month: DEC
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Temperature
0	72
24	

Schedule Name: HTGC
Project: HEATING COIL SCHEDULE
Location:
Client:
Program User: R. GERRANS
Comments:

Starting Month: JAN Ending Month: APR
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	100
24	

Starting Month: MAY Ending Month: OCT
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	0
24	

Starting Month: NOV Ending Month: HTG
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	100
24	

Schedule Name: OFF
Project: ALWAYS OFF
Location:
Client:
Program User:
Comments:

Starting Month: JAN Ending Month: HTG
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	0
24	

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

****
****
**
** TRACE 600 ANALYSIS **
**
** by **
**
****
****

FT MCPHERSON & FT GILLEM EEAP
FT MCPHERSON, BLDG 100

R. GERRANS

Weather File Code:	ATLANTA.	
Location:	ATLANTA, GEORGIA	
Latitude:	33.0	(deg)
Longitude:	84.0	(deg)
Time Zone:	6	
Elevation:	1,005	(ft)
Barometric Pressure:	28.8	(in. Hg)
Summer Clearness Number:	0.90	
Winter Clearness Number:	0.90	
Summer Design Dry Bulb:	92	(F)
Summer Design Wet Bulb:	74	(F)
Winter Design Dry Bulb:	22	(F)
Summer Ground Relectance:	0.20	
Winter Ground Relectance:	0.20	
Air Density:	0.0731	(Lbm/cuft)
Air Specific Heat:	0.2444	(Btu/lbm/F)
Density-Specific Heat Prod:	1.0727	(Btu-min./hr/cuft/F)
Latent Heat Factor:	4,721.8	(Btu-min./hr/cuft)
Enthalpy Factor:	4.3883	(Lb-min./hr/cuft)

Design Simulation Period: May To October
System Simulation Period: January To December
Cooling Load Methodology: TETD/Time Averaging

Time/Date Program was Run: 8:28:40 4/ 8/92
Dataset Name: M100-B .TM

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

AIRFLOW - ALTERNATIVE 1
BLDG M100, BASELINE

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

System Number	System Type	Main Outside Airflow (Cfm)	Main Cooling Airflow (Cfm)	Main Heating Airflow (Cfm)	Main Return Airflow (Cfm)	Main Exhaust Airflow (Cfm)	Auxil. Supply Airflow (Cfm)	Room Exhaust Airflow (Cfm)
1	SZ	0	6,648	6,648	6,941	293	0	1,045
2	SZ	0	1,740	1,740	1,871	131	0	0
Totals		0	8,388	8,388	8,812	424	0	1,045

CAPACITY - ALTERNATIVE 1
BLDG M100, BASELINE

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

System Number	System Type	Cooling Main Sys. Capacity (Tons)	Cooling Aux. Sys. Capacity (Tons)	Cooling Opt. Vent Capacity (Tons)	Cooling Totals (Tons)	Heating Main Sys. Capacity (Btuh)	Heating Aux. Sys. Capacity (Btuh)	Heating Preheat Capacity (Btuh)	Heating Reheat Capacity (Btuh)	Heating Humidif. Capacity (Btuh)	Heating Opt. Vent Capacity (Btuh)	Heating Totals (Btuh)
1	SZ	9.0	0.0	0.0	9.0	-32,746	0	0	0	0	0	-32,746
2	SZ	2.1	0.0	0.0	2.1	-24,570	0	0	0	0	0	-24,570
Totals		11.1	0.0	0.0	11.1	-57,316	0	0	0	0	0	-57,316

The building peaked at hour 15 month 6 with a capacity of 11.1 tons

ENGINEERING CHECKS - ALTERNATIVE 1
BLDG M100, BASELINE

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 Cfm/ Sq Ft	Cooling Cfm/ Ton	Cooling Sq Ft /Ton	Cooling Btuh/ Sq Ft	Heating Cfm/ Sq Ft	Heating Btuh/ Sq Ft	Floor Area Sq Ft
1	Main	SZ	0.00	1.80	735.8	409.1	29.33	1.80	-8.86	3,696
2	Main	SZ	0.00	0.47	828.2	1,759.4	6.82	0.47	-6.65	3,696

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

System 1 Peak SZ - SINGLE ZONE

********** COOLING COIL PEAK **********							CLG SPACE PEAK **********			HEATING COIL PEAK ********		
Peaked at Time ==>	Mo/Hr: 6/15						Mo/Hr: 6/16			Mo/Hr: 13/ 1		
Outside Air ==>	OADB/WB/HR: 96/ 73/ 91.0						OADB: 96			OADB: 22		
	Space Sens.+Lat. (Btuh)	Ret. Air Sensible (Btuh)	Ret. Air Latent (Btuh)	Net Total (Btuh)	Percnt Of Tot (%)		Space Sensible (Btuh)	Percnt Of Tot (%)		Space Peak Space Sens (Btuh)	Coil Peak Tot Sens (Btuh)	Percnt 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	13,130		13,130	12.11		0	0.00		0	-8,585	26.22
Glass Solar	14,662	0		14,662	13.52		15,812	17.72		0	0	0.00
Glass Cond	4,065	0		4,065	3.75		3,945	4.42		-10,686	-10,686	32.63
Wall Cond	5,475	618		6,093	5.62		5,910	6.62		-8,372	-9,599	29.31
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	10,523			10,523	9.71		6,152	6.89		-15,695	-15,695	47.93
Sub Total==>	34,726	13,748		48,474	44.71		31,820	35.66		-34,753	-44,564	136.09
Internal Loads												
Lights	21,543	0		21,543	19.87		21,543	24.14		0	0	0.00
People	8,100			8,100	7.47		4,500	5.04		0	0	0.00
Misc	18,481	0	0	18,481	17.05		18,481	20.71		0	0	0.00
Sub Total==>	48,124	0	0	48,124	44.39		44,524	49.90		0	0	0.00
Ceiling Load	13,748	-13,748		0	0.00		12,885	14.44		-9,812	0	0.00
Outside Air	0	0	0	0	0.00		0	0.00		0	0	0.00
Sup. Fan Heat				11,819	10.90			0.00			11,819	-36.09
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==>	96,599	0	0	108,417	100.00		89,229	100.00		-44,564	-32,746	100.00

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

	Total Capacity (Tons)	Capacity (Mbh)	Sens Cap. (Mbh)	Coil Airfl (cfm)	Entering DB/WB/HR Deg F	Deg F	Grains	Leaving DB/WB/HR Deg F	Deg F	Grains
Main Clg	9.0	108.4	100.6	6,648	76.0	63.2	69.8	61.8	57.9	68.2
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
0										
Totals	9.0	108.4								
9										

----------AREAS----------

	Gross Total	Glass (sf)	(%)
Floor	3,696		
Part	0		
ExFlr	0		
Roof	4,688	0	
Wall	3,227	288	

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

	Capacity (Mbh)	Coil Airfl (cfm)	Ent Deg F	Lvg Deg F
Main Htg	-32.7	6,648	72.0	76.6
Aux Htg	0.0	0	0.0	0.0
Preheat	-0.0	6,648	72.0	61.8
Reheat	0.0	0	0.0	0.0
Humidif	0.0	0	0.0	0.0
Opt Vent	0.0	0	0.0	0.0
Total	-32.7			

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

Type	Cooling	Heating
Vent	0	0
Infil	293	293
Supply	6,648	6,648
Mincfm	0	0
Return	5,896	6,648
Exhaust	0	0
Rm Exh	1,045	0
Auxil	0	0

--ENGINEERING CHECKS--

Clg % OA	0.0
Clg Cfm/Sqft	1.80
Clg Cfm/Ton	735.82
Clg Sqft/Ton	409.12
Clg Btuh/Sqft	29.33
No. People	18
Htg % OA	0.0
Htg Cfm/SqFt	1.80
Htg Btuh/SqFt	-8.86

--TEMPERATURES (F)---

Type	Clg	Htg
SADB	63.5	78.2
Plenum	87.7	63.6
Return	76.0	72.0
Ret/OA	76.0	72.0
Runarnd	76.0	72.0
Fn MtrTD	0.4	0.0
Fn BldTD	0.3	0.0
Fn Frict	0.9	0.0

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

System 2 Peak SZ - SINGLE ZONE

	COOLING COIL PEAK					CLG SPACE PEAK			HEATING COIL PEAK	
Peaked at Time ==>	Mo/Hr: 7/15					Mo/Hr: 6/16			Mo/Hr: 13/ 1	
Outside Air ==>	OADB/WB/HR: 92/ 74/105.0					OADB: 96			OADB: 22	
	Space Sens.+Lat. (Btuh)	Ret. Air Sensible (Btuh)	Ret. Air Latent (Btuh)	Net Total (Btuh)	Percnt Of Tot (%)	Space Sensible (Btuh)	Percnt Of Tot (%)	Space Peak Space Sens (Btuh)	Coil Peak Tot Sens (Btuh)	Percnt 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	7,082	1,198		8,280	32.84	8,114	38.90	-14,336	-16,761	68.22
Partition	0			0	0.00	0	0.00	0	0	0.00
Exposed Floor	0			0	0.00	0	0.00	-3,881	-3,881	15.79
Infiltration	5,015			5,015	19.89	2,752	13.19	-7,021	-7,021	28.58
Sub Total==>	12,097	1,198		13,295	52.74	10,867	52.09	-25,238	-27,663	112.59
Internal Loads										
Lights	4,676	0		4,676	18.55	4,676	22.41	0	0	0.00
People	450			450	1.79	250	1.20	0	0	0.00
Misc	3,696	0	0	3,696	14.66	3,696	17.72	0	0	0.00
Sub Total==>	8,822	0	0	8,822	34.99	8,622	41.33	0	0	0.00
Ceiling Load	1,198	-1,198		0	0.00	1,373	6.58	-2,425	0	0.00
Outside Air	0	0	0	0	0.00	0	0.00	0	0	0.00
Sup. Fan Heat				3,093	12.27		0.00		3,093	-12.59
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==>	22,117	0	0	25,210	100.00	20,861	100.00	-27,663	-24,570	100

COOLING COIL SELECTION

	Total Capacity (Tons)	Capacity (Mbh)	Sens Cap. (Mbh)	Coil Airfl (cfm)	Entering DB F	Entering WB F	Entering Grains	Leaving DB F	Leaving WB F	Leaving Grains
Main Clg	2.1	25.2	22.2	1,740	76.0	64.0	73.7	63.2	59.3	72.6
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
0										
Totals	2.1	25.2								
0										

AREAS

	Gross Total	Glass (sf)	(%)
Floor	3,696		
Part	0		
ExFlr	3,696		
Roof	0		0
Wall	293		0

HEATING COIL SELECTION

	Capacity (Mbh)	Coil Airfl (cfm)	Ent Deg F	Lvg Deg F
Main Htg	-24.6	1,740	72.0	85.2
Aux Htg	0.0	0	0.0	0.0
Preheat	-0.0	1,740	72.0	63.2
Reheat	0.0	0	0.0	0.0
Humidif	0.0	0	0.0	0.0
Opt Vent	0.0	0	0.0	0.0
Total	-24.6			

AIRFLOWS (cfm)

Type	Cooling	Heating
Vent	0	0
Infil	131	131
Supply	1,740	1,740
Mincfm	0	0
Return	1,740	1,740
Exhaust	0	0
Rm Exh	0	0
Auxil	0	0

ENGINEERING CHECKS

Clg % OA	0.0
Clg Cfm/Sqft	0.47
Clg Cfm/Ton	828.24
Clg Sqft/Ton	1759.44
Clg Btuh/Sqft	6.82
No. People	1
Htg % OA	0.0
Htg Cfm/SqFt	0.47
Htg Btuh/SqFt	-6.65

TEMPERATURES (F)

Type	Clg	Htg
SADB	64.8	86.8
Plenum	77.0	69.9
Return	76.0	72.0
Ret/OA	76.0	72.0
Runarnd	76.0	72.0
Fn MtrTD	0.4	0.0
Fn BldTD	0.3	0.0
Fn Frict	0.9	0.0

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

COOLING LOADS AT COIL PEAK - ALTERNATIVE 1
BLDG M100, BASELINE

A I R F L O W C O O L I N G L O A D S
(At time of Coil Peak)

Room Number	Description	Ventilation Airflow (Cfm)	Ventilation Sensible (Btuh)	Ventilation Latent (Btuh)	Optional Ventilation Airflow (Cfm)	Optional Ventilation Sensible (Btuh)	Optional Ventilation Latent (Btuh)	Bypass Airflow (Cfm)	Bypass Sensible (Btuh)	Bypass Latent (Btuh)	Ov/Undr Sizing (Btuh)
1	UPSTAIRS	0	0	0	0	0	0	0	0	0	0
Zone 1	Total/Ave.	0	0	0	0	0	0	0	0	0	0
Zone 1	Block	0	0	0	0	0	0	0	0	0	0
System 1	Total/Ave.	0	0	0	0	0	0	0	0	0	0
System 1	Block	0	0	0	0	0	0	0	0	0	0
2	BASEMENT	0	0	0	0	0	0	0	0	0	0
Zone 2	Total/Ave.	0	0	0	0	0	0	0	0	0	0
Zone 2	Block	0	0	0	0	0	0	0	0	0	0
System 2	Total/Ave.	0	0	0	0	0	0	0	0	0	0
System 2	Block	0	0	0	0	0	0	0	0	0	0

HEATING LOADS AT COIL PEAK - ALTERNATIVE 1
BLDG M100, BASELINE

A I R F L O W H E A T I N G L O A D S
(At time of Coil Peak)

Room Number	Description	Ventilation Airflow (Cfm)	Ventilation Sensible (Btuh)	Op. Vent. Airflow (Cfm)	Op. Vent. Sensible (Btuh)	Reheat Airflow (Cfm)	Reheat Sensible (Btuh)	Humidif. Airflow (Cfm)	Humidif. Latent (Btuh)	Total (Btuh)
1	UPSTAIRS	0	0	0	0	0	0	0	0	0
Zone 1	Total/Ave.	0	0	0	0	0	0	0	0	0
Zone 1	Block	0	0	0	0	0	0	0	0	0
System 1	Total/Ave.	0	0	0	0	0	0	0	0	0
System 1	Block	0	0	0	0	0	0	0	0	0
2	BASEMENT	0	0	0	0	0	0	0	0	0
Zone 2	Total/Ave.	0	0	0	0	0	0	0	0	0
Zone 2	Block	0	0	0	0	0	0	0	0	0
System 2	Total/Ave.	0	0	0	0	0	0	0	0	0
System 2	Block	0	0	0	0	0	0	0	0	0

COOLING AIRFLOW HEAT GAIN/LOSS - ALTERNATIVE 1
BLDG M100, BASELINE

AIRFLOW HEAT GAIN AND LOSS
(At time of Coil Peak)

Room Number	Description	Cooling: Duct Heat Pickup (Btuh)	Supply Fan Heat (Btuh)	Return Fan Heat (Btuh)	System Exhaust Heat Loss (Btuh)	Total (Btuh)	System Exhaust Airflow (Cfm)	Room Exhaust Airflow (Cfm)	Ducted Airflow (Cfm)	Plenum Airflow (Cfm)	Run Around Airflow (Cfm)	Corridr Airflow (Cfm)	System Return Airflow (Cfm)
1	UPSTAIRS	0	11,819	0	0	11,819	0	1,045	0	0	0	5,896	5,896
Zone 1	Total/Ave.	0	11,819	0	0	11,819	0	1,045	0	0	0	5,896	5,896
Zone 1	Block	0	11,819	0	0	11,819	0	1,045	0	0	0	5,896	5,896
System 1	Total/Ave.	0	11,819	0	0	11,819	0	1,045	0	0	0	5,896	5,896
System 1	Block	0	11,819	0	0	11,819	0	1,045	0	0	0	5,896	5,896
2	BASEMENT	0	3,093	0	0	3,093	0	0	1,740	0	0	0	1,740
Zone 2	Total/Ave.	0	3,093	0	0	3,093	0	0	1,740	0	0	0	1,740
Zone 2	Block	0	3,093	0	0	3,093	0	0	1,740	0	0	0	1,740
System 2	Total/Ave.	0	3,093	0	0	3,093	0	0	1,740	0	0	0	1,740
System 2	Block	0	3,093	0	0	3,093	0	0	1,740	0	0	0	1,740

HEATING AIRFLOW HEAT GAIN/LOSS - ALTERNATIVE 1
BLDG M100, BASELINE

AIRFLOW HEAT GAIN AND LOSS
(At time of Coil Peak)

Room Number	Description	Heating: Supply Fan Heat (Btuh)	Return Fan Heat (Btuh)	System Exhaust Heat Loss (Btuh)	Total (Btuh)	System Exhaust Airflow (Cfm)	Room Exhaust Airflow (Cfm)	Ducted Airflow (Cfm)	Plenum Airflow (Cfm)	Run Around Airflow (Cfm)	Corridr Airflow (Cfm)	System Return Airflow (Cfm)
1	UPSTAIRS	11,819	0	0	11,819	0	0	0	0	0	6,648	6,648
Zone 1	Total/Ave.	11,819	0	0	11,819	0	0	0	0	0	6,648	6,648
Zone 1	Block	11,819	0	0	11,819	0	0	0	0	0	6,648	6,648
System 1	Total/Ave.	11,819	0	0	11,819	0	0	0	0	0	6,648	6,648
System 1	Block	11,819	0	0	11,819	0	0	0	0	0	6,648	6,648
2	BASEMENT	3,093	0	0	3,093	0	0	1,740	0	0	0	1,740
Zone 2	Total/Ave.	3,093	0	0	3,093	0	0	1,740	0	0	0	1,740
Zone 2	Block	3,093	0	0	3,093	0	0	1,740	0	0	0	1,740
System 2	Total/Ave.	3,093	0	0	3,093	0	0	1,740	0	0	0	1,740
System 2	Block	3,093	0	0	3,093	0	0	1,740	0	0	0	1,740

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

ZONE PSYCHROMETRICS - ALTERNATIVE 1
BLDG M100, BASELINE

---------- P S Y C H R O M E T R I C S T A T E P O I N T S ----------

Zone 1

	Dry Bulb (F)	Wet Bulb (F)	Relat. Humid. (%)	Humid. Ratio (GR)	Enthalpy (Btu/Lb)	Temp. Diff. (F)
Space	76.0	63.2	50.0	69.8	29.2	
Main System						0.0
Return Air Heat Pickup						0.0
Return Fan						
Return Air	76.0	63.2	50.0	69.8	29.2	
Outdoor Air	96.2	73.2	34.1	91.0	37.4	
Return/Outdoor Air Mix	76.0	63.2	50.0	69.8	29.2	
Blow through Fan						0.0
Entering Coil	76.0	63.2	50.0	69.8	29.2	
Leaving Coil	61.8	58.0	80.0	68.7	25.5	
Draw Through Fan						0.7
Duct Frictional Heat						0.9
Supply Duct Heat Gain						0.0
Cold Deck Supply Air	63.5	58.6	75.5	68.7	25.9	
Supply Air	63.5	58.6	75.5	68.7	25.9	

Percent Outside Air	0.00	(%)
Sensible Heat Ratio (SHR)	0.933	
Percent Supply Air Bypassing Coil	0.00	(%)
Coil Airflow	6,648	(Cfm)

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

ZONE PSYCHROMETRICS - ALTERNATIVE 1
BLDG M100, BASELINE

---------- P S Y C H R O M E T R I C S T A T E P O I N T S ----------

Zone 2

	Dry Bulb (F)	Wet Bulb (F)	Relat. Humid. (%)	Humid. Ratio (GR)	Enthalpy (Btu/Lb)	Temp. Diff. (F)
Space	76.0	64.0	52.7	73.7	29.8	
Main System						
Return Air Heat Pickup						0.0
Return Fan						0.0
Return Air	76.0	64.0	52.7	73.7	29.8	
Outdoor Air	92.0	74.4	44.6	105.0	38.6	
Return/Outdoor Air Mix	76.0	64.0	52.7	73.7	29.8	
Blow through Fan						0.0
Entering Coil	76.0	64.0	52.7	73.7	29.8	
Leaving Coil	63.2	59.3	80.6	72.6	26.5	
Draw Through Fan						0.7
Duct Frictional Heat						0.9
Supply Duct Heat Gain						0.0
Cold Deck Supply Air	64.8	59.9	76.0	72.6	26.9	
Supply Air	64.8	59.9	76.0	72.6	26.9	

Percent Outside Air	0.00	(%)
Sensible Heat Ratio (SHR)	0.935	
Percent Supply Air Bypassing Coil	0.00	(%)
Coil Airflow	1,740	(Cfm)

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

BUILDING U-VALUES - ALTERNATIVE 1
BLDG M100, BASELINE

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) Part.	ExFlr	Summr Skylt	Wintr Skylt	Roof	Summr Windo	Wintr Windo	Wall	Ceil.	Room Mass (lb/ sqft)	Room Capac. (Btu/ sqft/F)
1	UPSTAIRS	0.000	0.000	0.000	0.000	0.044	0.700	0.743	0.067	0.317	47.7	12.24
Zone 1	Total/Ave.	0.000	0.000	0.000	0.000	0.044	0.700	0.743	0.067	0.317	47.7	12.24
System 1	Total/Ave.	0.000	0.000	0.000	0.000	0.044	0.700	0.743	0.067	0.317	47.7	12.24
2	BASEMENT	0.000	0.021	0.000	0.000	0.000	0.000	0.000	1.150	0.317	16.7	3.33
Zone 2	Total/Ave.	0.000	0.021	0.000	0.000	0.000	0.000	0.000	1.150	0.317	16.7	3.33
System 2	Total/Ave.	0.000	0.021	0.000	0.000	0.000	0.000	0.000	1.150	0.317	16.7	3.33
Building		0.000	0.021	0.000	0.000	0.044	0.700	0.743	0.165	0.317	32.2	7.79

BUILDING AREAS - ALTERNATIVE 1
BLDG M100, BASELINE

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	UPSTAIRS	1	1	3,696	3,696	0	0	0	0	4,688	288	9	2,939
Zone 1	Total/Ave.				3,696	0	0	0	0	4,688	288	9	2,939
System 1	Total/Ave.				3,696	0	0	0	0	4,688	288	9	2,939
2	BASEMENT	1	1	3,696	3,696	0	3,696	0	0	0	0	0	293
Zone 2	Total/Ave.				3,696	0	3,696	0	0	0	0	0	293
System 2	Total/Ave.				3,696	0	3,696	0	0	0	0	0	293
Building					7,393	0	3,696	0	0	4,688	288	8	3,232

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

ASHRAE 90 ANALYSIS - ALTERNATIVE 1
BLDG M100, BASELINE

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

Overall Roof U-Value = 0.044 (Btu/Hr/Sq Ft/F)
Overall Wall U-Value = 0.209 (Btu/Hr/Sq Ft/F)
Overall Building U-Value = 0.115 (Btu/Hr/Sq Ft/F)

Roof Overall Thermal Transfer Value (OTTVr) = 2.25 (Btu/Hr/Sq Ft)
Wall Overall Thermal Transfer Value (OTTVw) = 12.20 (Btu/Hr/Sq Ft)

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

SYSTEM TOTALS LOAD PROFILE - ALTERNATIVE 1
BLDG M100, BASELINE

S Y S T E M L O A D P R O F I L E

System Totals

Percent Design Load	Cooling Load Cap. (Ton)	Cooling Load Hours (%)	Cooling Load Hours	Heating Load Capacity (Btuh)	Heating Load Hours (%)	Heating Load Hours	Cooling Airflow Cap. (Cfm)	Cooling Airflow Hours (%)	Cooling Airflow Hours	Heating Airflow Cap. (Cfm)	Heating Airflow Hours (%)	Heating Airflow Hours
0 - 5	0.6	4	164	-2,866	26	367	419.4	0	0	0.0	0	0
5 - 10	1.1	9	401	-5,732	34	476	838.8	0	0	0.0	0	0
10 - 15	1.7	12	507	-8,597	30	423	1,258.2	0	0	0.0	0	0
15 - 20	2.2	13	570	-11,463	11	153	1,677.6	0	0	0.0	0	0
20 - 25	2.8	12	489	-14,329	0	0	2,097.0	0	0	0.0	0	0
25 - 30	3.3	8	346	-17,195	0	0	2,516.4	0	0	0.0	0	0
30 - 35	3.9	6	246	-20,060	0	0	2,935.8	0	0	0.0	0	0
35 - 40	4.5	4	163	-22,926	0	0	3,355.2	0	0	0.0	0	0
40 - 45	5.0	5	207	-25,792	0	0	3,774.6	0	0	0.0	0	0
45 - 50	5.6	1	41	-28,658	0	0	4,194.0	0	0	0.0	0	0
50 - 55	6.1	6	237	-31,524	0	0	4,613.4	0	0	0.0	0	0
55 - 60	6.7	2	88	-34,389	0	0	5,032.8	0	0	0.0	0	0
60 - 65	7.2	3	147	-37,255	0	0	5,452.2	0	0	0.0	0	0
65 - 70	7.8	5	219	-40,121	0	0	5,871.6	0	0	0.0	0	0
70 - 75	8.4	5	232	-42,987	0	0	6,291.0	0	0	0.0	0	0
75 - 80	8.9	0	0	-45,852	0	0	6,710.4	0	0	0.0	0	0
80 - 85	9.5	4	173	-48,718	0	0	7,129.8	0	0	0.0	0	0
85 - 90	10.0	1	22	-51,584	0	0	7,549.2	0	0	0.0	0	0
90 - 95	10.6	0	0	-54,450	0	0	7,968.6	0	0	0.0	0	0
95 - 100	11.1	0	0	-57,316	0	0	8,388.0	100	8,760	0.0	0	0
Hours Off	0.0	0	4,508	0	0	7,341	0.0	0	0	0.0	0	8,760

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

BUILDING COOL-HEAT DEMAND - ALTERNATIVE 1
BLDG M100, BASELINE

January			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	33.4	30.4	-14,345	0.0	0	0.0	-5,104	0.0	-5,104	0.0	-5,104	0.0
2	32.1	29.3	-16,890	0.0	0	0.0	-5,755	0.0	-5,755	0.0	-5,755	0.0
3	31.7	29.3	-19,008	0.0	-5,085	0.0	-6,514	0.0	-6,514	0.0	-6,514	0.0
4	31.9	29.5	-20,135	0.0	-7,065	0.0	-7,067	0.0	-7,067	0.0	-7,067	0.0
5	32.6	30.3	-21,093	0.0	-7,963	0.0	-7,964	0.0	-7,964	0.0	-7,964	0.0
6	33.6	31.3	-22,146	0.0	-8,399	0.0	-8,399	0.0	-8,399	0.0	-8,399	0.0
7	35.0	32.6	-22,314	0.0	-8,828	0.0	-8,828	0.0	-8,828	0.0	-8,828	0.0
8	36.6	34.4	-2,509	0.0	-2,856	0.0	-9,260	0.0	-9,260	0.0	-2,856	0.0
9	38.5	36.3	-722	0.0	-1,364	0.0	-9,568	0.0	-9,568	0.0	-1,364	0.0
10	40.4	37.7	-357	0.0	-1,422	0.0	-9,626	0.0	-9,626	0.0	-1,422	0.0
11	42.3	38.7	0	0.0	-764	0.0	-8,968	0.0	-8,968	0.0	-764	0.0
12	44.2	39.6	0	0.0	0	0.0	-8,241	0.0	-8,241	0.0	0	0.0
13	45.8	40.5	0	0.0	-1,173	0.0	-7,552	0.0	-7,552	0.0	-1,173	0.0
14	47.2	41.1	0	0.0	0	0.0	-6,817	0.0	-6,817	0.0	0	0.0
15	48.2	41.6	0	0.0	0	0.0	-6,155	0.0	-6,155	0.0	0	0.0
16	48.9	41.8	0	0.0	0	0.0	-5,366	0.0	-5,366	0.0	0	0.0
17	49.1	41.9	0	0.0	0	0.0	-4,729	0.0	-4,729	0.0	0	0.0
18	48.7	41.9	0	0.0	0	0.0	-3,851	0.0	-3,851	0.0	0	0.0
19	47.4	41.7	0	0.0	0	0.0	-3,063	0.0	-3,063	0.0	0	0.0
20	45.5	40.5	0	0.0	0	0.0	-2,909	0.0	-2,909	0.0	0	0.0
21	43.1	38.9	0	0.0	-2,586	0.0	-3,193	0.0	-3,193	0.0	-2,586	0.0
22	40.4	36.7	0	0.0	-3,563	0.0	-3,564	0.0	-3,564	0.0	-3,563	0.0
23	37.7	34.3	0	0.0	-4,017	0.0	-4,017	0.0	-4,017	0.0	-4,017	0.0
24	35.3	32.3	0	0.0	-4,861	0.0	-4,861	0.0	-4,861	0.0	-4,861	0.0

February			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	37.5	34.5	-4,276	0.0	0	0.0	-5,562	0.0	-5,562	0.0	-5,562	0.0
2	36.0	33.0	-5,059	0.0	0	0.0	-6,145	0.0	-6,145	0.0	-6,145	0.0
3	34.7	31.8	-6,149	0.0	-253	0.0	-6,670	0.0	-6,670	0.0	-6,670	0.0
4	33.6	30.9	-6,875	0.0	-7,061	0.0	-7,058	0.0	-7,058	0.0	-7,058	0.0
5	32.8	30.1	-7,574	0.0	-7,764	0.0	-7,768	0.0	-7,768	0.0	-7,768	0.0
6	32.2	29.8	-7,867	0.0	-8,208	0.0	-8,208	0.0	-8,208	0.0	-8,208	0.0
7	32.1	29.6	-8,425	0.0	-8,960	0.0	-8,960	0.0	-8,960	0.0	-8,960	0.0
8	32.5	30.3	-2,160	0.0	-3,025	0.0	-9,429	0.0	-9,429	0.0	-3,025	0.0
9	33.9	31.6	-414	0.0	-1,407	0.0	-9,611	0.0	-9,611	0.0	-1,407	0.0
10	36.0	33.0	0	0.0	-1,616	0.0	-9,820	0.0	-9,820	0.0	-1,616	0.0
11	38.5	34.8	0	0.0	-1,468	0.0	-9,672	0.0	-9,672	0.0	-1,468	0.0
12	41.3	36.5	0	0.0	-1,173	0.0	-9,326	0.0	-9,326	0.0	-1,173	0.0
13	43.8	38.1	0	0.0	-2,321	0.0	-8,700	0.0	-8,700	0.0	-2,321	0.0
14	45.9	39.5	0	0.0	0	0.0	-7,787	0.0	-7,787	0.0	0	0.0
15	47.2	40.4	0	0.0	0	0.0	-6,898	0.0	-6,898	0.0	0	0.0
16	47.7	40.6	0	0.0	0	0.0	-6,680	0.0	-6,680	0.0	0	0.0
17	47.5	40.2	0	0.0	0	0.0	-5,737	0.0	-5,737	0.0	0	0.0
18	47.0	39.8	0	0.0	0	0.0	-5,184	0.0	-5,184	0.0	0	0.0
19	46.2	39.9	0	0.0	-2,610	0.0	-4,148	0.0	-4,148	0.0	-2,610	0.0
20	45.1	39.7	0	0.0	-3,722	0.0	-3,721	0.0	-3,721	0.0	-3,722	0.0
21	43.8	39.2	0	0.0	-3,575	0.0	-3,576	0.0	-3,576	0.0	-3,575	0.0
22	42.3	38.3	0	0.0	-3,872	0.0	-3,872	0.0	-3,872	0.0	-3,872	0.0
23	40.7	37.2	0	0.0	-4,459	0.0	-4,459	0.0	-4,459	0.0	-4,459	0.0
24	39.1	35.8	0	0.0	-4,782	0.0	-4,782	0.0	-4,782	0.0	-4,782	0.0

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

BUILDING COOL-HEAT DEMAND - ALTERNATIVE 1
BLDG M100, BASELINE

March			------ Design -----		----- Weekday -----		-----Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	45.4	41.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2	43.3	39.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
3	41.6	38.6	0	0.0	0	0.0	0	0.0	0	0.0	-732	0.0
4	40.6	37.5	-1,132	0.0	0	0.0	0	0.0	0	0.0	-3,034	0.0
5	40.2	37.3	-2,386	0.0	0	0.0	0	0.0	0	0.0	-3,722	0.0
6	40.6	37.8	-2,999	0.0	0	0.0	0	0.0	0	0.0	-4,314	0.0
7	41.6	39.0	-3,516	0.0	0	0.0	0	0.0	-4,326	0.0	-5,231	0.0
8	43.3	40.7	0	0.0	0	0.0	0	0.0	-5,386	0.0	0	0.0
9	45.4	42.5	0	0.0	0	0.0	0	0.0	-5,874	0.0	0	0.0
10	47.9	44.3	0	0.0	0	0.0	0	0.0	-6,093	0.0	0	0.0
11	50.6	45.5	0	0.0	0	0.0	0	0.0	-5,142	0.0	0	0.0
12	53.3	46.8	0	0.0	0	0.0	0	0.0	-4,229	0.0	0	0.0
13	55.8	48.5	0	0.0	0	0.0	0	0.0	-3,495	0.0	0	0.0
14	58.0	49.6	0	0.0	0	0.0	0	0.0	-2,543	0.0	0	0.0
15	59.6	50.3	0	0.0	0	0.0	0	0.0	-2,130	0.0	0	0.0
16	60.7	50.9	0	0.0	0	0.0	0	0.0	-1,460	0.0	0	0.0
17	61.0	50.9	0	0.0	0	0.0	0	0.0	-740	0.0	0	0.0
18	60.7	50.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
19	59.6	50.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
20	58.0	50.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
21	55.8	49.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
22	53.3	47.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
23	50.6	45.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
24	47.9	43.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0

April			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	57.7	53.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2	55.9	52.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
3	54.2	51.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
4	52.9	50.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
5	51.9	49.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
6	51.2	49.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
7	51.0	49.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
8	51.6	49.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
9	53.3	50.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
10	55.9	51.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
11	59.0	53.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
12	62.4	55.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
13	65.5	57.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
14	68.1	59.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
15	69.8	60.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
16	70.4	60.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
17	70.2	60.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
18	69.5	60.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
19	68.5	59.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
20	67.2	59.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
21	65.5	59.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
22	63.7	58.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
23	61.7	57.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
24	59.7	55.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0

BUILDING COOL-HEAT DEMAND - ALTERNATIVE 1
BLDG M100, BASELINE

May			Design		Weekday		Saturday		Sunday		Monday	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	66.6	62.3	0	11.1	0	1.3	0	1.4	0	1.4	0	1.4
2	64.5	60.4	0	11.1	0	1.1	0	1.1	0	1.1	0	1.1
3	62.7	59.1	0	11.1	0	0.9	0	0.9	0	0.9	0	0.9
4	61.2	58.1	0	11.1	0	0.7	0	0.7	0	0.7	0	0.7
5	60.0	57.1	0	11.1	0	0.5	0	0.5	0	0.5	0	0.5
6	59.3	56.6	0	11.1	0	0.8	0	0.8	0	0.8	0	0.8
7	59.0	56.5	0	10.8	0	1.0	0	1.0	0	1.0	0	1.0
8	59.5	56.6	0	9.9	0	4.4	0	1.2	0	1.2	0	4.6
9	60.9	56.6	0	10.1	0	5.5	0	1.2	0	1.2	0	5.6
10	63.0	57.2	0	10.1	0	6.1	0	1.7	0	1.7	0	6.1
11	65.7	58.1	0	10.3	0	6.3	0	1.9	0	1.9	0	6.3
12	68.7	59.8	0	10.4	0	6.3	0	2.0	0	2.0	0	6.3
13	71.7	61.6	0	10.3	0	5.8	0	2.5	0	2.5	0	5.8
14	74.5	63.4	0	10.6	0	7.2	0	2.9	0	2.9	0	7.2
15	76.6	64.8	0	10.6	0	7.7	0	3.3	0	3.3	0	7.7
16	78.0	65.6	0	10.7	0	7.7	0	3.1	0	3.1	0	7.7
17	78.5	65.6	0	10.6	0	6.7	0	3.2	0	3.2	0	6.7
18	78.2	65.8	0	10.4	0	4.5	0	2.9	0	2.9	0	4.5
19	77.5	65.6	0	10.1	0	2.4	0	2.4	0	2.4	0	2.4
20	76.3	66.1	0	6.7	0	2.3	0	2.3	0	2.3	0	2.3
21	74.8	67.2	0	3.0	0	2.2	0	2.2	0	2.2	0	2.2
22	73.0	66.4	0	2.7	0	2.0	0	2.0	0	2.0	0	2.0
23	70.9	65.4	0	2.3	0	1.9	0	1.9	0	1.9	0	1.9
24	68.7	64.0	0	2.0	0	1.6	0	1.6	0	1.6	0	1.6

June			Design		Weekday		Saturday		Sunday		Monday	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	73.0	67.9	0	3.0	0	2.1	0	2.3	0	2.3	0	2.3
2	71.2	66.1	0	2.7	0	1.9	0	2.0	0	2.0	0	2.0
3	69.7	65.2	0	2.5	0	1.7	0	1.8	0	1.8	0	1.8
4	68.5	64.3	0	2.3	0	1.5	0	1.6	0	1.6	0	1.6
5	67.8	64.2	0	2.2	0	1.4	0	1.4	0	1.4	0	1.4
6	67.6	64.2	0	2.8	0	1.7	0	1.8	0	1.8	0	1.8
7	68.1	64.8	0	3.4	0	2.0	0	2.0	0	2.0	0	2.0
8	69.4	65.7	0	7.2	0	5.8	0	2.2	0	2.2	0	5.8
9	71.6	66.2	0	8.6	0	7.1	0	2.6	0	2.6	0	7.1
10	74.2	67.2	0	9.0	0	7.8	0	3.2	0	3.2	0	7.8
11	77.2	68.5	0	9.4	0	7.9	0	3.4	0	3.4	0	7.9
12	80.2	70.0	0	9.6	0	8.1	0	3.6	0	3.6	0	8.1
13	82.8	70.8	0	9.1	0	7.5	0	4.1	0	4.1	0	7.5
14	85.0	71.6	0	10.6	0	9.1	0	4.7	0	4.7	0	9.1
15	86.3	72.3	0	11.1	0	9.5	0	5.0	0	5.0	0	9.5
16	86.8	72.1	0	11.1	0	9.5	0	4.9	0	4.9	0	9.5
17	86.6	71.7	0	9.8	0	8.2	0	4.6	0	4.6	0	8.2
18	85.8	71.5	0	7.3	0	6.0	0	4.4	0	4.4	0	6.0
19	84.7	71.2	0	4.7	0	3.7	0	3.7	0	3.7	0	3.7
20	83.2	71.5	0	4.4	0	3.6	0	3.7	0	3.7	0	3.6
21	81.4	71.7	0	4.1	0	3.4	0	3.4	0	3.4	0	3.4
22	79.3	71.4	0	3.8	0	3.1	0	3.1	0	3.1	0	3.1
23	77.2	70.5	0	3.4	0	2.8	0	2.8	0	2.8	0	2.8
24	75.1	69.1	0	3.1	0	2.5	0	2.5	0	2.5	0	2.5

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

BUILDING COOL-HEAT DEMAND - ALTERNATIVE 1
BLDG M100, BASELINE

July			------ Design -----		----- Weekday -----		-----Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	72.0	69.3	0	2.9	0	2.1	0	2.2	0	2.2	0	2.2
2	70.5	68.0	0	2.7	0	1.8	0	1.9	0	1.9	0	1.9
3	69.4	67.1	0	2.5	0	1.7	0	1.7	0	1.7	0	1.7
4	68.5	66.4	0	2.3	0	1.5	0	1.6	0	1.6	0	1.6
5	67.9	66.0	0	2.2	0	1.4	0	1.4	0	1.4	0	1.4
6	67.7	65.9	0	2.7	0	1.6	0	1.6	0	1.6	0	1.6
7	68.1	66.3	0	3.4	0	2.0	0	2.0	0	2.0	0	2.0
8	69.1	67.3	0	7.3	0	5.9	0	2.3	0	2.3	0	5.9
9	70.8	68.0	0	8.6	0	7.1	0	2.5	0	2.5	0	7.1
10	72.9	69.1	0	9.1	0	7.7	0	3.1	0	3.1	0	7.7
11	75.2	70.5	0	9.4	0	7.9	0	3.3	0	3.3	0	7.9
12	77.5	71.7	0	9.6	0	8.0	0	3.5	0	3.5	0	8.0
13	79.6	72.7	0	9.0	0	7.4	0	4.0	0	4.0	0	7.4
14	81.3	73.5	0	10.6	0	9.0	0	4.5	0	4.5	0	9.0
15	82.3	73.7	0	11.0	0	9.4	0	4.8	0	4.8	0	9.4
16	82.7	73.5	0	11.0	0	9.3	0	4.8	0	4.8	0	9.3
17	82.5	73.1	0	9.7	0	8.0	0	4.5	0	4.5	0	8.0
18	82.0	72.6	0	7.2	0	5.7	0	4.2	0	4.2	0	5.7
19	81.1	73.2	0	4.5	0	3.5	0	3.5	0	3.5	0	3.5
20	79.9	73.8	0	4.3	0	3.4	0	3.4	0	3.4	0	3.4
21	78.5	73.9	0	4.0	0	3.2	0	3.2	0	3.2	0	3.2
22	76.9	73.1	0	3.7	0	3.0	0	3.0	0	3.0	0	3.0
23	75.2	71.9	0	3.4	0	2.7	0	2.7	0	2.7	0	2.7
24	73.5	70.8	0	3.1	0	2.4	0	2.4	0	2.4	0	2.4

August			------ Design -----		----- Weekday -----		-----Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	72.7	70.2	0	3.0	0	2.1	0	2.2	0	2.2	0	2.2
2	71.2	69.0	0	2.7	0	1.9	0	2.0	0	2.0	0	2.0
3	69.9	68.0	0	2.5	0	1.7	0	1.8	0	1.8	0	1.8
4	68.8	67.1	0	2.3	0	1.6	0	1.6	0	1.6	0	1.6
5	68.0	66.6	0	2.1	0	1.4	0	1.4	0	1.4	0	1.4
6	67.5	66.2	0	2.3	0	1.5	0	1.5	0	1.5	0	1.5
7	67.3	66.1	0	3.2	0	1.9	0	2.0	0	2.0	0	2.0
8	67.8	66.5	0	7.2	0	5.9	0	2.1	0	2.1	0	5.9
9	69.1	67.0	0	8.6	0	7.0	0	2.4	0	2.4	0	7.0
10	71.2	67.8	0	9.0	0	7.5	0	2.9	0	2.9	0	7.5
11	73.8	68.7	0	9.3	0	7.6	0	3.0	0	3.0	0	7.6
12	76.5	70.0	0	9.4	0	7.8	0	3.3	0	3.3	0	7.8
13	79.1	71.2	0	8.8	0	7.3	0	3.9	0	3.9	0	7.3
14	81.1	72.6	0	10.5	0	8.9	0	4.5	0	4.5	0	8.9
15	82.5	73.6	0	11.0	0	9.4	0	4.8	0	4.8	0	9.4
16	83.0	73.7	0	11.0	0	9.1	0	4.5	0	4.5	0	9.1
17	82.8	73.5	0	9.6	0	7.9	0	4.3	0	4.3	0	7.9
18	82.3	73.5	0	6.9	0	5.4	0	3.8	0	3.8	0	5.4
19	81.5	73.1	0	4.4	0	3.3	0	3.4	0	3.4	0	3.3
20	80.4	73.7	0	4.3	0	3.3	0	3.3	0	3.3	0	3.3
21	79.1	74.9	0	4.0	0	3.2	0	3.2	0	3.2	0	3.2
22	77.6	73.9	0	3.7	0	2.9	0	2.9	0	2.9	0	2.9
23	76.0	72.7	0	3.4	0	2.7	0	2.7	0	2.7	0	2.7
24	74.3	71.3	0	3.1	0	2.4	0	2.4	0	2.4	0	2.4

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

BUILDING COOL-HEAT DEMAND - ALTERNATIVE 1
BLDG M100, BASELINE

September			------ Design -----		----- Weekday -----		-----Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	69.8	66.1	0	2.4	0	1.5	0	1.7	0	1.7	0	1.7
2	68.0	64.5	0	2.1	0	1.3	0	1.5	0	1.5	0	1.5
3	66.3	63.0	0	1.9	0	1.2	0	1.2	0	1.2	0	1.2
4	64.9	61.9	0	1.7	0	1.0	0	1.0	0	1.0	0	1.0
5	63.9	61.3	0	1.6	0	0.8	0	0.9	0	0.9	0	0.9
6	63.2	61.0	0	1.4	0	0.7	0	0.7	0	0.7	0	0.7
7	63.0	60.8	0	2.4	0	1.2	0	1.2	0	1.2	0	1.2
8	63.4	61.4	0	6.3	0	4.9	0	1.4	0	1.4	0	5.0
9	64.7	61.8	0	7.7	0	6.1	0	1.6	0	1.6	0	6.1
10	66.6	62.1	0	8.1	0	6.3	0	1.8	0	1.8	0	6.4
11	69.1	62.9	0	8.4	0	6.8	0	2.2	0	2.2	0	6.8
12	71.8	63.7	0	8.6	0	6.8	0	2.4	0	2.4	0	6.8
13	74.5	65.5	0	8.2	0	6.3	0	2.9	0	2.9	0	6.3
14	77.0	67.1	0	9.7	0	7.9	0	3.5	0	3.5	0	7.9
15	78.9	68.2	0	10.1	0	8.1	0	3.5	0	3.5	0	8.1
16	80.2	68.6	0	10.0	0	8.1	0	3.5	0	3.5	0	8.1
17	80.6	68.5	0	8.5	0	6.9	0	3.4	0	3.4	0	6.9
18	80.4	68.9	0	5.6	0	4.4	0	2.8	0	2.8	0	4.4
19	79.7	70.0	0	3.7	0	2.7	0	2.8	0	2.8	0	2.7
20	78.7	71.2	0	3.5	0	2.7	0	2.7	0	2.7	0	2.7
21	77.3	71.6	0	3.2	0	2.6	0	2.6	0	2.6	0	2.6
22	75.6	70.5	0	2.9	0	2.4	0	2.4	0	2.4	0	2.4
23	73.7	69.4	0	2.6	0	2.2	0	2.2	0	2.2	0	2.2
24	71.8	67.7	0	2.3	0	2.0	0	2.0	0	2.0	0	2.0

October			------ Design -----		----- Weekday -----		-----Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	54.8	51.3	0	0.4	0	0.3	0	0.3	0	0.2	0	0.2
2	52.9	49.6	0	0.1	0	0.1	0	0.1	0	0.1	0	0
3	51.2	48.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0
4	49.8	47.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
5	48.8	46.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
6	48.2	45.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
7	47.9	45.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
8	48.5	46.2	0	3.6	0	2.6	0	0.0	0	0.0	0	2.6
9	50.3	47.3	0	5.3	0	4.0	0	0.4	0	0.4	0	4.0
10	52.9	48.7	0	5.7	0	4.4	0	0.7	0	0.7	0	4.2
11	56.2	49.9	0	6.0	0	4.7	0	0.8	0	0.7	0	4.3
12	59.6	51.5	0	6.3	0	5.0	0	1.1	0	1.1	0	4.5
13	62.9	53.5	0	5.9	0	4.4	0	1.4	0	1.4	0	4.3
14	65.5	55.2	0	7.4	0	5.6	0	1.6	0	1.6	0	5.7
15	67.3	56.3	0	7.7	0	5.9	0	1.7	0	1.7	0	5.9
16	67.9	56.6	0	7.6	0	6.0	0	1.6	0	1.6	0	6.0
17	67.7	56.4	0	5.8	0	4.6	0	1.1	0	1.1	0	4.6
18	67.0	56.6	0	3.6	0	2.6	0	0.9	0	0.9	0	2.6
19	66.0	57.6	0	1.9	0	1.1	0	0.9	0	0.9	0	1.1
20	64.6	57.9	0	1.6	0	1.0	0	0.8	0	0.8	0	1.0
21	62.9	57.3	0	1.3	0	0.9	0	0.7	0	0.7	0	0.9
22	61.0	56.0	0	1.0	0	0.7	0	0.6	0	0.6	0	0.7
23	59.0	54.8	0	0.8	0	0.5	0	0.4	0	0.4	0	0.5
24	56.9	53.0	0	0.5	0	0.4	0	0.3	0	0.3	0	0.4

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

BUILDING COOL-HEAT DEMAND - ALTERNATIVE 1
BLDG M100, BASELINE

November			------ Design -----		----- Weekday -----		-----Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	48.7	45.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2	46.9	44.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
3	45.5	42.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
4	44.6	41.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
5	44.4	42.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
6	44.8	42.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
7	45.9	43.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
8	47.8	46.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
9	50.2	48.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
10	52.9	49.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
11	55.8	51.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
12	58.5	52.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
13	60.9	52.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
14	62.8	53.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
15	64.0	53.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
16	64.4	53.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
17	64.1	53.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
18	63.2	53.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
19	61.8	54.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
20	60.0	53.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
21	57.9	52.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
22	55.6	51.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
23	53.2	49.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
24	50.8	47.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0

December			------ Design -----		----- Weekday -----		-----Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	37.5	35.3	0	0.0	0	0.0	0	0.0	-4,456	0.0	-4,456	0.0
2	37.1	35.1	0	0.0	0	0.0	0	0.0	-5,183	0.0	-5,183	0.0
3	37.4	35.5	0	0.0	0	0.0	0	0.0	-5,871	0.0	-5,871	0.0
4	38.1	36.2	0	0.0	0	0.0	0	0.0	-6,334	0.0	-6,334	0.0
5	39.3	37.6	0	0.0	0	0.0	-4,857	0.0	-6,637	0.0	-6,637	0.0
6	40.9	39.2	0	0.0	0	0.0	-7,159	0.0	-7,161	0.0	-7,161	0.0
7	42.7	41.2	0	0.0	0	0.0	-7,544	0.0	-7,545	0.0	-7,545	0.0
8	44.7	43.1	0	0.0	0	0.0	-7,793	0.0	-7,793	0.0	-1,389	0.0
9	46.8	45.3	0	0.0	0	0.0	-7,622	0.0	-7,622	0.0	0	0.0
10	48.8	47.0	0	0.0	0	0.0	-7,464	0.0	-7,464	0.0	0	0.0
11	50.7	48.1	0	0.0	0	0.0	-6,712	0.0	-6,712	0.0	0	0.0
12	52.2	48.8	0	0.0	0	0.0	-5,959	0.0	-5,959	0.0	0	0.0
13	53.4	49.2	0	0.0	0	0.0	-4,961	0.0	-4,961	0.0	0	0.0
14	54.1	49.2	0	0.0	0	0.0	-4,178	0.0	-4,178	0.0	0	0.0
15	54.4	48.9	0	0.0	0	0.0	-3,543	0.0	-3,543	0.0	0	0.0
16	54.0	48.2	0	0.0	0	0.0	-2,420	0.0	-2,420	0.0	0	0.0
17	53.0	47.3	0	0.0	0	0.0	-1,929	0.0	-1,929	0.0	0	0.0
18	51.4	46.3	0	0.0	0	0.0	-1,270	0.0	-1,270	0.0	0	0.0
19	49.3	45.4	0	0.0	0	0.0	-872	0.0	-872	0.0	0	0.0
20	47.0	43.5	0	0.0	0	0.0	-977	0.0	-977	0.0	0	0.0
21	44.5	41.5	0	0.0	0	0.0	-1,556	0.0	-1,556	0.0	0	0.0
22	42.2	39.3	0	0.0	0	0.0	-2,400	0.0	-2,400	0.0	0	0.0
23	40.1	37.6	0	0.0	0	0.0	-2,814	0.0	-2,814	0.0	0	0.0
24	38.5	36.2	0	0.0	0	0.0	-3,502	0.0	-3,502	0.0	0	0.0

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M100, BASELINE

---------- M O N T H L Y E N E R G Y C O N S U M P T I O N ----------

Month	ELEC On Peak (kWh)	DEMAND On Peak (kW)	GAS On Peak (Therm)	GAS DMND On Peak (Thrm/hr)
Jan	10,634	25	34	0
Feb	9,620	25	32	0
March	10,542	24	3	0
April	9,874	24	0	0
May	13,619	40	0	0
June	14,759	41	0	0
July	14,536	41	0	0
Aug	15,008	41	0	0
Sept	13,289	40	0	0
Oct	12,230	38	0	0
Nov	9,874	24	0	0
Dec	10,283	24	14	0
Total	144,267	41	83	0

Building Energy Consumption = 67,729 (Btu/Sq Ft/Year)
Source Energy Consumption = 201,018 (Btu/Sq Ft/Year)

Floor Area = 7,393 (Sq Ft)

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M100, BASELINE

EQUIPMENT ENERGY CONSUMPTION

Ref Num	Equip Code	Monthly Consumption Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	1778	1608	1920	1698	1849	1840	1707	1920	1698	1849	1698	1707	21,271
	PK	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7
1	MISC LD													
	ELEC	1504	1360	1624	1436	1564	1556	1444	1624	1436	1564	1436	1444	17,993
	PK	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
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	2770	4013	3819	3895	2925	1582	0	0	19,005
	PK	0.0	0.0	0.0	0.0	15.0	16.2	15.6	15.6	15.3	13.4	0.0	0.0	16.2
1	EQ5200	CONDENSER FANS												
	ELEC	0	0	0	0	248	394	378	381	274	105	0	0	1,779
	PK	0.0	0.0	0.0	0.0	1.4	1.5	1.5	1.5	1.3	1.0	0.0	0.0	1.5
1	EQ5303	CONTROLS												
	ELEC	0	0	0	0	223	216	223	223	216	165	0	0	1,266
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3
1	EQ4003	FC CENTRIF. FAN C.V.												
	ELEC	5292	4780	5292	5122	5292	5122	5292	5292	5122	5292	5122	5292	62,313
	PK	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1
1	EQ4372	UNIT VENTILATOR FAN												
	ELEC	287	259	287	278	287	278	287	287	278	287	278	287	3,381
	PK	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M100, BASELINE

2	EQ4003			FC CENTRIF. FAN C.V.									
	ELEC	1385	1251	1385	1340	1385	1340	1385	1385	1340	1385	1340	1385	16,309
	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
1	EQ2001			GAS FIRE TUBE HOT WATER									
	GAS	34	32	3	0	0	0	0	0	0	0	14	83	
	PK	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3
1	EQ5020			HEAT WATER CIRC. PUMP C.V.									
	ELEC	105	98	9	0	0	0	0	0	0	0	46	258	
	PK	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3
1	EQ5240			BOILER FORCED DRAFT FAN									
	ELEC	94	88	8	0	0	0	0	0	0	0	41	230	
	PK	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3
1	EQ5307			BOILER CONTROLS									
	ELEC	188	175	16	0	0	0	0	0	0	0	81	461	
	PK	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

UTILITY PEAK CHECKSUMS - ALTERNATIVE 1
BLDG M100, BASELINE

---------- 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 41.5 (kW)
Yearly Time of Peak 15 (hr) 6 (mo)

Hour 15 Month 6

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Percnt Of Tot (%)
Cooling Equipment				
1	EQ1161	AIR-CLD COND COMP <15 TONS	18.0	43.26
Sub Total			18.0	43.26
Sub Total			0.0	0.00
Air Moving Equipment				
1		SUMMATION OF FAN ELECTRICAL DEMAND	7.5	18.07
2		SUMMATION OF FAN ELECTRICAL DEMAND	1.9	4.49
Sub Total			9.4	22.56
Sub Total			0.0	0.00
Miscellaneous				
Lights			7.7	18.51
Base Utilities			0.0	0.00
Misc Equipment			6.5	15.66
Sub Total			14.2	34.18
Grand Total			41.5	100.00

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

CALIFORNIA TITLE 24 COMPLIANCE - ALTERNATIVE 1
BLDG M100, BASELINE

CALIFORNIA TITLE 24 COMPLIANCE REPORT

Weather Name ..... ATLANTA.
Gross Conditioned Floor Area (sqft)..... 7,393
ACM Multiplier 1.025

E N E R G Y U S E S U M M A R Y

	ELEC (kWh/yr)	GAS (kBtu/yr)	PERCENT OF TOTAL ENERGY (%)	TOTAL SOURCE ENERGY (kBtu/yr)	ADJUSTED UNIT SOURCE ENERGY (kBtu/yr-sf)
Primary Heating	690.8	8,310.9	2.1	15,821.6	2.2
Primary Cooling					
Compressor	19,004.6	0.0	13.0	194,607.2	27.0
Tower/Cond Fans	1,779.3	0.0	1.2	18,219.9	2.5
Condenser Pump	0.0	0.0	0.0	0.0	0.0
Other Accessories	1,266.3	0.0	0.9	12,966.9	1.8
Auxiliary					
Supply Fans	82,003.4	0.0	55.9	839,716.6	116.4
Circulation Pumps	257.9	0.0	0.2	2,640.7	0.4
Base Utilities	0.0	0.0	0.0	0.0	0.0
Subtotal	82,261.3	0.0	56.1	842,357.3	116.8
Lighting	21,271.5	0.0	14.5	217,820.3	29.5
Receptacle	17,993.0	0.0	12.3	184,248.8	24.9
Domestic Hot Water	0.0	0.0	0.0	0.0	0.0
Cogeneration	0.0	0.0	0.0	0.0	0.0
Totals	144,266.6	8,310.9	100.0	1,486,042.0	204.7

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M100, ECO#1 -WALL

M O N T H L Y E N E R G Y C O N S U M P T I O N

Month	ELEC On Peak (kWh)	DEMAND On Peak (kW)	GAS On Peak (Therm)	GAS DMND On Peak (Thrm/hr)
Jan	10,696	25	83	0
Feb	9,667	25	74	0
March	10,544	24	3	0
April	9,874	24	0	0
May	13,783	40	0	0
June	15,333	41	0	0
July	15,049	40	0	0
Aug	15,484	40	0	0
Sept	13,519	40	0	0
Oct	11,803	38	0	0
Nov	9,874	24	0	0
Dec	10,301	24	37	0
Total	145,927	41	196	0

Building Energy Consumption = 70,025 (Btu/Sq Ft/Year)
Source Energy Consumption = 204,927 (Btu/Sq Ft/Year)

Floor Area = 7,393 (Sq Ft)

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M100, ECO#1 -WALL

EQUIPMENT ENERGY CONSUMPTION

Ref Num	Equip Code	Monthly Consumption Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	1778	1608	1920	1698	1849	1840	1707	1920	1698	1849	1698	1707	21,271
	PK	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7
1	MISC LD													
	ELEC	1504	1360	1624	1436	1564	1556	1444	1624	1436	1564	1436	1444	17,993
	PK	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
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	2916	4535	4284	4327	3132	1220	0	0	20,413
	PK	0.0	0.0	0.0	0.0	14.5	15.7	15.1	15.2	14.8	13.1	0.0	0.0	15.7
1	EQ5200	CONDENSER FANS												
	ELEC	0	0	0	0	266	446	426	425	297	85	0	0	1,945
	PK	0.0	0.0	0.0	0.0	1.3	1.4	1.4	1.4	1.4	1.0	0.0	0.0	1.4
1	EQ5303	CONTROLS												
	ELEC	0	0	0	0	223	216	223	223	216	121	0	0	1,222
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3
1	EQ4003	FC CENTRIF. FAN C.V.												
	ELEC	5292	4780	5292	5122	5292	5122	5292	5292	5122	5292	5122	5292	62,313
	PK	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1
1	EQ4372	UNIT VENTILATOR FAN												
	ELEC	287	259	287	278	287	278	287	287	278	287	278	287	3,381
	PK	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M100, ECO#1 -WALL

2	EQ4003		FC CENTRIF. FAN C.V.										16,309
	ELEC	1385	1251	1385	1340	1385	1340	1385	1385	1340	1385	1340	1385	1.9
	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	EQ2001		GAS FIRE TUBE HOT WATER										196
	GAS	83	74	3	0	0	0	0	0	0	0	37	0.5	
	PK	0.5	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4		
1	EQ5020		HEAT WATER CIRC. PUMP C.V.										330
	ELEC	138	125	11	0	0	0	0	0	0	0	57	0.3	
	PK	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3		
1	EQ5240		BOILER FORCED DRAFT FAN										249
	ELEC	104	94	8	0	0	0	0	0	0	0	43	0.3	
	PK	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3		
1	EQ5307		BOILER CONTROLS										499
	ELEC	208	189	16	0	0	0	0	0	0	0	86	0.5	
	PK	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5		

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

UTILITY PEAK CHECKSUMS - ALTERNATIVE 1
BLDG M100, ECO#1 -WALL

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 41.0 (kW)
Yearly Time of Peak 15 (hr) 6 (mo)

Hour 15 Month 6

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Percnt Of Tot (%)
Cooling Equipment				
1	EQ1161	AIR-CLD COND COMP <15 TONS	17.5	42.59
Sub Total			17.5	42.59
Sub Total			0.0	0.00
Air Moving Equipment				
1		SUMMATION OF FAN ELECTRICAL DEMAND	7.5	18.29
2		SUMMATION OF FAN ELECTRICAL DEMAND	1.9	4.54
Sub Total			9.4	22.83
Sub Total			0.0	0.00
Miscellaneous				
Lights			7.7	18.73
Base Utilities			0.0	0.00
Misc Equipment			6.5	15.85
Sub Total			14.2	34.58
Grand Total			41.0	100.00

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

CALIFORNIA TITLE 24 COMPLIANCE - ALTERNATIVE 1
BLDG M100, ECO#1 -WALL

CALIFORNIA TITLE 24 COMPLIANCE REPORT

Weather Name	ATLANTA.
Gross Conditioned Floor Area (sqft).....	7,393
ACM Multiplier	1.025

E N E R G Y U S E S U M M A R Y

	ELEC (kWh/yr)	GAS (kBtu/yr)	PERCENT OF TOTAL ENERGY (%)	TOTAL SOURCE ENERGY (kBtu/yr)	ADJUSTED UNIT SOURCE ENERGY (kBtu/yr-sf)
Primary Heating	747.8	19,616.1	4.3	28,305.5	3.9
Primary Cooling	20,413.3	0.0	13.5	209,033.2	29.0
Compressor	1,945.3	0.0	1.3	19,920.0	2.8
Tower/Cond Fans	0.0	0.0	0.0	0.0	0.0
Condenser Pump	1,222.2	0.0	0.8	12,515.4	1.7
Other Accessories	82,003.4	0.0	54.1	839,716.6	116.4
Auxiliary	330.4	0.0	0.2	3,383.3	0.5
Supply Fans	0.0	0.0	0.0	0.0	0.0
Circulation Pumps	82,333.8	0.0	54.3	843,099.9	116.9
Base Utilities	21,271.5	0.0	14.0	217,820.3	29.5
Subtotal	17,993.0	0.0	11.9	184,248.8	24.9
Lighting	0.0	0.0	0.0	0.0	0.0
Receptacle	0.0	0.0	0.0	0.0	0.0
Domestic Hot Water	145,926.9	19,616.1	100.0	1,514,943.0	208.7
Cogeneration					
Totals					

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M100, ECO#1 -ROOF

MONTHLY ENERGY CONSUMPTION

Month	ELEC On Peak (kWh)	DEMAND On Peak (kW)	GAS On Peak (Therm)	GAS DMND On Peak (Thrm/hr)
Jan	10,675	25	75	0
Feb	9,657	25	65	0
March	10,544	24	3	0
April	9,874	24	0	0
May	13,881	40	0	0
June	15,432	41	0	0
July	15,147	41	0	0
Aug	15,515	41	0	0
Sept	13,524	40	0	0
Oct	11,865	38	0	0
Nov	9,874	24	0	0
Dec	10,301	24	32	0
Total	146,289	41	175	0

Building Energy Consumption = 69,907 (Btu/Sq Ft/Year)
Source Energy Consumption = 205,129 (Btu/Sq Ft/Year)

Floor Area = 7,393 (Sq Ft)

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M100, ECO#1 -ROOF

EQUIPMENT ENERGY CONSUMPTION

Ref Num	Equip Code	Monthly Consumption Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	1778	1608	1920	1698	1849	1840	1707	1920	1698	1849	1698	1707	21,271
	PK	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7
1	MISC LD													
	ELEC	1504	1360	1624	1436	1564	1556	1444	1624	1436	1564	1436	1444	17,993
	PK	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
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	3022	4624	4372	4354	3144	1291	0	0	20,808
	PK	0.0	0.0	0.0	0.0	14.8	16.0	15.4	15.4	15.1	13.3	0.0	0.0	16.0
1	EQ5200	CONDENSER FANS												
	ELEC	0	0	0	0	277	456	436	429	299	91	0	0	1,988
	PK	0.0	0.0	0.0	0.0	1.4	1.5	1.5	1.5	1.4	1.1	0.0	0.0	1.5
1	EQ5303	CONTROLS												
	ELEC	0	0	0	0	205	216	223	223	207	105	0	0	1,179
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3
1	EQ4003	FC CENTRIF. FAN C.V.												
	ELEC	5292	4780	5292	5122	5292	5122	5292	5292	5122	5292	5122	5292	62,313
	PK	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1
1	EQ4372	UNIT VENTILATOR FAN												
	ELEC	287	259	287	278	287	278	287	287	278	287	278	287	3,381
	PK	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M100, ECO#1 -ROOF

2	EQ4003		FC CENTRIF. FAN C.V.										16,309
	ELEC	1385	1251	1385	1340	1385	1340	1385	1385	1340	1385	1340	1385	
	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
1	EQ2001		GAS FIRE TUBE HOT WATER										175
	GAS	75	65	3	0	0	0	0	0	0	0	32	
	PK	0.5	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.5
1	EQ5020		HEAT WATER CIRC. PUMP C.V.										321
	ELEC	131	122	11	0	0	0	0	0	0	0	57	
	PK	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3
1	EQ5240		BOILER FORCED DRAFT FAN										242
	ELEC	99	92	8	0	0	0	0	0	0	0	43	
	PK	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3
1	EQ5307		BOILER CONTROLS										484
	ELEC	198	184	16	0	0	0	0	0	0	0	86	
	PK	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

UTILITY PEAK CHECKSUMS - ALTERNATIVE 1
BLDG M100, ECO#1 -ROOF

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 41.3 (kW)
Yearly Time of Peak 15 (hr) 6 (mo)

Hour 15 Month 6

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Percnt Of Tot (%)
Cooling Equipment				
1	EQ1161	AIR-CLD COND COMP <15 TONS	17.8	43.01
Sub Total			17.8	43.01
Sub Total			0.0	0.00
Air Moving Equipment				
1		SUMMATION OF FAN ELECTRICAL DEMAND	7.5	18.16
2		SUMMATION OF FAN ELECTRICAL DEMAND	1.9	4.51
Sub Total			9.4	22.66
Sub Total			0.0	0.00
Miscellaneous				
Lights			7.7	18.60
Base Utilities			0.0	0.00
Misc Equipment			6.5	15.73
Sub Total			14.2	34.33
Grand Total			41.3	100.00

CALIFORNIA TITLE 24 COMPLIANCE - ALTERNATIVE 1
BLDG M100, ECO#1 -ROOF

CALIFORNIA TITLE 24 COMPLIANCE REPORT

Weather Name ..... ATLANTA.
Gross Conditioned Floor Area (sqft)..... 7,393
ACM Multiplier 1.025

ENERGY USE SUMMARY

	ELEC (kWh/yr)	GAS (kBtu/yr)	PERCENT OF TOTAL ENERGY (%)	TOTAL SOURCE ENERGY (kBtu/yr)	ADJUSTED UNIT SOURCE ENERGY (kBtu/yr-sf)
Primary Heating	726.0	17,513.2	3.9	25,869.2	3.6
Primary Cooling					
Compressor	20,807.8	0.0	13.7	213,072.0	29.5
Tower/Cond Fans	1,987.7	0.0	1.3	20,353.7	2.8
Condenser Pump	0.0	0.0	0.0	0.0	0.0
Other Accessories	1,178.7	0.0	0.8	12,069.9	1.7
Auxiliary					
Supply Fans	82,003.4	0.0	54.2	839,716.6	116.4
Circulation Pumps	320.8	0.0	0.2	3,284.9	0.5
Base Utilities	0.0	0.0	0.0	0.0	0.0
Subtotal	82,324.2	0.0	54.4	843,001.4	116.9
Lighting	21,271.5	0.0	14.0	217,820.3	29.5
Receptacle	17,993.0	0.0	11.9	184,248.8	24.9
Domestic Hot Water	0.0	0.0	0.0	0.0	0.0
Cogeneration	0.0	0.0	0.0	0.0	0.0
Totals	146,288.8	17,513.2	100.0	1,516,435.4	208.9

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M100, ECO#2

M O N T H L Y E N E R G Y C O N S U M P T I O N

Month	ELEC On Peak (kWh)	DEMAND On Peak (kW)	GAS On Peak (Therm)	GAS DMND On Peak (Thrm/hr)
Jan	10,653	25	38	0
Feb	9,638	25	35	0
March	10,544	24	3	0
April	9,874	24	0	0
May	13,611	40	0	0
June	14,831	41	0	0
July	14,589	41	0	0
Aug	15,057	41	0	0
Sept	13,301	40	0	0
Oct	12,090	38	0	0
Nov	9,874	24	0	0
Dec	10,292	24	14	0
Total	144,352	41	90	0

Building Energy Consumption = 67,863 (Btu/Sq Ft/Year)
Source Energy Consumption = 201,236 (Btu/Sq Ft/Year)

Floor Area = 7,393 (Sq Ft)

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M100, ECO#2

EQUIPMENT ENERGY CONSUMPTION

Ref Num	Equip Code	Monthly Consumption Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	1778	1608	1920	1698	1849	1840	1707	1920	1698	1849	1698	1707	21,271
	PK	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7
1	MISC LD													
	ELEC	1504	1360	1624	1436	1564	1556	1444	1624	1436	1564	1436	1444	17,993
	PK	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
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	2762	4078	3867	3940	2935	1467	0	0	19,050
	PK	0.0	0.0	0.0	0.0	14.9	16.1	15.5	15.5	15.2	13.3	0.0	0.0	16.1
1	EQ5200	CONDENSER FANS												
	ELEC	0	0	0	0	248	400	383	385	276	99	0	0	1,791
	PK	0.0	0.0	0.0	0.0	1.4	1.5	1.5	1.5	1.4	1.0	0.0	0.0	1.5
1	EQ5303	CONTROLS												
	ELEC	0	0	0	0	223	216	223	223	216	146	0	0	1,247
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3
1	EQ4003	FC CENTRIF. FAN C.V.												
	ELEC	5292	4780	5292	5122	5292	5122	5292	5292	5122	5292	5122	5292	62,313
	PK	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1
1	EQ4372	UNIT VENTILATOR FAN												
	ELEC	287	259	287	278	287	278	287	287	278	287	278	287	3,381
	PK	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M100, ECO#2

2	EQ4003		FC CENTRIF. FAN C.V.										
	ELEC	1385	1251	1385	1340	1385	1340	1385	1385	1340	1385	1340	1385	16,309
	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
1	EQ2001		GAS FIRE TUBE HOT WATER										
	GAS	38	35	3	0	0	0	0	0	0	0	14		90
	PK	0.3	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1		0.3
1	EQ5020		HEAT WATER CIRC. PUMP C.V.										
	ELEC	125	116	11	0	0	0	0	0	0	0	0	54	305
	PK	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3
1	EQ5240		BOILER FORCED DRAFT FAN										
	ELEC	94	88	8	0	0	0	0	0	0	0	0	41	230
	PK	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3
1	EQ5307		BOILER CONTROLS										
	ELEC	188	175	16	0	0	0	0	0	0	0	0	81	461
	PK	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

UTILITY PEAK CHECKSUMS - ALTERNATIVE 1
BLDG M100, ECO#2

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 41.4 (kW)
Yearly Time of Peak 15 (hr) 6 (mo)

Hour 15 Month 6

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Percnt Of Tot (%)
Cooling Equipment				
1	EQ1161	AIR-CLD COND COMP <15 TONS	17.8	43.10
Sub Total			17.8	43.10
Sub Total			0.0	0.00
Air Moving Equipment				
1		SUMMATION OF FAN ELECTRICAL DEMAND	7.5	18.13
2		SUMMATION OF FAN ELECTRICAL DEMAND	1.9	4.50
Sub Total			9.4	22.63
Sub Total			0.0	0.00
Miscellaneous				
Lights			7.7	18.57
Base Utilities			0.0	0.00
Misc Equipment			6.5	15.71
Sub Total			14.2	34.27
Grand Total			41.4	100.00

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

CALIFORNIA TITLE 24 COMPLIANCE - ALTERNATIVE 1
BLDG M100, ECO#2

CALIFORNIA TITLE 24 COMPLIANCE REPORT

Weather Name	ATLANTA.
Gross Conditioned Floor Area (sqft).....	7,393
ACM Multiplier	1.025

E N E R G Y U S E S U M M A R Y

	ELEC (kWh/yr)	GAS (kBtu/yr)	PERCENT OF TOTAL ENERGY (%)	TOTAL SOURCE ENERGY (kBtu/yr)	ADJUSTED UNIT SOURCE ENERGY (kBtu/yr-sf)
Primary Heating	690.8	9,010.7	2.3	16,558.2	2.3
Primary Cooling	19,049.9	0.0	13.0	195,071.5	27.0
Compressor	1,791.3	0.0	1.2	18,343.1	2.5
Tower/Cond Fans	0.0	0.0	0.0	0.0	0.0
Condenser Pump	1,247.4	0.0	0.8	12,773.4	1.8
Other Accessories	82,003.4	0.0	55.8	839,716.6	116.4
Auxiliary	305.2	0.0	0.2	3,125.4	0.4
Supply Fans	0.0	0.0	0.0	0.0	0.0
Circulation Pumps	82,308.6	0.0	56.0	842,841.9	116.9
Base Utilities	21,271.5	0.0	14.5	217,820.3	29.5
Subtotal	17,993.0	0.0	12.2	184,248.8	24.9
Lighting	0.0	0.0	0.0	0.0	0.0
Receptacle	0.0	0.0	0.0	0.0	0.0
Domestic Hot Water	144,352.4	9,010.7	100.0	1,487,657.2	204.9
Cogeneration					
Totals					

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M100, ECO#3

---------- M O N T H L Y E N E R G Y C O N S U M P T I O N ----------

Month	ELEC On Peak (kWh)	DEMAND On Peak (kW)	GAS On Peak (Therm)	GAS DMND On Peak (Thrm/hr)
Jan	10,635	25	33	0
Feb	9,638	25	32	0
March	10,544	24	3	0
April	9,874	24	0	0
May	13,620	40	0	0
June	14,755	41	0	0
July	14,531	41	0	0
Aug	15,004	41	0	0
Sept	13,288	40	0	0
Oct	12,232	38	0	0
Nov	9,874	24	0	0
Dec	10,292	24	14	0
Total	144,285	41	82	0

Building Energy Consumption = 67,721 (Btu/Sq Ft/Year)
Source Energy Consumption = 201,026 (Btu/Sq Ft/Year)

Floor Area = 7,393 (Sq Ft)

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M100, ECO#3

E Q U I P M E N T E N E R G Y C O N S U M P T I O N

Ref Num	Equip Code	Monthly Consumption Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	1778	1608	1920	1698	1849	1840	1707	1920	1698	1849	1698	1707	21,271
	PK	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7
1	MISC LD													
	ELEC	1504	1360	1624	1436	1564	1556	1444	1624	1436	1564	1436	1444	17,993
	PK	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
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	2771	4009	3815	3891	2924	1584	0	0	18,995
	PK	0.0	0.0	0.0	0.0	14.9	16.1	15.5	15.6	15.2	13.4	0.0	0.0	16.1
1	EQ5200	CONDENSER FANS												
	ELEC	0	0	0	0	248	393	377	380	274	105	0	0	1,778
	PK	0.0	0.0	0.0	0.0	1.4	1.5	1.5	1.5	1.3	1.0	0.0	0.0	1.5
1	EQ5303	CONTROLS												
	ELEC	0	0	0	0	223	216	223	223	216	165	0	0	1,266
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3
1	EQ4003	FC CENTRIF. FAN C.V.												
	ELEC	5292	4780	5292	5122	5292	5122	5292	5292	5122	5292	5122	5292	62,313
	PK	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1
1	EQ4372	UNIT VENTILATOR FAN												
	ELEC	287	259	287	278	287	278	287	287	278	287	278	287	3,381
	PK	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M100, ECO#3

2	EQ4003		FC CENTRIF. FAN C.V.											
	ELEC	1385	1251	1385	1340	1385	1340	1385	1385	1340	1385	1340	1385	16,309
	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
1	EQ2001		GAS FIRE TUBE HOT WATER											
	GAS	33	32	3	0	0	0	0	0	0	0	0	14	82
	PK	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3
1	EQ5020		HEAT WATER CIRC. PUMP C.V.											
	ELEC	119	116	11	0	0	0	0	0	0	0	0	54	300
	PK	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3
1	EQ5240		BOILER FORCED DRAFT FAN											
	ELEC	90	88	8	0	0	0	0	0	0	0	0	41	226
	PK	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3
1	EQ5307		BOILER CONTROLS											
	ELEC	180	175	16	0	0	0	0	0	0	0	0	81	452
	PK	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

UTILITY PEAK CHECKSUMS - ALTERNATIVE 1
BLDG M100, ECO#3

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 41.5 (kW)
Yearly Time of Peak 15 (hr) 6 (mo)

Hour 15 Month 6

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Percnt Of Tot (%)
Cooling Equipment				
1	EQ1161	AIR-CLD COND COMP <15 TONS	17.9	43.21
Sub Total			17.9	43.21
Sub Total			0.0	0.00
Air Moving Equipment				
1		SUMMATION OF FAN ELECTRICAL DEMAND	7.5	18.09
2		SUMMATION OF FAN ELECTRICAL DEMAND	1.9	4.49
Sub Total			9.4	22.58
Sub Total			0.0	0.00
Miscellaneous				
Lights			7.7	18.53
Base Utilities			0.0	0.00
Misc Equipment			6.5	15.67
Sub Total			14.2	34.21
Grand Total			41.5	100.00

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

CALIFORNIA TITLE 24 COMPLIANCE - ALTERNATIVE 1
BLDG M100, ECO#3

CALIFORNIA TITLE 24 COMPLIANCE REPORT

Weather Name	ATLANTA.
Gross Conditioned Floor Area (sqft).....	7,393
ACM Multiplier	1.025

E N E R G Y U S E S U M M A R Y

	ELEC (kWh/yr)	GAS (kBtu/yr)	PERCENT OF TOTAL ENERGY (%)	TOTAL SOURCE ENERGY (kBtu/yr)	ADJUSTED UNIT SOURCE ENERGY (kBtu/yr-sf)
Primary Heating	678.0	8,185.9	2.1	15,559.5	2.2
Primary Cooling					
Compressor	18,995.4	0.0	12.9	194,513.3	27.0
Tower/Cond Fans	1,778.2	0.0	1.2	18,208.6	2.5
Condenser Pump	0.0	0.0	0.0	0.0	0.0
Other Accessories	1,266.3	0.0	0.9	12,966.9	1.8
Auxiliary					
Supply Fans	82,003.4	0.0	55.9	839,716.6	116.4
Circulation Pumps	299.6	0.0	0.2	3,067.7	0.4
Base Utilities	0.0	0.0	0.0	0.0	0.0
Subtotal	82,303.0	0.0	56.1	842,784.2	116.9
Lighting	21,271.5	0.0	14.5	217,820.3	29.5
Receptacle	17,993.0	0.0	12.3	184,248.8	24.9
Domestic Hot Water	0.0	0.0	0.0	0.0	0.0
Cogeneration	0.0	0.0	0.0	0.0	0.0
Totals	144,285.3	8,185.9	100.0	1,486,101.6	204.7

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M100, ECO#12

M O N T H L Y E N E R G Y C O N S U M P T I O N

Month	ELEC On Peak (kWh)	DEMAND On Peak (kW)	GAS On Peak (Therm)	GAS DMND On Peak (Thrm/hr)
Jan	5,739	25	33	1
Feb	5,192	25	27	1
March	6,170	25	6	0
April	5,402	24	0	0
May	6,709	35	0	0
June	7,392	36	0	0
July	6,714	36	0	0
Aug	7,531	36	0	0
Sept	6,189	36	0	0
Oct	6,222	34	0	0
Nov	5,406	24	2	0
Dec	5,460	25	13	1
Total	74,125	36	81	1

Building Energy Consumption = 35,322 (Btu/Sq Ft/Year)
Source Energy Consumption = 103,834 (Btu/Sq Ft/Year)

Floor Area = 7,393 (Sq Ft)

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M100, ECO#12

EQUIPMENT ENERGY CONSUMPTION

Ref Num	Equip Code	Monthly Consumption Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	1778	1608	1920	1698	1849	1840	1707	1920	1698	1849	1698	1707	21,271
	PK	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7
1	MISC LD													
	ELEC	1504	1360	1624	1436	1564	1556	1444	1624	1436	1564	1436	1444	17,993
	PK	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
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	674	1297	1113	1191	659	273	0	0	5,207
	PK	0.0	0.0	0.0	0.0	10.6	11.5	11.1	11.1	10.9	9.6	0.0	0.0	11.5
1	EQ5200	CONDENSER FANS												
	ELEC	0	0	0	0	67	130	114	121	67	21	0	0	520
	PK	0.0	0.0	0.0	0.0	0.8	1.1	1.1	1.0	0.8	0.7	0.0	0.0	1.1
1	EQ5303	CONTROLS												
	ELEC	0	0	0	0	47	65	57	60	43	26	0	0	297
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3
1	EQ4003	FC CENTRIF. FAN C.V.												
	ELEC	1793	1622	1963	1707	1878	1878	1707	1963	1707	1878	1707	1707	21,511
	PK	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1
1	EQ4372	UNIT VENTILATOR FAN												
	ELEC	115	107	128	114	139	134	125	139	132	119	110	113	1,475
	PK	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M100, ECO#12

2	EQ4003		FC CENTRIF. FAN C.V.										
	ELEC	469	424	514	447	492	492	447	514	447	492	447	447	5,630
	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
1	EQ2001		GAS FIRE TUBE HOT WATER										
	GAS	33	27	6	0	0	0	0	0	0	0	2	13	81
	PK	0.8	0.8	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.8	0.8
1	EQ5020		HEAT WATER CIRC. PUMP C.V.										
	ELEC	22	19	6	0	0	0	0	0	0	0	2	11	60
	PK	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.3
1	EQ5240		BOILER FORCED DRAFT FAN										
	ELEC	20	17	5	0	0	0	0	0	0	0	2	10	54
	PK	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.3
1	EQ5307		BOILER CONTROLS										
	ELEC	39	34	10	0	0	0	0	0	0	0	4	20	108
	PK	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5	0.5

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

UTILITY PEAK CHECKSUMS - ALTERNATIVE 1
BLDG M100, ECO#12

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 36.4 (kW)
Yearly Time of Peak 15 (hr) 6 (mo)

Hour 15 Month 6

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Percnt Of Tot (%)
Cooling Equipment				
1	EQ1161	AIR-CLD COND COMP <15 TONS	12.9	35.33
Sub Total			12.9	35.33
Sub Total			0.0	0.00
Air Moving Equipment				
1		SUMMATION OF FAN ELECTRICAL DEMAND	7.5	20.60
2		SUMMATION OF FAN ELECTRICAL DEMAND	1.9	5.11
Sub Total			9.4	25.72
Sub Total			0.0	0.00
Miscellaneous				
Lights			7.7	21.10
Base Utilities			0.0	0.00
Misc Equipment			6.5	17.85
Sub Total			14.2	38.96
Grand Total			36.4	100.00

CALIFORNIA TITLE 24 COMPLIANCE - ALTERNATIVE 1
BLDG M100, ECO#12

CALIFORNIA TITLE 24 COMPLIANCE REPORT

Weather Name	ATLANTA.
Gross Conditioned Floor Area (sqft).....	7,393
ACM Multiplier	1.025

E N E R G Y U S E S U M M A R Y

	ELEC (kWh/yr)	GAS (kBtu/yr)	PERCENT OF TOTAL ENERGY (%)	TOTAL SOURCE ENERGY (kBtu/yr)	ADJUSTED UNIT SOURCE ENERGY (kBtu/yr-sf)
Primary Heating	161.2	8,127.1	3.3	10,206.0	1.4
Primary Cooling					
Compressor	5,206.7	0.0	6.8	53,317.2	7.4
Tower/Cond Fans	519.6	0.0	0.7	5,320.8	0.7
Condenser Pump	0.0	0.0	0.0	0.0	0.0
Other Accessories	297.0	0.0	0.4	3,041.3	0.4
Auxiliary					
Supply Fans	28,616.1	0.0	37.4	293,029.9	40.6
Circulation Pumps	60.2	0.0	0.1	616.4	0.1
Base Utilities	0.0	0.0	0.0	0.0	0.0
Subtotal	28,676.3	0.0	37.5	293,646.3	40.7
Lighting	21,271.5	0.0	27.8	217,820.3	29.5
Receptacle	17,993.0	0.0	23.5	184,248.8	24.9
Domestic Hot Water	0.0	0.0	0.0	0.0	0.0
Cogeneration	0.0	0.0	0.0	0.0	0.0
Totals	74,125.4	8,127.1	100.0	767,600.6	105.1

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M100, ECO#15

M O N T H L Y E N E R G Y C O N S U M P T I O N

Month	ELEC On Peak (kWh)	DEMAND On Peak (kW)	GAS On Peak (Therm)	GAS DMND On Peak (Thrm/hr)
Jan	10,041	22	39	0
Feb	9,105	22	40	0
March	9,822	21	4	0
April	9,228	21	0	0
May	12,628	36	0	0
June	13,753	37	0	0
July	13,609	37	0	0
Aug	13,968	37	0	0
Sept	12,373	36	0	0
Oct	11,271	34	0	0
Nov	9,228	21	0	0
Dec	9,716	22	19	0
Total	134,744	37	102	0

Building Energy Consumption = 63,582 (Btu/Sq Ft/Year)
Source Energy Consumption = 188,089 (Btu/Sq Ft/Year)

Floor Area = 7,393 (Sq Ft)

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M100, ECO#15

EQUIPMENT ENERGY CONSUMPTION

Ref Num	Equip Code	Monthly Consumption Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	1102	997	1190	1052	1146	1140	1058	1190	1052	1146	1052	1058	13,186
	PK	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8
1	MISC LD													
	ELEC	1504	1360	1624	1436	1564	1556	1444	1624	1436	1564	1436	1444	17,993
	PK	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
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	2505	3734	3567	3612	2677	1343	0	0	17,437
	PK	0.0	0.0	0.0	0.0	13.7	14.8	14.3	14.3	14.0	12.3	0.0	0.0	14.8
1	EQ5200	CONDENSER FANS												
	ELEC	0	0	0	0	225	366	353	353	251	90	0	0	1,639
	PK	0.0	0.0	0.0	0.0	1.3	1.4	1.3	1.3	1.2	0.9	0.0	0.0	1.4
1	EQ5303	CONTROLS												
	ELEC	0	0	0	0	223	216	223	223	216	163	0	0	1,265
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3
1	EQ4003	FC CENTRIF. FAN C.V.												
	ELEC	5292	4780	5292	5122	5292	5122	5292	5292	5122	5292	5122	5292	62,313
	PK	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1
1	EQ4372	UNIT VENTILATOR FAN												
	ELEC	287	259	287	278	287	278	287	287	278	287	278	287	3,381
	PK	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M100, ECO#15

2	EQ4003		FC CENTRIF. FAN C.V.										16,309
	ELEC	1385	1251	1385	1340	1385	1340	1385	1385	1340	1385	1340	1385	
	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
1	EQ2001		GAS FIRE TUBE HOT WATER										102
	GAS	39	40	4	0	0	0	0	0	0	0	19		
	PK	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3
1	EQ5020		HEAT WATER CIRC. PUMP C.V.										374
	ELEC	144	140	13	0	0	0	0	0	0	0	0	77	
	PK	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3
1	EQ5240		BOILER FORCED DRAFT FAN										282
	ELEC	109	106	10	0	0	0	0	0	0	0	0	58	
	PK	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3
1	EQ5307		BOILER CONTROLS										565
	ELEC	217	212	20	0	0	0	0	0	0	0	0	116	
	PK	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

UTILITY PEAK CHECKSUMS - ALTERNATIVE 1
BLDG M100, ECO#15

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 37.1 (kW)
Yearly Time of Peak 15 (hr) 6 (mo)

Hour 15 Month 6

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Percnt Of Tot (%)
Cooling Equipment				
1	EQ1161	AIR-CLD COND COMP <15 TONS	16.5	44.46
Sub Total			16.5	44.46
Sub Total			0.0	0.00
Air Moving Equipment				
1		SUMMATION OF FAN ELECTRICAL DEMAND	7.5	20.20
2		SUMMATION OF FAN ELECTRICAL DEMAND	1.9	5.01
Sub Total			9.4	25.21
Sub Total			0.0	0.00
Miscellaneous				
Lights			4.8	12.83
Base Utilities			0.0	0.00
Misc Equipment			6.5	17.50
Sub Total			11.3	30.33
Grand Total			37.1	100.00

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

CALIFORNIA TITLE 24 COMPLIANCE - ALTERNATIVE 1
BLDG M100, ECO#15

CALIFORNIA TITLE 24 COMPLIANCE REPORT

Weather Name	ATLANTA.
Gross Conditioned Floor Area (sqft)	7,393
ACM Multiplier	1.025

ENERGY USE SUMMARY

	ELEC (kWh/yr)	GAS (kBtu/yr)	PERCENT OF TOTAL ENERGY (%)	TOTAL SOURCE ENERGY (kBtu/yr)	ADJUSTED UNIT SOURCE ENERGY (kBtu/yr-sf)
Primary Heating	846.7	10,150.4	2.8	19,355.3	2.7
Primary Cooling					
Compressor	17,437.4	0.0	12.7	178,559.4	24.8
Tower/Cond Fans	1,638.5	0.0	1.2	16,778.8	2.3
Condenser Pump	0.0	0.0	0.0	0.0	0.0
Other Accessories	1,264.8	0.0	0.9	12,951.6	1.8
Auxiliary					
Supply Fans	82,003.4	0.0	59.5	839,716.5	116.4
Circulation Pumps	374.1	0.0	0.3	3,831.2	0.5
Base Utilities	0.0	0.0	0.0	0.0	0.0
Subtotal	82,377.5	0.0	59.8	843,547.7	117.0
Lighting	13,186.0	0.0	9.6	135,024.7	18.3
Receptacle	17,993.0	0.0	13.1	184,248.8	24.9
Domestic Hot Water	0.0	0.0	0.0	0.0	0.0
Cogeneration	0.0	0.0	0.0	0.0	0.0
Totals	134,744.0	10,150.4	100.0	1,390,466.3	191.7

BUILDING 168

E M C ENGINEERS, INC.

PROJECT: FORT McPHERSON & FORT GILLEM ESOS STUDY
LOCATION: FORT McPHERSON
ECO: Computer Simulation Summary

CLIENT CONTRACT NO: DACA21-91-C-0097
CLIENT PROJECT ENG: TERRY SEABROOK

EMC PROJECT: #3105.000
DATE: 10-APR-92
FILE: M168ECO.WK3
PREPARED BY: R. GERRANS
CHECKED BY:

Bldg: M168 **Area: 11,720 ft^2**

Run Description	Heating Gas Use (kBtu/yr)	Heating Electric Use (kWh/yr)	Cooling Electric Use (kWh/yr)	Fan Electric Use (kWh/yr)	Pump Electric Use (kWh/yr)	Lighting Electric Use (kWh/yr)	Recept. Electric Use (kWh/yr)	Total Electric Use (kWh/yr)	Peak Electric Demand (kW)	Total Gas Use (MBtu/yr)	Total Energy Use (MBtu/yr)
Baseline	80,140	1,126	22,484	47,061	33,103	41,081	24,305	169,161	48	80	657
ECO#1 – Roof	29,493	666	19,765	47,061	33,103	41,081	24,305	165,981	44	29	596
Savings/(Loss)	50,647	460	2,720	0	0	0	0	3,180	4	51	61
ECO#3	79,452	1,125	22,476	47,061	33,103	41,081	24,305	169,150	48	79	657
Savings/(Loss)	688	2	8	0	0	0	0	10	0	1	1
ECO#12	61,627	875	16,630	40,030	15,029	41,081	24,305	137,950	46	62	532
Savings/(Loss)	18,513	252	5,854	7,031	2,554	0	0	31,210	2	19	125

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB 3105.000
SHEET NO. 1 OF 5
CALCULATED BY [illegible] DATE 2/21/92
CHECKED BY _____ DATE _____
SCALE _____

Computer Simulation Bldg 168, Base Run

Bldg Type: Brick UOQ Area: 11,643 ft²
ECO: 1, 12 For take off: 3
Take off Bldg: 522

Assumptions:

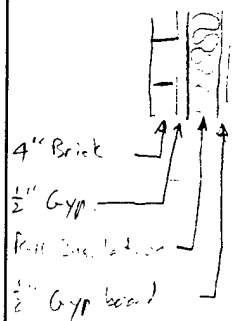
- Occupancy: top: 17 apts @ 1 person/bdrm @ 75% diversity
  basement: 13 people
- Wall insulation: R-11
- heating db: 72°F
- cooling db: 76°F
- basement walls: 12" concrete
- Lighting + misc loads: 75% diversity - top floors
- Infiltration Top floor: ½ ACH
  Basement: ¼ ACH

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB 3105 000
SHEET NO. 2 OF 5
CALCULATED BY RMM DATE 2/21/92
CHECKED BY _____ DATE _____
SCALE _____

Comp Simulations Bldg 168

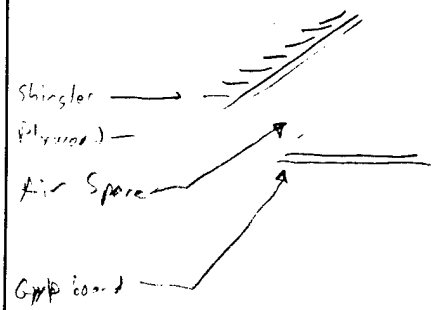
Wall U-Value - ASHRAE Table F 22.4



Material	R-Value
Outside Surface (15 mph wind)	0.17
4" Face Brick	1.24
½" Gyp board	0.45
R-11 Insulation	11.0
½" Gyp Board	0.45
Inside Surface (still Air)	0.68
	13.99

$U = \frac{1}{R} = \frac{1}{13.99} = \boxed{0.07}$

Roof U-Value - ASHRAE Table F 27.4



Material	R-Value
Outside Surface (15 mph wind)	0.17
Shingles (asphalt)	0.44
½" plywood	0.62
Air Space	1.24
½" Gyp Board	0.45
Inside Surface (still air)	0.68
	3.65

$U = \frac{1}{R} = \frac{1}{3.65} = \boxed{0.27}$

Window U-Value - ASHRAE Table F 27.13
- double Pane w/ ¼" air space, Al Frame, Type R
U = 0.70

Internal Shading - ASHRAE Table F 27 26
- Blinds
shading coefficient = 0.58

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB 3105.000
SHEET NO. 3 OF 5
CALCULATED BY [illegible] DATE 2/21/92
CHECKED BY _____ DATE _____
SCALE _____

Comp Sim Bldg 165

People - Room 1 (Apartment)

17 Apartments @ 1 person / Apt. * 75% = 12.75 = 13 people

sensible: 250 Btuh / person > ASHRAE TABLE F 26.3

latent: 200 Btuh / person

- Room 2 (Basement)

Assume: 18 people

sensible: 250 Btuh / person

latent: 200 Btuh / person

Lights:

- from field survey

Rm 1 (Apartments) 8,182 watts * 75% = 6,137 Watts

Rm 2 (Basement) : 7,831 Watts

Misc loads:

Rm 1 - ASHRAE Tables F 26.8, 26.9, 26.1

for Apts.

	Appliance	Watts	@ Peak
	TV	200	(200)
	Refrigerator	75	(75)
	Misc	10	(10)
Kitchen:			
	coke machine	300	300
	ice machine	2000	2000
	Refrigerator	200	200
	stove	1250	1250
	microwave	65	
	dishwasher	700	
Laundry			
	2-washers	375	2(375)
	2 dryers	750	2(750)
Misc	Water cooler	100	100

10.8 kW

10.8 kW * 75% = 8.1 kW

Comp Sim Bldg 163

Misc load.

Room 2 (Basement)

Appliance	Watts
1 TV	200
11 Computer	11(200)
8 Printer	8(100)
1 Coffee pot	260
1 copy machine	600
1 water fountain	100
3 Elec Typewriter	
Fax machine	75
1 Refrigerator	200
	4.4 kW

Infiltration.

$Q = L(A\Delta t + B v^2)^{1/2}$

A = Stack coefficient = 0.0313 - ASHRAE Table F23.7
B = Wind coefficient = 0.0051 - ASHRAE Table F23.8
v = Avg. Windspeed = 12.65 mph

Use $\frac{1}{2}$ ACH

L = Effective leakage Area:

single door, weatherstripped	$(0.114)(122.0) = 13.9\ in^2$
Door frames, caulked, Masonry wall	$(0.0143)(122.0) = 1.7\ in^2$
Windows, double slider, weatherstripped	$(0.037)(925) = 34.2\ in^2$
window frame, Masonry wall, caulked	$(0.019)(925) = 17.6\ in^2$
	$67.4\ in^2$

heating

$\Delta t = 72°F - 55°F = 19°F$ (indoor − outdoor)

$Q = 67.4(0.0313(17) + 0.0051(12.65)^2)^{1/2} = 78.3$ cfm

cooling

$\Delta t = 88°F - 76°F = 12°F$ (outdoor − indoor)

$Q = 67.4(0.0313(12) + 0.0051(12.65)^2)^{1/2} = 73.6$ cfm

683 cfm

Basement - Use $\frac{1}{4}$ ACH

A = 0.0156 B = 0.0039 v = 12.65 mph

L:

single door, weatherstripped	$(0.114)(93.8) = 10.7$ in
Door frame, Mason, caulked	$(0.0143)(93.8) = 1.3$ in
windows, double slider, stripped	$(0.037)(88.2) = 3.3$ in
Window frame, Mason, caulked	$(0.019)(88.2) = 1.7$
	17.0 in

heating

$Q = 17.0(0.0156(17) + 0.0039(12.65)^2) = 16.0$ cfm

cooling

$Q = 17.0(0.0156(12) + 0.0039(12.65)^2) = 15.3$ cfm

163 cfm

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB 3105.000

SHEET NO. 5 OF 5

CALCULATED BY RMH DATE 2/21/92

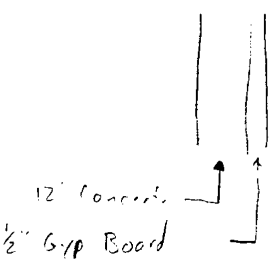
CHECKED BY ______ DATE ______

SCALE ______

[illegible] Bldg 58

<u>Basement Wall U Value</u> ASHRAE Table F22.4

- Assuming 12" Concrete wall w/ ½" Gyp



Material	R-Value
outside air (15 mph)	0.17
12" concrete	1.20
½" Gyp Board	0.45
Inside Surface (still air)	0.68
	2.50

$$U = \frac{1}{2.50} = \boxed{0.40}$$

Assuming 4' high will account for exposed + unexposed losses.

[illegible]

[illegible] grade [illegible] 0.022 Btu/h·ft²·°F ASHRAE Table F25.4

[illegible]

[illegible] 3906.6 ft

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • Germany

JOB ____________________

SHEET NO. ____________ OF ________

CALCULATED BY ____________ DATE ________

CHECKED BY ____________ DATE ________

SCALE ____________________

Comp[illegible] [illegible] - Bldg [illegible] [illegible]

[illegible]

Pump

DTW Pump = $\frac{(5\ hp)(0.746\ kW/hp)(0.85\ load)}{(0.839\ eff)}$ = 3.3 kW × 8760 hr/yr = **33,103** kwh/yr

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____

SHEET NO. _____ OF _____

CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____

SCALE _____

Computer Simulation Bldg 168 McPherson

ECO #1 - Roof Insulation

Roof U-Value - ASHRAE = 22.4
- add R-19 insulation
R = 22.65
U = 0.044

Delta UA
Roof Area = 7000 ft²
original U = 0.27
Original UA = 1350
Improved UA = 220
Delta UA = 1130

Electric Savings
Total Electric savings = 3,180 kWh/yr
Electric savings/dUA = 2.8 kWh/yr/dUA

Demand Savings
Peak electric demand savings = 4 kW
Demand savings/dUA = 0.0035 kW/dUA

Gas Savings
Total Gas Savings = 50.6 MBtu/yr
Gas savings/dUA = 0.045 MBtu/yr/dUA

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____
SHEET NO. _____ OF _____
CALCULATED BY _____ DATE _____
CHECKED BY _____ DATE _____
SCALE _____

Computer Simulation Bldg 168, McPherson

ECO #3 - Weatherstripping + Caulking

- Assume ΔT = 10 cfm

- upstairs Fan
  - present, ½ ACH = 521 cfm
  - improved, 521 - 10 = 511 cfm

- Downstairs Fan
  - present ½ ACH = 130 cfm
  - improved, 130 - 10 = 120 cfm

Delta cfm
reduction = 20 cfm

Electric Savings
Total Electric Savings = 10 KWh/yr
Electric Savings = 0.50 KWh/yr/dcfm

Demand Savings
Peak Electric Demand Savings = 0 KW
Demand savings = 0 KW/yr/dcfm

Gas Savings
Total Gas Savings = 0.69 MBtu/yr
Gas Savings / dcfm = 0.035 MBtu/yr/dcfm

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____
SHEET NO. _____ OF _____
CALCULATED BY _____ DATE _____
CHECKED BY _____ DATE _____
SCALE _____

Computer Simulation Bldg 168, McClellan

ECO #12 - HVAC Controls

Fan cycle:

- Change T-stat setpoints: 78°F cooling - 70°F Heating

Rm 2, basement

- Change T-stat setpoints, 78°F cooling - 70°F Heating
- Setback thermostat
- Fans on 06:00 - 18:00 M-F otherwise off

- Turn off pumps between heating + cooling season
  - Assume 4 wk/yr = 672 hrs/yr
  - Savings: 3.8 kW * 672 hrs/yr = 2,554 kWh/yr

Electric Savings:

Total Electric Savings = 31,210 kWh/yr

Demand Savings:

Peak Demand Savings = 2 kW

Gas Savings:

Total Gas Savings = 19 MBtu/yr

01 Card - Job Information

Project: FT MCPHERSON & FT GILLEM EEAP
Location: FT MCPHERSON, BLDG 168
Program User: R. GERRANS

-----CARD 08-- Climatic Information

Weather Code	Summer Clearness Number	Winter Clearness Number	Summer Design Dry Bulb	Summer Design Wet Bulb	Winter Design Dry Bulb	Building Orientation	Summer Ground Reflect	Winter Ground Reflect
ATLANTA								

-----CARD 09-- Load Simulation Periods

1st Month Cooling Simulation	Last Month Cooling Simulation	Peak Cooling Load Hr	1st Month Summer Period	Last Month Summer Period	1st Month Daylight Savings	Last Month Daylight Savings
MAY	OCT					

---------- Load Section Alternative #1 ----------

---- Load Alternative ----

Number	Description
1	BLDG M168, BASELINE

-----CARD 20-- General Room Parameters

Room Number	Zone Reference Number	Room Descrip	Floor Length	Floor Width	Const Type	Plenum Height	Acoustic Ceiling Resistance	Floor to Floor Height	Duplicate Floors Multiplier	Duplicate Rooms per Zone	Perimeter Depth
1	1	TOP 2 FLOORS	118.67	65.84		2		10			
2	2	BASEMENT	118.67	32.92		2		10			

-----CARD 21-- Thermostat Parameters

Room Number	Cooling Room Design DB	Room Design RH	Cooling T'stat Driftpoint	Cooling T'stat Schedule	Heating Room Design DB	Heating T'stat Driftpoint	Heating T'stat Schedule	T'stat Location Flag	Mass / No. Hrs Average	Carpet On Floor
1	76			CLG	72		HTG			
2	76			CLG	72		HTG			

-----CARD 22-- Roof Parameters ----------

Room Number	Roof Number	Roof Equal to Floor?	Roof Length	Roof Width	Roof U-Value	Const Type	Roof Direction	Roof Tilt	Roof Alpha
1	1	NO	125	40	.27	37			

-----CARD 24-- Wall Parameters ----------

Room Number	Wall Number	Wall Length	Wall Height	Wall U-Value	Wall Constuc Type	Wall Direction	Wall Tilt	Wall Alpha	Ground Reflectance Multiplier
M1	1	32.92	21	.07	76	0			
1	1	32.92				0			
1	2	118.67				90			
1	3	32.92				180			
1	4	118.67				270			
M2	1	32.92	4	.40	64	0			
2	1	32.92				0			
2	2	118.67				90			
2	3	32.92				180			
2	4	118.67				270			

-----CARD 25-- Wall/Glass Parameters ----------

Room Number	Wall Number	Glass Length	Glass Width	Pct Glass or No. of Windows	Glass U-Value	Shading Coefficient	External Shading Type	Internal Shading Type	Percent Solar to Ret. Air	Visible Transmittance	Inside Visible Reflectance
M1	1				.7	.58					
1	1	5.5	8.5	2							
1	2	10	36.9	1							
1	3	5.5	8.5	2							
1	4	10	36.9	1							

-----CARD 26-- Schedules ----------

Room Number	People	Lights	Ventilation	Infiltration	Reheat Minimum	Cooling Fans	Heating Fan	Auxiliary Fan	Room Exhaust	Daylighting Controls
1	RESO	RESL	OFF	AVAIL		AVAIL				
2	ADMPPL	ADMLGTEQ	OFF	AVAIL		AVAIL				

-----CARD 27-- People and Lights ----------

Room Number	People Value	People Units	People Sensible	People Latent	Lighting Value	Lighting Units	Lighting Fixture Type	Ballast Factor	Percent Lights to Ret. Air	--- Daylighting --- Reference Point 1	Reference Point 2
1	13	PEOPLE	250	200	6137	WATTS					
2	18	PEOPLE	250	200	7831	WATTS					

-----CARD 28--- Miscellaneous Equipment ----------

Room Number	Misc Equipment Number	Equipment Descrip	Energy Consump Value	Energy Consump Units	Schedule Code	Energy Meter Code	Percent of Load Sensible	Percent Misc. Load to Room	Percent Misc. Sens to Ret. Air	Radiant Fraction	Optional Air Path
1	1	APARTMENT EQUIP	8.1	KW	RESE	ELEC					
2	1	MISC BASEMENT	4.4	KW	ADMLGTEQ	ELEC					

-----CARD 29--- Room Airflows ----------

Room	Ventilation Cooling Value	Ventilation Cooling Units	Ventilation Heating Value	Ventilation Heating Units	Infiltration Cooling Value	Infiltration Cooling Units	Infiltration Heating Value	Infiltration Heating Units	Reheat Minimum Value	Reheat Minimum Units
1					.5	ACH-HR	.5	ACH-HR		
2					.25	ACH-HR	.25	ACH-HR		

-----CARD 32-- Exposed Floor Parameters----------

Room Number	Exposed Floor Number	Slab Perimeter Length	Slab Loss Coefficient	Exposed Floor Area	Exposed Floor U-Value	Exposed Floor Const Type	Exposed Floor Temp Flag	Cooling Temp	Heating Temp	Adjacent Room No
2	1	3906.6	.022							

---------- System Section Alternative #1 ----------

-----CARD 39-- System Alternative -----

Number	Description
1	BLDG M168, BASELINE

-----CARD 40--- System Type ----------

System Set Number	System Type	Ventil Deck Location	Optional Ventilation System Cooling SADBVh	Optional Ventilation System Heating SADBVh	Cooling Schedule	Heating Schedule	Fan Static Pressure
1	FC						
2	FC						

-----CARD 41-- Zone Assignment ----------

System Set Number	Ref #1 Begin	Ref #1 End	Ref #2 Begin	Ref #2 End	Ref #3 Begin	Ref #3 End	Ref #4 Begin	Ref #4 End	Ref #5 Begin	Ref #5 End	Ref #6 Begin	Ref #6 End
1	1	1										
2	2	2										

-----CARD 42--- Fan SP and Duct Parameters----------

System Set Number	Cool Fan SP	Heat Fan SP	Return Fan SP	Mn Exh Fan SP	Aux Fan SP	Rm Exh Fan SP	Cool Fan Mtr Loc	Return Fan Mtr Loc	Supply Duct Ht Gn	Supply Duct Loc	Return Air Path
1	.5						RETAIR			OTHER	ROOMDK
2	.5						RETAIR			OTHER	ROOMDK

-----CARD 45--- Equipment Schedules ----------

System Set Number	Main Cooling Coil	Economizer	Direct Evap Coil	Indirect Evap Coil	Auxiliary Cooling Coil	Main Heating Coil	Main Preheat Coil	Reheat Coil	Mech. Humidity	Auxiliary Heating Coil
1	CLGC					HTGC				
2	CLGC					HTGC				

---------- Equipment Section Alternative #1 ----------

-----CARD 59-- Equipment Description / TOD Schedules ----------

Alternative Number	Elec Consump Time of Day Schedule	Elec Demand Time of Day Schedule	Demand Limit Max KW	Alternative Description
1				BLDG M168, BASELINE

-----CARD 60--- Cooling Load Assignment----------

Load Asgn Ref	All Coil Loads To Cool Ref	Cooling Equipment Sizing	-Group 1- Begin	End	-Group 2- Begin End	-Group 3- Begin End	-Group 4- Begin End	-Group 5- Begin End	-Group 6- Begin End	-Group 7- Begin End	-Group 8- Begin End	-Group 9- Begin End
1	1	BLKPLANT	1	2								

-----CARD 62-- Cooling Equipment Parameters ----------

Cool Ref Num	Equip Code Name	Num Of Units	----------COOLING---------- --Capacity-- Value	Units	----Energy---- Value	Units	---------HEAT RECOVERY---------- --Capacity-- Value	Units	----Energy---- Value	Units	Seq Order Num	Seq Type	Demand Limit Number
1	EQ1121S	1											

-----CARD 63-- Cooling Pumps and References ----------

Cool Ref Num	---CHILLED WATER---- Full Load Value	Full Load Units	-----CONDENSER------ Full Load Value	Full Load Units	---HT REC or AUX---- Full Load Value	Full Load Units	Switch-over Control	Cold Storage	Cooling Tower	Misc. Access.
1	3.8	KW								

-----CARD 65-- Heating Load Assignment ----------

Load Assignment Reference	All Coil Loads To Heating Ref	-Group 1- Begin	End	-Group 2- Begin	End	-Group 3- Begin	End	-Group 4- Begin	End	-Group 5- Begin	End	-Group 6- Begin	End	-Group 7- Begin	End	-Group 8- Begin	End	-Group 9- Begin	End
1	1	1	2																

-----CARD 67-- Heating Equipment Parameters ----------

Heat Ref Number	Equip Code Name	Number Of Units	HW Pmp Full Ld Value	Units	Cap'y Value	Units	Energy Rate Value	Units	Seq Order Number	Switch over Control	Hot Strg	Misc. Acc.	Cogen	Demand Limit Number
1	EQ2002	1	3.8	KW										

-----CARD 69-- Fan Equipment Parameters ----------

System Set Number	Cooling Fan	Heating Fan	Return Fan	Exhaust Fan	Auxiliary Supply	Room Exhaust	Optional Ventilation
1	EQ4371						
2	EQ4371						

Utility Description Reference Table

Schedules:
- ADMLGTEQ ADMIN LIGHTING AND EQUIPMENT
- ADMPPL ADMIN PEOPLE SCHEDULE
- AVAIL AVAILABLE (100%)
- CLG COOLING TSTAT SCHEDULE
- CLGC COOLING COIL SCHEDULE
- HTG HEATING TSTAT SCHEDULE
- HTGC HEATING COIL SCHEDULE
- OFF ALWAYS OFF
- RESE RESIDENCE EQUIPMENT SCHEDULE
- RESL RESIDENCE LIGHTING SCHEDULE
- RESO RESIDENCE OCCUPANCY SCHEDULE

System:
- FC FAN COIL

Equipment:
- Cooling:
  - EQ1121S AIR-CLD RECIP 20-35 TONS
- Heating:
  - EQ2002 GAS FIRE TUBE STEAM
- Fan:
  - EQ4371 FAN COIL SUPPLY FAN

Schedule Name: ADMLGTEQ
Project: ADMIN LIGHTING AND EQUIPMENT SC
Location:
Client:
Program User:
Comments: OFFICE LIGHTING

Starting Month: JAN Ending Month: DEC
Starting Day Type: DSGN Ending Day Type: WKDY

Hour	Util Percent
0	5
7	80
8	100
12	80
13	100
16	80
17	40
18	5
24	

Starting Month: JAN Ending Month: DEC
Starting Day Type: SAT Ending Day Type: SUN

Hour	Util Percent
0	5
24	

Schedule Name: ADMPPL
Project: ADMIN PEOPLE SCHEDULE
Location:
Client:
Program User: D JONES
Comments: OFFICE PEOPLE SCHEDULE

Starting Month: JAN Ending Month: DEC
Starting Day Type: DSGN Ending Day Type: WKDY

Hour	Util Percent
0	0
7	50
8	100
11	80
12	40
13	80
14	100
16	70
17	30
18	0
24	

Starting Month: JAN Ending Month: DEC
Starting Day Type: SAT Ending Day Type: SUN

Hour	Util Percent
0	0
24	

Schedule Name: AVAIL
Project: AVAILABLE (100)
Location:
Client:
Program User:
Comments:

Starting Month: JAN Ending Month: HTG
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	100
24	

Schedule Name: CLG
Project: COOLING TSTAT SCHEDULE
Location:
Client:
Program User:
Comments:

Starting Month: JAN Ending Month: DEC
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Temperature
0	76
24	

Schedule Name: CLGC
Project: COOLING COIL SCHEDULE
Location:
Client:
Program User: R. GERRANS
Comments:

Starting Month: JAN Ending Month: APR
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	0
24	

Starting Month: MAY Ending Month: OCT
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	100
24	

Starting Month: NOV Ending Month: HTG
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	0
24	

Schedule Name: HTG
Project: HEATING TSTAT SCHEDULE
Location:
Client:
Program User:
Comments:

Starting Month: JAN Ending Month: DEC
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Temperature
0	72
24	

Schedule Name: HTGC
Project: HEATING COIL SCHEDULE
Location:
Client:
Program User: R. GERRANS
Comments:

Starting Month: JAN Ending Month: APR
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	100
24	

Starting Month: MAY Ending Month: OCT
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	0
24	

Starting Month: NOV Ending Month: HTG
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	100
24	

Schedule Name: OFF
Project: ALWAYS OFF
Location:
Client:
Program User:
Comments:

Starting Month: JAN Ending Month: HTG
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	0
24	

Schedule Name: RESE
Project: RESIDENCE EQUIPMENT SCHEDULE
Location:
Client:
Program User:
Comments:

Starting Month: JAN Ending Month: DEC
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	5
5	40
7	5
16	40
18	30
19	100
20	20
22	5
24	

Schedule Name: RESL
Project: RESIDENCE LIGHTING SCHEDULE
Location:
Client:
Program User:
Comments:

Starting Month: JAN Ending Month: DEC
Starting Day Type: DSGN Ending Day Type: WKDY

Hour	Util Percent
0	0
5	90
8	10
16	50
19	100
23	0
24	

Starting Month: JAN Ending Month: DEC
Starting Day Type: SAT Ending Day Type: SUN

Hour	Util Percent
0	0
7	50
9	20
16	50
19	100
23	0
24	

Schedule Name: RESO
Project: RESIDENCE OCCUPANCY SCHEDULE
Location:
Client:
Program User:
Comments:

Starting Month: JAN Ending Month: DEC
Starting Day Type: DSGN Ending Day Type: WKDY

Hour	Util Percent
0	40
8	20
16	100
20	60
23	40
24	

Starting Month: JAN Ending Month: DEC
Starting Day Type: SAT Ending Day Type: SUN

Hour	Util Percent
0	40
10	30
17	90
20	60
23	40
24	

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

****
****
**
** TRACE 600 ANALYSIS **
**
** by **
**
****
****

FT MCPHERSON & FT GILLEM EEAP
FT MCPHERSON, BLDG 168

R. GERRANS

Weather File Code:	ATLANTA.	
Location:	ATLANTA, GEORGIA	
Latitude:	33.0	(deg)
Longitude:	84.0	(deg)
Time Zone:	6	
Elevation:	1,005	(ft)
Barometric Pressure:	28.8	(in. Hg)
Summer Clearness Number:	0.90	
Winter Clearness Number:	0.90	
Summer Design Dry Bulb:	92	(F)
Summer Design Wet Bulb:	74	(F)
Winter Design Dry Bulb:	22	(F)
Summer Ground Relectance:	0.20	
Winter Ground Relectance:	0.20	
Air Density:	0.0731	(Lbm/cuft)
Air Specific Heat:	0.2444	(Btu/lbm/F)
Density-Specific Heat Prod:	1.0727	(Btu-min./hr/cuft/F)
Latent Heat Factor:	4,721.8	(Btu-min./hr/cuft)
Enthalpy Factor:	4.3883	(Lb-min./hr/cuft)

Design Simulation Period: May To October
System Simulation Period: January To December
Cooling Load Methodology: TETD/Time Averaging

Time/Date Program was Run: 8:57:24 4/ 8/92
Dataset Name: M168-B .TM

AIRFLOW - ALTERNATIVE 1
BLDG M168, BASELINE

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

System Number	System Type	Main: Outside Airflow (Cfm)	Main: Cooling Airflow (Cfm)	Main: Heating Airflow (Cfm)	Main: Return Airflow (Cfm)	Main: Exhaust Airflow (Cfm)	Auxil. Supply Airflow (Cfm)	Room Exhaust Airflow (Cfm)
1	FC	0	13,122	13,122	13,643	521	0	0
2	FC	0	3,879	3,879	4,009	130	0	0
Totals		0	17,001	17,001	17,652	651	0	0

CAPACITY - ALTERNATIVE 1
BLDG M168, BASELINE

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

System Number	System Type	Cooling: Main Sys. Capacity (Tons)	Cooling: Aux. Sys. Capacity (Tons)	Cooling: Opt. Vent Capacity (Tons)	Cooling Totals (Tons)	Heating: Main Sys. Capacity (Btuh)	Heating: Aux. Sys. Capacity (Btuh)	Heating: Preheat Capacity (Btuh)	Heating: Reheat Capacity (Btuh)	Heating: Humidif. Capacity (Btuh)	Heating: Opt. Vent Capacity (Btuh)	Heating Totals (Btuh)
1	FC	15.5	0.0	0.0	15.5	-118,914	0	0	0	0	0	-118,914
2	FC	5.6	0.0	0.0	5.6	-34,149	0	0	0	0	0	-34,149
Totals		21.1	0.0	0.0	21.1	-153,063	0	0	0	0	0	-153,063

The building peaked at hour 17 month 6 with a capacity of 20.1 tons

ENGINEERING CHECKS - ALTERNATIVE 1
BLDG M168, BASELINE

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: Cfm/ Sq Ft	Cooling: Cfm/ Ton	Cooling: Sq Ft /Ton	Cooling: Btuh/ Sq Ft	Heating: Cfm/ Sq Ft	Heating: Btuh/ Sq Ft	Floor Area Sq Ft
1	Main	FC	0.00	1.68	844.2	502.6	23.87	1.68	-15.22	7,813
2	Main	FC	0.00	0.99	698.8	703.7	17.05	0.99	-8.74	3,907

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

System 1 Block FC - FAN COIL

********** COOLING COIL PEAK **********							CLG SPACE PEAK **********			HEATING COIL PEAK ********		
Peaked at Time ==>		Mo/Hr: 6/17					Mo/Hr: 6/17			Mo/Hr: 13/ 1		
Outside Air ==>		OADB/WB/HR: 94/ 70/ 77.0					OADB: 94			OADB: 22		
	Space Sens.+Lat. (Btuh)	Ret. Air Sensible (Btuh)	Ret. Air Latent (Btuh)	Net Total (Btuh)	Percnt Of Tot (%)		Space Sensible (Btuh)	Percnt Of Tot (%)		Space Peak Space Sens (Btuh)	Coil Peak Tot Sens (Btuh)	Percnt 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	-42,686	35.90
Roof Cond	0	68,966		68,966	36.97		0	0.00		0	0	0.00
Glass Solar	48,100	0		48,100	25.79		48,100	27.22		-34,382	-34,382	28.91
Glass Cond	11,849	0		11,849	6.35		11,849	6.70		-14,589	-17,408	14.64
Wall Cond	11,963	1,131		13,094	7.02		11,963	6.77		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		-27,937	-27,937	23.49
Infiltration	12,752			12,752	6.84		10,225	5.79		-76,909	-122,413	102.94
Sub Total==>	84,664	70,097		154,761	82.97		82,138	46.47				
Internal Loads												
Lights	10,473	0		10,473	5.61		10,473	5.93		0	0	0.00
People	5,850			5,850	3.14		3,250	1.84		0	0	0.00
Misc	10,782	0	0	10,782	5.78		10,782	6.10		0	0	0.00
Sub Total==>	27,104	0	0	27,104	14.53		24,504	13.86		0	0	0.00
Ceiling Load	70,097	-70,097		0	0.00		70,097	39.66		-45,505	0	0.00
Outside Air	0	0	0	0	0.00		0	0.00		0	0	0.00
Sup. Fan Heat				3,499	1.88			0.00			3,499	-2.94
Ret. Fan Heat		1,166		1,166	0.63			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==>	181,865	1,166	0	186,531	100.00		176,739	100.00		-122,413	-118,914	100.00

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

	Total Capacity (Tons)	Capacity (Mbh)	Sens Cap. (Mbh)	Coil Airfl (cfm)	Entering DB/WB/HR Deg F	Deg F	Grains	Leaving DB/WB/HR Deg F	Deg F	Grains
Main Clg	15.5	186.5	181.4	13,122	76.1	63.2	69.8	63.3	58.6	69.1
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
0										
Totals	15.5	186.5								

----------AREAS----------

	Gross Total	Glass (sf)	(%)
Floor	7,813		
Part	0		
ExFlr	0		
Roof	5,000		0
Wall	6,367	925	15

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

	Capacity (Mbh)	Coil Airfl (cfm)	Ent Deg F	Lvg Deg F
Main Htg	-118.9	13,122	72.2	80.7
Aux Htg	0.0	0	0.0	0.0
Preheat	-0.0	13,122	72.2	63.4
Reheat	0.0	0	0.0	0.0
Humidif	0.0	0	0.0	0.0
Opt Vent	0.0	0	0.0	0.0
Total	-118.9			

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

Type	Cooling	Heating
Vent	0	0
Infil	521	521
Supply	13,122	13,122
Mincfm	0	0
Return	13,122	13,122
Exhaust	0	0
Rm Exh	0	0
Auxil	0	0

--ENGINEERING CHECKS--

Clg % OA	0.0
Clg Cfm/Sqft	1.68
Clg Cfm/Ton	844.15
Clg Sqft/Ton	502.65
Clg Btuh/Sqft	23.87
No. People	13
Htg % OA	0.0
Htg Cfm/SqFt	1.68
Htg Btuh/SqFt	-15.22

--TEMPERATURES (F)---

Type	Clg	Htg
SADB	63.4	80.7
Plenum	104.3	53.6
Return	76.0	72.0
Ret/OA	76.0	72.0
Runarnd	76.0	72.0
Fn MtrTD	0.1	0.0
Fn BldTD	0.1	0.0
Fn Frict	0.2	0.0

System 2 Block FC - FAN COIL

	COOLING COIL PEAK					CLG SPACE PEAK			HEATING COIL PEAK		
Peaked at Time ==>		Mo/Hr: 6/15				Mo/Hr: 6/16			Mo/Hr: 13/ 1		
Outside Air ==>		OADB/WB/HR: 96/ 73/ 91.0				OADB: 96			OADB: 22		
	Space Sens.+Lat.	Ret. Air Sensible	Ret. Air Latent	Net Total	Percnt Of Tot	Space Sensible	Percnt Of Tot		Space Peak Space Sens	Coil Peak Tot Sens	Percnt Of Tot
Envelope Loads	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)	(Btuh)	(%)		(Btuh)	(Btuh)	(%)
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	8,693	2,015		10,708	16.07	9,003	14.99		-19,404	-23,902	69.99
Partition	0			0	0.00	0	0.00		0	0	0.00
Exposed Floor	0			0	0.00	0	0.00		-4,297	-4,297	12.58
Infiltration	4,683			4,683	7.03	2,738	4.56		-6,984	-6,984	20.45
Sub Total==>	13,376	2,015		15,391	23.10	11,741	19.54		-30,685	-35,183	103.03
Internal Loads											
Lights	26,727	0		26,727	40.12	26,727	44.49		0	0	0.00
People	8,100			8,100	12.16	4,500	7.49		0	0	0.00
Misc	15,017	0	0	15,017	22.54	15,017	25.00		0	0	0.00
Sub Total==>	49,844	0	0	49,844	74.82	46,244	76.98		0	0	0.00
Ceiling Load	2,015	-2,015		0	0.00	2,087	3.47		-4,498	0	0.00
Outside Air	0	0	0	0	0.00	0	0.00		0	0	0.00
Sup. Fan Heat				1,034	1.55		0.00			1,034	-3.03
Ret. Fan Heat		345		345	0.52		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==>	65,235	345	0	66,615	100.00	60,073	100.00		-35,183	-34,149	10

COOLING COIL SELECTION

	Total Capacity (Tons)	(Mbh)	Sens Cap. (Mbh)	Coil Airfl (cfm)	Entering DB/WB/HR Deg F	Deg F	Grains	Leaving DB/WB/HR Deg F	Deg F	Grains
Main Clg	5.6	66.6	61.2	3,879	76.1	63.2	69.8	61.4	57.6	67.7
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
0										
Totals	5.6	66.6								
0										

AREAS

	Gross Total	Glass (sf)	(%)
Floor	3,907		
Part	0		
ExFlr	3,907		
Roof	0		0
Wall	1,213		0

HEATING COIL SELECTION

	Capacity (Mbh)	Coil Airfl (cfm)	Ent Deg F	Lvg Deg F
Main Htg	-34.1	3,879	72.2	80.5
Aux Htg	0.0	0	0.0	0.0
Preheat	-0.0	3,879	72.2	61.6
Reheat	0.0	0	0.0	0.0
Humidif	0.0	0	0.0	0.0
Opt Vent	0.0	0	0.0	0.0
Total	-34.1			

AIRFLOWS (cfm)

Type	Cooling	Heating
Vent	0	0
Infil	130	130
Supply	3,879	3,879
Mincfm	0	0
Return	3,879	3,879
Exhaust	0	0
Rm Exh	0	0
Auxil	0	0

ENGINEERING CHECKS

Clg % OA	0.0
Clg Cfm/Sqft	0.99
Clg Cfm/Ton	698.75
Clg Sqft/Ton	703.74
Clg Btuh/Sqft	17.05
No. People	18
Htg % OA	0.0
Htg Cfm/SqFt	0.99
Htg Btuh/SqFt	-8.74

TEMPERATURES (F)

Type	Clg	Htg
SADB	61.6	80.5
Plenum	77.6	68.4
Return	76.0	72.0
Ret/OA	76.0	72.0
Runarnd	76.0	72.0
Fn MtrTD	0.1	0.0
Fn BldTD	0.1	0.0
Fn Frict	0.2	0.0

COOLING LOADS AT COIL PEAK - ALTERNATIVE 1
BLDG M168, BASELINE

AIRFLOW COOLING LOADS
(At time of Coil Peak)

Room Number	Description	Ventilation Airflow (Cfm)	Ventilation Sensible (Btuh)	Ventilation Latent (Btuh)	Optional Ventilation Airflow (Cfm)	Optional Ventilation Sensible (Btuh)	Optional Ventilation Latent (Btuh)	Bypass Airflow (Cfm)	Bypass Sensible (Btuh)	Bypass Latent (Btuh)	Ov/Undr Sizing (Btuh)
1	TOP 2 FLOORS	0	0	0	0	0	0	0	0	0	0
Zone 1	Total/Ave.	0	0	0	0	0	0	0	0	0	0
Zone 1	Block	0	0	0	0	0	0	0	0	0	0
System 1	Total/Ave.	0	0	0	0	0	0	0	0	0	0
System 1	Block	0	0	0	0	0	0	0	0	0	0
2	BASEMENT	0	0	0	0	0	0	0	0	0	0
Zone 2	Total/Ave.	0	0	0	0	0	0	0	0	0	0
Zone 2	Block	0	0	0	0	0	0	0	0	0	0
System 2	Total/Ave.	0	0	0	0	0	0	0	0	0	0
System 2	Block	0	0	0	0	0	0	0	0	0	0

HEATING LOADS AT COIL PEAK - ALTERNATIVE 1
BLDG M168, BASELINE

AIRFLOW HEATING LOADS
(At time of Coil Peak)

Room Number	Description	Ventilation Airflow (Cfm)	Ventilation Sensible (Btuh)	Op. Vent. Airflow (Cfm)	Op. Vent. Sensible (Btuh)	Reheat Airflow (Cfm)	Reheat Sensible (Btuh)	Humidif. Airflow (Cfm)	Humidif. Latent (Btuh)	Total (Btuh)
1	TOP 2 FLOORS	0	0	0	0	0	0	0	0	0
Zone 1	Total/Ave.	0	0	0	0	0	0	0	0	0
Zone 1	Block	0	0	0	0	0	0	0	0	0
System 1	Total/Ave.	0	0	0	0	0	0	0	0	0
System 1	Block	0	0	0	0	0	0	0	0	0
2	BASEMENT	0	0	0	0	0	0	0	0	0
Zone 2	Total/Ave.	0	0	0	0	0	0	0	0	0
Zone 2	Block	0	0	0	0	0	0	0	0	0	0
System 2	Total/Ave.	0	0	0	0	0	0	0	0	0
System 2	Block	0	0	0	0	0	0	0	0	0

COOLING AIRFLOW HEAT GAIN/LOSS - ALTERNATIVE 1
BLDG M168, BASELINE

AIRFLOW HEAT GAIN AND LOSS
(At time of Coil Peak)

Cooling

Room Number	Description	Duct Heat Pickup (Btuh)	Supply Fan Heat (Btuh)	Return Fan Heat (Btuh)	System Exhaust Heat Loss (Btuh)	Total (Btuh)	System Exhaust Airflow (Cfm)	Room Exhaust Airflow (Cfm)	Ducted Airflow (Cfm)	Plenum Airflow (Cfm)	Run Around Airflow (Cfm)	Corridr Airflow (Cfm)	System Return Airflow (Cfm)
1	TOP 2 FLOORS	0	3,499	1,166	0	4,666	0	0	0	0	0	0	13,122
Zone 1	Total/Ave.	0	3,499	1,166	0	4,666	0	0	0	0	0	0	13,122
Zone 1	Block	0	3,499	1,166	0	4,666	0	0	0	0	0	0	13,122
System 1	Total/Ave.	0	3,499	1,166	0	4,666	0	0	0	0	0	0	13,122
System 1	Block	0	3,499	1,166	0	4,666	0	0	0	0	0	0	13,122
2	BASEMENT	0	1,034	345	0	1,379	0	0	0	0	0	0	3,879
Zone 2	Total/Ave.	0	1,034	345	0	1,379	0	0	0	0	0	0	3,879
Zone 2	Block	0	1,034	345	0	1,379	0	0	0	0	0	0	3,879
System 2	Total/Ave.	0	1,034	345	0	1,379	0	0	0	0	0	0	3,879
System 2	Block	0	1,034	345	0	1,379	0	0	0	0	0	0	3,879

HEATING AIRFLOW HEAT GAIN/LOSS - ALTERNATIVE 1
BLDG M168, BASELINE

AIRFLOW HEAT GAIN AND LOSS
(At time of Coil Peak)

Heating

Room Number	Description	Supply Fan Heat (Btuh)	Return Fan Heat (Btuh)	System Exhaust Heat Loss (Btuh)	Total (Btuh)	System Exhaust Airflow (Cfm)	Room Exhaust Airflow (Cfm)	Ducted Airflow (Cfm)	Plenum Airflow (Cfm)	Run Around Airflow (Cfm)	Corridr Airflow (Cfm)	System Return Airflow (Cfm)
1	TOP 2 FLOORS	3,499	0	0	3,499	0	0	0	0	0	0	13,122
Zone 1	Total/Ave.	3,499	0	0	3,499	0	0	0	0	0	0	13,122
Zone 1	Block	3,499	0	0	3,499	0	0	0	0	0	0	13,122
System 1	Total/Ave.	3,499	0	0	3,499	0	0	0	0	0	0	13,122
System 1	Block	3,499	0	0	3,499	0	0	0	0	0	0	13,122
2	BASEMENT	1,034	0	0	1,034	0	0	0	0	0	0	3,879
Zone 2	Total/Ave.	1,034	0	0	1,034	0	0	0	0	0	0	3,879
Zone 2	Block	1,034	0	0	1,034	0	0	0	0	0	0	3,879
System 2	Total/Ave.	1,034	0	0	1,034	0	0	0	0	0	0	3,879
System 2	Block	1,034	0	0	1,034	0	0	0	0	0	0	3,879

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

ROOM PSYCHROMETRICS - ALTERNATIVE 1
BLDG M168, BASELINE

---------- P S Y C H R O M E T R I C S T A T E P O I N T S ----------

Room 1

	Dry Bulb (F)	Wet Bulb (F)	Relat. Humid. (%)	Humid. Ratio (GR)	Enthalpy (Btu/Lb)	Temp. Diff. (F)
Space	76.0	63.2	50.0	69.8	29.2	
Main System						
Return Air Heat Pickup						-0.1
Return Fan						0.1
Return Air	76.0	63.2	50.0	69.8	29.2	
Outdoor Air	94.3	70.3	30.6	77.0	34.8	
Return/Outdoor Air Mix	76.0	63.2	50.0	69.8	29.2	
Blow through Fan						0.1
Entering Coil	76.1	63.2	49.9	69.8	29.2	
Leaving Coil	63.3	58.7	77.1	69.6	26.0	
Draw Through Fan						0.0
Duct Frictional Heat						0.2
Supply Duct Heat Gain						0.0
Cold Deck Supply Air	63.4	58.8	76.6	69.6	26.1	
Supply Air	63.4	58.8	76.6	69.6	26.1	

Percent Outside Air	0.00	(%)
Sensible Heat Ratio (SHR)	0.972	
Percent Supply Air Bypassing Coil	0.00	(%)
Coil Airflow	13,122	(Cfm)

ROOM PSYCHROMETRICS - ALTERNATIVE 1
BLDG M168, BASELINE

---------- P S Y C H R O M E T R I C S T A T E P O I N T S ----------

Room 2

	Dry Bulb (F)	Wet Bulb (F)	Relat. Humid. (%)	Humid. Ratio (GR)	Enthalpy (Btu/Lb)	Temp. Diff. (F)
Space	76.0	63.2	50.0	69.8	29.2	
Main System						
Return Air Heat Pickup						-0.1
Return Fan						0.1
Return Air	76.0	63.2	50.0	69.8	29.2	
Outdoor Air	96.2	73.2	34.1	91.0	37.4	
Return/Outdoor Air Mix	76.0	63.2	50.0	69.8	29.2	
Blow through Fan						0.1
Entering Coil	76.1	63.2	49.9	69.8	29.2	
Leaving Coil	61.4	57.7	80.9	68.4	25.4	
Draw Through Fan						0.0
Duct Frictional Heat						0.2
Supply Duct Heat Gain						0.0
Cold Deck Supply Air	61.6	57.8	80.4	68.4	25.4	
Supply Air	61.6	57.8	80.4	68.4	25.4	

Percent Outside Air	0.00	(%)
Sensible Heat Ratio (SHR)	0.925	
Percent Supply Air Bypassing Coil	0.00	(%)
Coil Airflow	3,879	(Cfm)

BUILDING U-VALUES - ALTERNATIVE 1
BLDG M168, BASELINE

BUILDING U-VALUES

Room Number	Description	Room U-Values (Btu/hr/sqft/F) Part.	ExFlr	Summr Skylt	Wintr Skylt	Roof	Summr Windo	Wintr Windo	Wall	Ceil.	Room Mass (lb/ sqft)	Room Capac. (Btu/ sqft/F)
1	TOP 2 FLOORS	0.000	0.000	0.000	0.000	0.270	0.700	0.743	0.070	0.317	38.7	9.11
Zone 1	Total/Ave.	0.000	0.000	0.000	0.000	0.270	0.700	0.743	0.070	0.317	38.7	9.11
System 1	Total/Ave.	0.000	0.000	0.000	0.000	0.270	0.700	0.743	0.070	0.317	38.7	9.11
2	BASEMENT	0.000	0.022	0.000	0.000	0.000	0.000	0.000	0.400	0.317	59.6	11.84
Zone 2	Total/Ave.	0.000	0.022	0.000	0.000	0.000	0.000	0.000	0.400	0.317	59.6	11.84
System 2	Total/Ave.	0.000	0.022	0.000	0.000	0.000	0.000	0.000	0.400	0.317	59.6	11.84
Building		0.000	0.022	0.000	0.000	0.270	0.700	0.743	0.130	0.317	45.7	10.02

BUILDING AREAS - ALTERNATIVE 1
BLDG M168, BASELINE

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	TOP 2 FLOORS	1	1	7,813	7,813	0	0	0	0	5,000	925	15	5,442
Zone 1	Total/Ave.				7,813	0	0	0	0	5,000	925	15	5,442
System 1	Total/Ave.				7,813	0	0	0	0	5,000	925	15	5,442
2	BASEMENT	1	1	3,907	3,907	0	3,907	0	0	0	0	0	1,213
Zone 2	Total/Ave.				3,907	0	3,907	0	0	0	0	0	1,213
System 2	Total/Ave.				3,907	0	3,907	0	0	0	0	0	1,213
Building					11,720	0	3,907	0	0	5,000	925	12	6,654

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

ASHRAE 90 ANALYSIS - ALTERNATIVE 1
BLDG M168, BASELINE

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

Overall Roof U-Value = 0.270 (Btu/Hr/Sq Ft/F)
Overall Wall U-Value = 0.200 (Btu/Hr/Sq Ft/F)
Overall Building U-Value = 0.228 (Btu/Hr/Sq Ft/F)

Roof Overall Thermal Transfer Value (OTTVr) = 20.97 (Btu/Hr/Sq Ft)
Wall Overall Thermal Transfer Value (OTTVw) = 12.03 (Btu/Hr/Sq Ft)

SYSTEM LOAD PROFILE - ALTERNATIVE 1
BLDG M168, BASELINE

Main System 1 FC FAN COIL

Percent Design Load	Cooling Load Cap. (Ton)	Cooling Load Hours (%)	Cooling Load Hours	Heating Load Capacity (Btuh)	Heating Load Hours (%)	Heating Load Hours	Cooling Airflow Cap. (Cfm)	Cooling Airflow Hours (%)	Cooling Airflow Hours	Heating Airflow Cap. (Cfm)	Heating Airflow Hours (%)	Heating Airflow Hours
0 - 5	0.8	7	194	-5,946	5	75	656.1	0	0	0.0	0	0
5 - 10	1.6	7	193	-11,891	11	183	1,312.2	0	0	0.0	0	0
10 - 15	2.3	2	67	-17,837	8	140	1,968.3	0	0	0.0	0	0
15 - 20	3.1	6	160	-23,783	7	122	2,624.3	0	0	0.0	0	0
20 - 25	3.9	15	433	-29,729	8	138	3,280.4	0	0	0.0	0	0
25 - 30	4.7	11	305	-35,674	10	170	3,936.5	0	0	0.0	0	0
30 - 35	5.4	7	196	-41,620	7	119	4,592.6	0	0	0.0	0	0
35 - 40	6.2	8	221	-47,566	7	118	5,248.7	0	0	0.0	0	0
40 - 45	7.0	8	228	-53,511	4	69	5,904.8	0	0	0.0	0	0
45 - 50	7.8	7	185	-59,457	5	89	6,560.9	0	0	0.0	0	0
50 - 55	8.5	7	192	-65,403	4	67	7,217.0	0	0	0.0	0	0
55 - 60	9.3	3	84	-71,348	13	220	7,873.0	0	0	0.0	0	0
60 - 65	10.1	7	183	-77,294	9	149	8,529.1	0	0	0.0	0	0
65 - 70	10.9	4	123	-83,240	0	0	9,185.2	0	0	0.0	0	0
70 - 75	11.7	1	38	-89,186	0	0	9,841.3	0	0	0.0	0	0
75 - 80	12.4	0	0	-95,131	0	0	10,497.4	0	0	0.0	0	0
80 - 85	13.2	0	0	-101,077	0	0	11,153.5	0	0	0.0	0	0
85 - 90	14.0	0	0	-107,023	0	0	11,809.6	0	0	0.0	0	0
90 - 95	14.8	0	0	-112,968	0	0	12,465.7	0	0	0.0	0	0
95 - 100	15.5	0	0	-118,914	0	0	13,121.7	100	8,760	0.0	0	0
Hours Off	0.0	0	5,958	0	0	7,101	0.0	0	0	0.0	0	8,760

Main System 2 FC FAN COIL

Percent Design Load	Cooling Load Cap. (Ton)	Cooling Load Hours (%)	Cooling Load Hours	Heating Load Capacity (Btuh)	Heating Load Hours (%)	Heating Load Hours	Cooling Airflow Cap. (Cfm)	Cooling Airflow Hours (%)	Cooling Airflow Hours	Heating Airflow Cap. (Cfm)	Heating Airflow Hours (%)	Heating Airflow Hours
0 - 5	0.3	3	115	-1,707	0	0	193.9	0	0	0.0	0	0
5 - 10	0.6	19	739	-3,415	0	0	387.9	0	0	0.0	0	0
10 - 15	0.8	30	1,165	-5,122	0	0	581.8	0	0	0.0	0	0
15 - 20	1.1	12	481	-6,830	2	5	775.8	0	0	0.0	0	0
20 - 25	1.4	1	39	-8,537	0	0	969.7	0	0	0.0	0	0
25 - 30	1.7	0	0	-10,245	47	113	1,163.7	0	0	0.0	0	0
30 - 35	1.9	1	42	-11,952	37	88	1,357.6	0	0	0.0	0	0
35 - 40	2.2	1	43	-13,660	13	32	1,551.6	0	0	0.0	0	0
40 - 45	2.5	1	44	-15,367	0	0	1,745.5	0	0	0.0	0	0
45 - 50	2.8	1	22	-17,074	0	0	1,939.5	0	0	0.0	0	0
50 - 55	3.1	1	44	-18,782	0	0	2,133.4	0	0	0.0	0	0
55 - 60	3.3	2	97	-20,489	0	0	2,327.4	0	0	0.0	0	0
60 - 65	3.6	4	172	-22,197	0	0	2,521.3	0	0	0.0	0	0
65 - 70	3.9	3	123	-23,904	0	0	2,715.3	0	0	0.0	0	0
70 - 75	4.2	3	126	-25,612	0	0	2,909.2	0	0	0.0	0	0
75 - 80	4.4	4	153	-27,319	0	0	3,103.1	0	0	0.0	0	0
80 - 85	4.7	6	217	-29,027	0	0	3,297.1	0	0	0.0	0	0
85 - 90	5.0	7	282	-30,734	0	0	3,491.0	0	0	0.0	0	0
90 - 95	5.3	0	0	-32,442	0	0	3,685.0	0	0	0.0	0	0
95 - 100	5.6	0	0	-34,149	0	0	3,878.9	100	8,760	0.0	0	0
Hours Off	0.0	0	4,856	0	0	8,522	0.0	0	0	0.0	0	8,760

SYSTEM TOTALS LOAD PROFILE - ALTERNATIVE 1
BLDG M168, BASELINE

S Y S T E M L O A D P R O F I L E

System Totals

Percent Design Load	Cooling Load Cap. (Ton)	Cooling Load Hours (%)	Cooling Load Hours	Heating Load Capacity (Btuh)	Heating Load Hours (%)	Heating Load Hours	Cooling Airflow Cap. (Cfm)	Cooling Airflow Hours (%)	Cooling Airflow Hours	Heating Airflow Cap. (Cfm)	Heating Airflow Hours (%)	Heating Airflow Hours
0 - 5	1.1	27	1,091	-7,653	7	115	850.0	0	0	0.0	0	0
5 - 10	2.1	6	241	-15,306	15	258	1,700.1	0	0	0.0	0	0
10 - 15	3.2	4	166	-22,959	11	182	2,550.1	0	0	0.0	0	0
15 - 20	4.2	11	455	-30,613	8	145	3,400.1	0	0	0.0	0	0
20 - 25	5.3	7	279	-38,266	13	224	4,250.2	0	0	0.0	0	0
25 - 30	6.3	5	209	-45,919	7	115	5,100.2	0	0	0.0	0	0
30 - 35	7.4	6	236	-53,572	8	140	5,950.2	0	0	0.0	0	0
35 - 40	8.4	8	305	-61,225	6	104	6,800.3	0	0	0.0	0	0
40 - 45	9.5	5	207	-68,878	13	230	7,650.3	0	0	0.0	0	0
45 - 50	10.5	5	212	-76,532	9	153	8,500.3	0	0	0.0	0	0
50 - 55	11.6	7	290	-84,185	3	50	9,350.4	0	0	0.0	0	0
55 - 60	12.7	2	86	-91,838	0	8	10,200.4	0	0	0.0	0	0
60 - 65	13.7	1	23	-99,491	0	0	11,050.4	0	0	0.0	0	0
65 - 70	14.8	3	128	-107,144	0	0	11,900.5	0	0	0.0	0	0
70 - 75	15.8	3	109	-114,797	0	0	12,750.5	0	0	0.0	0	0
75 - 80	16.9	0	0	-122,451	0	0	13,600.5	0	0	0.0	0	0
80 - 85	17.9	0	0	-130,104	0	0	14,450.6	0	0	0.0	0	0
85 - 90	19.0	0	0	-137,757	0	0	15,300.6	0	0	0.0	0	0
90 - 95	20.0	0	0	-145,410	0	0	16,150.6	0	0	0.0	0	0
95 - 100	21.1	0	0	-153,063	0	0	17,000.7	100	8,760	0.0	0	0
Hours Off	0.0	0	4,723	0	0	7,036	0.0	0	0	0.0	0	8,760

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

BUILDING COOL-HEAT DEMAND - ALTERNATIVE 1
BLDG M168, BASELINE

January			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	33.4	30.4	-70,471	0.0	-31,158	0.0	-66,638	0.0	-66,638	0.0	-75,601	0.0
2	32.1	29.3	-73,859	0.0	-69,324	0.0	-69,320	0.0	-69,320	0.0	-78,741	0.0
3	31.7	29.3	-76,675	0.0	-72,433	0.0	-72,433	0.0	-72,433	0.0	-81,943	0.0
4	31.9	29.5	-80,262	0.0	-74,726	0.0	-74,726	0.0	-74,726	0.0	-84,597	0.0
5	32.6	30.3	-81,819	0.0	-76,536	0.0	-76,536	0.0	-76,536	0.0	-86,633	0.0
6	33.6	31.3	-53,923	0.0	-49,318	0.0	-68,170	0.0	-77,673	0.0	-59,993	0.0
7	35.0	32.6	-54,752	0.0	-46,508	0.0	-65,359	0.0	-76,270	0.0	-57,420	0.0
8	36.6	34.4	-22,682	0.0	-40,503	0.0	-48,882	0.0	-60,368	0.0	-40,503	0.0
9	38.5	36.3	-19,873	0.0	-46,510	0.0	-37,482	0.0	-48,941	0.0	-46,510	0.0
10	40.4	37.7	-9,714	0.0	-35,701	0.0	-32,956	0.0	-44,951	0.0	-35,701	0.0
11	42.3	38.7	-4,108	0.0	-30,622	0.0	-28,202	0.0	-40,209	0.0	-30,622	0.0
12	44.2	39.6	0	0.0	-25,288	0.0	-22,868	0.0	-34,819	0.0	-25,288	0.0
13	45.8	40.5	0	0.0	-14,963	0.0	-12,544	0.0	-24,477	0.0	-14,963	0.0
14	47.2	41.1	0	0.0	-4,420	0.0	-2,001	0.0	-13,391	0.0	-4,420	0.0
15	48.2	41.6	0	0.0	0	0.0	0	0.0	-11,399	0.0	0	0.0
16	48.9	41.8	0	0.0	0	0.0	0	0.0	-10,802	0.0	0	0.0
17	49.1	41.9	0	0.0	0	0.0	0	0.0	-10,358	0.0	0	0.0
18	48.7	41.9	0	0.0	0	0.0	0	0.0	-9,673	0.0	0	0.0
19	47.4	41.7	0	0.0	-8,667	0.0	-7,084	0.0	-16,163	0.0	-8,667	0.0
20	45.5	40.5	0	0.0	0	0.0	0	0.0	-8,925	0.0	0	0.0
21	43.1	38.9	0	0.0	-8,592	0.0	-8,908	0.0	-17,638	0.0	-8,592	0.0
22	40.4	36.7	0	0.0	-25,342	0.0	-25,342	0.0	-34,108	0.0	-25,342	0.0
23	37.7	34.3	0	0.0	-34,565	0.0	-34,565	0.0	-43,447	0.0	-34,565	0.0
24	35.3	32.3	0	0.0	-62,397	0.0	-62,397	0.0	-71,452	0.0	-62,397	0.0

February			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	37.5	34.5	-63,707	0.0	0	0.0	-61,580	0.0	-61,580	0.0	-70,666	0.0
2	36.0	33.0	-66,914	0.0	-11,145	0.0	-66,265	0.0	-66,265	0.0	-76,075	0.0
3	34.7	31.8	-69,098	0.0	-68,452	0.0	-68,446	0.0	-68,446	0.0	-78,111	0.0
4	33.6	30.9	-71,171	0.0	-71,416	0.0	-71,416	0.0	-71,416	0.0	-81,612	0.0
5	32.8	30.1	-72,194	0.0	-73,419	0.0	-73,419	0.0	-73,419	0.0	-83,654	0.0
6	32.2	29.8	-45,348	0.0	-47,160	0.0	-66,011	0.0	-66,011	0.0	-57,977	0.0
7	32.1	29.6	-41,503	0.0	-46,876	0.0	-65,727	0.0	-65,727	0.0	-57,775	0.0
8	32.5	30.3	-8,833	0.0	-34,600	0.0	-42,979	0.0	-42,979	0.0	-34,600	0.0
9	33.9	31.6	-11,444	0.0	-47,937	0.0	-38,909	0.0	-38,909	0.0	-47,937	0.0
10	36.0	33.0	-740	0.0	-42,285	0.0	-39,540	0.0	-45,438	0.0	-42,285	0.0
11	38.5	34.8	0	0.0	-37,487	0.0	-35,067	0.0	-47,775	0.0	-37,487	0.0
12	41.3	36.5	0	0.0	-29,625	0.0	-27,205	0.0	-39,902	0.0	-29,625	0.0
13	43.8	38.1	0	0.0	-18,811	0.0	-16,391	0.0	-28,654	0.0	-18,811	0.0
14	45.9	39.5	0	0.0	-6,976	0.0	-4,556	0.0	-16,578	0.0	-6,976	0.0
15	47.2	40.4	0	0.0	0	0.0	0	0.0	-11,804	0.0	0	0.0
16	47.7	40.6	0	0.0	0	0.0	0	0.0	-11,442	0.0	0	0.0
17	47.5	40.2	0	0.0	0	0.0	0	0.0	-10,693	0.0	0	0.0
18	47.0	39.8	0	0.0	0	0.0	0	0.0	-10,811	0.0	0	0.0
19	46.2	39.9	0	0.0	0	0.0	0	0.0	-9,969	0.0	0	0.0
20	45.1	39.7	0	0.0	0	0.0	0	0.0	-9,399	0.0	0	0.0
21	43.8	39.2	0	0.0	0	0.0	0	0.0	-9,255	0.0	0	0.0
22	42.3	38.3	0	0.0	-21,855	0.0	-20,721	0.0	-29,459	0.0	-21,855	0.0
23	40.7	37.2	0	0.0	-33,138	0.0	-33,138	0.0	-42,127	0.0	-33,138	0.0
24	39.1	35.8	0	0.0	-57,443	0.0	-57,443	0.0	-66,419	0.0	-57,443	0.0

BUILDING COOL-HEAT DEMAND - ALTERNATIVE 1
BLDG M168, BASELINE

March			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	45.4	41.6	-39,275	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2	43.3	39.7	-44,443	0.0	0	0.0	0	0.0	0	0.0	0	0.0
3	41.6	38.6	-46,739	0.0	0	0.0	0	0.0	0	0.0	0	0.0
4	40.6	37.5	-49,890	0.0	0	0.0	0	0.0	-11,649	0.0	-11,649	0.0
5	40.2	37.3	-51,851	0.0	0	0.0	-6,892	0.0	-58,147	0.0	-58,147	0.0
6	40.6	37.8	-24,010	0.0	0	0.0	-49,978	0.0	-49,972	0.0	-31,121	0.0
7	41.6	39.0	0	0.0	0	0.0	-29,323	0.0	-29,323	0.0	-10,473	0.0
8	43.3	40.7	0	0.0	0	0.0	-22,335	0.0	-22,335	0.0	-13,957	0.0
9	45.4	42.5	0	0.0	0	0.0	-14,261	0.0	-14,261	0.0	-23,289	0.0
10	47.9	44.3	0	0.0	0	0.0	-13,206	0.0	-13,206	0.0	-15,951	0.0
11	50.6	45.5	0	0.0	0	0.0	0	0.0	0	0.0	-1,701	0.0
12	53.3	46.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
13	55.8	48.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
14	58.0	49.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
15	59.6	50.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
16	60.7	50.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
17	61.0	50.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
18	60.7	50.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
19	59.6	50.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
20	58.0	50.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
21	55.8	49.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
22	53.3	47.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
23	50.6	45.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
24	47.9	43.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0

April			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	57.7	53.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2	55.9	52.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
3	54.2	51.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
4	52.9	50.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
5	51.9	49.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
6	51.2	49.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
7	51.0	49.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
8	51.6	49.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
9	53.3	50.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
10	55.9	51.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
11	59.0	53.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
12	62.4	55.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
13	65.5	57.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
14	68.1	59.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
15	69.8	60.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
16	70.4	60.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
17	70.2	60.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
18	69.5	60.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
19	68.5	59.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
20	67.2	59.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
21	65.5	59.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
22	63.7	58.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
23	61.7	57.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
24	59.7	55.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0

BUILDING COOL-HEAT DEMAND - ALTERNATIVE 1
BLDG M168, BASELINE

May			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	66.6	62.3	0	21.1	0	0.4	0	0.5	0	0.4	0	0.4
2	64.5	60.4	0	21.1	0	0.4	0	0.4	0	0.4	0	0.4
3	62.7	59.1	0	20.4	0	0.4	0	0.4	0	0.4	0	0.4
4	61.2	58.1	0	5.6	0	0.4	0	0.4	0	0.4	0	0.4
5	60.0	57.1	0	5.6	0	0.3	0	0.3	0	0.3	0	0.3
6	59.3	56.6	0	6.5	0	0.3	0	0.3	0	0.3	0	0.3
7	59.0	56.5	0	10.8	0	0.2	0	0.2	0	0.2	0	0.2
8	59.5	56.6	0	11.1	0	3.0	0	0.2	0	0.2	0	3.0
9	60.9	56.6	0	10.8	0	3.8	0	0.1	0	0.1	0	4.1
10	63.0	57.2	0	11.7	0	6.4	0	0.2	0	0.2	0	6.3
11	65.7	58.1	0	12.2	0	7.0	0	3.1	0	3.1	0	7.0
12	68.7	59.8	0	13.0	0	7.5	0	3.9	0	3.9	0	7.5
13	71.7	61.6	0	14.8	0	7.8	0	5.2	0	5.2	0	7.8
14	74.5	63.4	0	16.6	0	10.4	0	6.8	0	6.8	0	10.4
15	76.6	64.8	0	17.6	0	11.6	0	7.9	0	7.9	0	11.6
16	78.0	65.6	0	17.8	0	11.2	0	7.4	0	7.4	0	11.2
17	78.5	65.6	0	18.7	0	11.6	0	8.5	0	8.5	0	11.6
18	78.2	65.8	0	16.3	0	8.7	0	7.4	0	7.4	0	8.7
19	77.5	65.6	0	12.3	0	5.1	0	5.1	0	5.1	0	5.1
20	76.3	66.1	0	10.8	0	6.8	0	6.8	0	6.8	0	6.8
21	74.8	67.2	0	5.8	0	4.1	0	4.1	0	4.1	0	4.1
22	73.0	66.4	0	4.9	0	3.4	0	3.4	0	3.4	0	3.4
23	70.9	65.4	0	3.7	0	2.5	0	2.5	0	2.5	0	2.5
24	68.7	64.0	0	1.2	0	0.5	0	0.5	0	0.5	0	0.5

June			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	73.0	67.9	0	2.9	0	1.3	0	1.4	0	1.4	0	1.4
2	71.2	66.1	0	2.5	0	0.8	0	0.8	0	0.9	0	0.9
3	69.7	65.2	0	2.2	0	0.8	0	0.8	0	0.8	0	0.8
4	68.5	64.3	0	1.9	0	0.8	0	0.8	0	0.8	0	0.8
5	67.8	64.2	0	1.7	0	0.7	0	0.7	0	0.8	0	0.8
6	67.6	64.2	0	6.3	0	1.5	0	0.7	0	0.7	0	1.6
7	68.1	64.8	0	8.1	0	4.4	0	2.3	0	2.3	0	4.5
8	69.4	65.7	0	11.7	0	7.4	0	3.8	0	3.8	0	8.1
9	71.6	66.2	0	12.5	0	8.0	0	4.6	0	4.6	0	8.1
10	74.2	67.2	0	13.2	0	9.8	0	6.3	0	6.4	0	10.1
11	77.2	68.5	0	14.0	0	10.2	0	6.7	0	6.7	0	10.5
12	80.2	70.0	0	14.9	0	10.7	0	7.3	0	7.3	0	11.1
13	82.8	70.8	0	15.7	0	11.5	0	9.0	0	9.0	0	11.6
14	85.0	71.6	0	19.0	0	14.7	0	10.8	0	10.8	0	14.7
15	86.3	72.3	0	20.0	0	15.8	0	11.9	0	11.9	0	15.8
16	86.8	72.1	0	20.0	0	14.9	0	11.0	0	11.0	0	14.9
17	86.6	71.7	0	19.9	0	15.1	0	11.8	0	11.8	0	15.1
18	85.8	71.5	0	16.0	0	11.8	0	10.5	0	10.5	0	11.8
19	84.7	71.2	0	10.2	0	7.5	0	7.5	0	7.5	0	7.5
20	83.2	71.5	0	11.4	0	9.5	0	9.5	0	9.5	0	9.5
21	81.4	71.7	0	8.1	0	6.1	0	6.1	0	6.1	0	6.1
22	79.3	71.4	0	7.0	0	5.3	0	5.3	0	5.3	0	5.3
23	77.2	70.5	0	5.8	0	4.3	0	4.4	0	4.4	0	4.3
24	75.1	69.1	0	3.5	0	1.9	0	2.0	0	2.0	0	1.9

BUILDING COOL-HEAT DEMAND - ALTERNATIVE 1
BLDG M168, BASELINE

July			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	72.0	69.3	0	2.9	0	0.9	0	1.1	0	1.1	0	1.1
2	70.5	68.0	0	2.3	0	0.8	0	0.8	0	0.8	0	0.8
3	69.4	67.1	0	2.0	0	0.7	0	0.8	0	0.8	0	0.8
4	68.5	66.4	0	1.7	0	0.7	0	0.7	0	0.7	0	0.7
5	67.9	66.0	0	1.6	0	0.7	0	0.7	0	0.7	0	0.7
6	67.7	65.9	0	5.6	0	0.7	0	0.7	0	0.7	0	0.7
7	68.1	66.3	0	8.0	0	4.1	0	1.1	0	1.1	0	4.9
8	69.1	67.3	0	12.0	0	7.8	0	4.1	0	4.1	0	8.5
9	70.8	68.0	0	12.1	0	8.0	0	5.1	0	5.1	0	8.2
10	72.9	69.1	0	13.1	0	9.8	0	6.0	0	6.0	0	9.9
11	75.2	70.5	0	13.9	0	10.3	0	6.4	0	6.4	0	10.3
12	77.5	71.7	0	14.6	0	10.7	0	7.0	0	7.0	0	10.7
13	79.6	72.7	0	15.5	0	11.2	0	8.6	0	8.6	0	11.2
14	81.3	73.5	0	18.5	0	14.2	0	10.3	0	10.3	0	14.2
15	82.3	73.7	0	19.4	0	15.1	0	11.2	0	11.2	0	15.1
16	82.7	73.5	0	19.5	0	14.7	0	10.9	0	10.9	0	14.7
17	82.5	73.1	0	19.5	0	14.7	0	11.3	0	11.3	0	14.7
18	82.0	72.6	0	15.0	0	11.2	0	9.9	0	9.9	0	11.2
19	81.1	73.2	0	9.4	0	6.8	0	6.8	0	6.8	0	6.8
20	79.9	73.8	0	10.8	0	9.2	0	9.2	0	9.2	0	9.2
21	78.5	73.9	0	7.5	0	5.4	0	5.5	0	5.5	0	5.4
22	76.9	73.1	0	6.5	0	4.9	0	5.0	0	5.0	0	4.9
23	75.2	71.9	0	5.4	0	4.0	0	4.1	0	4.1	0	4.0
24	73.5	70.8	0	3.2	0	1.6	0	1.6	0	1.6	0	1.6

August			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	72.7	70.2	0	2.9	0	1.0	0	1.1	0	1.2	0	1.2
2	71.2	69.0	0	2.3	0	0.7	0	0.8	0	0.8	0	0.8
3	69.9	68.0	0	2.0	0	0.7	0	0.7	0	0.7	0	0.7
4	68.8	67.1	0	1.7	0	0.7	0	0.7	0	0.7	0	0.7
5	68.0	66.6	0	1.6	0	0.6	0	0.6	0	0.6	0	0.6
6	67.5	66.2	0	4.4	0	0.6	0	0.6	0	0.6	0	0.6
7	67.3	66.1	0	7.7	0	3.6	0	0.6	0	0.6	0	4.2
8	67.8	66.5	0	12.0	0	7.5	0	3.5	0	3.5	0	8.2
9	69.1	67.0	0	12.1	0	7.5	0	4.7	0	4.7	0	7.7
10	71.2	67.8	0	13.0	0	9.0	0	5.6	0	5.6	0	9.3
11	73.8	68.7	0	13.6	0	9.5	0	5.7	0	5.7	0	9.5
12	76.5	70.0	0	14.3	0	10.0	0	6.3	0	6.3	0	10.0
13	79.1	71.2	0	15.1	0	10.9	0	8.3	0	8.3	0	10.9
14	81.1	72.6	0	18.3	0	14.1	0	10.1	0	10.1	0	14.1
15	82.5	73.6	0	19.3	0	14.9	0	11.0	0	11.0	0	14.9
16	83.0	73.7	0	19.2	0	13.3	0	9.4	0	9.4	0	13.3
17	82.8	73.5	0	19.0	0	14.1	0	10.8	0	10.8	0	14.1
18	82.3	73.5	0	13.5	0	9.8	0	8.5	0	8.5	0	9.8
19	81.5	73.1	0	8.9	0	6.3	0	6.3	0	6.3	0	6.3
20	80.4	73.7	0	10.5	0	8.9	0	8.9	0	8.9	0	8.9
21	79.1	74.9	0	7.2	0	5.2	0	5.3	0	5.3	0	5.2
22	77.6	73.9	0	6.3	0	4.8	0	4.9	0	4.9	0	4.8
23	76.0	72.7	0	5.2	0	4.0	0	4.1	0	4.1	0	4.0
24	74.3	71.3	0	3.1	0	1.6	0	1.7	0	1.7	0	1.6

BUILDING COOL-HEAT DEMAND - ALTERNATIVE 1
BLDG M168, BASELINE

September			------ Design -----		----- Weekday -----		-----Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	69.8	66.1	0	1.6	0	0.5	0	0.6	0	0.6	0	0.6
2	68.0	64.5	0	1.0	0	0.5	0	0.5	0	0.5	0	0.5
3	66.3	63.0	0	1.0	0	0.5	0	0.5	0	0.5	0	0.5
4	64.9	61.9	0	0.9	0	0.4	0	0.5	0	0.5	0	0.5
5	63.9	61.3	0	0.9	0	0.4	0	0.5	0	0.5	0	0.5
6	63.2	61.0	0	1.7	0	0.4	0	0.4	0	0.4	0	0.4
7	63.0	60.8	0	5.6	0	0.3	0	0.3	0	0.3	0	0.3
8	63.4	61.4	0	10.0	0	3.4	0	0.3	0	0.3	0	3.8
9	64.7	61.8	0	10.4	0	6.0	0	0.3	0	0.3	0	6.3
10	66.6	62.1	0	11.0	0	6.4	0	1.7	0	1.7	0	6.4
11	69.1	62.9	0	11.5	0	7.6	0	3.9	0	3.9	0	7.7
12	71.8	63.7	0	12.4	0	8.1	0	4.4	0	4.4	0	8.1
13	74.5	65.5	0	13.7	0	8.5	0	5.9	0	5.9	0	8.5
14	77.0	67.1	0	16.9	0	11.4	0	7.8	0	7.8	0	11.5
15	78.9	68.2	0	17.3	0	11.6	0	7.9	0	7.9	0	11.7
16	80.2	68.6	0	17.0	0	11.3	0	7.5	0	7.5	0	11.3
17	80.6	68.5	0	15.8	0	11.1	0	8.1	0	8.1	0	11.4
18	80.4	68.9	0	10.2	0	7.2	0	5.8	0	5.8	0	7.2
19	79.7	70.0	0	7.5	0	4.9	0	4.9	0	4.9	0	4.9
20	78.7	71.2	0	8.8	0	7.1	0	7.1	0	7.1	0	7.2
21	77.3	71.6	0	5.8	0	4.2	0	4.2	0	4.2	0	4.2
22	75.6	70.5	0	5.0	0	3.8	0	3.8	0	3.8	0	3.8
23	73.7	69.4	0	4.1	0	3.1	0	3.1	0	3.1	0	3.1
24	71.8	67.7	0	1.8	0	0.6	0	0.6	0	0.6	0	0.6

October			------ Design -----		----- Weekday -----		-----Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	54.8	51.3	0	0.2	0	0.0	0	0.0	0	0.0	0	0.0
2	52.9	49.6	0	0.2	0	0.0	0	0.0	0	0.0	0	0.0
3	51.2	48.2	0	0.1	0	0.0	0	0.0	0	0.0	0	0.0
4	49.8	47.2	0	0.1	0	0.0	0	0.0	0	0.0	0	0.0
5	48.8	46.2	0	0.1	0	0.0	0	0.0	0	0.0	0	0.0
6	48.2	45.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
7	47.9	45.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
8	48.5	46.2	0	2.8	0	1.3	0	0.0	0	0.0	0	0.0
9	50.3	47.3	0	3.7	0	3.3	0	0.0	0	0.0	0	0.0
10	52.9	48.7	0	3.7	0	3.3	0	0.0	0	0.0	0	0.8
11	56.2	49.9	0	3.8	0	3.3	0	0.0	0	0.0	0	3.3
12	59.6	51.5	0	4.9	0	3.3	0	0.0	0	0.0	0	3.3
13	62.9	53.5	0	8.8	0	2.4	0	0.0	0	0.0	0	2.4
14	65.5	55.2	0	11.5	0	3.4	0	0.0	0	0.0	0	3.4
15	67.3	56.3	0	12.4	0	3.6	0	0.0	0	0.0	0	3.5
16	67.9	56.6	0	11.8	0	3.7	0	0.0	0	0.0	0	3.7
17	67.7	56.4	0	9.3	0	2.7	0	0.0	0	0.0	0	2.7
18	67.0	56.6	0	5.8	0	2.6	0	0.2	0	0.2	0	2.5
19	66.0	57.6	0	3.2	0	1.4	0	1.4	0	1.4	0	1.4
20	64.6	57.9	0	4.7	0	3.3	0	3.3	0	3.3	0	3.4
21	62.9	57.3	0	1.9	0	0.9	0	0.9	0	0.9	0	0.9
22	61.0	56.0	0	1.1	0	0.5	0	0.5	0	0.5	0	0.5
23	59.0	54.8	0	0.3	0	0.0	0	0.0	0	0.0	0	0.0
24	56.9	53.0	0	0.3	0	0.0	0	0.0	0	0.0	0	0.0

BUILDING COOL-HEAT DEMAND - ALTERNATIVE 1
BLDG M168, BASELINE

November			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	48.7	45.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2	46.9	44.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
3	45.5	42.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
4	44.6	41.9	0	0.0	0	0.0	0	0.0	-13,390	0.0	-13,390	0.0
5	44.4	42.0	0	0.0	0	0.0	-20,713	0.0	-50,031	0.0	-50,031	0.0
6	44.8	42.7	0	0.0	0	0.0	-42,319	0.0	-42,315	0.0	-23,464	0.0
7	45.9	43.9	0	0.0	0	0.0	-39,674	0.0	-39,673	0.0	-20,822	0.0
8	47.8	46.0	0	0.0	0	0.0	-15,942	0.0	-15,942	0.0	-7,564	0.0
9	50.2	48.0	0	0.0	0	0.0	-7,211	0.0	-7,211	0.0	-16,239	0.0
10	52.9	49.9	0	0.0	0	0.0	-6,221	0.0	-6,221	0.0	-8,966	0.0
11	55.8	51.1	0	0.0	0	0.0	-2,351	0.0	-2,351	0.0	-4,770	0.0
12	58.5	52.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
13	60.9	52.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
14	62.8	53.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
15	64.0	53.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
16	64.4	53.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
17	64.1	53.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
18	63.2	53.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
19	61.8	54.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
20	60.0	53.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
21	57.9	52.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
22	55.6	51.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
23	53.2	49.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
24	50.8	47.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0

December			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	37.5	35.3	0	0.0	0	0.0	-62,512	0.0	-62,512	0.0	-62,512	0.0
2	37.1	35.1	0	0.0	-5,725	0.0	-65,498	0.0	-65,498	0.0	-65,498	0.0
3	37.4	35.5	-13,649	0.0	-66,473	0.0	-66,476	0.0	-66,476	0.0	-66,476	0.0
4	38.1	36.2	-59,080	0.0	-66,562	0.0	-66,562	0.0	-66,562	0.0	-66,562	0.0
5	39.3	37.6	-60,097	0.0	-67,346	0.0	-67,346	0.0	-67,346	0.0	-67,346	0.0
6	40.9	39.2	-32,257	0.0	-37,294	0.0	-56,146	0.0	-56,146	0.0	-37,294	0.0
7	42.7	41.2	-31,810	0.0	-35,642	0.0	-54,492	0.0	-54,492	0.0	-35,642	0.0
8	44.7	43.1	-10,045	0.0	-24,420	0.0	-32,799	0.0	-32,799	0.0	-24,420	0.0
9	46.8	45.3	-8,265	0.0	-28,521	0.0	-19,494	0.0	-19,494	0.0	-28,521	0.0
10	48.8	47.0	0	0.0	-22,054	0.0	-19,309	0.0	-19,309	0.0	-22,054	0.0
11	50.7	48.1	0	0.0	-16,735	0.0	-14,315	0.0	-14,315	0.0	-16,735	0.0
12	52.2	48.8	0	0.0	-10,697	0.0	-8,278	0.0	-8,278	0.0	-10,697	0.0
13	53.4	49.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
14	54.1	49.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
15	54.4	48.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
16	54.0	48.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
17	53.0	47.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
18	51.4	46.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
19	49.3	45.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
20	47.0	43.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
21	44.5	41.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
22	42.2	39.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
23	40.1	37.6	0	0.0	-16,583	0.0	-11,782	0.0	-11,782	0.0	-16,583	0.0
24	38.5	36.2	0	0.0	-57,687	0.0	-57,687	0.0	-57,687	0.0	-57,687	0.0

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M168, BASELINE

---------- M O N T H L Y E N E R G Y C O N S U M P T I O N ----------

Month	ELEC On Peak (kWh)	DEMAND On Peak (kW)	GAS On Peak (Therm)	WATER (1000 Gl)	GAS DMND On Peak (Thrm/hr)
Jan	12,245	26	308	0	1
Feb	10,794	26	249	0	1
March	10,099	26	24	0	1
April	9,157	21	0	0	0
May	15,288	46	0	0	0
June	17,323	50	0	0	0
July	17,129	48	0	0	0
Aug	17,344	48	0	0	0
Sept	15,014	42	0	0	0
Oct	11,978	34	0	0	0
Nov	9,598	26	26	0	1
Dec	11,242	26	193	0	1
Total	157,212	50	801	1	1

Building Energy Consumption = 52,621 (Btu/Sq Ft/Year) Floor Area = 11,720 (Sq Ft)
Source Energy Consumption = 144,559 (Btu/Sq Ft/Year)

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M168, BASELINE

EQUIPMENT ENERGY CONSUMPTION

Ref Num	Equip Code	Monthly Consumption Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	3457	3125	3616	3320	3536	3479	3378	3616	3320	3536	3320	3378	41,081
	PK	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8
1	MISC LD													
	ELEC	2048	1851	2129	1969	2089	2050	2007	2129	1969	2089	1969	2007	24,305
	PK	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3
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
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	EQ1121S	AIR-CLD RECIP 20-35 TONS												
	ELEC	0	0	0	0	2733	4403	4150	4028	2783	830	0	0	18,926
	PK	0.0	0.0	0.0	0.0	19.6	22.3	20.6	20.4	17.2	10.1	0.0	0.0	22.3
1	EQ5200	CONDENSER FANS												
	ELEC	0	0	0	0	338	572	547	524	352	66	0	0	2,400
	PK	0.0	0.0	0.0	0.0	2.3	2.6	2.4	2.4	2.1	1.5	0.0	0.0	2.6
1	EQ5001	CHILLED WATER PUMP C.V.												
	ELEC	0	0	0	0	2405	2736	2827	2827	2523	1353	0	0	14,672
	PK	0.0	0.0	0.0	0.0	3.8	3.8	3.8	3.8	3.8	3.8	0.0	0.0	3.8
1	EQ5313	CONTROLS												
	ELEC	0	0	0	0	190	216	223	223	199	107	0	0	1,158
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3
1	EQ4371	FAN COIL SUPPLY FAN												
	ELEC	3085	2786	3085	2985	3085	2985	3085	3085	2985	3085	2985	3085	36,323
	PK	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M168, BASELINE

2	EQ4371			FAN COIL SUPPLY FAN									
	ELEC	912	824	912	883	912	883	912	912	883	912	883	912	10,737
	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
1	EQ2002			GAS FIRE TUBE STEAM									
	GAS	308	249	24	0	0	0	0	0	0	0	26	193	801
	PK	1.0	1.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.8	1.0
1	EQ5020			HEAT WATER CIRC. PUMP C.V.									
	ELEC	2337	1881	304	0	0	0	0	0	0	0	376	1585	6,483
	PK	3.8	3.8	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.8	3.8	3.8
1	EQ5240			BOILER FORCED DRAFT FAN									
	ELEC	94	76	12	0	0	0	0	0	0	0	15	64	261
	PK	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2
1	EQ5307			BOILER CONTROLS									
	ELEC	308	247	40	0	0	0	0	0	0	0	49	208	853
	PK	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5	0.5
1	EQ5061			CONDENSATE RETURN PUMP									
	ELEC	4	4	1	0	0	0	0	0	0	0	1	3	12
	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	1
	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

UTILITY PEAK CHECKSUMS - ALTERNATIVE 1
BLDG M168, BASELINE

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 49.8 (kW)
Yearly Time of Peak 17 (hr) 6 (mo)

Hour 17 Month 6

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Percnt Of Tot (%)
Cooling Equipment				
1	EQ1121S	AIR-CLD RECIP 20-35 TONS	28.4	56.93
Sub Total			28.4	56.93
Sub Total			0.0	0.00
Air Moving Equipment				
1		SUMMATION OF FAN ELECTRICAL DEMAND	4.1	8.32
2		SUMMATION OF FAN ELECTRICAL DEMAND	1.2	2.46
Sub Total			5.4	10.78
Sub Total			0.0	0.00
Miscellaneous				
Lights			9.3	18.73
Base Utilities			0.0	0.00
Misc Equipment			6.8	13.56
Sub Total			16.1	32.29
Grand Total			49.8	100.00

CALIFORNIA TITLE 24 COMPLIANCE - ALTERNATIVE 1
BLDG M168, BASELINE

CALIFORNIA TITLE 24 COMPLIANCE REPORT

Weather Name ..... ATLANTA.
Gross Conditioned Floor Area (sqft)..... 11,720
ACM Multiplier 1.025

E N E R G Y U S E S U M M A R Y

	ELEC (kWh/yr)	GAS (kBtu/yr)	WATER (1000 gal)	PERCENT OF TOTAL ENERGY (%)	TOTAL SOURCE ENERGY (kBtu/yr)	ADJUSTED UNIT SOURCE ENERGY (kBtu/yr-sf)
Primary Heating	1,126.4	80,139.6	1.4	13.6	95,891.8	8.4
Primary Cooling						
Compressor	18,925.8	0.0	0.0	10.5	193,800.3	16.9
Tower/Cond Fans	2,399.9	0.0	0.0	1.3	24,575.5	2.1
Condenser Pump	0.0	0.0	0.0	0.0	0.0	0.0
Other Accessories	1,158.3	0.0	0.0	0.6	11,861.0	1.0
Auxiliary						
Supply Fans	47,060.6	0.0	0.0	26.0	481,901.7	42.1
Circulation Pumps	21,154.6	0.0	0.0	11.7	216,623.5	18.9
Base Utilities	0.0	0.0	0.0	0.0	0.0	0.0
Subtotal	68,215.2	0.0	0.0	37.8	698,525.1	61.1
Lighting	41,081.3	0.0	0.0	22.7	420,673.0	35.9
Receptacle	24,305.2	0.0	0.0	13.5	248,886.3	21.2
Domestic Hot Water	0.0	0.0	0.0	0.0	0.0	0.0
Cogeneration	0.0	0.0	0.0	0.0	0.0	0.0
Totals	157,212.1	80,139.6	1.4	100.0	1,694,213.3	146.7

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M168, ECO#1

M O N T H L Y E N E R G Y C O N S U M P T I O N

Month	ELEC On Peak (kWh)	DEMAND On Peak (kW)	GAS On Peak (Therm)	WATER (1000 Gl)	GAS DMND On Peak (Thrm/hr)
Jan	12,194	27	140	0	1
Feb	10,921	27	111	0	1
March	9,742	21	0	0	0
April	9,157	21	0	0	0
May	15,986	43	0	0	0
June	17,324	45	0	0	0
July	17,226	44	0	0	0
Aug	17,579	44	0	0	0
Sept	15,696	40	0	0	0
Oct	12,939	33	0	0	0
Nov	9,157	21	0	0	0
Dec	10,311	24	44	0	1
Total	158,233	45	295	1	1

Building Energy Consumption = 48,596 (Btu/Sq Ft/Year) Floor Area = 11,720 (Sq Ft)
Source Energy Consumption = 140,902 (Btu/Sq Ft/Year)

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M168, ECO#1

EQUIPMENT ENERGY CONSUMPTION

Ref Num	Equip Code	Monthly Consumption Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	3457	3125	3616	3320	3536	3479	3378	3616	3320	3536	3320	3378	41,081
	PK	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8
1	MISC LD													
	ELEC	2048	1851	2129	1969	2089	2050	2007	2129	1969	2089	1969	2007	24,305
	PK	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3
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	EQ1121S	AIR-CLD RECIP 20-35 TONS												
	ELEC	0	0	0	0	2368	3660	3470	3468	2487	1047	0	0	16,500
	PK	0.0	0.0	0.0	0.0	15.0	16.9	15.7	15.7	13.6	8.2	0.0	0.0	16.9
1	EQ5200	CONDENSER FANS												
	ELEC	0	0	0	0	285	472	453	447	309	88	0	0	2,054
	PK	0.0	0.0	0.0	0.0	1.8	2.0	1.8	1.8	1.7	1.2	0.0	0.0	2.0
1	EQ5001	CHILLED WATER PUMP C.V.												
	ELEC	0	0	0	0	3500	3579	3699	3699	3530	2058	0	0	20,064
	PK	0.0	0.0	0.0	0.0	5.0	5.0	5.0	5.0	5.0	5.0	0.0	0.0	5.0
1	EQ5313	CONTROLS												
	ELEC	0	0	0	0	211	216	223	223	213	124	0	0	1,211
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3
1	EQ4371	FAN COIL SUPPLY FAN												
	ELEC	3085	2786	3085	2986	3085	2986	3085	3085	2986	3085	2986	3085	36,324
	PK	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M168, ECO#1

2	EQ4371			FAN COIL SUPPLY FAN									
	ELEC	912	824	912	883	912	883	912	912	883	912	883	912	10,738
	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
1	EQ2002			GAS FIRE TUBE STEAM									
	GAS	140	111	0	0	0	0	0	0	0	0	0	44	295
	PK	0.7	0.7	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.7
1	EQ5020			HEAT WATER CIRC. PUMP C.V.									
	ELEC	2391	2073	0	0	0	0	0	0	0	0	0	825	5,290
	PK	5.0	5.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.0	5.0
1	EQ5240			BOILER FORCED DRAFT FAN									
	ELEC	58	50	0	0	0	0	0	0	0	0	0	20	128
	PK	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
1	EQ5307			BOILER CONTROLS									
	ELEC	240	208	0	0	0	0	0	0	0	0	0	83	532
	PK	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5
1	EQ5061			CONDENSATE RETURN PUMP									
	ELEC	3	2	0	0	0	0	0	0	0	0	0	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	EQ5406			MAKE-UP WATER									
	WATER	0	0	0	0	0	0	0	0	0	0	0	0	1
	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

UTILITY PEAK CHECKSUMS - ALTERNATIVE 1
BLDG M168, ECO#1

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 44.9 (kW)
Yearly Time of Peak 17 (hr) 6 (mo)

Hour 17 Month 6

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Percnt Of Tot (%)
Cooling Equipment				
1	EQ1121S	AIR-CLD RECIP 20-35 TONS	23.4	52.14
Sub Total			23.4	52.14
Sub Total			0.0	0.00
Air Moving Equipment				
1		SUMMATION OF FAN ELECTRICAL DEMAND	4.1	9.24
2		SUMMATION OF FAN ELECTRICAL DEMAND	1.2	2.73
Sub Total			5.4	11.98
Sub Total			0.0	0.00
Miscellaneous				
Lights			9.3	20.81
Base Utilities			0.0	0.00
Misc Equipment			6.8	15.07
Sub Total			16.1	35.88
Grand Total			44.9	100.00

CALIFORNIA TITLE 24 COMPLIANCE - ALTERNATIVE 1
BLDG M168, ECO#1

CALIFORNIA TITLE 24 COMPLIANCE REPORT

Weather Name ..... ATLANTA.
Gross Conditioned Floor Area (sqft)..... 11,720
ACM Multiplier 1.025

E N E R G Y U S E S U M M A R Y

	ELEC (kWh/yr)	GAS (kBtu/yr)	WATER (1000 gal)	PERCENT OF TOTAL ENERGY (%)	TOTAL SOURCE ENERGY (kBtu/yr)	ADJUSTED UNIT SOURCE ENERGY (kBtu/yr-sf)
Primary Heating	666.2	29,493.0	0.7	5.6	37,867.6	3.3
Primary Cooling						
Compressor	16,499.9	0.0	0.0	9.9	168,958.9	14.8
Tower/Cond Fans	2,053.9	0.0	0.0	1.2	21,032.3	1.8
Condenser Pump	0.0	0.0	0.0	0.0	0.0	0.0
Other Accessories	1,210.8	0.0	0.0	0.7	12,398.6	1.1
Auxiliary						
Supply Fans	47,061.5	0.0	0.0	28.2	481,910.7	42.1
Circulation Pumps	25,353.9	0.0	0.0	15.2	259,624.4	22.7
Base Utilities	0.0	0.0	0.0	0.0	0.0	0.0
Subtotal	72,415.4	0.0	0.0	43.4	741,535.1	64.9
Lighting	41,081.3	0.0	0.0	24.6	420,673.0	35.9
Receptacle	24,305.2	0.0	0.0	14.6	248,886.3	21.2
Domestic Hot Water	0.0	0.0	0.0	0.0	0.0	0.0
Cogeneration	0.0	0.0	0.0	0.0	0.0	0.0
Totals	158,232.7	29,493.0	0.7	100.0	1,651,351.9	143.0

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M168, ECO#3

---------- M O N T H L Y E N E R G Y C O N S U M P T I O N ----------

Month	ELEC On Peak (kWh)	DEMAND On Peak (kW)	GAS On Peak (Therm)	WATER (1000 Gl)	GAS DMND On Peak (Thrm/hr)
Jan	12,965	27	306	0	1
Feb	11,373	27	247	0	1
March	10,192	27	24	0	1
April	9,157	21	0	0	0
May	16,056	47	0	0	0
June	18,159	51	0	0	0
July	17,993	50	0	0	0
Aug	18,208	49	0	0	0
Sept	15,792	44	0	0	0
Oct	12,404	35	0	0	0
Nov	9,714	27	26	0	1
Dec	11,730	27	192	0	1
Total	163,744	51	795	1	1

Building Energy Consumption = 54,464 (Btu/Sq Ft/Year)
Source Energy Consumption = 150,205 (Btu/Sq Ft/Year)

Floor Area = 11,720 (Sq Ft)

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M168, ECO#3

EQUIPMENT ENERGY CONSUMPTION

Ref Num	Equip Code	Monthly Consumption Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	3457	3125	3616	3320	3536	3479	3378	3616	3320	3536	3320	3378	41,081
	PK	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8
1	MISC LD													
	ELEC	2048	1851	2129	1969	2089	2050	2007	2129	1969	2089	1969	2007	24,305
	PK	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3
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
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	EQ1121S	AIR-CLD RECIP 20-35 TONS												
	ELEC	0	0	0	0	2737	4396	4143	4021	2783	838	0	0	18,918
	PK	0.0	0.0	0.0	0.0	19.5	22.3	20.6	20.4	17.2	10.1	0.0	0.0	22.3
1	EQ5200	CONDENSER FANS												
	ELEC	0	0	0	0	339	571	546	523	352	67	0	0	2,398
	PK	0.0	0.0	0.0	0.0	2.3	2.6	2.4	2.4	2.1	1.5	0.0	0.0	2.6
1	EQ5001	CHILLED WATER PUMP C.V.												
	ELEC	0	0	0	0	3167	3579	3699	3699	3301	1770	0	0	19,214
	PK	0.0	0.0	0.0	0.0	5.0	5.0	5.0	5.0	5.0	5.0	0.0	0.0	5.0
1	EQ5313	CONTROLS												
	ELEC	0	0	0	0	191	216	223	223	199	107	0	0	1,159
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3
1	EQ4371	FAN COIL SUPPLY FAN												
	ELEC	3085	2786	3085	2986	3085	2986	3085	3085	2986	3085	2986	3085	36,324
	PK	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M168, ECO#3

2	EQ4371			FAN COIL SUPPLY FAN										
	ELEC	912	824	912	883	912	883	912	912	883	912	883	912	10,738
	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
1	EQ2002			GAS FIRE TUBE STEAM										
	GAS	306	247	24	0	0	0	0	0	0	0	26	192	795
	PK	1.0	1.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.8	1.0
1	EQ5020			HEAT WATER CIRC. PUMP C.V.										
	ELEC	3057	2461	398	0	0	0	0	0	0	0	492	2073	8,481
	PK	5.0	5.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.0	5.0	5.0
1	EQ5240			BOILER FORCED DRAFT FAN										
	ELEC	93	75	12	0	0	0	0	0	0	0	15	63	259
	PK	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2
1	EQ5307			BOILER CONTROLS										
	ELEC	308	247	40	0	0	0	0	0	0	0	49	208	853
	PK	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5	0.5
1	EQ5061			CONDENSATE RETURN PUMP										
	ELEC	4	4	1	0	0	0	0	0	0	0	1	3	12
	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	1
	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

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

UTILITY PEAK CHECKSUMS - ALTERNATIVE 1
BLDG M168, ECO#3

---------- 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 50.9 (kW)
Yearly Time of Peak 17 (hr) 6 (mo)

Hour 17 Month 6

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Percnt Of Tot (%)
Cooling Equipment				
1	EQ1121S	AIR-CLD RECIP 20-35 TONS	29.4	57.84
Sub Total			29.4	57.84
Sub Total			0.0	0.00
Air Moving Equipment				
1		SUMMATION OF FAN ELECTRICAL DEMAND	4.1	8.14
2		SUMMATION OF FAN ELECTRICAL DEMAND	1.2	2.41
Sub Total			5.4	10.55
Sub Total			0.0	0.00
Miscellaneous				
Lights			9.3	18.33
Base Utilities			0.0	0.00
Misc Equipment			6.8	13.28
Sub Total			16.1	31.61
Grand Total			50.9	100.00

CALIFORNIA TITLE 24 COMPLIANCE - ALTERNATIVE 1
BLDG M168, ECO#3

CALIFORNIA TITLE 24 COMPLIANCE REPORT

Weather Name ..... ATLANTA.
Gross Conditioned Floor Area (sqft)..... 11,720
ACM Multiplier 1.025

E N E R G Y U S E S U M M A R Y

	ELEC (kWh/yr)	GAS (kBtu/yr)	WATER (1000 gal)	PERCENT OF TOTAL ENERGY (%)	TOTAL SOURCE ENERGY (kBtu/yr)	ADJUSTED UNIT SOURCE ENERGY (kBtu/yr-sf)
Primary Heating	1,124.5	79,451.9	1.3	13.0	95,148.2	8.3
Primary Cooling						
Compressor	18,918.1	0.0	0.0	10.1	193,721.9	16.9
Tower/Cond Fans	2,398.5	0.0	0.0	1.3	24,560.7	2.1
Condenser Pump	0.0	0.0	0.0	0.0	0.0	0.0
Other Accessories	1,159.5	0.0	0.0	0.6	11,873.3	1.0
Auxiliary						
Supply Fans	47,061.5	0.0	0.0	25.2	481,910.7	42.1
Circulation Pumps	27,695.4	0.0	0.0	14.8	283,601.4	24.8
Base Utilities	0.0	0.0	0.0	0.0	0.0	0.0
Subtotal	74,756.9	0.0	0.0	40.0	765,512.2	67.0
Lighting	41,081.3	0.0	0.0	22.0	420,673.0	35.9
Receptacle	24,305.2	0.0	0.0	13.0	248,886.3	21.2
Domestic Hot Water	0.0	0.0	0.0	0.0	0.0	0.0
Cogeneration	0.0	0.0	0.0	0.0	0.0	0.0
Totals	163,744.0	79,451.9	1.3	100.0	1,760,375.6	152.5

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M168, ECO#12

---------- M O N T H L Y E N E R G Y C O N S U M P T I O N ----------

Month	ELEC On Peak (kWh)	DEMAND On Peak (kW)	GAS On Peak (Therm)	WATER (1000 Gl)	GAS DMND On Peak (Thrm/hr)
Jan	11,033	26	251	0	1
Feb	9,771	26	199	0	1
March	9,400	26	10	0	1
April	8,569	21	0	0	0
May	13,012	43	0	0	0
June	14,984	48	0	0	0
July	14,674	47	0	0	0
Aug	14,909	46	0	0	0
Sept	12,548	41	0	0	0
Oct	9,862	33	0	0	0
Nov	8,782	26	8	0	0
Dec	10,408	26	148	0	1
Total	137,951	48	616	1	1

Building Energy Consumption = 45,432 (Btu/Sq Ft/Year) Floor Area = 11,720 (Sq Ft)
Source Energy Consumption = 126,067 (Btu/Sq Ft/Year)

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M168, ECO#12

EQUIPMENT ENERGY CONSUMPTION

Ref Num	Equip Code	Monthly Consumption Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	3457	3125	3616	3320	3536	3479	3378	3616	3320	3536	3320	3378	41,081
	PK	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8
1	MISC LD													
	ELEC	2048	1851	2129	1969	2089	2050	2007	2129	1969	2089	1969	2007	24,305
	PK	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3
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	EQ1121S	AIR-CLD RECIP 20-35 TONS												
	ELEC	0	0	0	0	1961	3507	3235	3109	1989	211	0	0	14,011
	PK	0.0	0.0	0.0	0.0	15.2	20.6	19.3	18.9	16.3	8.9	0.0	0.0	20.6
1	EQ5200	CONDENSER FANS												
	ELEC	0	0	0	0	254	458	432	410	260	19	0	0	1,833
	PK	0.0	0.0	0.0	0.0	1.9	2.3	2.2	2.2	2.0	1.3	0.0	0.0	2.3
1	EQ5001	CHILLED WATER PUMP C.V.												
	ELEC	0	0	0	0	1634	2022	2079	2060	1604	555	0	0	9,952
	PK	0.0	0.0	0.0	0.0	3.8	3.8	3.8	3.8	3.8	3.8	0.0	0.0	3.8
1	EQ5313	CONTROLS												
	ELEC	0	0	0	0	129	160	164	163	127	44	0	0	786
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3
1	EQ4371	FAN COIL SUPPLY FAN												
	ELEC	3085	2786	3085	2986	3085	2986	3085	3085	2986	3085	2986	3085	36,324
	PK	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M168, ECO#12

2	EQ4371			FAN COIL SUPPLY FAN									
	ELEC	309	279	338	294	324	324	294	338	294	324	294	294	3,707
	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
1	EQ2002			GAS FIRE TUBE STEAM									
	GAS	251	199	10	0	0	0	0	0	0	0	8	148	616
	PK	0.9	0.9	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.8	0.9
1	EQ5020			HEAT WATER CIRC. PUMP C.V.									
	ELEC	1820	1474	198	0	0	0	0	0	0	0	182	1402	5,077
	PK	3.8	3.8	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.8	3.8	3.8
1	EQ5240			BOILER FORCED DRAFT FAN									
	ELEC	71	57	8	0	0	0	0	0	0	0	7	55	197
	PK	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
1	EQ5307			BOILER CONTROLS									
	ELEC	240	194	26	0	0	0	0	0	0	0	24	184	668
	PK	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5	0.5
1	EQ5061			CONDENSATE RETURN PUMP									
	ELEC	3	3	0	0	0	0	0	0	0	0	0	3	9
	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	1
	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

UTILITY PEAK CHECKSUMS - ALTERNATIVE 1
BLDG M168, ECO#12

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 48.1 (kW)
Yearly Time of Peak 17 (hr) 6 (mo)

Hour 17 Month 6

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Percnt Of Tot (%)
Cooling Equipment				
1	EQ1121S	AIR-CLD RECIP 20-35 TONS	26.7	55.41
Sub Total			26.7	55.41
Sub Total			0.0	0.00
Air Moving Equipment				
1		SUMMATION OF FAN ELECTRICAL DEMAND	4.1	8.61
2		SUMMATION OF FAN ELECTRICAL DEMAND	1.2	2.55
Sub Total			5.4	11.16
Sub Total			0.0	0.00
Miscellaneous				
Lights			9.3	19.39
Base Utilities			0.0	0.00
Misc Equipment			6.8	14.04
Sub Total			16.1	33.43
Grand Total			48.1	100.00

CALIFORNIA TITLE 24 COMPLIANCE - ALTERNATIVE 1
BLDG M168, ECO#12

CALIFORNIA TITLE 24 COMPLIANCE REPORT

Weather Name ..... ATLANTA.
Gross Conditioned Floor Area (sqft)..... 11,720
ACM Multiplier 1.025

E N E R G Y U S E S U M M A R Y

	ELEC (kWh/yr)	GAS (kBtu/yr)	WATER (1000 gal)	PERCENT OF TOTAL ENERGY (%)	TOTAL SOURCE ENERGY (kBtu/yr)	ADJUSTED UNIT SOURCE ENERGY (kBtu/yr-sf)
Primary Heating	874.8	61,627.0	1.0	12.1	73,828.0	6.5
Primary Cooling						
Compressor	14,011.3	0.0	0.0	9.0	143,476.5	12.5
Tower/Cond Fans	1,833.0	0.0	0.0	1.2	18,769.6	1.6
Condenser Pump	0.0	0.0	0.0	0.0	0.0	0.0
Other Accessories	785.7	0.0	0.0	0.5	8,045.6	0.7
Auxiliary						
Supply Fans	40,030.5	0.0	0.0	25.7	409,913.2	35.9
Circulation Pumps	15,029.0	0.0	0.0	9.6	153,897.3	13.5
Base Utilities	0.0	0.0	0.0	0.0	0.0	0.0
Subtotal	55,059.5	0.0	0.0	35.3	563,810.4	49.3
Lighting	41,081.3	0.0	0.0	26.3	420,673.0	35.9
Receptacle	24,305.2	0.0	0.0	15.6	248,886.3	21.2
Domestic Hot Water	0.0	0.0	0.0	0.0	0.0	0.0
Cogeneration	0.0	0.0	0.0	0.0	0.0	0.0
Totals	137,950.7	61,627.0	1.0	100.0	1,477,489.4	127.8

BUILDING 171

E M C ENGINEERS, INC.

PROJECT: FORT McPHERSON & FORT GILLEM ESOS STUDY
LOCATION: FORT McPHERSON
ECO: Computer Simulation Summary

CLIENT CONTRACT NO: DACA21-91-C-0097
CLIENT PROJECT ENG: TERRY SEABROOK

EMC PROJECT: #3105.000
DATE: 15-APR-92
FILE: M171ECO.WK3
PREPARED BY: R. GERRANS
CHECKED BY:

Bldg: M171 **Area: 35,398 ft^2**

Run Description	Heating Gas Use (kBtu/yr)	Heating Electric Use (kWh/yr)	Cooling Electric Use (kWh/yr)	Fan Electric Use (kWh/yr)	Pump Electric Use (kWh/yr)	Lighting Electric Use (kWh/yr)	Recept. Electric Use (kWh/yr)	Total Electric Use (kWh/yr)	Peak Electric Demand (kW)	Total Gas Use (MBtu/yr)	Total Energy Use (Mbtu/yr)
Baseline	296,389	1,574	65,183	102,491	79,993	93,656	86,156	429,054	161	296	1,760
ECO#7	46,949	185	65,183	102,491	33,743	93,656	86,156	381,414	161	47	1,348
Savings/(Loss)	249,440	1,389	0	0	46,250	0	0	47,639	0	249	412
ECO#12	34,322	96	14,947	35,381	5,427	93,656	86,156	235,663	135	34	838
Savings/(Loss)	262,068	1,478	50,236	67,111	74,566	0	0	193,390	26	262	922
ECO#13	296,389	1,574	81,478	102,491	79,993	93,656	86,156	445,349	101	296	1,816
Savings/(Loss)	0	0	(16,296)	0	0	0	0	(16,296)	60	0	(56)
ECO#15	319,459	1,644	62,248	102,491	79,993	75,862	86,156	408,395	161	319	1,713
Savings/(Loss)	(23,070)	(69)	2,934	0	0	17,794	0	20,659	0	(23)	47

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB 3105 000
SHEET NO. 1 OF
CALCULATED BY RMA DATE 3/5/92
CHECKED BY DATE
SCALE

Computer Simulation - Bldg 171, Existing Run
Bldg. Type: Brick Hospital Area: 34,114
ECO: 12, 13
Take off bldg: 170

Assumptions:

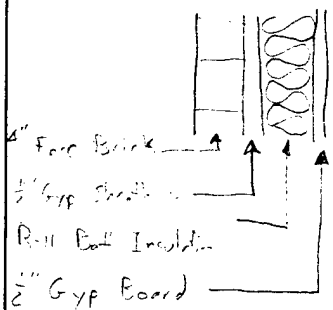
- Heating db = 72°F
- Cooling db = 76°F
- Basement walls framed w/ R-11 Insulation
- Occupancy: 1.5 people/room ⇒ 105 people
- Misc Equip: 3.0 Btu/ft²
- No infiltration due to Outside air fan coil units

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB 3105.000
SHEET NO. 2 OF
CALCULATED BY [illegible] DATE 3/5/92
CHECKED BY DATE
SCALE

Camp Sim - Bldg 171

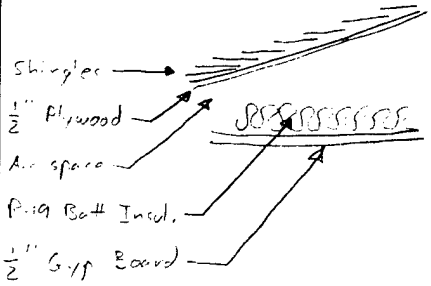
Wall U-Value - ASHRAE Table F 22.4



Material	R-Value
Outside Surface (15 mph)	0.17
4" Face Brick	1.24
½" Gyp	0.45
R-11 Insulation	11.0
½" Gyp	0.45
Inside Surface (still air)	0.68
	13.99

$$U = \frac{1}{R} = \frac{1}{13.99} = \boxed{0.071}$$

Roof U-Value ASHRAE Table F 22.4



Material	R-Value
Outside Surface (15 mph)	0.17
Shingles	0.44
½" Plywood	0.62
Air Space	1.24
R-19 Insulation	19.00
½" Gyp Board	0.45
Inside Surface (still Air)	0.62
	22.54

$$U = \frac{1}{22.54} = \boxed{0.044}$$

Window U-Value - ASHRAE Table F 27.13
- Double Pane, Al Frame, sliding
$\boxed{U = 0.70}$

Indoor Shading Coefficient - ASHRAE Table F 27.26
- Light Venetian blinds
$\Rightarrow \boxed{0.58}$

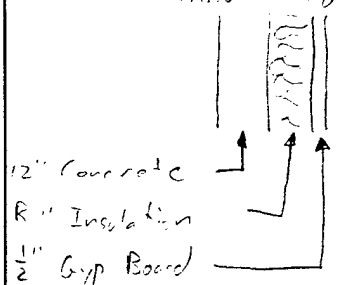
Comp Sim - Bldg 171

Slab Heat loss Coefficient - ASHRAE Table F 25.5

0.62

Basement Walls U-Value - ASHRAE Table F 22.4

- Assumed construction



Material	R-Value
Outside surface (15 mph)	0.17
12" Concrete	1.20
R-11 Insulation	11.0
½ Gyp Board	0.45
Inside Surface (still air)	0.68
	13.5

$U = \frac{1}{13.5} =$ 0.074

- Assume 5' height to account for both above + below surface

Basement Floor U-Value - ASHRAE Table F 25.4

- shorter width = 20 ft
- Depth below grade = 5 ft

U = 0.032

Lighting - from ECO #15

33,823 W

People

- Assume 1.5 people/room * 70 rooms = 105 people

Misc Equipment

- Assume 5.0 Btuh/ft²

Infl

- Assume none due to OA Fan coils

OA Ventilation

- 3950 cfm, from building drawings' mech. equip schedules

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • Germany

JOB _____

SHEET NO. _____ OF _____

CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____

SCALE _____

Computer Simulation — Bldg 171, McPherson

Baseline (cont'd)

Pumps:

CHW Pump: $\frac{(10\ HP)(0.746\ kW/HP)(0.85\ load)}{0.865\ eff} = 7.3\ kW * 4,380\ hr/yr = 32,108\ kWh/yr$

HW Pump: $\frac{(15\ HP)(0.746\ kW/HP)(0.85\ load)}{0.87\ eff} = 10.9\ kW * 4,380\ hr/yr = 47,885\ kWh/yr$

79,993 kWh/yr

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • Germany

JOB
SHEET NO. OF
CALCULATED BY DATE
CHECKED BY DATE
SCALE

Computer Simulation Bldg 171, McPherson

ECO #7 - Pump Controls

HW Circulation Pump:
- Add time clock: on 06:00 - 18:00 M-F, off otherwise
- cycle with load

DHW Pumps:
- off as per survey, should have no savings

Electric Savings

Total Electric Savings = 47,639 kWh/yr

Demand Savings

Peak Demand Savings = 0 kW

Gas Savings

Total Gas Savings = 249 MBtu/yr

RATIO SAVINGS TO BLDG 170

$47{,}639 \text{ KWH} \times \frac{30{,}205 \text{ sq ft}}{34{,}114} = 42{,}180 \text{ KWH}$

$0 \text{ kW} \times 0 = 0$

$249 \text{ MBTU} \times \frac{30{,}205}{34{,}114} = 220 \text{ MBTU}$

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____

SHEET NO. _____ OF _____

CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____

SCALE _____

Computer Simulation - Bldg 171, McPherson

ECO #12 - HVAC Controls

- Reset T.stat setpoints: 70 F - heating 78 F - cooling
- Add timeclock + cycle switch used for pump
- Setback thermostats
- Turn off fans at night - assume 5 AHUs all

Electric Savings:

Total Electric Savings = 193,390 kWh/yr

Demand Savings

Peak Demand Savings = 26 kW/yr

Gas Savings

Total Gas Savings = 262 MBtu/yr

Fan + Pump schedule

On 06:00 - 18:00 M-F, off otherwise

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____
SHEET NO. _____ OF _____
CALCULATED BY _____ DATE _____
CHECKED BY _____ DATE _____
SCALE _____

Computer Simulation - Bldg 17 McPherson

ECO #13 - Thermal Storage

Charge Tank: 00:00 - 06:00 M-Sun
Discharge Tank: 12:00 - 15:00 M-Sun
Tank capacity: 247.5 Ton-Hr - from Trace output for August design
Chiller capacity: 41.25 Tons - Use 45 Ton

Demand Savings

Existing chiller kw/ton = 1.064 kw/ton
Peak capacity (Avg) = 56.1 Tons
Demand Savings = 56.1 * 1.064 = 59.7 = **60** kw

Electric Loss

Additional Electric = **16,296** kwh/yr

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • Germany

JOB ______

SHEET NO. ______ OF ______

CALCULATED BY ______ DATE ______

CHECKED BY ______ DATE ______

SCALE ______

[illegible] Bldg [illegible] Mc[illegible]

[illegible]

[illegible] = 3?,?2? W

[illegible] 5,?2? W

27,3?7 W

[illegible]

[illegible]

= [illegible] 2,35? kWh/yr

Cooling Factor = 0.?5 [illegible]

[illegible]

[illegible] MBtu/yr

[illegible] = [illegible] MBtu/[illegible]

01 Card - Job Information

Project: FT MCPHERSON & FT GILLEM EEAP
Location: FT MCPHERSON, BLDG 171
Program User: R. GERRANS

-----CARD 08-- Climatic Information

Weather Code	Summer Clearness Number	Winter Clearness Number	Summer Design Dry Bulb	Summer Design Wet Bulb	Winter Design Dry Bulb	Building Orientation	Summer Ground Reflect	Winter Ground Reflect
ATLANTA								

-----CARD 09-- Load Simulation Periods

1st Month Cooling Simulation	Last Month Cooling Simulation	Peak Cooling Load Hr	1st Month Summer Period	Last Month Summer Period	1st Month Daylight Savings	Last Month Daylight Savings
MAY	OCT					

---------- Load Section Alternative #1 ----------

---- Load Alternative ----

Number	Description
1	BLDG M171, BASELINE

-----CARD 20-- General Room Parameters

Room Number	Zone Reference Number	Room Descrip	Floor Length	Floor Width	Const Type	Plenum Height	Acoustic Ceiling Resistance	Floor to Floor Height	Duplicate Floors Multiplier	Duplicate Rooms per Zone	Perimeter Depth
1	1	2 FLOORS + BASEM	35398	1		4		12			

-----CARD 21-- Thermostat Parameters

Room Number	Cooling Room Design DB	Room Design RH	Cooling T'stat Driftpoint	Cooling T'stat Schedule CLG	Heating Room Design DB	Heating T'stat Driftpoint	Heating T'stat Schedule HTG	T'stat Location Flag	Mass / No. Hrs Average	Carpet On Floor
1	76				72					

-----CARD 22-- Roof Parameters ----------

Room Number	Roof Number	Roof Equal to Floor?	Roof Length	Roof Width	Roof U-Value	Const Type	Roof Direction	Roof Tilt	Roof Alpha
1	1	NO	16760	1	.044	38			

-----CARD 24-- Wall Parameters ----------

Room Number	Wall Number	Wall Length	Wall Height	Wall U-Value	Wall Constuc Type	Wall Direction	Wall Tilt	Wall Alpha	Ground Reflectance Multiplier
M	1		24	.071	76				
1	1	38				180			
1	2	131				90			
1	3	41				0			
1	4	203				0			
1	5	90				90			
1	6	216				180			
1	7	238				270			
M1	1		6	.074	65				
1	8	102				0			
1	9	80				90			
1	10	135				180			
1	11	141				270			

-----CARD 25-- Wall/Glass Parameters ----------

Room Number	Wall Number	Glass Length	Glass Width	Pct Glass or No. of Windows	Glass U-Value	Shading Coefficient	External Shading Type	Internal Shading Type	Percent Solar to Ret. Air	Visible Transmittance	Inside Visible Reflectance
M	1			1	.7	.58					
1	1	7	41				3				
1	2	8.5	62.8				4				
1	3	8.5	23.7				4				
1	4	7	157.5								
1	5	7	65.5								
1	6	7	100.7								
1	7	7	152.5								
1	8	2.5	12.9								
1	9	2.5	22.1								
1	10	2.5	9.5								
1	11										

-----CARD 26-- Schedules ----------

Room Number	People	Lights	Ventilation	Infiltration	Reheat Minimum	Cooling Fans	Heating Fan	Auxiliary Fan	Room Exhaust	Daylighting Controls
1	ADMPPL	ADMLGTEQ	AVAIL	OFF		AVAIL				

-----CARD 27-- People and Lights ----------

Room Number	People Value	People Units	People Sensible	People Latent	Lighting Value	Lighting Units	Lighting Fixture Type	Ballast Factor	Percent Lights to Ret. Air	--- Daylighting ---- Reference Point 1	Reference Point 2
1	105	PEOPLE	250	200	33823	WATTS					

-----CARD 28--- Miscellaneous Equipment ----------

Room Number	Misc Equipment Number	Equipment Descrip	Energy Consump Value	Energy Consump Units	Schedule Code	Energy Meter Code	Percent of Load Sensible	Percent Misc. Load to Room	Percent Misc. Sens to Ret. Air	Radiant Fraction	Optional Air Path
1	1	MISC EQUIP	3	BTUH-SF	ADMLGTEQ	ELEC					

-----CARD 29--- Room Airflows ----------

Room Number	Ventilation-----Cooling----- Value	Units	Ventilation-----Heating----- Value	Units	Infiltration-----Cooling----- Value	Units	Infiltration-----Heating----- Value	Units	--Reheat Minimum-- Value	Units
1	3950	CFM	3950	CFM						

-----CARD 32-- Exposed Floor Parameters----------

Room Number	Exposed Floor Number	-----Slab------ Perimeter Length	Loss Coefficient	-----------Exposed Floor----------- Floor Area	Floor U-Value	Const Type	Temp Flag	Cooling Temp	Heating Temp	Adjacent Room No
1	1	499	.62							
1	2	458	.032							

-----CARD 33-- External Shading ----------

Shading Type	---------OVERHANG--------- Glass Height	Height Above Glass	Projection Out	----------VERTICAL FINS---------- Glass Width	Projection Left	Left Projection Out	Projection Right	Right Projection Out	Adjacent Building Flag
3	7	1	10						
4	8.5	1	10						

---------- System Section Alternative #1 ----------

-----CARD 39-- System Alternative -----

Number	Description
1	BLDG M171, BASELINE

-----CARD 40--- System Type ----------

System Set Number	System Type	Ventil Deck Location	Cooling SADBVh	Heating SADBVh	Cooling Schedule	Heating Schedule	Fan Static Pressure
		----------OPTIONAL VENTILATION SYSTEM----------					
1	FC						

-----CARD 41-- Zone Assignment ----------

System Set Number	Ref #1 Begin	Ref #1 End	Ref #2 Begin	Ref #2 End	Ref #3 Begin	Ref #3 End	Ref #4 Begin	Ref #4 End	Ref #5 Begin	Ref #5 End	Ref #6 Begin	Ref #6 End
1	1	1										

-----CARD 42--- Fan SP and Duct Parameters----------

System Set Number	Cool Fan SP	Heat Fan SP	Return Fan SP	Mn Exh Fan SP	Aux Fan SP	Rm Exh Fan SP	Cool Fan Mtr Loc	Return Fan Mtr Loc	Supply Duct Ht Gn	Supply Duct Loc	Return Air Path
1	2						RETAIR			OTHER	ROOMDK

-----CARD 45--- Equipment Schedules ----------

System Set Number	Main Cooling Coil	Economizer	Direct Evap Coil	Indirect Evap Coil	Auxiliary Cooling Coil	Main Heating Coil	Main Preheat Coil	Reheat Coil	Mech. Humidity	Auxiliary Heating Coil
1	CLGC					HTGC				

---------- Equipment Section Alternative #1 ----------

-----CARD 59-- Equipment Description / TOD Schedules ----------

Alternative Number	Elec Consump Time of Day Schedule	Elec Demand Time of Day Schedule	Demand Limit Max KW	Alternative Description
1				BLDG M171, BASELINE

-----CARD 60--- Cooling Load Assignment----------

Load Asgn Ref	All Coil Cooling Loads To Cool Ref	Cooling Equipment Sizing	-Group 1- Begin End	-Group 2- Begin End	-Group 3- Begin End	-Group 4- Begin End	-Group 5- Begin End	-Group 6- Begin End	-Group 7- Begin End	-Group 8- Begin End	-Group 9- Begin End
1	1	BLKPLANT	1 1								

-----CARD 62-- Cooling Equipment Parameters ----------

Cool Equip Ref Num	Equip Code Name	Num Of Units	----------COOLING---------- --Capacity-- Value	Units	----Energy---- Value	Units	---------HEAT RECOVERY---------- --Capacity-- Value	Units	----Energy---- Value	Units	Seq Order Num	Seq Type	Demand Limit Number
1	EQ1122L	1	75	TONS									

-----CARD 63-- Cooling Pumps and References ----------

Cool Ref Num	---CHILLED WATER---- Full Load Value	Full Load Units	-----CONDENSER------ Full Load Value	Full Load Units	---HT REC or AUX---- Full Load Value	Full Load Units	Switch-over Control	Cold Storage	Cooling Tower	Misc. Access.
1	7.3	KW								

-----CARD 65-- Heating Load Assignment ----------

Load Assignment Reference	All Coil Loads To Heating Ref	-Group 1- Begin	End	-Group 2- Begin End	-Group 3- Begin End	-Group 4- Begin End	-Group 5- Begin End	-Group 6- Begin End	-Group 7- Begin End	-Group 8- Begin End	-Group 9- Begin End
1	1	1	1								

-----CARD 67-- Heating Equipment Parameters ----------

Heat Ref Number	Equip Code Name	Number Of Units	HW Pmp Full Ld Value	Units	Cap'y Value	Units	Energy Rate Value	Units	Seq Order Number	Switch over Control	Hot Strg	Misc. Acc.	Cogen	Demand Limit Number
1	EQ2004	1	10.9	KW										

-----CARD 69-- Fan Equipment Parameters ----------

System Set Number	Cooling Fan	Heating Fan	Return Fan	Exhaust Fan	Auxiliary Supply	Room Exhaust	Optional Ventilation
1	EQ4371						

Utility Description Reference Table

Schedules:
ADMLGTEQ ADMIN LIGHTING AND EQUIPMENT
ADMPPL ADMIN PEOPLE SCHEDULE
AVAIL AVAILABLE (100%)
CLG COOLING TSTAT SCHEDULE
CLGC COOLING COIL SCHEDULE
HTG HEATING TSTAT SCHEDULE
HTGC HEATING COIL SCHEDULE
OFF ALWAYS OFF
System:
FC FAN COIL
Equipment:
Cooling:
EQ1122L AIR-CLD RECIP >55 TONS
Heating:
EQ2004 GAS WATER TUBE STEAM
Fan:
EQ4371 FAN COIL SUPPLY FAN

Schedule Name: ADMLGTEQ
Project: ADMIN LIGHTING AND EQUIPMENT SC
Location:
Client:
Program User:
Comments: OFFICE LIGHTING

Starting Month: JAN Ending Month: DEC
Starting Day Type: DSGN Ending Day Type: WKDY

Hour	Util Percent
0	5
7	80
8	100
12	80
13	100
16	80
17	40
18	5
24	

Starting Month: JAN Ending Month: DEC
Starting Day Type: SAT Ending Day Type: SUN

Hour	Util Percent
0	5
24	

Schedule Name: ADMPPL
Project: ADMIN PEOPLE SCHEDULE
Location:
Client:
Program User: D JONES
Comments: OFFICE PEOPLE SCHEDULE

Starting Month: JAN Ending Month: DEC
Starting Day Type: DSGN Ending Day Type: WKDY

Hour	Util Percent
0	0
7	50
8	100
11	80
12	40
13	80
14	100
16	70
17	30
18	0
24	

Starting Month: JAN Ending Month: DEC
Starting Day Type: SAT Ending Day Type: SUN

Hour	Util Percent
0	0
24	

Schedule Name: AVAIL
Project: AVAILABLE (100)
Location:
Client:
Program User:
Comments:

Starting Month: JAN Ending Month: HTG
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	100
24	

Schedule Name: CLG
Project: COOLING TSTAT SCHEDULE
Location:
Client:
Program User:
Comments:

Starting Month: JAN Ending Month: DEC
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Temperature
0	76
24	

Schedule Name: CLGC
Project: COOLING COIL SCHEDULE
Location:
Client:
Program User: R. GERRANS
Comments:

Starting Month: JAN Ending Month: APR
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	0
24	

Starting Month: MAY Ending Month: OCT
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	100
24	

Starting Month: NOV Ending Month: HTG
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	0
24	

Schedule Name: HTG
Project: HEATING TSTAT SCHEDULE
Location:
Client:
Program User:
Comments:

Starting Month: JAN Ending Month: DEC
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Temperature
0	72
24	

Schedule Name: HTGC
Project: HEATING COIL SCHEDULE
Location:
Client:
Program User: R. GERRANS
Comments:

Starting Month: JAN Ending Month: APR
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	100
24	

Starting Month: MAY Ending Month: OCT
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	0
24	

Starting Month: NOV Ending Month: HTG
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	100
24	

Schedule Name: OFF
Project: ALWAYS OFF
Location:
Client:
Program User:
Comments:

Starting Month: JAN Ending Month: HTG
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	0
24	

****
****
**
** TRACE 600 ANALYSIS **
**
** by **
**
****
****

FT MCPHERSON & FT GILLEM EEAP
FT MCPHERSON, BLDG 171

R. GERRANS

Weather File Code:	ATLANTA.	
Location:	ATLANTA, GEORGIA	
Latitude:	33.0	(deg)
Longitude:	84.0	(deg)
Time Zone:	6	
Elevation:	1,005	(ft)
Barometric Pressure:	28.8	(in. Hg)
Summer Clearness Number:	0.90	
Winter Clearness Number:	0.90	
Summer Design Dry Bulb:	92	(F)
Summer Design Wet Bulb:	74	(F)
Winter Design Dry Bulb:	22	(F)
Summer Ground Relectance:	0.20	
Winter Ground Relectance:	0.20	
Air Density:	0.0731	(Lbm/cuft)
Air Specific Heat:	0.2444	(Btu/lbm/F)
Density-Specific Heat Prod:	1.0727	(Btu-min./hr/cuft/F)
Latent Heat Factor:	4,721.8	(Btu-min./hr/cuft)
Enthalpy Factor:	4.3883	(Lb-min./hr/cuft)

Design Simulation Period: May To October
System Simulation Period: January To December
Cooling Load Methodology: TETD/Time Averaging

Time/Date Program was Run: 9:33:34 4/ 8/92
Dataset Name: M171-B .TM

AIRFLOW - ALTERNATIVE 1
BLDG M171, BASELINE

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

System Number	System Type	Main: Outside Airflow (Cfm)	Main: Cooling Airflow (Cfm)	Main: Heating Airflow (Cfm)	Main: Return Airflow (Cfm)	Main: Exhaust Airflow (Cfm)	Auxil. Supply Airflow (Cfm)	Room Exhaust Airflow (Cfm)
1	FC	3,950	37,025	37,025	37,025	3,950	0	0
Totals		3,950	37,025	37,025	37,025	3,950	0	0

CAPACITY - ALTERNATIVE 1
BLDG M171, BASELINE

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

System Number	System Type	Cooling: Main Sys. Capacity (Tons)	Cooling: Aux. Sys. Capacity (Tons)	Cooling: Opt. Vent Capacity (Tons)	Cooling Totals (Tons)	Heating: Main Sys. Capacity (Btuh)	Heating: Aux. Sys. Capacity (Btuh)	Heating: Preheat Capacity (Btuh)	Heating: Reheat Capacity (Btuh)	Heating: Humidif. Capacity (Btuh)	Heating: Opt. Vent Capacity (Btuh)	Heating Totals (Btuh)
1	FC	67.6	0.0	0.0	67.6	-460,338	0	0	0	0	0	-460,338
Totals		67.6	0.0	0.0	67.6	-460,338	0	0	0	0	0	-460,338

The building peaked at hour 15 month 8 with a capacity of 67.6 tons

ENGINEERING CHECKS - ALTERNATIVE 1
BLDG M171, BASELINE

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: Cfm/ Sq Ft	Cooling: Cfm/ Ton	Cooling: Sq Ft /Ton	Cooling: Btuh/ Sq Ft	Heating: Cfm/ Sq Ft	Heating: Btuh/ Sq Ft	Floor Area Sq Ft
1	Main	FC	10.67	1.05	547.8	523.7	22.91	1.05	-13.00	35,398

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

System 1 Block FC - FAN COIL

********** COOLING COIL PEAK **********						* CLG SPACE PEAK **********			* HEATING COIL PEAK ********		
Peaked at Time ==>	Mo/Hr: 8/15					* Mo/Hr: 6/16			* Mo/Hr: 13/ 1		
Outside Air ==>	OADB/WB/HR: 92/ 74/105.0					* OADB: 96			* OADB: 22		
	Space Sens.+Lat. (Btuh)	Ret. Air Sensible (Btuh)	Ret. Air Latent (Btuh)	Net Total (Btuh)	Percnt Of Tot (%)	* Space Sensible (Btuh)	Percnt Of Tot (%)	*	Space Peak Space Sens (Btuh)	Coil Peak Tot Sens (Btuh)	Percnt 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	50,364		50,364	6.21	* 0	0.00	*	0	-32,913	7.15
Glass Solar	183,490	0		183,490	22.62	* 183,490	30.79	*	0	0	0.00
Glass Cond	51,064	0		51,064	6.30	* 61,402	10.30	*	-166,349	-166,349	36.14
Wall Cond	27,035	14,741		41,776	5.15	* 29,928	5.02	*	-45,209	-72,514	15.75
Partition	0			0	0.00	* 0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	* 0	0.00	*	-16,202	-16,202	3.52
Infiltration	0			0	0.00	* 0	0.00	*	0	0	0.00
Sub Total==>	261,588	65,105		326,694	40.28	* 274,820	46.12	*	-227,760	-287,978	62.56
Internal Loads						*		*			
Lights	115,438	0		115,438	14.23	* 115,438	19.37	*	0	0	0.00
People	47,250			47,250	5.83	* 26,250	4.40	*	0	0	0.00
Misc	106,194	0	0	106,194	13.09	* 106,194	17.82	*	0	0	0.00
Sub Total==>	268,882	0	0	268,882	33.15	* 247,882	41.60	*	0	0	0.00
Ceiling Load	65,105	-65,105		0	0.00	* 73,238	12.29	*	-60,218	0	0.00
Outside Air	0	0	0	162,829	20.08	* 0	0.00	*	0	-211,854	46.02
Sup. Fan Heat				39,493	4.87	*	0.00	*		39,493	-8.58
Ret. Fan Heat		13,164		13,164	1.62	*	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==>	595,576	13,164	0	811,063	100.00	* 595,940	100.00	*	-287,978	-460,338	10

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

	Total Capacity (Tons)	Capacity (Mbh)	Sens Cap. (Mbh)	Coil Airfl (cfm)	Entering DB/WB/HR Deg F	Deg F	Grains	Leaving DB/WB/HR Deg F	Deg F	Grains
Main Clg	67.6	811.1	696.3	37,025	78.0	64.6	73.6	60.2	57.5	69.4
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
0										
Totals	67.6	811.1								

----------AREAS----------

	Gross Total	Glass (sf)	(%)
Floor	35,398		
Part	0		
ExFlr	10,126		
Roof	16,760		0
Wall	25,716	4,475	17

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

	Capacity (Mbh)	Coil Airfl (cfm)	Ent Deg F	Lvg Deg F
Main Htg	-460.3	37,025	67.7	79.3
Aux Htg	0.0	0	0.0	0.0
Preheat	-0.0	37,025	67.7	61.0
Reheat	0.0	0	0.0	0.0
Humidif	0.0	0	0.0	0.0
Opt Vent	0.0	0	0.0	0.0
Total	-460.3			

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

Type	Cooling	Heating
Vent	3,950	3,950
Infil	0	0
Supply	37,025	37,025
Mincfm	0	0
Return	37,025	37,025
Exhaust	3,950	3,950
Rm Exh	0	0
Auxil	0	0

--ENGINEERING CHECKS--

Clg % OA	10.7
Clg Cfm/Sqft	1.05
Clg Cfm/Ton	547.80
Clg Sqft/Ton	523.73
Clg Btuh/Sqft	22.91
No. People	105
Htg % OA	10.7
Htg Cfm/SqFt	1.05
Htg Btuh/SqFt	-13.00

--TEMPERATURES (F)--

Type	Clg	Htg
SADB	61.0	79.3
Plenum	81.8	66.6
Return	76.0	72.0
Ret/OA	77.7	66.7
Runarnd	76.0	72.0
Fn MtrTD	0.3	0.0
Fn BldTD	0.2	0.0
Fn Frict	0.7	0.0

COOLING LOADS AT COIL PEAK - ALTERNATIVE 1
BLDG M171, BASELINE

AIRFLOW COOLING LOADS
(At time of Coil Peak)

Room Number	Description	Ventilation Airflow (Cfm)	Ventilation Sensible (Btuh)	Ventilation Latent (Btuh)	Optional Ventilation Airflow (Cfm)	Optional Ventilation Sensible (Btuh)	Optional Ventilation Latent (Btuh)	Bypass Airflow (Cfm)	Bypass Sensible (Btuh)	Bypass Latent (Btuh)	Ov/Undr Sizing (Btuh)
1	2 FLOORS + BASEM	3,950	69,064	93,765	0	0	0	0	0	0	0
Zone	1 Total/Ave.	3,950	69,064	93,765	0	0	0	0	0	0	0
Zone	1 Block	3,950	69,064	93,765	0	0	0	0	0	0	0
System	1 Total/Ave.	3,950	69,064	93,765	0	0	0	0	0	0	0
System	1 Block	3,950	69,064	93,765	0	0	0	0	0	0	0

HEATING LOADS AT COIL PEAK - ALTERNATIVE 1
BLDG M171, BASELINE

AIRFLOW HEATING LOADS
(At time of Coil Peak)

Room Number	Description	Ventilation Airflow (Cfm)	Ventilation Sensible (Btuh)	Op. Vent. Airflow (Cfm)	Op. Vent. Sensible (Btuh)	Reheat Airflow (Cfm)	Reheat Sensible (Btuh)	Humidif. Airflow (Cfm)	Humidif. Latent (Btuh)	Total (Btuh)
1	2 FLOORS + BASEM	3,950	-211,854	0	0	0	0	0	0	-211,854
Zone	1 Total/Ave.	3,950	-211,854	0	0	0	0	0	0	-211,854
Zone	1 Block	3,950	-211,854	0	0	0	0	0	0	-211,854
System	1 Total/Ave.	3,950	-211,854	0	0	0	0	0	0	-211,854
System	1 Block	3,950	-211,854	0	0	0	0	0	0	-211,854

COOLING AIRFLOW HEAT GAIN/LOSS - ALTERNATIVE 1
BLDG M171, BASELINE

AIRFLOW HEAT GAIN AND LOSS
(At time of Coil Peak)

Room Number	Description	Cooling: Duct Heat Pickup (Btuh)	Supply Fan Heat (Btuh)	Return Fan Heat (Btuh)	System Exhaust Heat Loss (Btuh)	Total (Btuh)	System Exhaust Airflow (Cfm)	Room Exhaust Airflow (Cfm)	Ducted Airflow (Cfm)	Plenum Airflow (Cfm)	Run Around Airflow (Cfm)	Corridr Airflow (Cfm)	System Return Airflow (Cfm)
1	2 FLOORS + BASEM	0	39,493	13,164	0	52,658	3,950	0	0	0	0	0	37,025
Zone 1	Total/Ave.	0	39,493	13,164	0	52,658	3,950	0	0	0	0	0	37,025
Zone 1	Block	0	39,493	13,164	0	52,658	3,950	0	0	0	0	0	37,025
System 1	Total/Ave.	0	39,493	13,164	0	52,658	3,950	0	0	0	0	0	37,025
System 1	Block	0	39,493	13,164	0	52,658	3,950	0	0	0	0	0	37,025

HEATING AIRFLOW HEAT GAIN/LOSS - ALTERNATIVE 1
BLDG M171, BASELINE

AIRFLOW HEAT GAIN AND LOSS
(At time of Coil Peak)

Room Number	Description	Heating: Supply Fan Heat (Btuh)	Return Fan Heat (Btuh)	System Exhaust Heat Loss (Btuh)	Total (Btuh)	System Exhaust Airflow (Cfm)	Room Exhaust Airflow (Cfm)	Ducted Airflow (Cfm)	Plenum Airflow (Cfm)	Run Around Airflow (Cfm)	Corridr Airflow (Cfm)	System Return Airflow (Cfm)
1	2 FLOORS + BASEM	39,493	0	0	39,493	3,950	0	0	0	0	0	37,025
Zone 1	Total/Ave.	39,493	0	0	39,493	3,950	0	0	0	0	0	37,025
Zone 1	Block	39,493	0	0	39,493	3,950	0	0	0	0	0	37,025
System 1	Total/Ave.	39,493	0	0	39,493	3,950	0	0	0	0	0	37,025
System 1	Block	39,493	0	0	39,493	3,950	0	0	0	0	0	37,025

ROOM PSYCHROMETRICS - ALTERNATIVE 1
BLDG M171, BASELINE

---------- P S Y C H R O M E T R I C S T A T E P O I N T S ----------

Room 1

	Dry Bulb (F)	Wet Bulb (F)	Relat. Humid. (%)	Humid. Ratio (GR)	Enthalpy (Btu/Lb)	Temp. Diff. (F)
Space	76.0	63.2	50.0	69.8	29.2	
Main System						
Return Air Heat Pickup						-0.3
Return Fan						0.3
Return Air	76.0	63.2	50.0	69.8	29.2	
Outdoor Air	92.3	74.4	44.2	105.0	38.7	
Return/Outdoor Air Mix	77.7	64.5	49.7	73.6	30.2	
Blow through Fan						0.2
Entering Coil	78.0	64.6	49.3	73.6	30.2	
Leaving Coil	60.2	57.5	85.5	69.4	25.2	
Draw Through Fan						0.0
Duct Frictional Heat						0.7
Supply Duct Heat Gain						0.0
Cold Deck Supply Air	61.0	57.8	83.2	69.4	25.4	
Supply Air	61.0	57.8	83.2	69.4	25.4	

Percent Outside Air	10.67	(%)
Sensible Heat Ratio (SHR)	0.966	
Percent Supply Air Bypassing Coil	0.00	(%)
Coil Airflow	37,025	(Cfm)

BUILDING U-VALUES - ALTERNATIVE 1
BLDG M171, BASELINE

---------- 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) Part.	ExFlr	Summr Skylt	Wintr Skylt	Roof	Summr Windo	Wintr Windo	Wall	Ceil.	Room Mass (lb/ sqft)	Room Capac. (Btu/ sqft/F)
1	2 FLOORS + BASEM	0.000	0.032	0.000	0.000	0.044	0.700	0.743	0.071	0.317	43.8	9.74
Zone 1	Total/Ave.	0.000	0.032	0.000	0.000	0.044	0.700	0.743	0.071	0.317	43.8	9.74
System 1	Total/Ave.	0.000	0.032	0.000	0.000	0.044	0.700	0.743	0.071	0.317	43.8	9.74
Building		0.000	0.032	0.000	0.000	0.044	0.700	0.743	0.071	0.317	43.8	9.74

BUILDING AREAS - ALTERNATIVE 1
BLDG M171, BASELINE

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

Room Number	Description	Number of Duplicate Flr	Number of Duplicate 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	2 FLOORS + BASEM	1	1	35,398	35,398	0	10,126	0	0	16,760	4,475	17	21,241
Zone	1 Total/Ave.				35,398	0	10,126	0	0	16,760	4,475	17	21,241
System	1 Total/Ave.				35,398	0	10,126	0	0	16,760	4,475	17	21,241
Building					35,398	0	10,126	0	0	16,760	4,475	17	21,241

ASHRAE 90 ANALYSIS - ALTERNATIVE 1
BLDG M171, BASELINE

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

Overall Roof U-Value = 0.044 (Btu/Hr/Sq Ft/F)
Overall Wall U-Value = 0.181 (Btu/Hr/Sq Ft/F)
Overall Building U-Value = 0.127 (Btu/Hr/Sq Ft/F)

Roof Overall Thermal Transfer Value (OTTVr) = 2.25 (Btu/Hr/Sq Ft)
Wall Overall Thermal Transfer Value (OTTVw) = 16.35 (Btu/Hr/Sq Ft)

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

SYSTEM LOAD PROFILE - ALTERNATIVE 1
BLDG M171, BASELINE

Main System 1 FC FAN COIL

Percent Design Load	Cooling Load Cap. (Ton)	Cooling Load Hours (%)	Cooling Load Hours	Heating Load Capacity (Btuh)	Heating Load Hours (%)	Heating Load Hours	Cooling Airflow Cap. (Cfm)	Cooling Airflow Hours (%)	Cooling Airflow Hours	Heating Airflow Cap. (Cfm)	Heating Airflow Hours (%)	Heating Airflow Hours
0 - 5	3.4	12	359	-23,017	5	73	1,851.3	0	0	0.0	0	0
5 - 10	6.8	12	363	-46,034	6	79	3,702.5	0	0	0.0	0	0
10 - 15	10.1	11	336	-69,051	11	152	5,553.8	0	0	0.0	0	0
15 - 20	13.5	12	347	-92,068	4	56	7,405.0	0	0	0.0	0	0
20 - 25	16.9	4	123	-115,085	3	39	9,256.3	0	0	0.0	0	0
25 - 30	20.3	4	124	-138,101	5	69	11,107.5	0	0	0.0	0	0
30 - 35	23.7	3	80	-161,118	8	114	12,958.8	0	0	0.0	0	0
35 - 40	27.0	7	212	-184,135	6	81	14,810.1	0	0	0.0	0	0
40 - 45	30.4	6	164	-207,152	8	109	16,661.3	0	0	0.0	0	0
45 - 50	33.8	5	156	-230,169	6	86	18,512.6	0	0	0.0	0	0
50 - 55	37.2	3	82	-253,186	10	137	20,363.8	0	0	0.0	0	0
55 - 60	40.6	6	174	-276,203	6	77	22,215.1	0	0	0.0	0	0
60 - 65	43.9	6	193	-299,220	5	69	24,066.3	0	0	0.0	0	0
65 - 70	47.3	2	62	-322,237	17	231	25,917.6	0	0	0.0	0	0
70 - 75	50.7	1	23	-345,254	0	0	27,768.9	0	0	0.0	0	0
75 - 80	54.1	2	64	-368,271	0	0	29,620.1	0	0	0.0	0	0
80 - 85	57.5	4	108	-391,288	0	0	31,471.4	0	0	0.0	0	0
85 - 90	60.8	0	0	-414,304	0	0	33,322.6	0	0	0.0	0	0
90 - 95	64.2	0	0	-437,321	0	0	35,173.9	0	0	0.0	0	0
95 - 100	67.6	0	0	-460,338	0	0	37,025.1	100	8,760	0.0	0	0
Hours Off	0.0	0	5,790	0	0	7,388	0.0	0	0	0.0	0	8,760

SYSTEM TOTALS LOAD PROFILE - ALTERNATIVE 1
BLDG M171, BASELINE

S Y S T E M L O A D P R O F I L E

System Totals

Percent Design Load	Cooling Load Cap. (Ton)	Cooling Load Hours (%)	Cooling Load Hours	Heating Load Capacity (Btuh)	Heating Load Hours (%)	Heating Load Hours	Cooling Airflow Cap. (Cfm)	Cooling Airflow Hours (%)	Cooling Airflow Hours	Heating Airflow Cap. (Cfm)	Heating Airflow Hours (%)	Heating Airflow Hours
0 - 5	3.4	12	359	-23,017	5	73	1,851.3	0	0	0.0	0	0
5 - 10	6.8	12	363	-46,034	6	79	3,702.5	0	0	0.0	0	0
10 - 15	10.1	11	336	-69,051	11	152	5,553.8	0	0	0.0	0	0
15 - 20	13.5	12	347	-92,068	4	56	7,405.0	0	0	0.0	0	0
20 - 25	16.9	4	123	-115,085	3	39	9,256.3	0	0	0.0	0	0
25 - 30	20.3	4	124	-138,101	5	69	11,107.5	0	0	0.0	0	0
30 - 35	23.7	3	80	-161,118	8	114	12,958.8	0	0	0.0	0	0
35 - 40	27.0	7	212	-184,135	6	81	14,810.1	0	0	0.0	0	0
40 - 45	30.4	6	164	-207,152	8	109	16,661.3	0	0	0.0	0	0
45 - 50	33.8	5	156	-230,169	6	86	18,512.6	0	0	0.0	0	0
50 - 55	37.2	3	82	-253,186	10	137	20,363.8	0	0	0.0	0	0
55 - 60	40.6	6	174	-276,203	6	77	22,215.1	0	0	0.0	0	0
60 - 65	43.9	6	193	-299,220	5	69	24,066.3	0	0	0.0	0	0
65 - 70	47.3	2	62	-322,237	17	231	25,917.6	0	0	0.0	0	0
70 - 75	50.7	1	23	-345,254	0	0	27,768.9	0	0	0.0	0	0
75 - 80	54.1	2	64	-368,271	0	0	29,620.1	0	0	0.0	0	0
80 - 85	57.5	4	108	-391,288	0	0	31,471.4	0	0	0.0	0	0
85 - 90	60.8	0	0	-414,304	0	0	33,322.6	0	0	0.0	0	0
90 - 95	64.2	0	0	-437,321	0	0	35,173.9	0	0	0.0	0	0
95 - 100	67.6	0	0	-460,338	0	0	37,025.1	100	8,760	0.0	0	0
Hours Off	0.0	0	5,790	0	0	7,388	0.0	0	0	0.0	0	8,760

BUILDING COOL-HEAT DEMAND - ALTERNATIVE 1
BLDG M171, BASELINE

January			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	33.4	30.4	-212,678	0.0	0	0.0	-291,604	0.0	-291,604	0.0	-291,604	0.0
2	32.1	29.3	-222,936	0.0	0	0.0	-308,798	0.0	-308,798	0.0	-308,798	0.0
3	31.7	29.3	-232,349	0.0	0	0.0	-316,940	0.0	-316,940	0.0	-316,940	0.0
4	31.9	29.5	-239,709	0.0	-157,672	0.0	-318,500	0.0	-318,500	0.0	-318,500	0.0
5	32.6	30.3	-245,795	0.0	-316,773	0.0	-316,739	0.0	-316,739	0.0	-316,739	0.0
6	33.6	31.3	-245,306	0.0	-314,910	0.0	-314,910	0.0	-314,910	0.0	-314,910	0.0
7	35.0	32.6	-239,085	0.0	-304,941	0.0	-304,941	0.0	-304,941	0.0	-304,941	0.0
8	36.6	34.4	0	0.0	-56,485	0.0	-235,833	0.0	-235,833	0.0	-56,485	0.0
9	38.5	36.3	0	0.0	0	0.0	-187,253	0.0	-187,253	0.0	0	0.0
10	40.4	37.7	0	0.0	0	0.0	-145,371	0.0	-145,371	0.0	0	0.0
11	42.3	38.7	0	0.0	0	0.0	-133,276	0.0	-133,276	0.0	0	0.0
12	44.2	39.6	0	0.0	0	0.0	-118,360	0.0	-118,360	0.0	0	0.0
13	45.8	40.5	0	0.0	0	0.0	-88,828	0.0	-88,828	0.0	0	0.0
14	47.2	41.1	0	0.0	0	0.0	-69,486	0.0	-69,486	0.0	0	0.0
15	48.2	41.6	0	0.0	0	0.0	-46,803	0.0	-46,803	0.0	0	0.0
16	48.9	41.8	0	0.0	0	0.0	-34,653	0.0	-34,653	0.0	0	0.0
17	49.1	41.9	0	0.0	0	0.0	-116,658	0.0	-116,658	0.0	0	0.0
18	48.7	41.9	0	0.0	0	0.0	-142,559	0.0	-142,559	0.0	0	0.0
19	47.4	41.7	0	0.0	0	0.0	-156,922	0.0	-156,922	0.0	0	0.0
20	45.5	40.5	0	0.0	0	0.0	-173,827	0.0	-173,827	0.0	0	0.0
21	43.1	38.9	0	0.0	0	0.0	-200,924	0.0	-200,924	0.0	0	0.0
22	40.4	36.7	0	0.0	0	0.0	-228,089	0.0	-228,089	0.0	0	0.0
23	37.7	34.3	-65,534	0.0	-187,785	0.0	-251,215	0.0	-251,215	0.0	-187,785	0.0
24	35.3	32.3	-3,491	0.0	-277,120	0.0	-277,107	0.0	-277,107	0.0	-277,120	0.0

February			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	37.5	34.5	-211,049	0.0	0	0.0	-264,954	0.0	-264,954	0.0	-264,954	0.0
2	36.0	33.0	-222,089	0.0	0	0.0	-277,756	0.0	-277,756	0.0	-277,756	0.0
3	34.7	31.8	-231,078	0.0	0	0.0	-288,503	0.0	-288,503	0.0	-288,503	0.0
4	33.6	30.9	-238,014	0.0	-55,664	0.0	-303,648	0.0	-303,648	0.0	-303,648	0.0
5	32.8	30.1	-240,064	0.0	-313,534	0.0	-313,484	0.0	-313,484	0.0	-313,484	0.0
6	32.2	29.8	-239,998	0.0	-317,229	0.0	-317,229	0.0	-317,229	0.0	-317,229	0.0
7	32.1	29.6	-229,654	0.0	-314,732	0.0	-314,732	0.0	-314,732	0.0	-314,732	0.0
8	32.5	30.3	0	0.0	-54,024	0.0	-233,372	0.0	-233,372	0.0	-54,024	0.0
9	33.9	31.6	0	0.0	0	0.0	-222,867	0.0	-222,867	0.0	0	0.0
10	36.0	33.0	0	0.0	0	0.0	-203,509	0.0	-203,509	0.0	0	0.0
11	38.5	34.8	0	0.0	0	0.0	-185,598	0.0	-185,598	0.0	0	0.0
12	41.3	36.5	0	0.0	0	0.0	-145,121	0.0	-145,121	0.0	0	0.0
13	43.8	38.1	0	0.0	0	0.0	-109,435	0.0	-109,435	0.0	0	0.0
14	45.9	39.5	0	0.0	0	0.0	-86,801	0.0	-86,801	0.0	0	0.0
15	47.2	40.4	0	0.0	0	0.0	-38,030	0.0	-38,030	0.0	0	0.0
16	47.7	40.6	0	0.0	0	0.0	-37,072	0.0	-37,072	0.0	0	0.0
17	47.5	40.2	0	0.0	0	0.0	-78,522	0.0	-78,522	0.0	0	0.0
18	47.0	39.8	0	0.0	0	0.0	-157,838	0.0	-157,838	0.0	0	0.0
19	46.2	39.9	0	0.0	0	0.0	-164,838	0.0	-164,838	0.0	0	0.0
20	45.1	39.7	0	0.0	0	0.0	-179,558	0.0	-179,558	0.0	0	0.0
21	43.8	39.2	0	0.0	0	0.0	-197,958	0.0	-197,958	0.0	0	0.0
22	42.3	38.3	0	0.0	-59,344	0.0	-211,963	0.0	-211,963	0.0	-59,344	0.0
23	40.7	37.2	0	0.0	-229,259	0.0	-229,225	0.0	-229,225	0.0	-229,259	0.0
24	39.1	35.8	0	0.0	-247,691	0.0	-247,691	0.0	-247,691	0.0	-247,691	0.0

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

BUILDING COOL-HEAT DEMAND - ALTERNATIVE 1
BLDG M171, BASELINE

March			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	45.4	41.6	-123,335	0.0	0	0.0	0	0.0	-180,695	0.0	-180,695	0.0
2	43.3	39.7	-135,221	0.0	0	0.0	0	0.0	-201,281	0.0	-201,281	0.0
3	41.6	38.6	-145,058	0.0	0	0.0	0	0.0	-218,968	0.0	-218,968	0.0
4	40.6	37.5	-154,468	0.0	0	0.0	0	0.0	-230,852	0.0	-230,852	0.0
5	40.2	37.3	-161,762	0.0	-60,331	0.0	0	0.0	-238,993	0.0	-238,993	0.0
6	40.6	37.8	-161,273	0.0	-2,922	0.0	0	0.0	-239,709	0.0	-239,709	0.0
7	41.6	39.0	-58,627	0.0	0	0.0	-14,641	0.0	-170,063	0.0	-170,063	0.0
8	43.3	40.7	0	0.0	0	0.0	-148,898	0.0	-148,864	0.0	0	0.0
9	45.4	42.5	0	0.0	0	0.0	-124,943	0.0	-124,943	0.0	0	0.0
10	47.9	44.3	0	0.0	0	0.0	-103,207	0.0	-103,207	0.0	0	0.0
11	50.6	45.5	0	0.0	0	0.0	-44,683	0.0	-44,683	0.0	0	0.0
12	53.3	46.8	0	0.0	0	0.0	-5,866	0.0	-5,866	0.0	0	0.0
13	55.8	48.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
14	58.0	49.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
15	59.6	50.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
16	60.7	50.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
17	61.0	50.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
18	60.7	50.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
19	59.6	50.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
20	58.0	50.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
21	55.8	49.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
22	53.3	47.8	0	0.0	0	0.0	-29,514	0.0	-29,514	0.0	0	0.0
23	50.6	45.9	0	0.0	0	0.0	-131,269	0.0	-131,269	0.0	0	0.0
24	47.9	43.8	0	0.0	0	0.0	-158,416	0.0	-158,416	0.0	0	0.0

April			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	57.7	53.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2	55.9	52.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
3	54.2	51.3	0	0.0	0	0.0	0	0.0	0	0.0	-4,387	0.0
4	52.9	50.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
5	51.9	49.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
6	51.2	49.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
7	51.0	49.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
8	51.6	49.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
9	53.3	50.6	0	0.0	0	0.0	0	0.0	-17,382	0.0	0	0.0
10	55.9	51.8	0	0.0	0	0.0	0	0.0	-22,785	0.0	0	0.0
11	59.0	53.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
12	62.4	55.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
13	65.5	57.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
14	68.1	59.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
15	69.8	60.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
16	70.4	60.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
17	70.2	60.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
18	69.5	60.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
19	68.5	59.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
20	67.2	59.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
21	65.5	59.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
22	63.7	58.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
23	61.7	57.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
24	59.7	55.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0

BUILDING COOL-HEAT DEMAND - ALTERNATIVE 1
BLDG M171, BASELINE

May			Design		Weekday		Saturday		Sunday		Monday	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	66.6	62.3	0	63.1	0	0.0	0	0.0	0	0.0	0	0.0
2	64.5	60.4	0	55.3	0	0.0	0	0.0	0	0.0	0	0.0
3	62.7	59.1	0	10.7	0	0.0	0	0.0	0	0.0	0	0.0
4	61.2	58.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
5	60.0	57.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
6	59.3	56.6	0	3.9	0	0.0	0	0.0	0	0.0	0	0.0
7	59.0	56.5	0	11.3	0	0.0	0	0.0	0	0.0	0	0.0
8	59.5	56.6	0	27.6	0	0.0	0	0.0	0	0.0	0	9.7
9	60.9	56.6	0	33.9	0	9.7	0	0.0	0	0.0	0	24.5
10	63.0	57.2	0	37.2	0	24.5	0	0.0	0	0.0	0	26.0
11	65.7	58.1	0	39.5	0	26.0	0	0.0	0	0.0	0	27.9
12	68.7	59.8	0	41.5	0	27.9	0	0.0	0	0.0	0	27.1
13	71.7	61.6	0	41.1	0	27.1	0	9.1	0	9.1	0	35.8
14	74.5	63.4	0	51.9	0	35.8	0	16.4	0	16.4	0	40.2
15	76.6	64.8	0	55.4	0	40.0	0	19.3	0	19.3	0	38.8
16	78.0	65.6	0	55.2	0	38.8	0	17.8	0	17.8	0	33.4
17	78.5	65.6	0	46.5	0	33.4	0	17.7	0	17.7	0	21.7
18	78.2	65.8	0	31.9	0	21.7	0	14.5	0	14.5	0	8.4
19	77.5	65.6	0	13.6	0	8.4	0	8.4	0	8.4	0	7.2
20	76.3	66.1	0	11.2	0	7.2	0	7.2	0	7.2	0	5.4
21	74.8	67.2	0	8.5	0	5.4	0	5.4	0	5.4	0	4.1
22	73.0	66.4	0	6.4	0	4.1	0	3.9	0	3.9	0	1.8
23	70.9	65.4	0	4.6	0	1.8	0	1.8	0	1.8	0	0.0
24	68.7	64.0	0	3.0	0	0.0	0	0.0	0	0.0	0	0.0

June			Design		Weekday		Saturday		Sunday		Monday	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	73.0	67.9	0	8.6	0	3.7	0	4.4	0	4.4	0	4.4
2	71.2	66.1	0	7.6	0	2.1	0	2.3	0	2.3	0	2.3
3	69.7	65.2	0	6.3	0	0.6	0	0.9	0	0.9	0	0.9
4	68.5	64.3	0	6.1	0	0.0	0	0.0	0	0.0	0	0.0
5	67.8	64.2	0	5.5	0	0.0	0	0.0	0	0.0	0	0.0
6	67.6	64.2	0	14.2	0	2.5	0	2.5	0	2.5	0	2.5
7	68.1	64.8	0	18.9	0	6.0	0	6.1	0	6.1	0	6.1
8	69.4	65.7	0	36.9	0	23.9	0	6.9	0	6.9	0	24.8
9	71.6	66.2	0	45.3	0	33.0	0	8.7	0	8.7	0	33.1
10	74.2	67.2	0	47.8	0	39.4	0	14.3	0	14.3	0	39.4
11	77.2	68.5	0	51.6	0	40.4	0	16.4	0	16.4	0	40.4
12	80.2	70.0	0	53.7	0	43.1	0	19.3	0	19.3	0	43.1
13	82.8	70.8	0	51.1	0	40.7	0	23.7	0	23.7	0	40.7
14	85.0	71.6	0	64.1	0	53.7	0	29.4	0	29.4	0	53.7
15	86.3	72.3	0	66.2	0	56.9	0	32.9	0	32.9	0	56.9
16	86.8	72.1	0	65.6	0	53.0	0	29.1	0	29.1	0	53.0
17	86.6	71.7	0	56.6	0	44.1	0	26.5	0	26.5	0	44.1
18	85.8	71.5	0	40.6	0	30.7	0	23.4	0	23.4	0	30.7
19	84.7	71.2	0	20.8	0	15.0	0	15.2	0	15.2	0	15.0
20	83.2	71.5	0	18.0	0	13.3	0	13.4	0	13.4	0	13.3
21	81.4	71.7	0	15.6	0	11.6	0	12.2	0	12.2	0	11.6
22	79.3	71.4	0	13.1	0	10.2	0	10.3	0	10.3	0	10.2
23	77.2	70.5	0	11.2	0	8.3	0	8.4	0	8.4	0	8.3
24	75.1	69.1	0	9.6	0	6.2	0	6.3	0	6.3	0	6.2

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

BUILDING COOL-HEAT DEMAND - ALTERNATIVE 1
BLDG M171, BASELINE

July			------ Design -----		----- Weekday -----		-----Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	72.0	69.3	0	8.2	0	2.6	0	3.5	0	3.5	0	3.5
2	70.5	68.0	0	7.2	0	1.6	0	2.0	0	2.0	0	2.0
3	69.4	67.1	0	6.6	0	0.0	0	0.0	0	0.0	0	0.0
4	68.5	66.4	0	6.1	0	0.0	0	0.0	0	0.0	0	0.0
5	67.9	66.0	0	6.0	0	0.0	0	0.0	0	0.0	0	0.0
6	67.7	65.9	0	11.7	0	0.0	0	0.0	0	0.0	0	0.0
7	68.1	66.3	0	17.6	0	5.8	0	6.3	0	6.3	0	6.3
8	69.1	67.3	0	40.5	0	27.4	0	7.7	0	7.7	0	28.0
9	70.8	68.0	0	45.5	0	34.6	0	9.3	0	9.3	0	34.6
10	72.9	69.1	0	49.1	0	39.9	0	15.1	0	15.1	0	39.9
11	75.2	70.5	0	51.2	0	41.3	0	16.8	0	16.8	0	41.3
12	77.5	71.7	0	53.8	0	43.3	0	19.4	0	19.4	0	43.3
13	79.6	72.7	0	51.3	0	40.2	0	23.4	0	23.4	0	40.2
14	81.3	73.5	0	63.9	0	54.4	0	28.9	0	28.9	0	54.4
15	82.3	73.7	0	65.8	0	55.9	0	31.4	0	31.4	0	55.9
16	82.7	73.5	0	65.1	0	53.4	0	29.1	0	29.1	0	53.4
17	82.5	73.1	0	55.0	0	43.8	0	25.8	0	25.8	0	43.8
18	82.0	72.6	0	37.9	0	29.0	0	22.3	0	22.3	0	29.0
19	81.1	73.2	0	18.3	0	12.3	0	13.6	0	13.6	0	12.3
20	79.9	73.8	0	16.1	0	12.9	0	13.5	0	13.5	0	12.9
21	78.5	73.9	0	14.0	0	12.5	0	12.7	0	12.7	0	12.5
22	76.9	73.1	0	12.0	0	10.5	0	10.6	0	10.6	0	10.5
23	75.2	71.9	0	10.3	0	8.2	0	8.2	0	8.2	0	8.2
24	73.5	70.8	0	8.9	0	5.8	0	5.8	0	5.8	0	5.8

August			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	72.7	70.2	0	9.3	0	3.2	0	4.4	0	4.4	0	4
2	71.2	69.0	0	7.5	0	2.0	0	2.4	0	2.4	0	2
3	69.9	68.0	0	6.4	0	0.9	0	1.1	0	1.1	0	1.
4	68.8	67.1	0	5.9	0	0.0	0	0.0	0	0.0	0	0.0
5	68.0	66.6	0	5.8	0	0.0	0	0.0	0	0.0	0	0.0
6	67.5	66.2	0	7.4	0	0.0	0	0.0	0	0.0	0	0.0
7	67.3	66.1	0	15.8	0	3.2	0	3.3	0	3.3	0	3.3
8	67.8	66.5	0	40.0	0	26.6	0	6.7	0	6.7	0	27.0
9	69.1	67.0	0	46.5	0	32.3	0	7.7	0	7.7	0	32.2
10	71.2	67.8	0	49.5	0	37.3	0	12.8	0	12.8	0	37.3
11	73.8	68.7	0	52.0	0	39.1	0	14.7	0	14.7	0	39.1
12	76.5	70.0	0	53.6	0	41.6	0	17.7	0	17.7	0	41.6
13	79.1	71.2	0	50.9	0	40.7	0	23.5	0	23.5	0	40.7
14	81.1	72.6	0	65.3	0	54.3	0	29.3	0	29.3	0	54.3
15	82.5	73.6	0	66.7	0	56.1	0	32.2	0	32.2	0	56.1
16	83.0	73.7	0	64.6	0	49.9	0	25.5	0	25.5	0	49.9
17	82.8	73.5	0	54.2	0	42.6	0	24.2	0	24.2	0	42.6
18	82.3	73.5	0	33.2	0	25.3	0	19.0	0	19.0	0	25.3
19	81.5	73.1	0	18.2	0	12.6	0	14.1	0	14.1	0	12.6
20	80.4	73.7	0	15.8	0	12.8	0	13.2	0	13.2	0	12.8
21	79.1	74.9	0	13.8	0	12.5	0	12.6	0	12.6	0	12.5
22	77.6	73.9	0	11.4	0	11.2	0	11.2	0	11.2	0	11.2
23	76.0	72.7	0	10.2	0	8.7	0	8.8	0	8.8	0	8.7
24	74.3	71.3	0	8.7	0	6.1	0	6.1	0	6.1	0	6.1

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

BUILDING COOL-HEAT DEMAND - ALTERNATIVE 1
BLDG M171, BASELINE

September			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	69.8	66.1	0	5.3	0	0.6	0	0.9	0	0.9	0	0.9
2	68.0	64.5	0	4.3	0	0.0	0	0.0	0	0.0	0	0.0
3	66.3	63.0	0	2.8	0	0.0	0	0.0	0	0.0	0	0.0
4	64.9	61.9	0	2.1	0	0.0	0	0.0	0	0.0	0	0.0
5	63.9	61.3	0	1.6	0	0.0	0	0.0	0	0.0	0	0.0
6	63.2	61.0	0	1.6	0	0.0	0	0.0	0	0.0	0	0.0
7	63.0	60.8	0	11.3	0	0.0	0	0.0	0	0.0	0	2.6
8	63.4	61.4	0	31.7	0	2.6	0	0.0	0	0.0	0	25.8
9	64.7	61.8	0	41.7	0	24.8	0	0.0	0	0.0	0	26.8
10	66.6	62.1	0	44.3	0	26.5	0	0.0	0	0.0	0	33.3
11	69.1	62.9	0	47.3	0	33.2	0	9.4	0	9.4	0	34.3
12	71.8	63.7	0	49.1	0	34.3	0	13.4	0	13.4	0	33.6
13	74.5	65.5	0	47.9	0	33.6	0	17.7	0	17.7	0	45.8
14	77.0	67.1	0	59.6	0	45.8	0	21.7	0	21.7	0	44.2
15	78.9	68.2	0	61.1	0	44.2	0	20.7	0	20.7	0	43.1
16	80.2	68.6	0	57.9	0	43.1	0	19.5	0	19.5	0	33.9
17	80.6	68.5	0	44.3	0	33.9	0	16.7	0	16.7	0	17.8
18	80.4	68.9	0	24.5	0	17.8	0	10.7	0	10.7	0	9.7
19	79.7	70.0	0	15.1	0	9.7	0	9.8	0	9.8	0	8.6
20	78.7	71.2	0	12.8	0	8.6	0	8.6	0	8.6	0	7.6
21	77.3	71.6	0	10.3	0	7.6	0	7.8	0	7.8	0	6.6
22	75.6	70.5	0	8.4	0	6.6	0	6.6	0	6.6	0	4.8
23	73.7	69.4	0	6.9	0	4.8	0	4.9	0	4.9	0	2.9
24	71.8	67.7	0	5.4	0	2.9	0	2.9	0	2.9	0	0.0

October			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	54.8	51.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2	52.9	49.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
3	51.2	48.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
4	49.8	47.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
5	48.8	46.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
6	48.2	45.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
7	47.9	45.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
8	48.5	46.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
9	50.3	47.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
10	52.9	48.7	0	25.6	0	0.0	0	0.0	0	0.0	0	0.0
11	56.2	49.9	0	32.0	0	0.0	0	0.0	0	0.0	0	0.0
12	59.6	51.5	0	34.3	0	0.0	0	0.0	0	0.0	0	0.0
13	62.9	53.5	0	34.5	0	0.0	0	0.0	0	0.0	0	0.0
14	65.5	55.2	0	43.0	0	25.1	0	0.0	0	0.0	0	0.0
15	67.3	56.3	0	45.2	0	28.9	0	0.0	0	0.0	0	8.5
16	67.9	56.6	0	42.1	0	27.9	0	0.0	0	0.0	0	17.5
17	67.7	56.4	0	26.3	0	17.5	0	0.0	0	0.0	0	6.5
18	67.0	56.6	0	13.3	0	6.5	0	0.0	0	0.0	0	0.0
19	66.0	57.6	0	3.6	0	0.0	0	0.0	0	0.0	0	0.0
20	64.6	57.9	0	1.0	0	0.0	0	0.0	0	0.0	0	0.0
21	62.9	57.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
22	61.0	56.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
23	59.0	54.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
24	56.9	53.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0

BUILDING COOL-HEAT DEMAND - ALTERNATIVE 1
BLDG M171, BASELINE

November			Design		Weekday		Saturday		Sunday		Monday	
Hour	ODB	OWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	48.7	45.7	0	0.0	0	0.0	0	0.0	0	0.0	-153,397	0.0
2	46.9	44.1	0	0.0	0	0.0	0	0.0	-156,804	0.0	-171,508	0.0
3	45.5	42.8	0	0.0	0	0.0	0	0.0	-183,889	0.0	-183,887	0.0
4	44.6	41.9	0	0.0	0	0.0	-49,076	0.0	-194,144	0.0	-194,144	0.0
5	44.4	42.0	0	0.0	0	0.0	-2,469	0.0	-201,439	0.0	-201,439	0.0
6	44.8	42.7	0	0.0	0	0.0	0	0.0	-200,946	0.0	-200,946	0.0
7	45.9	43.9	0	0.0	0	0.0	0	0.0	-182,979	0.0	-182,979	0.0
8	47.8	46.0	0	0.0	-49,701	0.0	0	0.0	-91,258	0.0	0	0.0
9	50.2	48.0	0	0.0	0	0.0	0	0.0	-53,364	0.0	0	0.0
10	52.9	49.9	0	0.0	0	0.0	0	0.0	-32,275	0.0	0	0.0
11	55.8	51.1	0	0.0	0	0.0	0	0.0	-11,099	0.0	0	0.0
12	58.5	52.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
13	60.9	52.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
14	62.8	53.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
15	64.0	53.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
16	64.4	53.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
17	64.1	53.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
18	63.2	53.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
19	61.8	54.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
20	60.0	53.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
21	57.9	52.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
22	55.6	51.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
23	53.2	49.5	0	0.0	0	0.0	0	0.0	-18,151	0.0	0	0.0
24	50.8	47.6	0	0.0	0	0.0	0	0.0	-128,798	0.0	0	0.0

December			Design		Weekday		Saturday		Sunday		Monday	
Hour	ODB	OWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	37.5	35.3	0	0.0	0	0.0	-115,580	0.0	-259,712	0.0	-259,712	0.0
2	37.1	35.1	0	0.0	0	0.0	-267,885	0.0	-267,854	0.0	-267,854	0.0
3	37.4	35.5	0	0.0	0	0.0	-268,990	0.0	-268,990	0.0	-268,990	0.0
4	38.1	36.2	0	0.0	0	0.0	-267,229	0.0	-267,229	0.0	-267,229	0.0
5	39.3	37.6	0	0.0	0	0.0	-259,311	0.0	-259,311	0.0	-259,311	0.0
6	40.9	39.2	0	0.0	-36,563	0.0	-248,495	0.0	-248,495	0.0	-248,495	0.0
7	42.7	41.2	-32,479	0.0	-236,879	0.0	-236,832	0.0	-236,832	0.0	-236,832	0.0
8	44.7	43.1	0	0.0	0	0.0	-152,850	0.0	-152,850	0.0	0	0.0
9	46.8	45.3	0	0.0	0	0.0	-98,268	0.0	-98,268	0.0	0	0.0
10	48.8	47.0	0	0.0	0	0.0	-71,701	0.0	-71,701	0.0	0	0.0
11	50.7	48.1	0	0.0	0	0.0	-58,440	0.0	-58,440	0.0	0	0.0
12	52.2	48.8	0	0.0	0	0.0	-42,893	0.0	-42,893	0.0	0	0.0
13	53.4	49.2	0	0.0	0	0.0	-11,492	0.0	-11,492	0.0	0	0.0
14	54.1	49.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
15	54.4	48.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
16	54.0	48.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
17	53.0	47.3	0	0.0	0	0.0	-54,139	0.0	-54,139	0.0	0	0.0
18	51.4	46.3	0	0.0	0	0.0	-110,165	0.0	-110,165	0.0	0	0.0
19	49.3	45.4	0	0.0	0	0.0	-133,149	0.0	-133,149	0.0	0	0.0
20	47.0	43.5	0	0.0	0	0.0	-155,785	0.0	-155,785	0.0	0	0.0
21	44.5	41.5	0	0.0	0	0.0	-183,305	0.0	-183,305	0.0	0	0.0
22	42.2	39.3	0	0.0	0	0.0	-208,773	0.0	-208,773	0.0	0	0.0
23	40.1	37.6	0	0.0	0	0.0	-229,360	0.0	-229,360	0.0	0	0.0
24	38.5	36.2	0	0.0	0	0.0	-247,825	0.0	-247,825	0.0	0	0.0

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M171, BASELINE

M O N T H L Y E N E R G Y C O N S U M P T I O N

Month	ELEC On Peak (kWh)	DEMAND On Peak (kW)	GAS On Peak (Therm)	WATER (1000 Gl)	GAS DMND On Peak (Thrm/hr)
Jan	28,553	77	1,033	1	4
Feb	26,010	77	922	1	4
March	26,566	77	228	0	3
April	22,896	77	2	0	0
May	35,631	146	0	0	0
June	44,205	166	0	0	0
July	42,456	160	0	0	0
Aug	44,419	161	0	0	0
Sept	35,958	153	0	0	0
Oct	27,021	128	0	0	0
Nov	24,357	77	195	0	2
Dec	26,588	77	583	1	3
Total	384,662	166	2,964	3	4

Building Energy Consumption = 45,461 (Btu/Sq Ft/Year)
Source Energy Consumption = 120,090 (Btu/Sq Ft/Year)

Floor Area = 35,398 (Sq Ft)

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M171, BASELINE

EQUIPMENT ENERGY CONSUMPTION

Ref Num	Equip Code	Monthly Consumption Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	7828	7081	8454	7475	8141	8101	7515	8454	7475	8141	7475	7515	93,656
	PK	33.8	33.8	33.8	33.8	33.8	33.8	33.8	33.8	33.8	33.8	33.8	33.8	33.8
1	MISC LD													
	ELEC	7201	6514	7777	6876	7489	7452	6914	7777	6876	7489	6876	6914	86,156
	PK	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1
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	EQ1122L	AIR-CLD RECIP >55 TONS												
	ELEC	0	0	0	0	7176	13750	12976	13136	8499	1758	0	0	57,297
	PK	0.0	0.0	0.0	0.0	54.6	72.1	67.9	69.0	61.7	38.5	0.0	0.0	72.1
1	EQ5200	CONDENSER FANS												
	ELEC	0	0	0	0	859	1691	1634	1635	1035	168	0	0	7,022
	PK	0.0	0.0	0.0	0.0	6.7	9.3	8.1	8.2	7.5	5.3	0.0	0.0	9.3
1	EQ5001	CHILLED WATER PUMP C.V.												
	ELEC	0	0	0	0	3132	4599	4526	4526	3504	730	0	0	21,017
	PK	0.0	0.0	0.0	0.0	7.3	7.3	7.3	7.3	7.3	7.3	0.0	0.0	7.3
1	EQ5313	CONTROLS												
	ELEC	0	0	0	0	129	189	186	186	144	30	0	0	864
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3
1	EQ4371	FAN COIL SUPPLY FAN												
	ELEC	8705	7862	8705	8424	8705	8424	8705	8705	8424	8705	8424	8705	102,491
	PK	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M171, BASELINE

1	EQ2004		GAS WATER TUBE STEAM										
	GAS	1033	922	228	2	0	0	0	0	0	0	195	583	2,964
	PK	3.8	3.8	2.9	0.3	0.0	0.0	0.0	0.0	0.0	0.0	2.4	3.2	3.8
1	EQ5020		HEAT WATER CIRC. PUMP C.V.										
	ELEC	4349	4109	1471	109	0	0	0	0	0	0	1428	3117	14,584
	PK	10.9	10.9	10.9	10.9	0.0	0.0	0.0	0.0	0.0	0.0	10.9	10.9	10.9
1	EQ5240		BOILER FORCED DRAFT FAN										
	ELEC	184	174	62	5	0	0	0	0	0	0	60	132	616
	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	EQ5307		BOILER CONTROLS										
	ELEC	200	189	68	5	0	0	0	0	0	0	65	143	669
	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	EQ5062		CONDENSATE RETURN PUMP										
	ELEC	86	82	29	2	0	0	0	0	0	0	28	62	289
	PK	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2
1	EQ5406		MAKE-UP WATER										
	WATER	1	1	0	0	0	0	0	0	0	0	0	1	3
	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

UTILITY PEAK CHECKSUMS - ALTERNATIVE 1
BLDG M171, BASELINE

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 165.6 (kW)
Yearly Time of Peak 15 (hr) 6 (mo)

Hour 15 Month 6

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Percnt Of Tot (%)
Cooling Equipment				
1	EQ1122L	AIR-CLD RECIP >55 TONS	88.9	53.71
Sub Total			88.9	53.71
Sub Total			0.0	0.00
Air Moving Equipment				
1		SUMMATION OF FAN ELECTRICAL DEMAND	11.7	7.07
Sub Total			11.7	7.07
Sub Total			0.0	0.00
Miscellaneous				
Lights			33.8	20.43
Base Utilities			0.0	0.00
Misc Equipment			31.1	18.79
Sub Total			64.9	39.22
Grand Total			165.6	100.00

CALIFORNIA TITLE 24 COMPLIANCE - ALTERNATIVE 1
BLDG M171, BASELINE

---------- CALIFORNIA TITLE 24 COMPLIANCE REPORT ----------

Weather Name ..... ATLANTA.
Gross Conditioned Floor Area (sqft)..... 35,398
ACM Multiplier 1.025

---------- E N E R G Y U S E S U M M A R Y ----------

	ELEC (kWh/yr)	GAS (kBtu/yr)	WATER (1000 gal)	PERCENT OF TOTAL ENERGY (%)	TOTAL SOURCE ENERGY (kBtu/yr)	ADJUSTED UNIT SOURCE ENERGY (kBtu/yr-sf)
Primary Heating	1,574.4	296,389.4	3.2	18.8	328,111.0	9.5
Primary Cooling						
Compressor	57,296.7	0.0	0.0	12.2	586,719.9	17.0
Tower/Cond Fans	7,022.2	0.0	0.0	1.5	71,908.0	2.1
Condenser Pump	0.0	0.0	0.0	0.0	0.0	0.0
Other Accessories	863.7	0.0	0.0	0.2	8,844.3	0.3
Auxiliary						
Supply Fans	102,491.4	0.0	0.0	21.7	1,049,514.6	30.4
Circulation Pumps	35,600.9	0.0	0.0	7.6	364,554.0	10.6
Base Utilities	0.0	0.0	0.0	0.0	0.0	0.0
Subtotal	138,092.3	0.0	0.0	29.3	1,414,068.8	40.9
Lighting	93,655.9	0.0	0.0	19.9	959,038.3	27.1
Receptacle	86,156.3	0.0	0.0	18.3	882,242.7	24.9
Domestic Hot Water	0.0	0.0	0.0	0.0	0.0	0.0
Cogeneration	0.0	0.0	0.0	0.0	0.0	0.0
Totals	384,661.6	296,389.4	3.2	100.0	4,250,933.0	121.8

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M171, ECO#7

M O N T H L Y E N E R G Y C O N S U M P T I O N

Month	ELEC On Peak (kWh)	DEMAND On Peak (kW)	GAS On Peak (Therm)	WATER (1000 Gl)	GAS DMND On Peak (Thrm/hr)
Jan	18,779	89	189	0	6
Feb	16,748	89	144	0	6
March	19,557	77	41	0	5
April	17,159	77	0	0	0
May	27,962	147	0	0	0
June	33,037	165	0	0	0
July	29,976	160	0	0	0
Aug	33,297	161	0	0	0
Sept	26,781	153	0	0	0
Oct	22,494	128	0	0	0
Nov	17,208	77	13	0	3
Dec	17,625	89	83	0	6
Total	280,624	165	469	0	6

Building Energy Consumption = 28,384 (Btu/Sq Ft/Year) Floor Area = 35,398 (Sq Ft)
Source Energy Consumption = 82,576 (Btu/Sq Ft/Year)

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M171, ECO#7

EQUIPMENT ENERGY CONSUMPTION

Ref Num	Equip Code	Monthly Consumption Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	7828	7081	8454	7475	8141	8101	7515	8454	7475	8141	7475	7515	93,656
	PK	33.8	33.8	33.8	33.8	33.8	33.8	33.8	33.8	33.8	33.8	33.8	33.8	33.8
1	MISC LD													
	ELEC	7201	6514	7777	6876	7489	7452	6914	7777	6876	7489	6876	6914	86,156
	PK	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1
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	EQ1122L	AIR-CLD RECIP >55 TONS												
	ELEC	0	0	0	0	6500	11010	9674	10430	6974	2452	0	0	47,041
	PK	0.0	0.0	0.0	0.0	56.5	71.7	67.6	68.7	61.4	38.3	0.0	0.0	71.7
1	EQ5200	CONDENSER FANS												
	ELEC	0	0	0	0	736	1379	1241	1309	824	229	0	0	5,717
	PK	0.0	0.0	0.0	0.0	7.3	8.7	8.1	8.2	7.5	5.3	0.0	0.0	8.7
1	EQ5001	CHILLED WATER PUMP C.V.												
	ELEC	0	0	0	0	1927	1927	1752	2015	1752	1051	0	0	10,424
	PK	0.0	0.0	0.0	0.0	7.3	7.3	7.3	7.3	7.3	7.3	0.0	0.0	7.3
1	EQ5313	CONTROLS												
	ELEC	0	0	0	0	79	79	72	83	72	43	0	0	428
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3
1	EQ4371	FAN COIL SUPPLY FAN												
	ELEC	2948	2668	3229	2808	3089	3089	2808	3229	2808	3089	2808	2808	35,380
	PK	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M171, ECO#7

1	EQ2004			GAS WATER TUBE STEAM									
	GAS	189	144	41	0	0	0	0	0	0	13	83	469
	PK	6.0	6.0	5.3	0.0	0.0	0.0	0.0	0.0	0.0	3.2	6.0	6.0
1	EQ5020			HEAT WATER CIRC. PUMP C.V.									
	ELEC	719	436	87	0	0	0	0	0	0	44	349	1,635
	PK	10.9	10.9	10.9	0.0	0.0	0.0	0.0	0.0	0.0	10.9	10.9	10.9
1	EQ5240			BOILER FORCED DRAFT FAN									
	ELEC	33	20	4	0	0	0	0	0	0	2	16	75
	PK	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	EQ5307			BOILER CONTROLS									
	ELEC	33	20	4	0	0	0	0	0	0	2	16	75
	PK	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	EQ5062			CONDENSATE RETURN PUMP									
	ELEC	16	9	2	0	0	0	0	0	0	1	8	35
	PK	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2
1	EQ5406			MAKE-UP WATER									
	WATER	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

UTILITY PEAK CHECKSUMS - ALTERNATIVE 1
BLDG M171, ECO#7

UTILITY PEAK CHECKSUMS

Utility ELECTRIC DEMAND

Peak Value 164.6 (kW)
Yearly Time of Peak 15 (hr) 6 (mo)

Hour 15 Month 6

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Percnt Of Tot (%)
Cooling Equipment				
1	EQ1122L	AIR-CLD RECIP >55 TONS	88.0	53.45
Sub Total			88.0	53.45
Sub Total			0.0	0.00
Air Moving Equipment				
1		SUMMATION OF FAN ELECTRICAL DEMAND	11.7	7.11
Sub Total			11.7	7.11
Sub Total			0.0	0.00
Miscellaneous				
Lights			33.8	20.55
Base Utilities			0.0	0.00
Misc Equipment			31.1	18.90
Sub Total			64.9	39.45
Grand Total			164.6	100.00

CALIFORNIA TITLE 24 COMPLIANCE - ALTERNATIVE 1
BLDG M171, ECO#7

CALIFORNIA TITLE 24 COMPLIANCE REPORT

Weather Name ..... ATLANTA.
Gross Conditioned Floor Area (sqft)..... 35,398
ACM Multiplier 1.025

E N E R G Y U S E S U M M A R Y

	ELEC (kWh/yr)	GAS (kBtu/yr)	WATER (1000 gal)	PERCENT OF TOTAL ENERGY (%)	TOTAL SOURCE ENERGY (kBtu/yr)	ADJUSTED UNIT SOURCE ENERGY (kBtu/yr-sf)
Primary Heating	185.2	46,949.3	0.4	4.7	51,316.9	1.5
Primary Cooling						
Compressor	47,041.2	0.0	0.0	16.0	481,702.6	13.9
Tower/Cond Fans	5,717.4	0.0	0.0	1.9	58,546.4	1.7
Condenser Pump	0.0	0.0	0.0	0.0	0.0	0.0
Other Accessories	428.4	0.0	0.0	0.1	4,386.8	0.1
Auxiliary						
Supply Fans	35,380.5	0.0	0.0	12.0	362,297.0	10.5
Circulation Pumps	12,059.4	0.0	0.0	4.1	123,488.5	3.6
Base Utilities	0.0	0.0	0.0	0.0	0.0	0.0
Subtotal	47,439.9	0.0	0.0	16.1	485,785.6	14.1
Lighting	93,655.9	0.0	0.0	31.8	959,038.3	27.1
Receptacle	86,156.3	0.0	0.0	29.3	882,242.7	24.9
Domestic Hot Water	0.0	0.0	0.0	0.0	0.0	0.0
Cogeneration	0.0	0.0	0.0	0.0	0.0	0.0
Totals	280,624.2	46,949.3	0.4	100.0	2,923,019.2	83.3

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M171, ECO#12

M O N T H L Y E N E R G Y C O N S U M P T I O N

Month	ELEC On Peak (kWh)	DEMAND On Peak (kW)	GAS On Peak (Therm)	WATER (1000 Gl)	GAS DMND On Peak (Thrm/hr)
Jan	18,317	89	148	0	6
Feb	16,516	89	116	0	6
March	19,509	77	18	0	4
April	17,159	77	0	0	0
May	20,389	108	0	0	0
June	24,850	143	0	0	0
July	21,896	135	3	0	0
Aug	24,320	135	0	0	0
Sept	19,446	132	0	0	0
Oct	18,719	115	0	0	0
Nov	17,159	77	0	0	0
Dec	17,382	89	59	0	6
Total	235,663	143	343	0	6

Building Energy Consumption = 23,692 (Btu/Sq Ft/Year)
Source Energy Consumption = 69,194 (Btu/Sq Ft/Year)

Floor Area = 35,398 (Sq Ft)

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M171, ECO#12

EQUIPMENT ENERGY CONSUMPTION

Ref Num	Equip Code	Monthly Consumption Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	7828	7081	8454	7475	8141	8101	7515	8454	7475	8141	7475	7515	93,656
	PK	33.8	33.8	33.8	33.8	33.8	33.8	33.8	33.8	33.8	33.8	33.8	33.8	33.8
1	MISC LD													
	ELEC	7201	6514	7777	6876	7489	7452	6914	7777	6876	7489	6876	6914	86,156
	PK	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1
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	EQ1122L	AIR-CLD RECIP >55 TONS												
	ELEC	0	0	0	0	997	4347	3071	3289	1439	0	0	0	13,143
	PK	0.0	0.0	0.0	0.0	21.2	50.0	45.1	45.8	42.6	26.8	0.0	0.0	50.0
1	EQ5200	CONDENSER FANS												
	ELEC	0	0	0	0	125	524	381	408	180	0	0	0	1,617
	PK	0.0	0.0	0.0	0.0	2.7	8.7	5.3	5.3	5.0	3.6	0.0	0.0	8.7
1	EQ5001	CHILLED WATER PUMP C.V.												
	ELEC	0	0	0	0	526	1285	985	1117	642	0	0	0	4,555
	PK	0.0	0.0	0.0	0.0	7.3	7.3	7.3	7.3	7.3	7.3	0.0	0.0	7.3
1	EQ5313	CONTROLS												
	ELEC	0	0	0	0	22	53	41	46	26	0	0	0	187
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3
1	EQ4371	FAN COIL SUPPLY FAN												
	ELEC	2948	2668	3229	2808	3089	3089	2808	3229	2808	3089	2808	2808	35,380
	PK	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M171, ECO#12

1	EQ2004		GAS WATER TUBE STEAM										
	GAS	148	116	18	0	0	0	3	0	0	0	0	59	343
	PK	5.8	5.8	4.5	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	5.8	5.8
1	EQ5020		HEAT WATER CIRC. PUMP C.V.										
	ELEC	305	229	44	0	0	0	164	0	0	0	0	131	872
	PK	10.9	10.9	10.9	0.0	0.0	0.0	10.9	0.0	0.0	0.0	0.0	10.9	10.9
1	EQ5240		BOILER FORCED DRAFT FAN										
	ELEC	13	10	2	0	0	0	7	0	0	0	0	6	38
	PK	0.5	0.5	0.5	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.5	0.5
1	EQ5307		BOILER CONTROLS										
	ELEC	14	10	2	0	0	0	8	0	0	0	0	6	40
	PK	0.5	0.5	0.5	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.5	0.5
1	EQ5062		CONDENSATE RETURN PUMP										
	ELEC	6	5	1	0	0	0	3	0	0	0	0	3	18
	PK	0.2	0.2	0.2	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.2	0.2
1	EQ5406		MAKE-UP WATER										
	WATER	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

UTILITY PEAK CHECKSUMS - ALTERNATIVE 1
BLDG M171, ECO#12

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 142.9 (kW)
Yearly Time of Peak 16 (hr) 6 (mo)

Hour 16 Month 6

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Percnt Of Tot (%)
Cooling Equipment				
1	EQ1122L	AIR-CLD RECIP >55 TONS	66.3	46.38
Sub Total			66.3	46.38
Sub Total			0.0	0.00
Air Moving Equipment				
1		SUMMATION OF FAN ELECTRICAL DEMAND	11.7	8.19
Sub Total			11.7	8.19
Sub Total			0.0	0.00
Miscellaneous				
Lights			33.8	23.66
Base Utilities			0.0	0.00
Misc Equipment			31.1	21.77
Sub Total			64.9	45.43
Grand Total			142.9	100.00

CALIFORNIA TITLE 24 COMPLIANCE - ALTERNATIVE 1
BLDG M171, ECO#12

CALIFORNIA TITLE 24 COMPLIANCE REPORT

Weather Name	ATLANTA.
Gross Conditioned Floor Area (sqft)	35,398
ACM Multiplier	1.025

ENERGY USE SUMMARY

	ELEC (kWh/yr)	GAS (kBtu/yr)	WATER (1000 gal)	PERCENT OF TOTAL ENERGY (%)	TOTAL SOURCE ENERGY (kBtu/yr)	ADJUSTED UNIT SOURCE ENERGY (kBtu/yr-sf)
Primary Heating	96.4	34,321.8	0.2	4.1	37,115.7	1.1
Primary Cooling						
Compressor	13,143.2	0.0	0.0	5.3	134,586.7	3.9
Tower/Cond Fans	1,616.6	0.0	0.0	0.7	16,554.4	0.5
Condenser Pump	0.0	0.0	0.0	0.0	0.0	0.0
Other Accessories	187.2	0.0	0.0	0.1	1,916.9	0.1
Auxiliary						
Supply Fans	35,380.5	0.0	0.0	14.4	362,297.0	10.5
Circulation Pumps	5,427.2	0.0	0.0	2.2	55,574.7	1.6
Base Utilities	0.0	0.0	0.0	0.0	0.0	0.0
Subtotal	40,807.7	0.0	0.0	16.6	417,871.7	12.1
Lighting	93,655.9	0.0	0.0	38.1	959,038.3	27.1
Receptacle	86,156.3	0.0	0.0	35.1	882,242.7	24.9
Domestic Hot Water	0.0	0.0	0.0	0.0	0.0	0.0
Cogeneration	0.0	0.0	0.0	0.0	0.0	0.0
Totals	235,663.3	34,321.8	0.2	100.0	2,449,326.5	69.6

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M171, ECO#13

M O N T H L Y E N E R G Y C O N S U M P T I O N

Month	ELEC On Peak (kWh)	DEMAND On Peak (kW)	GAS On Peak (Therm)	WATER (1000 Gl)	GAS DMND On Peak (Thrm/hr)
Jan	30,047	83	1,033	1	4
Feb	27,383	77	922	1	4
March	28,086	77	228	0	3
April	24,367	77	2	0	0
May	37,627	128	0	0	0
June	45,231	147	0	0	0
July	43,657	144	0	0	0
Aug	45,861	144	0	0	0
Sept	37,923	138	0	0	0
Oct	30,088	117	0	0	0
Nov	25,828	77	195	0	2
Dec	28,108	77	583	1	3
Total	404,206	147	2,964	3	4

Building Energy Consumption = 47,346 (Btu/Sq Ft/Year) Floor Area = 35,398 (Sq Ft)
Source Energy Consumption = 125,743 (Btu/Sq Ft/Year)

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M171, ECO#13

EQUIPMENT ENERGY CONSUMPTION

Ref Num	Equip Code	Monthly Consumption Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	7828	7081	8454	7475	8141	8101	7515	8454	7475	8141	7475	7515	93,656
	PK	33.8	33.8	33.8	33.8	33.8	33.8	33.8	33.8	33.8	33.8	33.8	33.8	33.8
1	MISC LD													
	ELEC	7201	6514	7777	6876	7489	7452	6914	7777	6876	7489	6876	6914	86,156
	PK	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1
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	EQ1122L	AIR-CLD RECIP >55 TONS												
	ELEC	0	0	0	0	3907	8419	8021	7998	4767	495	0	0	33,608
	PK	0.0	0.0	0.0	0.0	50.4	60.6	56.1	55.5	47.4	28.9	0.0	0.0	60.6
1	EQ5200	CONDENSER FANS												
	ELEC	0	0	0	0	435	1031	995	971	543	46	0	0	4,022
	PK	0.0	0.0	0.0	0.0	6.1	8.7	6.7	6.6	5.9	3.6	0.0	0.0	8.7
1	EQ5001	CHILLED WATER PUMP C.V.												
	ELEC	0	0	0	0	2226	3723	3621	3621	2628	321	0	0	16,140
	PK	0.0	0.0	0.0	0.0	7.3	7.3	7.3	7.3	7.3	7.3	0.0	0.0	7.3
1	EQ5313	CONTROLS												
	ELEC	0	0	0	0	91	153	149	149	108	13	0	0	663
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3
2	EQ1750	AIR-CLD CTV ICE-CHILL H2O												
	ELEC	1360	1252	1386	1341	6315	7603	7408	7850	6779	4645	1341	1386	48,666
	PK	20.5	20.5	20.5	20.5	50.5	52.4	52.1	52.0	50.5	50.5	27.0	20.5	52.4

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M171, ECO#13

2	EQ5205			CONDENSER FANS										
	ELEC	10	9	10	10	14	16	16	16	15	13	10	10	150
	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
2	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
2	EQ5309			CONTROLS										
	ELEC	124	112	124	120	301	310	314	321	307	218	120	124	2,495
	PK	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
1	EQ4371			FAN COIL SUPPLY FAN										
	ELEC	8705	7862	8705	8424	8705	8424	8705	8705	8424	8705	8424	8705	102,491
	PK	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
1	EQ2004			GAS WATER TUBE STEAM										
	GAS	1033	922	228	2	0	0	0	0	0	0	195	583	2,964
	PK	3.8	3.8	2.9	0.3	0.0	0.0	0.0	0.0	0.0	0.0	2.4	3.2	3.8
1	EQ5020			HEAT WATER CIRC. PUMP C.V.										
	ELEC	4349	4109	1471	109	0	0	0	0	0	0	1428	3117	14,584
	PK	10.9	10.9	10.9	10.9	0.0	0.0	0.0	0.0	0.0	0.0	10.9	10.9	10.9
1	EQ5240			BOILER FORCED DRAFT FAN										
	ELEC	184	174	62	5	0	0	0	0	0	0	60	132	616
	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	EQ5307			BOILER CONTROLS										
	ELEC	200	189	68	5	0	0	0	0	0	0	65	143	6
	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.
1	EQ5062			CONDENSATE RETURN PUMP										
	ELEC	86	82	29	2	0	0	0	0	0	0	28	62	289
	PK	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2
1	EQ5406			MAKE-UP WATER										
	WATER	1	1	0	0	0	0	0	0	0	0	0	1	3
	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

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

UTILITY PEAK CHECKSUMS - ALTERNATIVE 1
BLDG M171, ECO#13

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 146.7 (kW)
Yearly Time of Peak 12 (hr) 6 (mo)

Hour 12 Month 6

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Percnt Of Tot (%)
Cooling Equipment				
1	EQ1122L	AIR-CLD RECIP >55 TONS	70.1	47.76
Sub Total			70.1	47.76
Sub Total			0.0	0.00
Air Moving Equipment				
1		SUMMATION OF FAN ELECTRICAL DEMAND	11.7	7.97
Sub Total			11.7	7.97
Sub Total			0.0	0.00
Miscellaneous				
Lights			33.8	23.05
Base Utilities			0.0	0.00
Misc Equipment			31.1	21.21
Sub Total			64.9	44.26
Grand Total			146.7	100.00

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M171, ECO#13

---- B U I L D I N G C O O L I N G D E M A N D S A N D T H E R M A L S T O R A G E ----

January

	Design		Design			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	42.7	35.4	0.0	0.0	0.0	245
2	41.8	34.7	0.0	4.9	8.1	247
3	41.1	34.4	0.0	0.0	0.0	245
4	40.6	34.0	0.0	4.9	8.1	247
5	40.4	34.0	0.0	0.0	0.0	245
6	40.8	34.4	0.0	4.9	8.1	247
7	41.6	35.0	0.0	0.0	0.0	245
8	43.2	36.5	0.0	4.9	8.1	247
9	45.5	38.5	0.0	0.0	0.0	247
10	48.1	40.4	0.0	0.0	0.0	247
11	51.0	42.2	0.0	0.0	0.0	247
12	53.8	43.8	0.0	0.0	0.0	247
13	55.9	45.0	0.0	0.0	0.0	245
14	57.3	45.5	0.0	0.0	0.0	243
15	57.8	45.6	0.0	0.0	0.0	240
16	57.3	44.8	0.0	0.0	0.0	238
17	56.1	43.9	0.0	0.0	0.0	238
18	54.2	42.7	0.0	0.0	0.0	238
19	51.9	41.6	0.0	0.0	0.0	238
20	49.6	40.2	0.0	0.0	0.0	238
21	47.7	39.1	0.0	0.0	0.0	238
22	46.0	37.9	0.0	0.0	0.0	238
23	44.6	36.8	0.0	0.0	0.0	238
24	43.6	36.1	0.0	0.0	0.0	238

			Weekday				Saturday			
Hour	Typical OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	33.4	30.4	0.0	12.1	19.0	247	0.0	14.5	20.5	247
2	32.1	29.3	0.0	0.0	0.0	245	0.0	0.0	0.0	245
3	31.7	29.3	0.0	4.9	8.1	247	0.0	4.9	8.1	247
4	31.9	29.5	0.0	0.0	0.0	245	0.0	0.0	0.0	245
5	32.6	30.3	0.0	4.9	8.1	247	0.0	4.9	8.1	247
6	33.6	31.3	0.0	0.0	0.0	245	0.0	0.0	0.0	245
7	35.0	32.6	0.0	4.9	8.1	247	0.0	4.9	8.1	247
8	36.6	34.4	0.0	0.0	0.0	245	0.0	0.0	0.0	245
9	38.5	36.3	0.0	0.0	0.0	245	0.0	0.0	0.0	245
10	40.4	37.7	0.0	0.0	0.0	245	0.0	0.0	0.0	245
11	42.3	38.7	0.0	0.0	0.0	245	0.0	0.0	0.0	245
12	44.2	39.6	0.0	0.0	0.0	245	0.0	0.0	0.0	245
13	45.8	40.5	0.0	0.0	0.0	243	0.0	0.0	0.0	243
14	47.2	41.1	0.0	0.0	0.0	240	0.0	0.0	0.0	240
15	48.2	41.6	0.0	0.0	0.0	238	0.0	0.0	0.0	238

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M171, ECO#13

	Typical		Weekday				Saturday			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
16	48.9	41.8	0.0	0.0	0.0	235	0.0	0.0	0.0	235
17	49.1	41.9	0.0	0.0	0.0	235	0.0	0.0	0.0	235
18	48.7	41.9	0.0	0.0	0.0	235	0.0	0.0	0.0	235
19	47.4	41.7	0.0	0.0	0.0	235	0.0	0.0	0.0	235
20	45.5	40.5	0.0	0.0	0.0	235	0.0	0.0	0.0	235
21	43.1	38.9	0.0	0.0	0.0	235	0.0	0.0	0.0	235
22	40.4	36.7	0.0	0.0	0.0	235	0.0	0.0	0.0	235
23	37.7	34.3	0.0	0.0	0.0	235	0.0	0.0	0.0	235
24	35.3	32.3	0.0	0.0	0.0	235	0.0	0.0	0.0	235

	Typical		Sunday				Monday			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	33.4	30.4	0.0	14.5	20.5	247	0.0	14.5	20.5	247
2	32.1	29.3	0.0	0.0	0.0	245	0.0	0.0	0.0	245
3	31.7	29.3	0.0	4.9	8.1	247	0.0	4.9	8.1	247
4	31.9	29.5	0.0	0.0	0.0	245	0.0	0.0	0.0	245
5	32.6	30.3	0.0	4.9	8.1	247	0.0	4.9	8.1	247
6	33.6	31.3	0.0	0.0	0.0	245	0.0	0.0	0.0	245
7	35.0	32.6	0.0	4.9	8.1	247	0.0	4.9	8.1	247
8	36.6	34.4	0.0	0.0	0.0	245	0.0	0.0	0.0	245
9	38.5	36.3	0.0	0.0	0.0	245	0.0	0.0	0.0	245
10	40.4	37.7	0.0	0.0	0.0	245	0.0	0.0	0.0	245
11	42.3	38.7	0.0	0.0	0.0	245	0.0	0.0	0.0	245
12	44.2	39.6	0.0	0.0	0.0	245	0.0	0.0	0.0	245
13	45.8	40.5	0.0	0.0	0.0	243	0.0	0.0	0.0	243
14	47.2	41.1	0.0	0.0	0.0	240	0.0	0.0	0.0	240
15	48.2	41.6	0.0	0.0	0.0	238	0.0	0.0	0.0	238
16	48.9	41.8	0.0	0.0	0.0	235	0.0	0.0	0.0	235
17	49.1	41.9	0.0	0.0	0.0	235	0.0	0.0	0.0	235
18	48.7	41.9	0.0	0.0	0.0	235	0.0	0.0	0.0	235
19	47.4	41.7	0.0	0.0	0.0	235	0.0	0.0	0.0	235
20	45.5	40.5	0.0	0.0	0.0	235	0.0	0.0	0.0	235
21	43.1	38.9	0.0	0.0	0.0	235	0.0	0.0	0.0	235
22	40.4	36.7	0.0	0.0	0.0	235	0.0	0.0	0.0	235
23	37.7	34.3	0.0	0.0	0.0	235	0.0	0.0	0.0	235
24	35.3	32.3	0.0	0.0	0.0	235	0.0	0.0	0.0	235

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M171, ECO#13

---- B U I L D I N G C O O L I N G D E M A N D S A N D T H E R M A L S T O R A G E ----

February

	Design		Design			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	42.8	35.6	0.0	14.5	20.5	247
2	42.0	34.9	0.0	0.0	0.0	245
3	41.4	34.5	0.0	4.9	8.1	247
4	41.0	34.2	0.0	0.0	0.0	245
5	40.8	34.0	0.0	4.9	8.1	247
6	41.1	34.4	0.0	0.0	0.0	245
7	41.9	35.0	0.0	4.9	8.1	247
8	43.3	36.5	0.0	0.0	0.0	245
9	45.3	38.2	0.0	0.0	0.0	245
10	47.7	39.5	0.0	0.0	0.0	245
11	50.3	41.3	0.0	0.0	0.0	245
12	52.8	42.5	0.0	0.0	0.0	245
13	54.7	43.4	0.0	0.0	0.0	243
14	55.9	44.0	0.0	0.0	0.0	240
15	56.4	44.2	0.0	0.0	0.0	238
16	55.9	43.6	0.0	0.0	0.0	235
17	54.8	42.6	0.0	0.0	0.0	235
18	53.1	41.4	0.0	0.0	0.0	235
19	51.1	40.4	0.0	0.0	0.0	235
20	49.1	39.4	0.0	0.0	0.0	235
21	47.4	38.5	0.0	0.0	0.0	235
22	45.8	37.6	0.0	0.0	0.0	235
23	44.5	36.9	0.0	0.0	0.0	235
24	43.6	36.1	0.0	0.0	0.0	235

			Weekday				Saturday			
Hour	Typical OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	37.5	34.5	0.0	14.5	20.5	247	0.0	14.5	20.5	247
2	36.0	33.0	0.0	0.0	0.0	245	0.0	0.0	0.0	245
3	34.7	31.8	0.0	4.9	8.1	247	0.0	4.9	8.1	247
4	33.6	30.9	0.0	0.0	0.0	245	0.0	0.0	0.0	245
5	32.8	30.1	0.0	4.9	8.1	247	0.0	4.9	8.1	247
6	32.2	29.8	0.0	0.0	0.0	245	0.0	0.0	0.0	245
7	32.1	29.6	0.0	4.9	8.1	247	0.0	4.9	8.1	247
8	32.5	30.3	0.0	0.0	0.0	245	0.0	0.0	0.0	245
9	33.9	31.6	0.0	0.0	0.0	245	0.0	0.0	0.0	245
10	36.0	33.0	0.0	0.0	0.0	245	0.0	0.0	0.0	245
11	38.5	34.8	0.0	0.0	0.0	245	0.0	0.0	0.0	245
12	41.3	36.5	0.0	0.0	0.0	245	0.0	0.0	0.0	245
13	43.8	38.1	0.0	0.0	0.0	243	0.0	0.0	0.0	243
14	45.9	39.5	0.0	0.0	0.0	240	0.0	0.0	0.0	240
15	47.2	40.4	0.0	0.0	0.0	238	0.0	0.0	0.0	238

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M171, ECO#13

	Typical		Weekday				Saturday			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
16	47.7	40.6	0.0	0.0	0.0	235	0.0	0.0	0.0	235
17	47.5	40.2	0.0	0.0	0.0	235	0.0	0.0	0.0	235
18	47.0	39.8	0.0	0.0	0.0	235	0.0	0.0	0.0	235
19	46.2	39.9	0.0	0.0	0.0	235	0.0	0.0	0.0	235
20	45.1	39.7	0.0	0.0	0.0	235	0.0	0.0	0.0	235
21	43.8	39.2	0.0	0.0	0.0	235	0.0	0.0	0.0	235
22	42.3	38.3	0.0	0.0	0.0	235	0.0	0.0	0.0	235
23	40.7	37.2	0.0	0.0	0.0	235	0.0	0.0	0.0	235
24	39.1	35.8	0.0	0.0	0.0	235	0.0	0.0	0.0	235

	Typical		Sunday				Monday			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	37.5	34.5	0.0	14.5	20.5	247	0.0	14.5	20.5	247
2	36.0	33.0	0.0	0.0	0.0	245	0.0	0.0	0.0	245
3	34.7	31.8	0.0	4.9	8.1	247	0.0	4.9	8.1	247
4	33.6	30.9	0.0	0.0	0.0	245	0.0	0.0	0.0	245
5	32.8	30.1	0.0	4.9	8.1	247	0.0	4.9	8.1	247
6	32.2	29.8	0.0	0.0	0.0	245	0.0	0.0	0.0	245
7	32.1	29.6	0.0	4.9	8.1	247	0.0	4.9	8.1	247
8	32.5	30.3	0.0	0.0	0.0	245	0.0	0.0	0.0	245
9	33.9	31.6	0.0	0.0	0.0	245	0.0	0.0	0.0	245
10	36.0	33.0	0.0	0.0	0.0	245	0.0	0.0	0.0	245
11	38.5	34.8	0.0	0.0	0.0	245	0.0	0.0	0.0	245
12	41.3	36.5	0.0	0.0	0.0	245	0.0	0.0	0.0	245
13	43.8	38.1	0.0	0.0	0.0	243	0.0	0.0	0.0	243
14	45.9	39.5	0.0	0.0	0.0	240	0.0	0.0	0.0	240
15	47.2	40.4	0.0	0.0	0.0	238	0.0	0.0	0.0	238
16	47.7	40.6	0.0	0.0	0.0	235	0.0	0.0	0.0	235
17	47.5	40.2	0.0	0.0	0.0	235	0.0	0.0	0.0	235
18	47.0	39.8	0.0	0.0	0.0	235	0.0	0.0	0.0	235
19	46.2	39.9	0.0	0.0	0.0	235	0.0	0.0	0.0	235
20	45.1	39.7	0.0	0.0	0.0	235	0.0	0.0	0.0	235
21	43.8	39.2	0.0	0.0	0.0	235	0.0	0.0	0.0	235
22	42.3	38.3	0.0	0.0	0.0	235	0.0	0.0	0.0	235
23	40.7	37.2	0.0	0.0	0.0	235	0.0	0.0	0.0	235
24	39.1	35.8	0.0	0.0	0.0	235	0.0	0.0	0.0	235

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M171, ECO#13

---- B U I L D I N G C O O L I N G D E M A N D S A N D T H E R M A L S T O R A G E ----

March

			Design			
Hour	Design OADB (F)	Design OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	51.8	42.9	0.0	14.5	20.5	247
2	50.8	42.1	0.0	0.0	0.0	245
3	50.0	41.8	0.0	4.9	8.1	247
4	49.3	41.1	0.0	0.0	0.0	245
5	49.1	41.1	0.0	4.9	8.1	247
6	49.5	41.6	0.0	0.0	0.0	245
7	50.6	42.7	0.0	4.9	8.1	247
8	52.5	44.3	0.0	0.0	0.0	245
9	55.2	46.4	0.0	0.0	0.0	245
10	58.3	48.5	0.0	0.0	0.0	245
11	61.8	50.3	0.0	0.0	0.0	245
12	65.1	51.9	0.0	0.0	0.0	245
13	67.6	53.4	0.0	0.0	0.0	243
14	69.3	53.9	0.0	0.0	0.0	240
15	69.9	53.8	0.0	0.0	0.0	238
16	69.3	53.1	0.0	0.0	0.0	235
17	67.8	51.8	0.0	0.0	0.0	235
18	65.6	50.2	0.0	0.0	0.0	235
19	62.9	48.9	0.0	0.0	0.0	235
20	60.2	47.7	0.0	0.0	0.0	235
21	57.9	46.5	0.0	0.0	0.0	235
22	55.8	45.3	0.0	0.0	0.0	235
23	54.1	44.4	0.0	0.0	0.0	235
24	52.9	43.7	0.0	0.0	0.0	235

			Weekday				Saturday			
Hour	Typical OADB (F)	Typical OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	45.4	41.6	0.0	14.5	20.5	247	0.0	14.5	20.5	247
2	43.3	39.7	0.0	0.0	0.0	245	0.0	0.0	0.0	245
3	41.6	38.6	0.0	4.9	8.1	247	0.0	4.9	8.1	247
4	40.6	37.5	0.0	0.0	0.0	245	0.0	0.0	0.0	245
5	40.2	37.3	0.0	4.9	8.1	247	0.0	4.9	8.1	247
6	40.6	37.8	0.0	0.0	0.0	245	0.0	0.0	0.0	245
7	41.6	39.0	0.0	4.9	8.1	247	0.0	4.9	8.1	247
8	43.3	40.7	0.0	0.0	0.0	245	0.0	0.0	0.0	245
9	45.4	42.5	0.0	0.0	0.0	245	0.0	0.0	0.0	245
10	47.9	44.3	0.0	0.0	0.0	245	0.0	0.0	0.0	245
11	50.6	45.5	0.0	0.0	0.0	245	0.0	0.0	0.0	245
12	53.3	46.8	0.0	0.0	0.0	245	0.0	0.0	0.0	245
13	55.8	48.5	0.0	0.0	0.0	243	0.0	0.0	0.0	243
14	58.0	49.6	0.0	0.0	0.0	240	0.0	0.0	0.0	240
15	59.6	50.3	0.0	0.0	0.0	238	0.0	0.0	0.0	238

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M171, ECO#13

			Weekday				Saturday			
	Typical		Cooling	Chiller	Chiller	Storage	Cooling	Chiller	Chiller	Storage
	OADB	OAWB	Load	Load	Demand	Capacity	Load	Load	Demand	Capacity
Hour	(F)	(F)	(Ton)	(Ton)	(kW)	(Ton-Hr)	(Ton)	(Ton)	(kW)	(Ton-Hr)
16	60.7	50.9	0.0	0.0	0.0	235	0.0	0.0	0.0	235
17	61.0	50.9	0.0	0.0	0.0	235	0.0	0.0	0.0	235
18	60.7	50.7	0.0	0.0	0.0	235	0.0	0.0	0.0	235
19	59.6	50.7	0.0	0.0	0.0	235	0.0	0.0	0.0	235
20	58.0	50.5	0.0	0.0	0.0	235	0.0	0.0	0.0	235
21	55.8	49.4	0.0	0.0	0.0	235	0.0	0.0	0.0	235
22	53.3	47.8	0.0	0.0	0.0	235	0.0	0.0	0.0	235
23	50.6	45.9	0.0	0.0	0.0	235	0.0	0.0	0.0	235
24	47.9	43.8	0.0	0.0	0.0	235	0.0	0.0	0.0	235

			Sunday				Monday			
	Typical		Cooling	Chiller	Chiller	Storage	Cooling	Chiller	Chiller	Storage
	OADB	OAWB	Load	Load	Demand	Capacity	Load	Load	Demand	Capacity
Hour	(F)	(F)	(Ton)	(Ton)	(kW)	(Ton-Hr)	(Ton)	(Ton)	(kW)	(Ton-Hr)
1	45.4	41.6	0.0	14.5	20.5	247	0.0	14.5	20.5	247
2	43.3	39.7	0.0	0.0	0.0	245	0.0	0.0	0.0	245
3	41.6	38.6	0.0	4.9	8.1	247	0.0	4.9	8.1	247
4	40.6	37.5	0.0	0.0	0.0	245	0.0	0.0	0.0	245
5	40.2	37.3	0.0	4.9	8.1	247	0.0	4.9	8.1	247
6	40.6	37.8	0.0	0.0	0.0	245	0.0	0.0	0.0	245
7	41.6	39.0	0.0	4.9	8.1	247	0.0	4.9	8.1	247
8	43.3	40.7	0.0	0.0	0.0	245	0.0	0.0	0.0	245
9	45.4	42.5	0.0	0.0	0.0	245	0.0	0.0	0.0	245
10	47.9	44.3	0.0	0.0	0.0	245	0.0	0.0	0.0	245
11	50.6	45.5	0.0	0.0	0.0	245	0.0	0.0	0.0	245
12	53.3	46.8	0.0	0.0	0.0	245	0.0	0.0	0.0	245
13	55.8	48.5	0.0	0.0	0.0	243	0.0	0.0	0.0	243
14	58.0	49.6	0.0	0.0	0.0	240	0.0	0.0	0.0	240
15	59.6	50.3	0.0	0.0	0.0	238	0.0	0.0	0.0	238
16	60.7	50.9	0.0	0.0	0.0	235	0.0	0.0	0.0	235
17	61.0	50.9	0.0	0.0	0.0	235	0.0	0.0	0.0	235
18	60.7	50.7	0.0	0.0	0.0	235	0.0	0.0	0.0	235
19	59.6	50.7	0.0	0.0	0.0	235	0.0	0.0	0.0	235
20	58.0	50.5	0.0	0.0	0.0	235	0.0	0.0	0.0	235
21	55.8	49.4	0.0	0.0	0.0	235	0.0	0.0	0.0	235
22	53.3	47.8	0.0	0.0	0.0	235	0.0	0.0	0.0	235
23	50.6	45.9	0.0	0.0	0.0	235	0.0	0.0	0.0	235
24	47.9	43.8	0.0	0.0	0.0	235	0.0	0.0	0.0	235

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M171, ECO#13

---- B U I L D I N G C O O L I N G D E M A N D S A N D T H E R M A L S T O R A G E ----

April

			Design			
Hour	Design OADB (F)	Design OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	62.6	52.5	0.0	14.5	20.5	247
2	61.6	52.1	0.0	0.0	0.0	245
3	60.9	51.6	0.0	4.9	8.1	247
4	60.3	51.2	0.0	0.0	0.0	245
5	60.1	51.3	0.0	4.9	8.1	247
6	60.5	51.9	0.0	0.0	0.0	245
7	61.4	53.0	0.0	4.9	8.1	247
8	63.2	54.5	0.0	0.0	0.0	245
9	65.7	55.8	0.0	0.0	0.0	245
10	68.6	57.1	0.0	0.0	0.0	245
11	71.9	58.6	0.0	0.0	0.0	245
12	75.0	60.3	0.0	0.0	0.0	245
13	77.4	61.5	0.0	0.0	0.0	243
14	78.9	62.2	0.0	0.0	0.0	240
15	79.5	62.5	0.0	0.0	0.0	238
16	78.9	61.8	0.0	0.0	0.0	235
17	77.5	60.3	0.0	0.0	0.0	235
18	75.4	59.1	0.0	0.0	0.0	235
19	72.9	57.3	0.0	0.0	0.0	235
20	70.4	56.5	0.0	0.0	0.0	235
21	68.2	55.7	0.0	0.0	0.0	235
22	66.3	55.0	0.0	0.0	0.0	235
23	64.7	54.0	0.0	0.0	0.0	235
24	63.6	53.2	0.0	0.0	0.0	235

			Weekday				Saturday			
Hour	Typical OADB (F)	Typical OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	57.7	53.9	0.0	14.5	20.5	247	0.0	14.5	20.5	247
2	55.9	52.7	0.0	0.0	0.0	245	0.0	0.0	0.0	245
3	54.2	51.3	0.0	4.9	8.1	247	0.0	4.9	8.1	247
4	52.9	50.2	0.0	0.0	0.0	245	0.0	0.0	0.0	245
5	51.9	49.6	0.0	4.9	8.1	247	0.0	4.9	8.1	247
6	51.2	49.2	0.0	0.0	0.0	245	0.0	0.0	0.0	245
7	51.0	49.3	0.0	4.9	8.1	247	0.0	4.9	8.1	247
8	51.6	49.9	0.0	0.0	0.0	245	0.0	0.0	0.0	245
9	53.3	50.6	0.0	0.0	0.0	245	0.0	0.0	0.0	245
10	55.9	51.8	0.0	0.0	0.0	245	0.0	0.0	0.0	245
11	59.0	53.4	0.0	0.0	0.0	245	0.0	0.0	0.0	245
12	62.4	55.6	0.0	0.0	0.0	245	0.0	0.0	0.0	245
13	65.5	57.7	0.0	0.0	0.0	243	0.0	0.0	0.0	243
14	68.1	59.4	0.0	0.0	0.0	240	0.0	0.0	0.0	240
15	69.8	60.7	0.0	0.0	0.0	238	0.0	0.0	0.0	238

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M171, ECO#13

	Typical		Weekday				Saturday			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
16	70.4	60.9	0.0	0.0	0.0	235	0.0	0.0	0.0	235
17	70.2	60.2	0.0	0.0	0.0	235	0.0	0.0	0.0	235
18	69.5	60.1	0.0	0.0	0.0	235	0.0	0.0	0.0	235
19	68.5	59.4	0.0	0.0	0.0	235	0.0	0.0	0.0	235
20	67.2	59.7	0.0	0.0	0.0	235	0.0	0.0	0.0	235
21	65.5	59.3	0.0	0.0	0.0	235	0.0	0.0	0.0	235
22	63.7	58.8	0.0	0.0	0.0	235	0.0	0.0	0.0	235
23	61.7	57.3	0.0	0.0	0.0	235	0.0	0.0	0.0	235
24	59.7	55.6	0.0	0.0	0.0	235	0.0	0.0	0.0	235

	Typical		Sunday				Monday			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	57.7	53.9	0.0	14.5	20.5	247	0.0	14.5	20.5	247
2	55.9	52.7	0.0	0.0	0.0	245	0.0	0.0	0.0	245
3	54.2	51.3	0.0	4.9	8.1	247	0.0	4.9	8.1	247
4	52.9	50.2	0.0	0.0	0.0	245	0.0	0.0	0.0	245
5	51.9	49.6	0.0	4.9	8.1	247	0.0	4.9	8.1	247
6	51.2	49.2	0.0	0.0	0.0	245	0.0	0.0	0.0	245
7	51.0	49.3	0.0	4.9	8.1	247	0.0	4.9	8.1	247
8	51.6	49.9	0.0	0.0	0.0	245	0.0	0.0	0.0	245
9	53.3	50.6	0.0	0.0	0.0	245	0.0	0.0	0.0	245
10	55.9	51.8	0.0	0.0	0.0	245	0.0	0.0	0.0	245
11	59.0	53.4	0.0	0.0	0.0	245	0.0	0.0	0.0	245
12	62.4	55.6	0.0	0.0	0.0	245	0.0	0.0	0.0	245
13	65.5	57.7	0.0	0.0	0.0	243	0.0	0.0	0.0	243
14	68.1	59.4	0.0	0.0	0.0	240	0.0	0.0	0.0	240
15	69.8	60.7	0.0	0.0	0.0	238	0.0	0.0	0.0	238
16	70.4	60.9	0.0	0.0	0.0	235	0.0	0.0	0.0	235
17	70.2	60.2	0.0	0.0	0.0	235	0.0	0.0	0.0	235
18	69.5	60.1	0.0	0.0	0.0	235	0.0	0.0	0.0	235
19	68.5	59.4	0.0	0.0	0.0	235	0.0	0.0	0.0	235
20	67.2	59.7	0.0	0.0	0.0	235	0.0	0.0	0.0	235
21	65.5	59.3	0.0	0.0	0.0	235	0.0	0.0	0.0	235
22	63.7	58.8	0.0	0.0	0.0	235	0.0	0.0	0.0	235
23	61.7	57.3	0.0	0.0	0.0	235	0.0	0.0	0.0	235
24	59.7	55.6	0.0	0.0	0.0	235	0.0	0.0	0.0	235

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M171, ECO#13

---- B U I L D I N G C O O L I N G D E M A N D S A N D T H E R M A L S T O R A G E ----

May

	Design		Design			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	70.8	59.3	0.0	14.5	20.5	247
2	69.8	58.5	0.0	0.0	0.0	245
3	69.0	58.2	0.0	4.9	8.1	247
4	68.4	58.1	0.0	0.0	0.0	245
5	68.2	58.0	0.0	4.9	8.1	247
6	68.6	58.5	0.0	0.0	0.0	245
7	69.6	59.5	0.0	4.9	8.1	247
8	71.3	60.6	0.0	0.0	0.0	245
9	73.9	61.5	0.0	0.0	0.0	245
10	76.8	62.7	0.0	0.0	0.0	245
11	80.1	63.9	0.0	0.0	0.0	245
12	83.2	65.4	0.0	0.0	0.0	245
13	85.6	66.5	41.1	0.0	0.0	201
14	87.1	67.1	51.9	0.0	0.0	148
15	87.7	67.2	55.4	0.0	0.0	91
16	87.1	66.5	55.2	0.0	0.0	35
17	85.8	65.1	0.0	0.0	0.0	35
18	83.6	63.9	0.0	0.0	0.0	35
19	81.1	62.4	0.0	0.0	0.0	35
20	78.6	61.6	0.0	0.0	0.0	35
21	76.4	61.8	0.0	0.0	0.0	35
22	74.5	60.9	0.0	0.0	0.0	35
23	72.9	60.3	0.0	0.0	0.0	35
24	71.7	59.9	0.0	0.0	0.0	35

			Weekday				Saturday			
Hour	Typical OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	66.6	62.3	0.0	45.0	50.5	79	0.0	45.0	50.5	140
2	64.5	60.4	0.0	45.0	50.5	123	0.0	45.0	50.5	183
3	62.7	59.1	0.0	45.0	50.5	167	0.0	45.0	50.5	226
4	61.2	58.1	0.0	45.0	50.5	211	0.0	23.4	27.4	247
5	60.0	57.1	0.0	39.0	43.2	247	0.0	0.0	0.0	245
6	59.3	56.6	0.0	0.0	0.0	245	0.0	4.9	8.1	247
7	59.0	56.5	0.0	4.9	8.1	247	0.0	0.0	0.0	245
8	59.5	56.6	0.0	0.0	0.0	245	0.0	4.9	8.1	247
9	60.9	56.6	0.0	0.0	0.0	245	0.0	0.0	0.0	247
10	63.0	57.2	0.0	0.0	0.0	245	0.0	0.0	0.0	247
11	65.7	58.1	0.0	0.0	0.0	245	0.0	0.0	0.0	247
12	68.7	59.8	0.0	0.0	0.0	245	0.0	0.0	0.0	247
13	71.7	61.6	27.1	0.0	0.0	215	9.1	0.0	0.0	236
14	74.5	63.4	35.8	0.0	0.0	178	16.4	0.0	0.0	217
15	76.6	64.8	40.0	0.0	0.0	136	19.3	0.0	0.0	196

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M171, ECO#13

	Typical		Weekday				Saturday			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
16	78.0	65.6	38.8	0.0	0.0	96	17.8	0.0	0.0	176
17	78.5	65.6	0.0	0.0	0.0	96	0.0	0.0	0.0	176
18	78.2	65.8	0.0	0.0	0.0	96	0.0	0.0	0.0	176
19	77.5	65.6	0.0	0.0	0.0	96	0.0	0.0	0.0	176
20	76.3	66.1	0.0	0.0	0.0	96	0.0	0.0	0.0	176
21	74.8	67.2	0.0	0.0	0.0	96	0.0	0.0	0.0	176
22	73.0	66.4	0.0	0.0	0.0	96	0.0	0.0	0.0	176
23	70.9	65.4	0.0	0.0	0.0	96	0.0	0.0	0.0	176
24	68.7	64.0	0.0	0.0	0.0	96	0.0	0.0	0.0	176

	Typical		Sunday				Monday			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	66.6	62.3	0.0	45.0	50.5	219	0.0	45.0	50.5	219
2	64.5	60.4	0.0	30.5	34.0	247	0.0	30.5	34.0	247
3	62.7	59.1	0.0	0.0	0.0	245	0.0	0.0	0.0	245
4	61.2	58.1	0.0	4.9	8.1	247	0.0	4.9	8.1	247
5	60.0	57.1	0.0	0.0	0.0	245	0.0	0.0	0.0	245
6	59.3	56.6	0.0	4.9	8.1	247	0.0	4.9	8.1	247
7	59.0	56.5	0.0	0.0	0.0	245	0.0	0.0	0.0	245
8	59.5	56.6	0.0	4.9	8.1	247	0.0	4.9	8.1	247
9	60.9	56.6	0.0	0.0	0.0	247	0.0	0.0	0.0	247
10	63.0	57.2	0.0	0.0	0.0	247	0.0	0.0	0.0	247
11	65.7	58.1	0.0	0.0	0.0	247	0.0	0.0	0.0	247
12	68.7	59.8	0.0	0.0	0.0	247	0.0	0.0	0.0	247
13	71.7	61.6	9.1	0.0	0.0	236	27.1	0.0	0.0	218
14	74.5	63.4	16.4	0.0	0.0	217	35.8	0.0	0.0	180
15	76.6	64.8	19.3	0.0	0.0	196	40.2	0.0	0.0	138
16	78.0	65.6	17.8	0.0	0.0	176	38.8	0.0	0.0	98
17	78.5	65.6	0.0	0.0	0.0	176	0.0	0.0	0.0	98
18	78.2	65.8	0.0	0.0	0.0	176	0.0	0.0	0.0	98
19	77.5	65.6	0.0	0.0	0.0	176	0.0	0.0	0.0	98
20	76.3	66.1	0.0	0.0	0.0	176	0.0	0.0	0.0	98
21	74.8	67.2	0.0	0.0	0.0	176	0.0	0.0	0.0	98
22	73.0	66.4	0.0	0.0	0.0	176	0.0	0.0	0.0	98
23	70.9	65.4	0.0	0.0	0.0	176	0.0	0.0	0.0	98
24	68.7	64.0	0.0	0.0	0.0	176	0.0	0.0	0.0	98

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M171, ECO#13

---- B U I L D I N G C O O L I N G D E M A N D S A N D T H E R M A L S T O R A G E ----

June

			Design			
	Design		Cooling	Chiller	Chiller	Storage
	OADB	OAWB	Load	Load	Demand	Capacity
Hour	(F)	(F)	(Ton)	(Ton)	(kW)	(Ton-Hr)
1	79.5	66.2	0.0	45.0	52.4	142
2	78.5	65.3	0.0	45.0	51.9	185
3	77.7	65.1	0.0	45.0	51.6	229
4	77.2	64.8	0.0	21.3	26.1	247
5	77.0	65.1	0.0	0.0	0.0	245
6	77.4	65.6	0.0	4.9	8.2	247
7	78.3	66.5	0.0	0.0	0.0	245
8	80.0	67.7	0.0	4.9	8.4	247
9	82.5	68.3	0.0	0.0	0.0	247
10	85.4	69.5	0.0	0.0	0.0	247
11	88.7	70.8	0.0	0.0	0.0	247
12	91.8	72.2	0.0	0.0	0.0	247
13	94.1	72.6	51.1	0.0	0.0	194
14	95.6	72.9	64.1	0.0	0.0	128
15	96.2	72.9	66.2	0.0	0.0	60
16	95.6	72.0	65.6	0.0	0.0	0
17	94.3	70.8	0.0	0.0	0.0	0
18	92.1	69.7	0.0	0.0	0.0	0
19	89.6	68.3	0.0	0.0	0.0	0
20	87.1	67.7	0.0	0.0	0.0	0
21	85.0	67.5	0.0	0.0	0.0	0
22	83.1	67.3	0.0	0.0	0.0	0
23	81.6	66.8	0.0	0.0	0.0	0
24	80.4	66.3	0.0	0.0	0.0	0

			Weekday				Saturday			
	Typical		Cooling	Chiller	Chiller	Storage	Cooling	Chiller	Chiller	Storage
	OADB	OAWB	Load	Load	Demand	Capacity	Load	Load	Demand	Capacity
Hour	(F)	(F)	(Ton)	(Ton)	(kW)	(Ton-Hr)	(Ton)	(Ton)	(kW)	(Ton-Hr)
1	73.0	67.9	0.0	45.0	50.5	45	0.0	45.0	50.5	81
2	71.2	66.1	0.0	45.0	50.5	90	0.0	45.0	50.5	125
3	69.7	65.2	0.6	45.0	50.5	133	0.9	45.0	50.5	168
4	68.5	64.3	0.0	45.0	50.5	177	0.0	45.0	50.5	211
5	67.8	64.2	0.0	45.0	50.5	220	0.0	38.3	42.4	247
6	67.6	64.2	0.0	29.8	33.3	247	0.0	0.0	0.0	245
7	68.1	64.8	0.0	0.0	0.0	245	0.0	4.9	8.1	247
8	69.4	65.7	0.0	4.9	8.1	247	0.0	0.0	0.0	245
9	71.6	66.2	0.0	0.0	0.0	247	0.0	0.0	0.0	245
10	74.2	67.2	0.0	0.0	0.0	247	0.0	0.0	0.0	245
11	77.2	68.5	0.0	0.0	0.0	247	0.0	0.0	0.0	245
12	80.2	70.0	0.0	0.0	0.0	247	0.0	0.0	0.0	245
13	82.8	70.8	40.7	0.0	0.0	204	23.7	0.0	0.0	219
14	85.0	71.6	53.7	0.0	0.0	149	29.4	0.0	0.0	187
15	86.3	72.3	56.9	0.0	0.0	90	32.9	0.0	0.0	152

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M171, ECO#13

	Typical		Weekday				Saturday			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
16	86.8	72.1	53.0	0.0	0.0	36	29.1	0.0	0.0	122
17	86.6	71.7	0.0	0.0	0.0	36	0.0	0.0	0.0	122
18	85.8	71.5	0.0	0.0	0.0	36	0.0	0.0	0.0	122
19	84.7	71.2	0.0	0.0	0.0	36	0.0	0.0	0.0	122
20	83.2	71.5	0.0	0.0	0.0	36	0.0	0.0	0.0	122
21	81.4	71.7	0.0	0.0	0.0	36	0.0	0.0	0.0	122
22	79.3	71.4	0.0	0.0	0.0	36	0.0	0.0	0.0	122
23	77.2	70.5	0.0	0.0	0.0	36	0.0	0.0	0.0	122
24	75.1	69.1	0.0	0.0	0.0	36	0.0	0.0	0.0	122

	Typical		Sunday				Monday			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	73.0	67.9	0.0	45.0	50.5	166	0.0	45.0	50.5	166
2	71.2	66.1	0.0	45.0	50.5	209	0.0	45.0	50.5	209
3	69.7	65.2	0.9	41.5	46.1	247	0.9	41.5	46.1	247
4	68.5	64.3	0.0	0.0	0.0	245	0.0	0.0	0.0	245
5	67.8	64.2	0.0	4.9	8.1	247	0.0	4.9	8.1	247
6	67.6	64.2	0.0	0.0	0.0	245	0.0	0.0	0.0	245
7	68.1	64.8	0.0	4.9	8.1	247	0.0	4.9	8.1	247
8	69.4	65.7	0.0	0.0	0.0	245	0.0	0.0	0.0	245
9	71.6	66.2	0.0	0.0	0.0	245	0.0	0.0	0.0	245
10	74.2	67.2	0.0	0.0	0.0	245	0.0	0.0	0.0	245
11	77.2	68.5	0.0	0.0	0.0	245	0.0	0.0	0.0	245
12	80.2	70.0	0.0	0.0	0.0	245	0.0	0.0	0.0	245
13	82.8	70.8	23.7	0.0	0.0	219	40.7	0.0	0.0	202
14	85.0	71.6	29.4	0.0	0.0	187	53.7	0.0	0.0	146
15	86.3	72.3	32.9	0.0	0.0	152	56.9	0.0	0.0	88
16	86.8	72.1	29.1	0.0	0.0	122	53.0	0.0	0.0	34
17	86.6	71.7	0.0	0.0	0.0	122	0.0	0.0	0.0	34
18	85.8	71.5	0.0	0.0	0.0	122	0.0	0.0	0.0	34
19	84.7	71.2	0.0	0.0	0.0	122	0.0	0.0	0.0	34
20	83.2	71.5	0.0	0.0	0.0	122	0.0	0.0	0.0	34
21	81.4	71.7	0.0	0.0	0.0	122	0.0	0.0	0.0	34
22	79.3	71.4	0.0	0.0	0.0	122	0.0	0.0	0.0	34
23	77.2	70.5	0.0	0.0	0.0	122	0.0	0.0	0.0	34
24	75.1	69.1	0.0	0.0	0.0	122	0.0	0.0	0.0	34

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M171, ECO#13

---- B U I L D I N G C O O L I N G D E M A N D S A N D T H E R M A L S T O R A G E ----

July

	Design		Design			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	78.9	67.7	0.0	45.0	52.1	79
2	78.2	67.2	0.0	45.0	51.8	123
3	77.6	66.8	0.0	45.0	51.6	167
4	77.1	66.6	0.0	45.0	51.4	210
5	77.0	66.6	0.0	39.7	44.8	247
6	77.3	66.9	0.0	0.0	0.0	245
7	78.0	67.6	0.0	4.9	8.3	247
8	79.4	68.8	0.0	0.0	0.0	245
9	81.3	69.6	0.0	0.0	0.0	245
10	83.6	70.7	0.0	0.0	0.0	245
11	86.1	72.2	0.0	0.0	0.0	245
12	88.5	73.3	0.0	0.0	0.0	245
13	90.3	74.0	51.3	0.0	0.0	191
14	91.5	74.3	63.9	0.0	0.0	126
15	92.0	74.0	65.8	0.0	0.0	58
16	91.5	73.2	65.1	0.0	0.0	0
17	90.5	72.1	0.0	0.0	0.0	0
18	88.8	70.8	0.0	0.0	0.0	0
19	86.9	70.4	0.0	0.0	0.0	0
20	84.9	70.2	0.0	0.0	0.0	0
21	83.3	70.0	0.0	0.0	0.0	0
22	81.8	69.4	0.0	0.0	0.0	0
23	80.6	68.7	0.0	0.0	0.0	0
24	79.7	68.4	0.0	0.0	0.0	0

	Typical		Weekday				Saturday			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	72.0	69.3	0.0	45.0	50.5	45	0.0	45.0	50.5	81
2	70.5	68.0	0.0	45.0	50.5	90	0.0	45.0	50.5	126
3	69.4	67.1	0.0	45.0	50.5	134	0.0	45.0	50.5	169
4	68.5	66.4	0.0	45.0	50.5	177	0.0	45.0	50.5	213
5	67.9	66.0	0.0	45.0	50.5	221	0.0	37.1	40.9	247
6	67.7	65.9	0.0	29.2	32.7	247	0.0	0.0	0.0	245
7	68.1	66.3	0.0	0.0	0.0	245	0.0	4.9	8.1	247
8	69.1	67.3	0.0	4.9	8.1	247	0.0	0.0	0.0	245
9	70.8	68.0	0.0	0.0	0.0	247	0.0	0.0	0.0	245
10	72.9	69.1	0.0	0.0	0.0	247	0.0	0.0	0.0	245
11	75.2	70.5	0.0	0.0	0.0	247	0.0	0.0	0.0	245
12	77.5	71.7	0.0	0.0	0.0	247	0.0	0.0	0.0	245
13	79.6	72.7	40.2	0.0	0.0	205	23.4	0.0	0.0	219
14	81.3	73.5	54.4	0.0	0.0	148	28.9	0.0	0.0	188
15	82.3	73.7	55.9	0.0	0.0	91	31.4	0.0	0.0	155

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M171, ECO#13

	Typical		Weekday				Saturday			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
16	82.7	73.5	53.4	0.0	0.0	37	29.1	0.0	0.0	124
17	82.5	73.1	0.0	0.0	0.0	37	0.0	0.0	0.0	124
18	82.0	72.6	0.0	0.0	0.0	37	0.0	0.0	0.0	124
19	81.1	73.2	0.0	0.0	0.0	37	0.0	0.0	0.0	124
20	79.9	73.8	0.0	0.0	0.0	37	0.0	0.0	0.0	124
21	78.5	73.9	0.0	0.0	0.0	37	0.0	0.0	0.0	124
22	76.9	73.1	0.0	0.0	0.0	37	0.0	0.0	0.0	124
23	75.2	71.9	0.0	0.0	0.0	37	0.0	0.0	0.0	124
24	73.5	70.8	0.0	0.0	0.0	37	0.0	0.0	0.0	124

	Typical		Sunday				Monday			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	72.0	69.3	0.0	45.0	50.5	168	0.0	45.0	50.5	168
2	70.5	68.0	0.0	45.0	50.5	211	0.0	45.0	50.5	211
3	69.4	67.1	0.0	38.4	42.5	247	0.0	38.4	42.5	247
4	68.5	66.4	0.0	0.0	0.0	245	0.0	0.0	0.0	245
5	67.9	66.0	0.0	4.9	8.1	247	0.0	4.9	8.1	247
6	67.7	65.9	0.0	0.0	0.0	245	0.0	0.0	0.0	245
7	68.1	66.3	0.0	4.9	8.1	247	0.0	4.9	8.1	247
8	69.1	67.3	0.0	0.0	0.0	245	0.0	0.0	0.0	245
9	70.8	68.0	0.0	0.0	0.0	245	0.0	0.0	0.0	245
10	72.9	69.1	0.0	0.0	0.0	245	0.0	0.0	0.0	245
11	75.2	70.5	0.0	0.0	0.0	245	0.0	0.0	0.0	245
12	77.5	71.7	0.0	0.0	0.0	245	0.0	0.0	0.0	245
13	79.6	72.7	23.4	0.0	0.0	219	40.2	0.0	0.0	202
14	81.3	73.5	28.9	0.0	0.0	188	54.4	0.0	0.0	146
15	82.3	73.7	31.4	0.0	0.0	155	55.9	0.0	0.0	89
16	82.7	73.5	29.1	0.0	0.0	124	53.4	0.0	0.0	34
17	82.5	73.1	0.0	0.0	0.0	124	0.0	0.0	0.0	34
18	82.0	72.6	0.0	0.0	0.0	124	0.0	0.0	0.0	34
19	81.1	73.2	0.0	0.0	0.0	124	0.0	0.0	0.0	34
20	79.9	73.8	0.0	0.0	0.0	124	0.0	0.0	0.0	34
21	78.5	73.9	0.0	0.0	0.0	124	0.0	0.0	0.0	34
22	76.9	73.1	0.0	0.0	0.0	124	0.0	0.0	0.0	34
23	75.2	71.9	0.0	0.0	0.0	124	0.0	0.0	0.0	34
24	73.5	70.8	0.0	0.0	0.0	124	0.0	0.0	0.0	34

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M171, ECO#13

---- B U I L D I N G C O O L I N G D E M A N D S A N D T H E R M A L S T O R A G E ----

August

			Design			
Hour	Design OADB (F)	Design OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	78.6	67.6	0.0	45.0	52.0	79
2	77.9	67.2	0.0	45.0	51.7	123
3	77.2	66.9	0.0	45.0	51.4	167
4	76.8	66.6	0.0	45.0	51.2	210
5	76.6	66.7	0.0	39.3	44.1	247
6	76.9	67.1	0.0	0.0	0.0	245
7	77.7	67.8	0.0	4.9	8.2	247
8	79.1	69.0	0.0	0.0	0.0	245
9	81.2	70.0	0.0	0.0	0.0	245
10	83.5	70.9	0.0	0.0	0.0	245
11	86.2	71.8	0.0	0.0	0.0	245
12	88.7	72.7	0.0	0.0	0.0	245
13	90.6	73.2	50.9	0.0	0.0	192
14	91.8	73.8	65.3	0.0	0.0	124
15	92.3	74.0	66.7	0.0	0.0	56
16	91.8	73.3	64.6	0.0	0.0	0
17	90.7	72.4	0.0	0.0	0.0	0
18	89.0	71.4	0.0	0.0	0.0	0
19	87.0	70.1	0.0	0.0	0.0	0
20	84.9	69.8	0.0	0.0	0.0	0
21	83.2	70.3	0.0	0.0	0.0	0
22	81.6	69.3	0.0	0.0	0.0	0
23	80.4	68.5	0.0	0.0	0.0	0
24	79.4	67.9	0.0	0.0	0.0	0

			Weekday				Saturday			
Hour	Typical OADB (F)	Typical OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	72.7	70.2	0.0	45.0	50.5	45	0.0	45.0	50.5	84
2	71.2	69.0	0.0	45.0	50.5	90	0.0	45.0	50.5	128
3	69.9	68.0	0.9	45.0	50.5	133	1.1	45.0	50.5	171
4	68.8	67.1	0.0	45.0	50.5	176	0.0	45.0	50.5	214
5	68.0	66.6	0.0	45.0	50.5	220	0.0	35.4	39.1	247
6	67.5	66.2	0.0	30.1	33.6	247	0.0	0.0	0.0	245
7	67.3	66.1	0.0	0.0	0.0	245	0.0	4.9	8.1	247
8	67.8	66.5	0.0	4.9	8.1	247	0.0	0.0	0.0	245
9	69.1	67.0	0.0	0.0	0.0	247	0.0	0.0	0.0	245
10	71.2	67.8	0.0	0.0	0.0	247	0.0	0.0	0.0	245
11	73.8	68.7	0.0	0.0	0.0	247	0.0	0.0	0.0	245
12	76.5	70.0	0.0	0.0	0.0	247	0.0	0.0	0.0	245
13	79.1	71.2	40.7	0.0	0.0	204	23.5	0.0	0.0	219
14	81.1	72.6	54.3	0.0	0.0	148	29.3	0.0	0.0	188
15	82.5	73.6	56.1	0.0	0.0	90	32.2	0.0	0.0	153

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M171, ECO#13

			Weekday				Saturday			
Hour	Typical OADB (F)	Typical OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
16	83.0	73.7	49.9	0.0	0.0	40	25.5	0.0	0.0	126
17	82.8	73.5	0.0	0.0	0.0	40	0.0	0.0	0.0	126
18	82.3	73.5	0.0	0.0	0.0	40	0.0	0.0	0.0	126
19	81.5	73.1	0.0	0.0	0.0	40	0.0	0.0	0.0	126
20	80.4	73.7	0.0	0.0	0.0	40	0.0	0.0	0.0	126
21	79.1	74.9	0.0	0.0	0.0	40	0.0	0.0	0.0	126
22	77.6	73.9	0.0	0.0	0.0	40	0.0	0.0	0.0	126
23	76.0	72.7	0.0	0.0	0.0	40	0.0	0.0	0.0	126
24	74.3	71.3	0.0	0.0	0.0	40	0.0	0.0	0.0	126

			Sunday				Monday			
Hour	Typical OADB (F)	Typical OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	72.7	70.2	0.0	45.0	50.5	170	0.0	45.0	50.5	170
2	71.2	69.0	0.0	45.0	50.5	213	0.0	45.0	50.5	213
3	69.9	68.0	1.1	37.3	41.2	247	1.1	37.3	41.2	247
4	68.8	67.1	0.0	0.0	0.0	245	0.0	0.0	0.0	245
5	68.0	66.6	0.0	4.9	8.1	247	0.0	4.9	8.1	247
6	67.5	66.2	0.0	0.0	0.0	245	0.0	0.0	0.0	245
7	67.3	66.1	0.0	4.9	8.1	247	0.0	4.9	8.1	247
8	67.8	66.5	0.0	0.0	0.0	245	0.0	0.0	0.0	245
9	69.1	67.0	0.0	0.0	0.0	245	0.0	0.0	0.0	245
10	71.2	67.8	0.0	0.0	0.0	245	0.0	0.0	0.0	245
11	73.8	68.7	0.0	0.0	0.0	245	0.0	0.0	0.0	245
12	76.5	70.0	0.0	0.0	0.0	245	0.0	0.0	0.0	245
13	79.1	71.2	23.5	0.0	0.0	219	40.7	0.0	0.0	202
14	81.1	72.6	29.3	0.0	0.0	188	54.3	0.0	0.0	146
15	82.5	73.6	32.2	0.0	0.0	153	56.1	0.0	0.0	88
16	83.0	73.7	25.5	0.0	0.0	126	49.9	0.0	0.0	37
17	82.8	73.5	0.0	0.0	0.0	126	0.0	0.0	0.0	37
18	82.3	73.5	0.0	0.0	0.0	126	0.0	0.0	0.0	37
19	81.5	73.1	0.0	0.0	0.0	126	0.0	0.0	0.0	37
20	80.4	73.7	0.0	0.0	0.0	126	0.0	0.0	0.0	37
21	79.1	74.9	0.0	0.0	0.0	126	0.0	0.0	0.0	37
22	77.6	73.9	0.0	0.0	0.0	126	0.0	0.0	0.0	37
23	76.0	72.7	0.0	0.0	0.0	126	0.0	0.0	0.0	37
24	74.3	71.3	0.0	0.0	0.0	126	0.0	0.0	0.0	37

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M171, ECO#13

---- B U I L D I N G C O O L I N G D E M A N D S A N D T H E R M A L S T O R A G E ----

September

	Design		Design			
Hour	Design OADB (F)	Design OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	74.6	63.1	0.0	45.0	50.5	82
2	73.7	62.4	0.0	45.0	50.5	126
3	73.0	61.9	0.0	45.0	50.5	170
4	72.4	61.7	0.0	45.0	50.5	213
5	72.3	61.8	0.0	36.6	40.4	247
6	72.6	62.5	0.0	0.0	0.0	245
7	73.5	63.2	0.0	4.9	8.1	247
8	75.1	64.8	0.0	0.0	0.0	245
9	77.4	65.9	0.0	0.0	0.0	245
10	80.0	66.8	0.0	0.0	0.0	245
11	83.0	67.8	0.0	0.0	0.0	245
12	85.8	68.5	0.0	0.0	0.0	245
13	87.9	69.7	47.9	0.0	0.0	195
14	89.3	70.2	59.6	0.0	0.0	133
15	89.9	70.1	61.1	0.0	0.0	71
16	89.3	69.1	57.9	0.0	0.0	12
17	88.1	67.8	0.0	0.0	0.0	12
18	86.2	66.8	0.0	0.0	0.0	12
19	83.9	66.5	0.0	0.0	0.0	12
20	81.6	66.3	0.0	0.0	0.0	12
21	79.7	66.1	0.0	0.0	0.0	12
22	77.9	65.0	0.0	0.0	0.0	12
23	76.5	64.4	0.0	0.0	0.0	12
24	75.4	63.6	0.0	0.0	0.0	12

	Typical		Weekday				Saturday			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	69.8	66.1	0.6	45.0	50.5	56	0.9	45.0	50.5	117
2	68.0	64.5	0.0	45.0	50.5	101	0.0	45.0	50.5	161
3	66.3	63.0	0.0	45.0	50.5	145	0.0	45.0	50.5	204
4	64.9	61.9	0.0	45.0	50.5	188	0.0	45.0	50.5	247
5	63.9	61.3	0.0	45.0	50.5	231	0.0	3.1	5.0	247
6	63.2	61.0	0.0	18.4	23.3	247	0.0	0.0	0.0	245
7	63.0	60.8	0.0	0.0	0.0	245	0.0	4.9	8.1	247
8	63.4	61.4	0.0	4.9	8.1	247	0.0	0.0	0.0	245
9	64.7	61.8	0.0	0.0	0.0	247	0.0	0.0	0.0	245
10	66.6	62.1	0.0	0.0	0.0	247	0.0	0.0	0.0	245
11	69.1	62.9	0.0	0.0	0.0	247	0.0	0.0	0.0	245
12	71.8	63.7	0.0	0.0	0.0	247	0.0	0.0	0.0	245
13	74.5	65.5	33.6	0.0	0.0	211	17.7	0.0	0.0	225
14	77.0	67.1	45.8	0.0	0.0	163	21.7	0.0	0.0	201
15	78.9	68.2	44.2	0.0	0.0	118	20.7	0.0	0.0	178

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M171, ECO#13

	Typical		Weekday				Saturday			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
16	80.2	68.6	43.1	0.0	0.0	73	19.5	0.0	0.0	157
17	80.6	68.5	0.0	0.0	0.0	73	0.0	0.0	0.0	157
18	80.4	68.9	0.0	0.0	0.0	73	0.0	0.0	0.0	157
19	79.7	70.0	0.0	0.0	0.0	73	0.0	0.0	0.0	157
20	78.7	71.2	0.0	0.0	0.0	73	0.0	0.0	0.0	157
21	77.3	71.6	0.0	0.0	0.0	73	0.0	0.0	0.0	157
22	75.6	70.5	0.0	0.0	0.0	73	0.0	0.0	0.0	157
23	73.7	69.4	0.0	0.0	0.0	73	0.0	0.0	0.0	157
24	71.8	67.7	0.0	0.0	0.0	73	0.0	0.0	0.0	157

	Typical		Sunday				Monday			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	69.8	66.1	0.9	45.0	50.5	200	0.9	45.0	50.5	200
2	68.0	64.5	0.0	45.0	50.5	243	0.0	45.0	50.5	243
3	66.3	63.0	0.0	7.4	12.1	247	0.0	7.4	12.1	247
4	64.9	61.9	0.0	0.0	0.0	245	0.0	0.0	0.0	245
5	63.9	61.3	0.0	4.9	8.1	247	0.0	4.9	8.1	247
6	63.2	61.0	0.0	0.0	0.0	245	0.0	0.0	0.0	245
7	63.0	60.8	0.0	4.9	8.1	247	0.0	4.9	8.1	247
8	63.4	61.4	0.0	0.0	0.0	245	0.0	0.0	0.0	245
9	64.7	61.8	0.0	0.0	0.0	245	0.0	0.0	0.0	245
10	66.6	62.1	0.0	0.0	0.0	245	0.0	0.0	0.0	245
11	69.1	62.9	0.0	0.0	0.0	245	0.0	0.0	0.0	245
12	71.8	63.7	0.0	0.0	0.0	245	0.0	0.0	0.0	245
13	74.5	65.5	17.7	0.0	0.0	225	33.6	0.0	0.0	209
14	77.0	67.1	21.7	0.0	0.0	201	45.8	0.0	0.0	161
15	78.9	68.2	20.7	0.0	0.0	178	44.2	0.0	0.0	115
16	80.2	68.6	19.5	0.0	0.0	157	43.1	0.0	0.0	71
17	80.6	68.5	0.0	0.0	0.0	157	0.0	0.0	0.0	71
18	80.4	68.9	0.0	0.0	0.0	157	0.0	0.0	0.0	71
19	79.7	70.0	0.0	0.0	0.0	157	0.0	0.0	0.0	71
20	78.7	71.2	0.0	0.0	0.0	157	0.0	0.0	0.0	71
21	77.3	71.6	0.0	0.0	0.0	157	0.0	0.0	0.0	71
22	75.6	70.5	0.0	0.0	0.0	157	0.0	0.0	0.0	71
23	73.7	69.4	0.0	0.0	0.0	157	0.0	0.0	0.0	71
24	71.8	67.7	0.0	0.0	0.0	157	0.0	0.0	0.0	71

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M171, ECO#13

---- B U I L D I N G C O O L I N G D E M A N D S A N D T H E R M A L S T O R A G E ----

October

			Design			
	Design		Cooling	Chiller	Chiller	Storage
	OADB	OAWB	Load	Load	Demand	Capacity
Hour	(F)	(F)	(Ton)	(Ton)	(kW)	(Ton-Hr)
1	59.5	50.0	0.0	45.0	50.5	115
2	58.5	49.3	0.0	45.0	50.5	159
3	57.7	48.8	0.0	45.0	50.5	203
4	57.1	48.5	0.0	45.0	50.5	246
5	56.9	48.3	0.0	4.4	7.3	247
6	57.3	48.7	0.0	0.0	0.0	245
7	58.3	49.7	0.0	4.9	8.1	247
8	60.1	51.3	0.0	0.0	0.0	245
9	62.7	52.9	0.0	0.0	0.0	245
10	65.7	54.4	0.0	0.0	0.0	245
11	69.1	55.5	0.0	0.0	0.0	245
12	72.3	56.7	0.0	0.0	0.0	245
13	74.7	57.8	34.5	0.0	0.0	208
14	76.3	58.6	43.0	0.0	0.0	163
15	76.9	58.7	45.2	0.0	0.0	116
16	76.3	58.0	42.1	0.0	0.0	73
17	74.9	57.0	0.0	0.0	0.0	73
18	72.7	56.0	0.0	0.0	0.0	73
19	70.1	55.5	0.0	0.0	0.0	73
20	67.5	54.7	1.0	0.0	0.0	72
21	65.3	53.6	0.0	0.0	0.0	72
22	63.3	52.4	0.0	0.0	0.0	72
23	61.7	51.5	0.0	0.0	0.0	72
24	60.5	50.7	0.0	0.0	0.0	72

			Weekday				Saturday			
	Typical		Cooling	Chiller	Chiller	Storage	Cooling	Chiller	Chiller	Storage
	OADB	OAWB	Load	Load	Demand	Capacity	Load	Load	Demand	Capacity
Hour	(F)	(F)	(Ton)	(Ton)	(kW)	(Ton-Hr)	(Ton)	(Ton)	(kW)	(Ton-Hr)
1	54.8	51.3	0.0	45.0	50.5	116	0.0	45.0	50.5	198
2	52.9	49.6	0.0	45.0	50.5	160	0.0	45.0	50.5	241
3	51.2	48.2	0.0	45.0	50.5	203	0.0	9.1	15.0	247
4	49.8	47.2	0.0	45.0	50.5	246	0.0	0.0	0.0	245
5	48.8	46.2	0.0	3.6	5.9	247	0.0	4.9	8.1	247
6	48.2	45.7	0.0	0.0	0.0	245	0.0	0.0	0.0	245
7	47.9	45.6	0.0	4.9	8.1	247	0.0	4.9	8.1	247
8	48.5	46.2	0.0	0.0	0.0	245	0.0	0.0	0.0	245
9	50.3	47.3	0.0	0.0	0.0	245	0.0	0.0	0.0	245
10	52.9	48.7	0.0	0.0	0.0	245	0.0	0.0	0.0	245
11	56.2	49.9	0.0	0.0	0.0	245	0.0	0.0	0.0	245
12	59.6	51.5	0.0	0.0	0.0	245	0.0	0.0	0.0	245
13	62.9	53.5	0.0	0.0	0.0	243	0.0	0.0	0.0	243
14	65.5	55.2	25.1	0.0	0.0	215	0.0	0.0	0.0	240
15	67.3	56.3	28.9	0.0	0.0	184	0.0	0.0	0.0	238

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M171, ECO#13

	Typical		Weekday				Saturday			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
16	67.9	56.6	27.9	0.0	0.0	154	0.0	0.0	0.0	235
17	67.7	56.4	0.0	0.0	0.0	154	0.0	0.0	0.0	235
18	67.0	56.6	0.0	0.0	0.0	154	0.0	0.0	0.0	235
19	66.0	57.6	0.0	0.0	0.0	154	0.0	0.0	0.0	235
20	64.6	57.9	0.0	0.0	0.0	154	0.0	0.0	0.0	235
21	62.9	57.3	0.0	0.0	0.0	154	0.0	0.0	0.0	235
22	61.0	56.0	0.0	0.0	0.0	154	0.0	0.0	0.0	235
23	59.0	54.8	0.0	0.0	0.0	154	0.0	0.0	0.0	235
24	56.9	53.0	0.0	0.0	0.0	154	0.0	0.0	0.0	235

	Typical		Sunday				Monday			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	54.8	51.3	0.0	14.5	20.5	247	0.0	14.5	20.5	247
2	52.9	49.6	0.0	0.0	0.0	245	0.0	0.0	0.0	245
3	51.2	48.2	0.0	4.9	8.1	247	0.0	4.9	8.1	247
4	49.8	47.2	0.0	0.0	0.0	245	0.0	0.0	0.0	245
5	48.8	46.2	0.0	4.9	8.1	247	0.0	4.9	8.1	247
6	48.2	45.7	0.0	0.0	0.0	245	0.0	0.0	0.0	245
7	47.9	45.6	0.0	4.9	8.1	247	0.0	4.9	8.1	247
8	48.5	46.2	0.0	0.0	0.0	245	0.0	0.0	0.0	245
9	50.3	47.3	0.0	0.0	0.0	245	0.0	0.0	0.0	245
10	52.9	48.7	0.0	0.0	0.0	245	0.0	0.0	0.0	245
11	56.2	49.9	0.0	0.0	0.0	245	0.0	0.0	0.0	245
12	59.6	51.5	0.0	0.0	0.0	245	0.0	0.0	0.0	245
13	62.9	53.5	0.0	0.0	0.0	243	0.0	0.0	0.0	243
14	65.5	55.2	0.0	0.0	0.0	240	0.0	0.0	0.0	240
15	67.3	56.3	0.0	0.0	0.0	238	0.0	0.0	0.0	238
16	67.9	56.6	0.0	0.0	0.0	235	8.5	0.0	0.0	227
17	67.7	56.4	0.0	0.0	0.0	235	0.0	0.0	0.0	227
18	67.0	56.6	0.0	0.0	0.0	235	0.0	0.0	0.0	227
19	66.0	57.6	0.0	0.0	0.0	235	0.0	0.0	0.0	227
20	64.6	57.9	0.0	0.0	0.0	235	0.0	0.0	0.0	227
21	62.9	57.3	0.0	0.0	0.0	235	0.0	0.0	0.0	227
22	61.0	56.0	0.0	0.0	0.0	235	0.0	0.0	0.0	227
23	59.0	54.8	0.0	0.0	0.0	235	0.0	0.0	0.0	227
24	56.9	53.0	0.0	0.0	0.0	235	0.0	0.0	0.0	227

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M171, ECO#13

---- B U I L D I N G C O O L I N G D E M A N D S A N D T H E R M A L S T O R A G E ----

November

			Design			
	Design		Cooling	Chiller	Chiller	Storage
	OADB	OAWB	Load	Load	Demand	Capacity
Hour	(F)	(F)	(Ton)	(Ton)	(kW)	(Ton-Hr)
1	56.0	47.2	0.0	22.9	27.0	247
2	55.0	46.4	0.0	0.0	0.0	245
3	54.2	45.8	0.0	4.9	8.1	247
4	53.6	45.2	0.0	0.0	0.0	245
5	53.4	45.3	0.0	4.9	8.1	247
6	53.8	45.9	0.0	0.0	0.0	245
7	54.8	46.9	0.0	4.9	8.1	247
8	56.6	48.7	0.0	0.0	0.0	245
9	59.2	50.6	0.0	0.0	0.0	245
10	62.2	52.6	0.0	0.0	0.0	245
11	65.6	54.1	0.0	0.0	0.0	245
12	68.8	55.3	0.0	0.0	0.0	245
13	71.2	55.7	0.0	0.0	0.0	243
14	72.8	56.3	0.0	0.0	0.0	240
15	73.4	56.2	0.0	0.0	0.0	238
16	72.8	55.6	0.0	0.0	0.0	235
17	71.4	54.6	0.0	0.0	0.0	235
18	69.2	53.6	0.0	0.0	0.0	235
19	66.6	53.0	0.0	0.0	0.0	235
20	64.0	51.7	0.0	0.0	0.0	235
21	61.8	50.7	0.0	0.0	0.0	235
22	59.8	49.6	0.0	0.0	0.0	235
23	58.2	48.7	0.0	0.0	0.0	235
24	57.0	48.0	0.0	0.0	0.0	235

			Weekday				Saturday			
	Typical		Cooling	Chiller	Chiller	Storage	Cooling	Chiller	Chiller	Storage
	OADB	OAWB	Load	Load	Demand	Capacity	Load	Load	Demand	Capacity
Hour	(F)	(F)	(Ton)	(Ton)	(kW)	(Ton-Hr)	(Ton)	(Ton)	(kW)	(Ton-Hr)
1	48.7	45.7	0.0	14.5	20.5	247	0.0	14.5	20.5	247
2	46.9	44.1	0.0	0.0	0.0	245	0.0	0.0	0.0	245
3	45.5	42.8	0.0	4.9	8.1	247	0.0	4.9	8.1	247
4	44.6	41.9	0.0	0.0	0.0	245	0.0	0.0	0.0	245
5	44.4	42.0	0.0	4.9	8.1	247	0.0	4.9	8.1	247
6	44.8	42.7	0.0	0.0	0.0	245	0.0	0.0	0.0	245
7	45.9	43.9	0.0	4.9	8.1	247	0.0	4.9	8.1	247
8	47.8	46.0	0.0	0.0	0.0	245	0.0	0.0	0.0	245
9	50.2	48.0	0.0	0.0	0.0	245	0.0	0.0	0.0	245
10	52.9	49.9	0.0	0.0	0.0	245	0.0	0.0	0.0	245
11	55.8	51.1	0.0	0.0	0.0	245	0.0	0.0	0.0	245
12	58.5	52.0	0.0	0.0	0.0	245	0.0	0.0	0.0	245
13	60.9	52.5	0.0	0.0	0.0	243	0.0	0.0	0.0	243
14	62.8	53.4	0.0	0.0	0.0	240	0.0	0.0	0.0	240
15	64.0	53.8	0.0	0.0	0.0	238	0.0	0.0	0.0	238

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M171, ECO#13

	Typical		Weekday				Saturday			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
16	64.4	53.9	0.0	0.0	0.0	235	0.0	0.0	0.0	235
17	64.1	53.7	0.0	0.0	0.0	235	0.0	0.0	0.0	235
18	63.2	53.7	0.0	0.0	0.0	235	0.0	0.0	0.0	235
19	61.8	54.2	0.0	0.0	0.0	235	0.0	0.0	0.0	235
20	60.0	53.6	0.0	0.0	0.0	235	0.0	0.0	0.0	235
21	57.9	52.7	0.0	0.0	0.0	235	0.0	0.0	0.0	235
22	55.6	51.2	0.0	0.0	0.0	235	0.0	0.0	0.0	235
23	53.2	49.5	0.0	0.0	0.0	235	0.0	0.0	0.0	235
24	50.8	47.6	0.0	0.0	0.0	235	0.0	0.0	0.0	235

	Typical		Sunday				Monday			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	48.7	45.7	0.0	14.5	20.5	247	0.0	14.5	20.5	247
2	46.9	44.1	0.0	0.0	0.0	245	0.0	0.0	0.0	245
3	45.5	42.8	0.0	4.9	8.1	247	0.0	4.9	8.1	247
4	44.6	41.9	0.0	0.0	0.0	245	0.0	0.0	0.0	245
5	44.4	42.0	0.0	4.9	8.1	247	0.0	4.9	8.1	247
6	44.8	42.7	0.0	0.0	0.0	245	0.0	0.0	0.0	245
7	45.9	43.9	0.0	4.9	8.1	247	0.0	4.9	8.1	247
8	47.8	46.0	0.0	0.0	0.0	245	0.0	0.0	0.0	245
9	50.2	48.0	0.0	0.0	0.0	245	0.0	0.0	0.0	245
10	52.9	49.9	0.0	0.0	0.0	245	0.0	0.0	0.0	245
11	55.8	51.1	0.0	0.0	0.0	245	0.0	0.0	0.0	245
12	58.5	52.0	0.0	0.0	0.0	245	0.0	0.0	0.0	245
13	60.9	52.5	0.0	0.0	0.0	243	0.0	0.0	0.0	243
14	62.8	53.4	0.0	0.0	0.0	240	0.0	0.0	0.0	240
15	64.0	53.8	0.0	0.0	0.0	238	0.0	0.0	0.0	238
16	64.4	53.9	0.0	0.0	0.0	235	0.0	0.0	0.0	235
17	64.1	53.7	0.0	0.0	0.0	235	0.0	0.0	0.0	235
18	63.2	53.7	0.0	0.0	0.0	235	0.0	0.0	0.0	235
19	61.8	54.2	0.0	0.0	0.0	235	0.0	0.0	0.0	235
20	60.0	53.6	0.0	0.0	0.0	235	0.0	0.0	0.0	235
21	57.9	52.7	0.0	0.0	0.0	235	0.0	0.0	0.0	235
22	55.6	51.2	0.0	0.0	0.0	235	0.0	0.0	0.0	235
23	53.2	49.5	0.0	0.0	0.0	235	0.0	0.0	0.0	235
24	50.8	47.6	0.0	0.0	0.0	235	0.0	0.0	0.0	235

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M171, ECO#13

---- B U I L D I N G C O O L I N G D E M A N D S A N D T H E R M A L S T O R A G E ----

December

	Design		Design			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	48.2	40.8	0.0	14.5	20.5	247
2	47.3	40.2	0.0	0.0	0.0	245
3	46.6	39.7	0.0	4.9	8.1	247
4	46.1	39.3	0.0	0.0	0.0	245
5	45.9	39.4	0.0	4.9	8.1	247
6	46.3	39.7	0.0	0.0	0.0	245
7	47.1	40.6	0.0	4.9	8.1	247
8	48.7	42.0	0.0	0.0	0.0	245
9	50.9	44.0	0.0	0.0	0.0	245
10	53.5	46.1	0.0	0.0	0.0	245
11	56.5	48.0	0.0	0.0	0.0	245
12	59.2	49.7	0.0	0.0	0.0	245
13	61.3	50.8	0.0	0.0	0.0	243
14	62.7	51.4	0.0	0.0	0.0	240
15	63.2	51.4	0.0	0.0	0.0	238
16	62.7	50.7	0.0	0.0	0.0	235
17	61.5	49.7	0.0	0.0	0.0	235
18	59.6	48.5	0.0	0.0	0.0	235
19	57.3	47.6	0.0	0.0	0.0	235
20	55.1	45.9	0.0	0.0	0.0	235
21	53.2	44.6	0.0	0.0	0.0	235
22	51.5	43.1	0.0	0.0	0.0	235
23	50.1	42.2	0.0	0.0	0.0	235
24	49.0	41.5	0.0	0.0	0.0	235

			Weekday				Saturday			
Hour	Typical OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	37.5	35.3	0.0	14.5	20.5	247	0.0	14.5	20.5	247
2	37.1	35.1	0.0	0.0	0.0	245	0.0	0.0	0.0	245
3	37.4	35.5	0.0	4.9	8.1	247	0.0	4.9	8.1	247
4	38.1	36.2	0.0	0.0	0.0	245	0.0	0.0	0.0	245
5	39.3	37.6	0.0	4.9	8.1	247	0.0	4.9	8.1	247
6	40.9	39.2	0.0	0.0	0.0	245	0.0	0.0	0.0	245
7	42.7	41.2	0.0	4.9	8.1	247	0.0	4.9	8.1	247
8	44.7	43.1	0.0	0.0	0.0	245	0.0	0.0	0.0	245
9	46.8	45.3	0.0	0.0	0.0	245	0.0	0.0	0.0	245
10	48.8	47.0	0.0	0.0	0.0	245	0.0	0.0	0.0	245
11	50.7	48.1	0.0	0.0	0.0	245	0.0	0.0	0.0	245
12	52.2	48.8	0.0	0.0	0.0	245	0.0	0.0	0.0	245
13	53.4	49.2	0.0	0.0	0.0	243	0.0	0.0	0.0	243
14	54.1	49.2	0.0	0.0	0.0	240	0.0	0.0	0.0	240
15	54.4	48.9	0.0	0.0	0.0	238	0.0	0.0	0.0	238

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M171, ECO#13

	Typical		Weekday				Saturday			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
16	54.0	48.2	0.0	0.0	0.0	235	0.0	0.0	0.0	235
17	53.0	47.3	0.0	0.0	0.0	235	0.0	0.0	0.0	235
18	51.4	46.3	0.0	0.0	0.0	235	0.0	0.0	0.0	235
19	49.3	45.4	0.0	0.0	0.0	235	0.0	0.0	0.0	235
20	47.0	43.5	0.0	0.0	0.0	235	0.0	0.0	0.0	235
21	44.5	41.5	0.0	0.0	0.0	235	0.0	0.0	0.0	235
22	42.2	39.3	0.0	0.0	0.0	235	0.0	0.0	0.0	235
23	40.1	37.6	0.0	0.0	0.0	235	0.0	0.0	0.0	235
24	38.5	36.2	0.0	0.0	0.0	235	0.0	0.0	0.0	235

	Typical		Sunday				Monday			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	37.5	35.3	0.0	14.5	20.5	247	0.0	14.5	20.5	247
2	37.1	35.1	0.0	0.0	0.0	245	0.0	0.0	0.0	245
3	37.4	35.5	0.0	4.9	8.1	247	0.0	4.9	8.1	247
4	38.1	36.2	0.0	0.0	0.0	245	0.0	0.0	0.0	245
5	39.3	37.6	0.0	4.9	8.1	247	0.0	4.9	8.1	247
6	40.9	39.2	0.0	0.0	0.0	245	0.0	0.0	0.0	245
7	42.7	41.2	0.0	4.9	8.1	247	0.0	4.9	8.1	247
8	44.7	43.1	0.0	0.0	0.0	245	0.0	0.0	0.0	245
9	46.8	45.3	0.0	0.0	0.0	245	0.0	0.0	0.0	245
10	48.8	47.0	0.0	0.0	0.0	245	0.0	0.0	0.0	245
11	50.7	48.1	0.0	0.0	0.0	245	0.0	0.0	0.0	245
12	52.2	48.8	0.0	0.0	0.0	245	0.0	0.0	0.0	245
13	53.4	49.2	0.0	0.0	0.0	243	0.0	0.0	0.0	243
14	54.1	49.2	0.0	0.0	0.0	240	0.0	0.0	0.0	240
15	54.4	48.9	0.0	0.0	0.0	238	0.0	0.0	0.0	238
16	54.0	48.2	0.0	0.0	0.0	235	0.0	0.0	0.0	235
17	53.0	47.3	0.0	0.0	0.0	235	0.0	0.0	0.0	235
18	51.4	46.3	0.0	0.0	0.0	235	0.0	0.0	0.0	235
19	49.3	45.4	0.0	0.0	0.0	235	0.0	0.0	0.0	235
20	47.0	43.5	0.0	0.0	0.0	235	0.0	0.0	0.0	235
21	44.5	41.5	0.0	0.0	0.0	235	0.0	0.0	0.0	235
22	42.2	39.3	0.0	0.0	0.0	235	0.0	0.0	0.0	235
23	40.1	37.6	0.0	0.0	0.0	235	0.0	0.0	0.0	235
24	38.5	36.2	0.0	0.0	0.0	235	0.0	0.0	0.0	235

CALIFORNIA TITLE 24 COMPLIANCE - ALTERNATIVE 1
BLDG M171, ECO#13

CALIFORNIA TITLE 24 COMPLIANCE REPORT

Weather Name ..... ATLANTA.
Gross Conditioned Floor Area (sqft)..... 35,398
ACM Multiplier 1.025

E N E R G Y U S E S U M M A R Y

	ELEC (kWh/yr)	GAS (kBtu/yr)	WATER (1000 gal)	PERCENT OF TOTAL ENERGY (%)	TOTAL SOURCE ENERGY (kBtu/yr)	ADJUSTED UNIT SOURCE ENERGY (kBtu/yr-sf)
Primary Heating	1,574.4	296,390.2	3.2	18.0	328,111.8	9.5
Primary Cooling						
Compressor	82,273.7	0.0	0.0	16.8	842,484.9	24.4
Tower/Cond Fans	4,171.3	0.0	0.0	0.8	42,713.9	1.2
Condenser Pump	0.0	0.0	0.0	0.0	0.0	0.0
Other Accessories	3,158.3	0.0	0.0	0.6	32,341.1	0.9
Auxiliary						
Supply Fans	102,491.2	0.0	0.0	20.9	1,049,512.1	30.4
Circulation Pumps	30,724.5	0.0	0.0	6.3	314,619.5	9.1
Base Utilities	0.0	0.0	0.0	0.0	0.0	0.0
Subtotal	133,215.7	0.0	0.0	27.1	1,364,131.8	39.5
Lighting	93,655.9	0.0	0.0	19.1	959,038.3	27.1
Receptacle	86,156.3	0.0	0.0	17.5	882,242.7	24.9
Domestic Hot Water	0.0	0.0	0.0	0.0	0.0	0.0
Cogeneration	0.0	0.0	0.0	0.0	0.0	0.0
Totals	404,205.6	296,390.2	3.2	100.0	4,451,064.5	127.6

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M171, ECO#15

M O N T H L Y E N E R G Y C O N S U M P T I O N

Month	ELEC On Peak (kWh)	DEMAND On Peak (kW)	GAS On Peak (Therm)	WATER (1000 Gl)	GAS DMND On Peak (Thrm/hr)
Jan	27,525	71	1,124	1	4
Feb	24,665	71	996	1	4
March	25,008	70	235	0	3
April	21,355	70	0	0	0
May	33,621	137	0	0	0
June	42,114	156	0	0	0
July	40,517	151	0	0	0
Aug	42,252	153	0	0	0
Sept	33,953	144	0	0	0
Oct	25,062	120	0	0	0
Nov	23,022	70	207	0	2
Dec	25,401	71	633	1	3
Total	364,492	156	3,195	3	4

Building Energy Consumption = 44,168 (Btu/Sq Ft/Year) Floor Area = 35,398 (Sq Ft)
Source Energy Consumption = 114,941 (Btu/Sq Ft/Year)

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M171, ECO#15

EQUIPMENT ENERGY CONSUMPTION

Ref Num	Equip Code	Monthly Consumption Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	6341	5736	6848	6055	6594	6562	6088	6848	6055	6594	6055	6088	75,862
	PK	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4
1	MISC LD													
	ELEC	7201	6514	7777	6876	7489	7452	6914	7777	6876	7489	6876	6914	86,156
	PK	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1
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.
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	EQ1122L	AIR-CLD RECIP >55 TONS												
	ELEC	0	0	0	0	6758	13256	12519	12634	8082	1416	0	0	54,664
	PK	0.0	0.0	0.0	0.0	52.4	69.6	65.7	66.8	59.3	36.9	0.0	0.0	69.6
1	EQ5200	CONDENSER FANS												
	ELEC	0	0	0	0	814	1633	1580	1576	989	135	0	0	6,727
	PK	0.0	0.0	0.0	0.0	6.5	8.7	7.8	7.9	7.2	5.1	0.0	0.0	8.7
1	EQ5001	CHILLED WATER PUMP C.V.												
	ELEC	0	0	0	0	3132	4599	4526	4526	3387	694	0	0	20,863
	PK	0.0	0.0	0.0	0.0	7.3	7.3	7.3	7.3	7.3	7.3	0.0	0.0	7.3
1	EQ5313	CONTROLS												
	ELEC	0	0	0	0	129	189	186	186	139	29	0	0	857
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3
1	EQ4371	FAN COIL SUPPLY FAN												
	ELEC	8705	7862	8705	8424	8705	8424	8705	8705	8424	8705	8424	8705	102,491
	PK	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M171, ECO#15

1	EQ2004		GAS WATER TUBE STEAM										
	GAS	1124	996	235	0	0	0	0	0	0	0	207	633	3,195
	PK	3.8	3.8	2.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	3.2	3.8
1	EQ5020		HEAT WATER CIRC. PUMP C.V.										
	ELEC	4763	4109	1515	0	0	0	0	0	0	0	1504	3335	15,227
	PK	10.9	10.9	10.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.9	10.9	10.9
1	EQ5240		BOILER FORCED DRAFT FAN										
	ELEC	201	174	64	0	0	0	0	0	0	0	64	141	643
	PK	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5	0.5
1	EQ5307		BOILER CONTROLS										
	ELEC	219	189	69	0	0	0	0	0	0	0	69	153	699
	PK	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5	0.5
1	EQ5062		CONDENSATE RETURN PUMP										
	ELEC	95	82	30	0	0	0	0	0	0	0	30	66	302
	PK	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2
1	EQ5406		MAKE-UP WATER										
	WATER	1	1	0	0	0	0	0	0	0	0	0	1	3
	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

UTILITY PEAK CHECKSUMS - ALTERNATIVE 1
BLDG M171, ECO#15

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 156.1 (kW)
Yearly Time of Peak 15 (hr) 6 (mo)

Hour 15 Month 6

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Percnt Of Tot (%)
Cooling Equipment				
1	EQ1122L	AIR-CLD RECIP >55 TONS	85.9	55.01
Sub Total			85.9	55.01
Sub Total			0.0	0.00
Air Moving Equipment				
1		SUMMATION OF FAN ELECTRICAL DEMAND	11.7	7.50
Sub Total			11.7	7.50
Sub Total			0.0	0.00
Miscellaneous				
Lights			27.4	17.56
Base Utilities			0.0	0.00
Misc Equipment			31.1	19.94
Sub Total			58.5	37.49
Grand Total			156.1	100.00

CALIFORNIA TITLE 24 COMPLIANCE - ALTERNATIVE 1
BLDG M171, ECO#15

CALIFORNIA TITLE 24 COMPLIANCE REPORT

Weather Name	ATLANTA.
Gross Conditioned Floor Area (sqft).....	35,398
ACM Multiplier	1.025

E N E R G Y U S E S U M M A R Y

	ELEC (kWh/yr)	GAS (kBtu/yr)	WATER (1000 gal)	PERCENT OF TOTAL ENERGY (%)	TOTAL SOURCE ENERGY (kBtu/yr)	ADJUSTED UNIT SOURCE ENERGY (kBtu/yr-sf)
Primary Heating	1,643.8	319,459.2	3.3	20.8	353,105.9	10.2
Primary Cooling						
Compressor	54,663.6	0.0	0.0	11.9	559,757.0	16.2
Tower/Cond Fans	6,727.2	0.0	0.0	1.5	68,887.0	2.0
Condenser Pump	0.0	0.0	0.0	0.0	0.0	0.0
Other Accessories	857.4	0.0	0.0	0.2	8,779.8	0.3
Auxiliary						
Supply Fans	102,491.2	0.0	0.0	22.4	1,049,512.1	30.4
Circulation Pumps	36,090.7	0.0	0.0	7.9	369,569.6	10.7
Base Utilities	0.0	0.0	0.0	0.0	0.0	0.0
Subtotal	138,581.9	0.0	0.0	30.3	1,419,081.9	41.1
Lighting	75,862.3	0.0	0.0	16.6	776,831.6	21.9
Receptacle	86,156.3	0.0	0.0	18.8	882,242.7	24.9
Domestic Hot Water	0.0	0.0	0.0	0.0	0.0	0.0
Cogeneration	0.0	0.0	0.0	0.0	0.0	0.0
Totals	364,492.6	319,459.2	3.3	100.0	4,068,685.7	116.6

BUILDING 181

E M C ENGINEERS, INC.

PROJECT: FORT McPHERSON & FORT GILLEM ESOS STUDY
LOCATION: FORT McPHERSON
ECO: Computer Simulation Summary

CLIENT CONTRACT NO: DACA21-91-C-0097
CLIENT PROJECT ENG: TERRY SEABROOK

EMC PROJECT: #3105.000
DATE: 04/22/92
FILE: M181ECO
PREPARED BY: DENNIS JONES
CHECKED BY:

Bldg: M181 Area: 36,158 ft^2

Run Description	Heating Gas Use (kBtu/yr)	Heating Electric Use (kWh/yr)	Cooling Electric Use (kWh/yr)	Fan Electric Use (kWh/yr)	Pump Electric Use (kWh/yr)	Lighting Electric Use (kWh/yr)	Receot. Electric Use (kWh/yr)	Total Electric Use (kWh/yr)	Peak Electric Demand (kW)	Total Gas Use (MBtu/yr)	Total Energy Use (MBtu/yr)
Baseline	212,180	1,447	86,080	273,717	54,369	174,211	92,112	681,936	198	212	2,540
Wall Insulation	103,893	869	81,817	273,166	54,369	174,211	92,112	676,544	195	104	2,413
Savings (Loss)	108,287	578	4,263	551	0	0	0	5,392	3	108	127
Economizer	212,180	1,447	79,882	273,717	54,369	174,211	92,112	675,738	198	212	2,518
Savings (Loss)	0	0	6,198	0	0	0	0	6,198	0	0	21
HVAC Controls	10,306	199	52,098	94,489	18,843	174,211	92,112	431,952	198	10	1,485
Savings (Loss)	201,874	1,248	33,982	179,228	35,526	0	0	249,984	0	202	1,055
Ice Storage	212,180	1,447	120,006	273,717	54,369	174,211	92,112	715,862	146	212	2,655
Savings (Loss)	0	0	(33,926)	0	0	0	0	(33,926)	52	0	(116)

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB

SHEET NO. OF

CALCULATED BY [illegible] DATE [illegible]

CHECKED BY DATE

SCALE [illegible]

ECO's

ECONOMIZER

[illegible]

CCG

[illegible] ≤ 10 CFM/PERSON [illegible]

[illegible]

INSULATION

[illegible] ADDS R-10

R = 15.[illegible] U = 0.063

HVAC [illegible]

(2) CLG RACK [illegible]

HTG [illegible] HEATING

(26) FANOFF FAN SCHED

FANOFF VENT "

(27) 0.5 ACH INFIL

OFF 18-6 WEEKDAY
0-24 WEEKENDS

THERMAL STORAGE - (ALT-4)

(62) <EQ1750>

(63) STORAGE [illegible]

(73) CLIMICE STORAGE

SIZE FOR 190 TON-HRS
USE 40 TON CHILLER

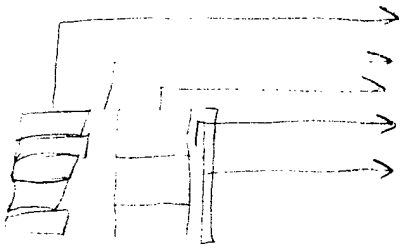
CAPACITY
CONTROL OPTIMIZE
[illegible] CHARGE
LOSS 0.07%

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____
SHEET NO. _____ OF _____
CALCULATED BY _____ DATE _____
CHECKED BY _____ DATE _____
SCALE 1" = 1'

U-VALUES

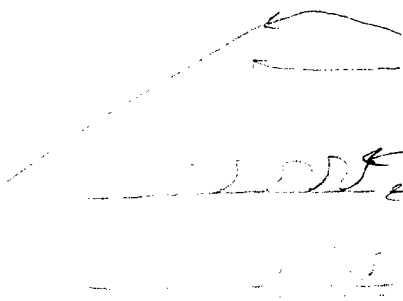
WALL



OUTER FILM	0.25
3.5" BRICK	1.48
AIRSPACE	1.01
8" CMU	1.05
½" AIRSPACE	1.01
GYP BOARD	0.45
FILM	0.68
	5.93

$U = 0.169$

ROOF



OUTER FILM	0.25
SHINGLES	0.44
PLYWOOD	2.50
AIR SPACE	1.24
FIBERGLASS R-11	11.00
HARDWOOD	2.50
AIR SPACE	1.24
FIBERGLASS R-19	19.00
ACCOUSTIC TILE	1.25
INNER FILM	0.75
	40.17

$U = 0.025$

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB

SHEET NO. OF

CALCULATED BY DATE

CHECKED BY DATE

SCALE

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____
SHEET NO. _____ OF _____
CALCULATED BY _____ DATE _____
CHECKED BY _____ DATE _____
SCALE 7181

FAN AIRFLOW

VENTILATION 2360 cfm (FROM SPECS) → 10.4 CFM/PERSON
FANS 3940 cfm = 1,0.7 cfm/SF

CHILLER

TRANE CGAA080RD5/CCLC4C311CKAR 80 TONS
McQUAY-PERFEX APS-080C-V-99 77.2 kW
0.965 kW/TON

HEATING

STEAM FROM CHP

PUMPS

CWP1 5 HP
CWP2 7.5 HP
HWP1 1.5 HP

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB 3105.000

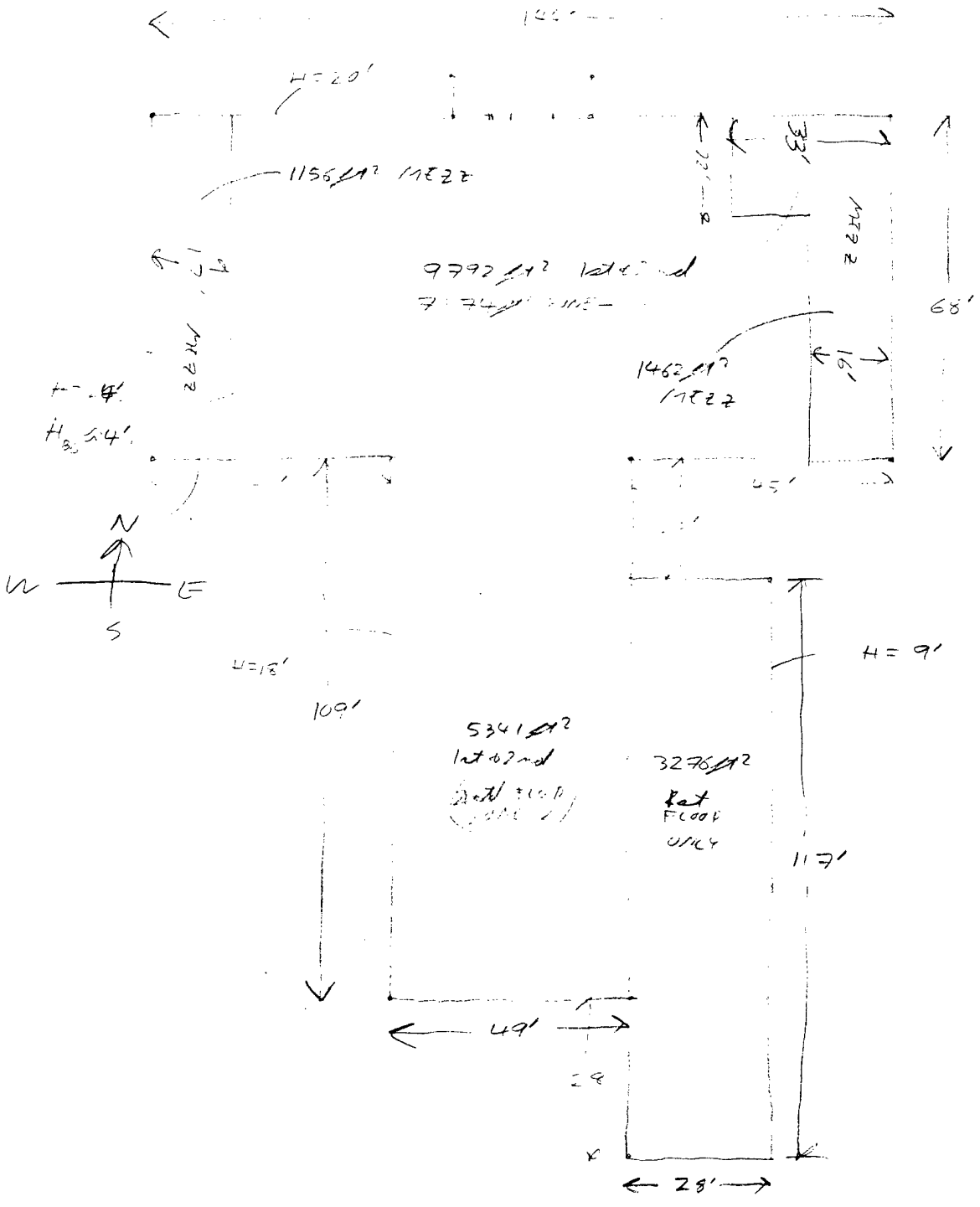
SHEET NO. _____ OF _____

CALCULATED BY _____ DATE 2/28/92

CHECKED BY _____ DATE _____

SCALE 1" = 20'

DIMENSIONS



E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB 3105-000
SHEET NO. _____ OF _____
CALCULATED BY DS DATE 3/4/92
CHECKED BY _____ DATE _____
SCALE 1/16"

DATA - SOU UNIT

BASIS

ENTIRE BUILDING SERVED BY FAN COILS AND CONSTANT VOLUME AHUS
MODEL AS ONE ZONE (NON-MIXING SYSTEM)

FLOOR AREAS

1st	18,400 ft²	ROOF AREA = 18,459
2nd	15,131	
MEZZ	2,618	
	36,158 ft²	

WALLS

WEST	3678 ft²	
NORTH	3172	
EAST	3862	
SOUTH	3208	144 x 24 - 49·18 + 49x18 + 28x9

PEOPLE

228 PEOPLE / 36,158 ft² = 1/159 PEOPLE/SF

LIGHTS

62,933 W / 36,158 ft² = 1.74 W/SF

EQUIPMENT

PC	99	200	= 19,800
MINI-MAINFRAMES	8	400	3,200
PRINTERS	50	100	5,000
COPY MACHINES	5	600	3,000
COFFEE MACHINE	2	300	600
TYPEWRITERS	9	30	270
REFRIGERATOR	3	200	600
COFFEE POTS	3	260	780
			33,250 W

33,250 W / 36,158 SF = 0.92 W/SF

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

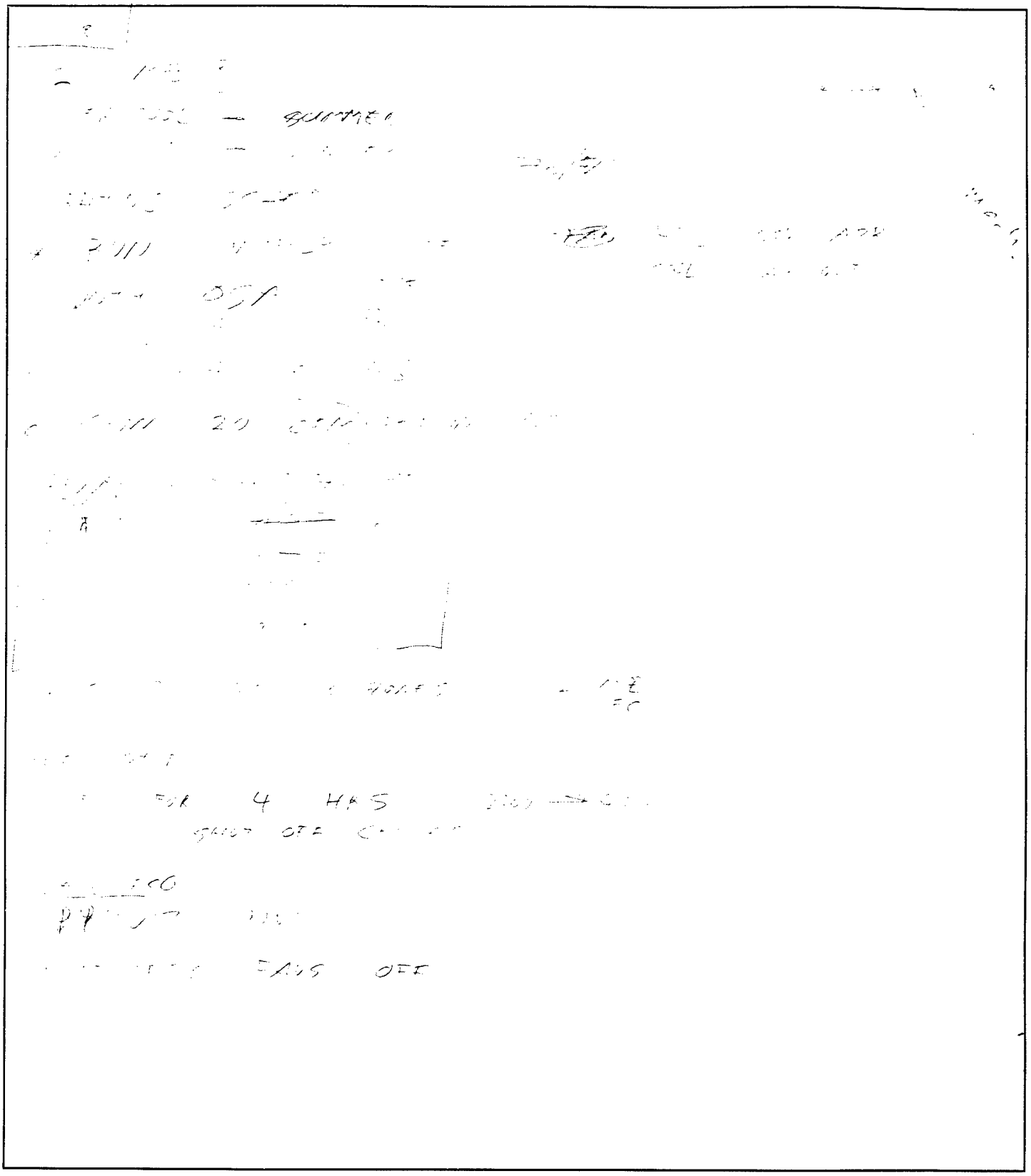
JOB _____

SHEET NO. _____ OF _____

CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____

SCALE _____



rd - Job Information

Project: FORT MCPHERSON & GILLEM EEAP #3105.000
Location: ATLANTA, GA
Client: COE - DACA21-9-C-0097
Program User: DENNIS JONES
Comments: BUILDING 181 - FORT MCPHERSON

-----CARD 08-- Climatic Information ----------

Weather Code	Summer Clearness Number	Winter Clearness Number	Summer Design Dry Bulb	Summer Design Wet Bulb	Winter Design Dry Bulb	Building Orientation	Summer Ground Reflect	Winter Ground Reflect
ATLANTA								

---------- Load Section Alternative #1 ----------

---- Load Alternative ----

Number	Description
1	M181 - BASELINE

-----CARD 20-- General Room Parameters ----------

Room Number	Zone Reference Number	Room Descrip	Floor Length	Floor Width	Const Type	Plenum Height	Acoustic Ceiling Resistance	Floor to Floor Height	Duplicate Floors Multiplier	Duplicate Rooms per Zone	Perimeter Depth
1	1	OFFICE	7174	1	1	2		10			
2	2	OFFICE	5341	1	1	2		10			
3	3	OFFICE	23643	1	1	2		10			

-----CARD 21-- Thermostat Parameters ----------

Room Number	Cooling Room Design DB	Room Design RH	Cooling T'stat Driftpoint	Cooling T'stat Schedule	Heating Room Design DB	Heating T'stat Driftpoint	Heating T'stat Schedule	T'stat Location Flag	Mass / No. Hrs Average	Carpet On Floor
M1	76			CLGM181	72		HTGM181			YES

-----CARD 22-- Roof Parameters ----------

Room Number	Roof Number	Roof Equal to Floor?	Roof Length	Roof Width	Roof U-Value	Const Type	Roof Direction	Roof Tilt	Roof Alpha
1	1	YES			0.025	42	0	90	0.45

-----CARD 22-- Roof Parameters ----------

Room Number	Roof Number	Roof Equal to Floor?	Roof Length	Roof Width	Roof U-Value	Const Type	Roof Direction	Roof Tilt	Roof Alpha
2	1	YES			0.025	42	0	90	0.45
3	1	NO	5894	1	0.025	42	0	90	0.45

-----CARD 24-- Wall Parameters ----------

Room Number	Wall Number	Wall Length	Wall Height	Wall U-Value	Wall Constuc Type	Wall Direction	Wall Tilt	Wall Alpha	Ground Reflectance Multiplier
M	1			0.169	77	0		.45	
1	1	94	20	0.169	77	0		.45	
1	2	62	24	0.169	77	180		.45	
2	1	109	9			270			
2	2	49	9			180			
2	3	20	9			90			
3	1	50	20			0			
3	2	68	24			270			
3	3	137	9			270			
3	4	77	9			180			
3	5	33	24			180			
3	6	68	24			90			
3	7	137	9			90			

-----CARD 26-- Schedules ----------

Room Number	People	Lights	Ventilation	Infiltration	Reheat Minimum	Cooling Fans	Heating Fan	Auxiliary Fan	Room Exhaust	Daylighting Controls
M1	PPL1	LGT1	AVAIL	OFF		AVAIL	AVAIL		AVAIL	

-----CARD 27-- People and Lights ----------

Room Number	People Value	People Units	People Sensible	People Latent	Lighting Value	Lighting Units	Lighting Fixture Type	Ballast Factor	Percent Lights to Ret. Air	--- Daylighting ---- Reference Point 1	Reference Point 2
M1	159	SF-PERS	250	200	1.74	WATT-SF	ASHRAE2	1			

-----CARD 28--- Miscellaneous Equipment ----------

Room Number	Misc Equipment Number	Equipment Descrip	Energy Consump Value	Energy Consump Units	Schedule Code	Energy Meter Code	Percent of Load Sensible	Percent Misc. Load to Room	Percent Misc. Sens to Ret. Air	Radiant Fraction	Optional Air Path
M1	1	GENERAL OFFICE	0.92	WATT-SF	LGT1	ELEC					

-----CARD 29--- Room Airflows ----------

Room	Ventilation Cooling Value	Ventilation Cooling Units	Ventilation Heating Value	Ventilation Heating Units	Infiltration Cooling Value	Infiltration Cooling Units	Infiltration Heating Value	Infiltration Heating Units	Reheat Minimum Value	Reheat Minimum Units
Number										
M1	20	CFM-P	20	CFM-P	0.5	ACH-HR	0.5	ACH-HR		

-----CARD 30- Fan Airflows ----------

Room	Main Cooling Value	Main Cooling Units	Main Heating Value	Main Heating Units	Auxiliary Cooling Value	Auxiliary Cooling Units	Auxiliary Heating Value	Auxiliary Heating Units	Room Exhaust Value	Room Exhaust Units
Number										
M1	1.09	CFM-SF	1.09	CFM-SF						

---------- System Section Alternative #1 ----------

-----CARD 39-- System Alternative -----

Number	Description
1	

-----CARD 40--- System Type ----------

System Set Number	System Type	Ventil Deck Location	Optional Ventilation System Cooling SADBVh	Optional Ventilation System Heating SADBVh	Cooling Schedule	Heating Schedule	Fan Static Pressure
1	MZ						
2	FC						

-----CARD 41-- Zone Assignment ----------

System Set Number	Ref #1 Begin	Ref #1 End	Ref #2 Begin	Ref #2 End	Ref #3 Begin	Ref #3 End	Ref #4 Begin	Ref #4 End	Ref #5 Begin	Ref #5 End	Ref #6 Begin	Ref #6 End
1	1	2										
2	3	3										

-----CARD 42--- Fan SP and Duct Parameters----------

System Set Number	Cool Fan SP	Heat Fan SP	Return Fan SP	Mn Exh Fan SP	Aux Fan SP	Rm Exh Fan SP	Cool Fan Mtr Loc	Return Fan Mtr Loc	Supply Duct Ht Gn	Supply Duct Loc	Return Air Path
1	2.50	2.50								RETAIR	DUCTED
2	1.50	1.50								RETAIR	DUCTED

-----CARD 44-- System Options ----------

System Set Number	Econ Type Flag	Econ On Point	Max Pct Outside Air	Direct Evap Cooling	Indirect Evap Cooling	1st Stage Evap Cooling	Fan Cycling	Exhaust Air Heat Recovery --- Effectiveness --- System	Exhaust Air Heat Recovery --- Effectiveness --- Room	Exhaust Air Heat Recovery --- Control Method --- System	Exhaust Air Heat Recovery --- Control Method --- Room
1	NONE										
2	NONE										

-----CARD 45--- Equipment Schedules ----------

System Set Number	Main Cooling Coil	Economizer	Direct Evap Coil	Indirect Evap Coil	Auxiliary Cooling Coil	Main Heating Coil	Main Preheat Coil	Reheat Coil	Mech. Humidity	Auxiliary Heating Coil
1	CLGMAC	OFF	OFF	OFF	OFF	HTGMAC	OFF	OFF	OFF	OFF
2	CLGMAC	OFF	OFF	OFF	OFF	HTGMAC	OFF	OFF	OFF	OFF

---------- Equipment Section Alternative #1 ----------

-----CARD 59-- Equipment Description / TOD Schedules ----------

Alternative Number	Elec Consump Time of Day Schedule	Elec Demand Time of Day Schedule	Demand Limit Max KW	Alternative Description
1				M181 - BASELINE

-----CARD 60--- Cooling Load Assignment----------

Load Asgn Ref	All Coil Loads To Cool Ref	Cooling Equipment Sizing	-Group 1- Begin	-Group 1- End	-Group 2- Begin	-Group 2- End	-Group 3- Begin	-Group 3- End	-Group 4- Begin	-Group 4- End	-Group 5- Begin	-Group 5- End	-Group 6- Begin	-Group 6- End	-Group 7- Begin	-Group 7- End	-Group 8- Begin	-Group 8- End	-Group 9- Begin	-Group 9- End
1	1		1	2																

-----CARD 62-- Cooling Equipment Parameters ----------

Cool Ref Num	Equip Code Name	Num Of Units	COOLING --Capacity-- Value	COOLING --Capacity-- Units	COOLING ----Energy---- Value	COOLING ----Energy---- Units	HEAT RECOVERY --Capacity-- Value	HEAT RECOVERY --Capacity-- Units	HEAT RECOVERY ----Energy---- Value	HEAT RECOVERY ----Energy---- Units	Seq Order Num	Seq Type	Demand Limit Number
1	EQ1121L	1	80	TONS									

-----CARD 63-- Cooling Pumps and References ----------

Cool Ref Num	CHILLED WATER Full Load Value	CHILLED WATER Full Load Units	CONDENSER Full Load Value	CONDENSER Full Load Units	HT REC or AUX Full Load Value	HT REC or AUX Full Load Units	Switch-over Control	Cold Storage	Cooling Tower	Misc. Access.
1	12.5	HP								

-----CARD 65-- Heating Load Assignment ----------

Load Assignment Reference	All Coil Loads To Heating Ref	-Group 1- Begin	End	-Group 2- Begin	End	-Group 3- Begin	End	-Group 4- Begin	End	-Group 5- Begin	End	-Group 6- Begin	End	-Group 7- Begin	End	-Group 8- Begin	End	-Group 9- Begin	End
1	1	1	2																

-----CARD 67-- Heating Equipment Parameters ----------

Heat Ref Number	Equip Code Name	Number Of Units	HW Pmp Full Ld Value	Units	Cap'y Value	Units	Energy Rate Value	Units	Seq Order Number	Switch over Control	Hot Strg	Misc. Acc.	Cogen	Demand Limit Number
1	EQ2001	1	1.5	HP										

-----CARD 69-- Fan Equipment Parameters ----------

System Set Number	Cooling Fan	Heating Fan	Return Fan	Exhaust Fan	Auxiliary Supply	Room Exhaust	Optional Ventilation
1	EQ4003	EQ4003					
2	EQ4003	EQ4003					

Utility Description Reference Table

Schedules:
- AVAIL AVAILABLE (100%)
- CLGM181 COOLING TSTAT SCHEDULE
- CLGMAC COOLING SCHEDULE
- HTGM181 HEATING TSTAT SCHEDULE
- HTGMAC HEATING SCHEDULE
- LGT1
- OFF ALWAYS OFF
- PPL1

System:
- FC FAN COIL
- MZ MULTIZONE

Equipment:
- Cooling:
  - EQ1121L AIR-CLD RECIP 35-60 TONS
- Heating:
  - EQ2001 GAS FIRE TUBE HOT WATER
- Fan:
  - EQ4003 FC CENTRIF. FAN C.V.

Schedule Name: AVAIL
Project: AVAILABLE (100)
Location:
Client:
Program User:
Comments:

Starting Month: JAN Ending Month: HTG
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	100
24	

Schedule Name: CLGM181
Project: COOLING TSTAT SCHEDULE
Location:
Client:
Program User:
Comments: 70 F SUMMER - BLDG M181

Starting Month: MAY Ending Month: OCT
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Temperature
0	70
24	

Schedule Name: CLGMAC
Project: COOLING SCHEDULE
Location:
Client:
Program User:
Comments:

Starting Month: JAN Ending Month: APR
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	0
24	

Starting Month: MAY Ending Month: OCT
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	100
24	

Starting Month: NOV Ending Month: HTG
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	0
24	

Schedule Name: HTGM181
Project: HEATING TSTAT SCHEDULE
Location:
Client:
Program User:
Comments: 78 F WINTER - BLDG M181

Starting Month: NOV Ending Month: APR
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Temperature
0	78
24	

ule Name: HTGMAC
Project: HEATING SCHEDULE
Location:
Client:
Program User: R. GERRANS
Comments:

Starting Month: JAN Ending Month: APR
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	100
24	

Starting Month: MAY Ending Month: OCT
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	0
24	

Starting Month: NOV Ending Month: HTG
Starting Day Type: DSGN Ending Day Type: SUN

	Util Percent
0	100
24	

Schedule Name: LGT1
Project:
Location:
Client:
Program User:
Comments: OFFICE LIGHTING

Starting Month: JAN Ending Month: DEC
Starting Day Type: DSGN Ending Day Type: WKDY

Hour	Util Percent
0	5
7	80
8	100
12	80
13	100
16	80
17	40
18	5
24	

Starting Month: JAN Ending Month: DEC
Starting Day Type: SAT Ending Day Type: SUN

Hour	Util Percent
0	5
24	

ule Name: OFF
Project: ALWAYS OFF
Location:
Client:
Program User:
Comments:

Starting Month: JAN Ending Month: HTG
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	0
24	

Schedule Name: PPL1
Project:
Location:
Client:
Program User: D JONES
Comments: OFFICE PEOPLE SCHEDULE

Starting Month: JAN Ending Month: DEC
Starting Day Type: DSGN Ending Day Type: WKDY

Hour	Util Percent
0	0
7	50
8	100
11	80
12	40
13	80
14	100
16	70
17	30
18	0
24	

Starting Month: JAN Ending Month: DEC
Starting Day Type: SAT Ending Day Type: SUN

Hour	Util Percent
0	0
24	

```
**********************************************************************
**********************************************************************
**                                                                  **
**              T R A C E   6 0 0   A N A L Y S I S                 **
**                                                                  **
**              by          **                                      **
**                                                                  **
**********************************************************************
**********************************************************************
```

FORT MCPHERSON & GILLEM EEAP #3105.000
ATLANTA, GA
COE - DACA21-9-C-0097
DENNIS JONES
BUILDING 181 - FORT MCPHERSON

Weather File Code:	ATLANTA.	
Location:		
Latitude:	33.0	(deg)
Longitude:	84.0	(deg)
Time Zone:	6	
Elevation:	1,005	(ft)
Barometric Pressure:	28.8	(in. Hg)
Summer Clearness Number:	0.90	
Winter Clearness Number:	0.90	
Summer Design Dry Bulb:	92	(F)
Summer Design Wet Bulb:	74	(F)
Winter Design Dry Bulb:	22	(F)
Summer Ground Relectance:	0.20	
Winter Ground Relectance:	0.20	
Air Density:	0.0731	(Lbm/cuft)
Air Specific Heat:	0.2444	(Btu/lbm/F)
Density-Specific Heat Prod:	1.0727	(Btu-min./hr/cuft/F)
Latent Heat Factor:	4,721.8	(Btu-min./hr/cuft)
Enthalpy Factor:	4.3883	(Lb-min./hr/cuft)

Design Simulation Period: June To November
System Simulation Period: January To December
Cooling Load Methodology: TETD/Time Averaging

Time/Date Program was Run: 2:18: 5 3/20/92
Dataset Name: M181 .TM

AIRFLOW - ALTERNATIVE 1
M181 - BASELINE

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

System Number	System Type	Main: Outside Airflow (Cfm)	Main: Cooling Airflow (Cfm)	Main: Heating Airflow (Cfm)	Main: Return Airflow (Cfm)	Main: Exhaust Airflow (Cfm)	Auxil. Supply Airflow (Cfm)	Room Exhaust Airflow (Cfm)
1	MZ	1,574	13,740	13,740	13,740	1,574	0	0
2	FC	2,974	25,771	25,771	25,771	2,974	0	0
Totals		4,548	39,510	39,510	39,510	4,548	0	0

CAPACITY - ALTERNATIVE 1
M181 - BASELINE

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

System Number	System Type	Cooling: Main Sys. Capacity (Tons)	Cooling: Aux. Sys. Capacity (Tons)	Cooling: Opt. Vent Capacity (Tons)	Cooling Totals (Tons)	Heating: Main Sys. Capacity (Btuh)	Heating: Aux. Sys. Capacity (Btuh)	Heating: Preheat Capacity (Btuh)	Heating: Reheat Capacity (Btuh)	Heating: Humidif. Capacity (Btuh)	Heating: Opt. Vent Capacity (Btuh)	Heating Totals (Btuh)
1	MZ	20.6	0.0	0.0	20.6	-121,341	0	0	0	0	0	-121,3
2	FC	36.3	0.0	0.0	36.3	-207,660	0	0	0	0	0	-207,6
Totals		56.8	0.0	0.0	56.8	-329,001	0	0	0	0	0	-329,001

The building peaked at hour 15 month 8 with a capacity of 56.8 tons

ENGINEERING CHECKS - ALTERNATIVE 1
M181 - BASELINE

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: Cfm/ Sq Ft	Cooling: Cfm/ Ton	Cooling: Sq Ft /Ton	Cooling: Btuh/ Sq Ft	Heating: Cfm/ Sq Ft	Heating: Btuh/ Sq Ft	Floor Area Sq Ft
1	Main	MZ	11.46	1.10	667.7	608.2	19.73	1.10	-9.70	12,515
2	Main	FC	11.54	1.09	710.8	652.1	18.40	1.09	-8.78	23,643

System 1 Block MZ - MULTIZONE

********** COOLING COIL PEAK **********							CLG SPACE PEAK **********			HEATING COIL PEAK ********	
Peaked at Time ==>	Mo/Hr: 8/15						Mo/Hr: 6/16			Mo/Hr: 13/ 1	
Outside Air ==>	OADB/WB/HR: 92/ 74/105.0						OADB: 96			OADB: 22	
	Space Sens.+Lat. (Btuh)	Ret. Air Sensible (Btuh)	Ret. Air Latent (Btuh)	Net Total (Btuh)	Percnt Of Tot (%)		Space Sensible (Btuh)	Percnt Of Tot (%)		Space Peak Space Sens (Btuh)	Coil Peak Tot Sens (Btuh)	Percnt 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	3,988		3,988	1.62		0	0.00		0	-14,007	11.47
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	12,470	2,840		15,310	6.20		14,941	9.41		-33,597	-41,111	33.66
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	0.00
Sub Total==>	12,470	6,828		19,298	7.82		14,941	9.41		-33,597	-55,118	45.13
Internal Loads												
Lights	74,322	0		74,322	30.10		74,322	46.83		0	0	0.00
People	35,420			35,420	14.34		19,678	12.40		0	0	0.00
Misc	39,297	0	0	39,297	15.91		39,297	24.76		0	0	0.00
Sub Total==>	149,038	0	0	149,038	60.36		133,296	83.99		0	0	0.00
Ceiling Load	6,559	-6,559		0	0.00		9,330	5.88		-21,443	0	0.00
Outside Air	0	0	0	53,025	21.47		0	0.00		0	-84,431	69.14
[redacted] Fan Heat				24,426	9.89			0.00			24,426	-20.00
[redacted] 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	1,135			1,135	0.46		1,135	0.71		-6,999	-6,999	5.73
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==>	169,202	269	0	246,922	100.00		158,702	100.00		-62,040	-122,123	100.00

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

	Total Capacity (Tons)	Capacity (Mbh)	Sens Cap. (Mbh)	Coil Airfl (cfm)	Entering DB/WB/HR Deg F	Deg F	Grains	Leaving DB/WB/HR Deg F	Deg F	Grains
Main Clg	20.6	246.9	205.7	13,740	77.9	66.6	83.7	63.6	61.1	80.0
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	20.6	246.9								

----------AREAS----------

	Gross Total	Glass (sf)	(%)
Floor	12,515		
Part	0		
ExFlr	0		
Roof	12,515	0	0
Wall	4,970	0	0

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

	Capacity (Mbh)	Coil Airfl (cfm)	Ent Deg F	Lvg Deg F
Main Htg	-121.3	13,740	68.0	76.2
Aux Htg	0.0	0	0.0	0.0
Preheat	-0.0	13,740	66.3	63.6
Reheat	0.0	0	0.0	0.0
Humidif	0.0	0	0.0	0.0
Opt Vent	0.0	0	0.0	0.0
[redacted]	-121.3			

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

Type	Cooling	Heating
Vent	1,574	1,574
Infil	0	0
Supply	13,740	13,740
Mincfm	0	0
Return	13,740	13,740
Exhaust	1,574	1,574
Rm Exh	0	0
Auxil	0	0

--ENGINEERING CHECKS--

Clg % OA	11.5
Clg Cfm/Sqft	1.10
Clg Cfm/Ton	667.72
Clg Sqft/Ton	608.21
Clg Btuh/Sqft	19.73
No. People	79
Htg % OA	11.5
Htg Cfm/SqFt	1.10
Htg Btuh/SqFt	-9.70

--TEMPERATURES (F)---

Type	Clg	Htg
SADB	65.2	76.2
Plenum	77.7	66.8
Return	76.0	72.0
Ret/OA	77.9	66.3
Runarnd	76.0	72.0
Fn MtrTD	0.4	0.4
Fn BldTD	0.3	0.3
Fn Frict	0.9	0.9

System 2 Block FC - FAN COIL

	COOLING COIL PEAK					CLG SPACE PEAK		HEATING COIL PEAK		
Peaked at Time ==>	Mo/Hr: 8/15					Mo/Hr: 6/16		Mo/Hr: 13/ 1		
Outside Air ==>	OADB/WB/HR: 92/ 74/105.0					OADB: 96		OADB: 22		
	Space Sens.+Lat. (Btuh)	Ret. Air Sensible (Btuh)	Ret. Air Latent (Btuh)	Net Total (Btuh)	Percnt Of Tot (%)	Space Sensible (Btuh)	Percnt Of Tot (%)	Space Peak Space Sens (Btuh)	Coil Peak Tot Sens (Btuh)	Percnt 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	1,977		1,977	0.45	0	0.00	0	-6,972	3.36
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	22,658	5,391		28,049	6.45	27,322	9.47	-55,533	-68,671	33.07
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	0.00
Sub Total==>	22,658	7,368		30,026	6.90	27,322	9.47	-55,533	-75,643	36.43
Internal Loads										
Lights	140,407	0		140,407	32.27	140,407	48.65	0	0	0.00
People	66,914			66,914	15.38	37,175	12.88	0	0	0.00
Misc	74,238	0	0	74,238	17.06	74,238	25.72	0	0	0.00
Sub Total==>	281,559	0	0	281,559	64.72	251,819	87.25	0	0	0.00
Ceiling Load	7,368	-7,368		0	0.00	9,462	3.28	-20,110	0	0.00
Outside Air	0	0	0	95,977	22.06	0	0.00	0	-159,505	76.81
Sup. Fan Heat				27,489	6.32		0.00		27,489	-13.2
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==>	311,585	0	0	435,051	100.00	288,604	100.00	-75,643	-207,660	100.00

COOLING COIL SELECTION

	Total Capacity (Tons)	(Mbh)	Sens Cap. (Mbh)	Coil Airfl (cfm)	Entering DB/WB/HR Deg F	Deg F	Grains	Leaving DB/WB/HR Deg F	Deg F	Grains
Main Clg	36.3	435.1	361.3	25,771	78.3	67.0	85.3	65.0	61.9	81.5
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	36.3	435.1								

AREAS

	Gross Total	Glass (sf)	(%)
Floor	23,643		
Part	0		
ExFlr	0		
Roof	5,894	0	0
Wall	8,215	0	0

HEATING COIL SELECTION

	Capacity (Mbh)	Coil Airfl (cfm)	Ent Deg F	Lvg Deg F
Main Htg	-207.7	25,771	67.2	74.7
Aux Htg	0.0	0	0.0	0.0
Preheat	-0.0	25,771	67.2	65.6
Reheat	0.0	0	0.0	0.0
Humidif	0.0	0	0.0	0.0
Opt Vent	0.0	0	0.0	0.0
Total	-207.7			

AIRFLOWS (cfm)

Type	Cooling	Heating
Vent	2,974	2,974
Infil	0	0
Supply	25,771	25,771
Mincfm	0	0
Return	25,771	25,771
Exhaust	2,974	2,974
Rm Exh	0	0
Auxil	0	0

ENGINEERING CHECKS

Clg % OA	11.5
Clg Cfm/Sqft	1.09
Clg Cfm/Ton	710.84
Clg Sqft/Ton	652.14
Clg Btuh/Sqft	18.40
No. People	149
Htg % OA	11.5
Htg Cfm/SqFt	1.09
Htg Btuh/SqFt	-8.78

TEMPERATURES (F)

Type	Clg	Htg
SADB	65.6	74.7
Plenum	77.0	69.3
Return	76.0	72.0
Ret/OA	77.9	66.2
Runarnd	76.0	72.0
Fn MtrTD	0.2	0.2
Fn BldTD	0.2	0.2
Fn Frict	0.6	0.6

[redacted]NG LOADS AT COIL PEAK - ALTERNATIVE 1
[redacted]- BASELINE

AIRFLOW COOLING LOADS
(At time of Coil Peak)

Room Number	Description	Ventilation Airflow (Cfm)	Ventilation Sensible (Btuh)	Ventilation Latent (Btuh)	Optional Ventilation Airflow (Cfm)	Optional Ventilation Sensible (Btuh)	Optional Ventilation Latent (Btuh)	Bypass Airflow (Cfm)	Bypass Sensible (Btuh)	Bypass Latent (Btuh)	Ov/Undr Sizing (Btuh)
1	OFFICE	902	15,778	14,618	0	0	0	0	0	0	0
Zone 1	Total/Ave.	902	15,778	14,618	0	0	0	0	0	0	0
Zone 1	Block	902	15,778	14,618	0	0	0	0	0	0	0
2	OFFICE	672	11,747	10,883	0	0	0	0	0	0	1,135
Zone 2	Total/Ave.	672	11,747	10,883	0	0	0	0	0	0	1,135
Zone 2	Block	672	11,747	10,883	0	0	0	0	0	0	1,135
System 1	Total/Ave.	1,574	27,525	25,501	0	0	0	0	0	0	1,135
System 1	Block	1,574	27,525	25,501	0	0	0	0	0	0	1,135
3	OFFICE	2,974	51,999	43,978	0	0	0	0	0	0	0
Zone 3	Total/Ave.	2,974	51,999	43,978	0	0	0	0	0	0	0
Zone 3	Block	2,974	51,999	43,978	0	0	0	0	0	0	0
System 2	Total/Ave.	2,974	51,999	43,978	0	0	0	0	0	0	0
System 2	Block	2,974	51,999	43,978	0	0	0	0	0	0	0

[redacted]NG LOADS AT COIL PEAK - ALTERNATIVE 1
[redacted]- BASELINE

AIRFLOW HEATING LOADS
(At time of Coil Peak)

Room Number	Description	Ventilation Airflow (Cfm)	Ventilation Sensible (Btuh)	Op. Vent. Airflow (Cfm)	Op. Vent. Sensible (Btuh)	Reheat Airflow (Cfm)	Reheat Sensible (Btuh)	Humidif. Airflow (Cfm)	Humidif. Latent (Btuh)	Total (Btuh)
1	OFFICE	902	-48,399	0	0	0	0	0	0	-48,399
Zone 1	Total/Ave.	902	-48,399	0	0	0	0	0	0	-48,399
Zone 1	Block	902	-48,399	0	0	0	0	0	0	-48,399
2	OFFICE	672	-36,033	0	0	0	0	0	0	-36,033
Zone 2	Total/Ave.	672	-36,033	0	0	0	0	0	0	-36,033
Zone 2	Block	672	-36,033	0	0	0	0	0	0	-36,033
System 1	Total/Ave.	1,574	-84,431	0	0	0	0	0	0	-84,431
System 1	Block	1,574	-84,431	0	0	0	0	0	0	-84,431
3	OFFICE	2,974	-159,505	0	0	0	0	0	0	-159,505
Zone 3	Total/Ave.	2,974	-159,505	0	0	0	0	0	0	-159,505
Zone 3	Block	2,974	-159,505	0	0	0	0	0	0	-159,505
System 2	Total/Ave.	2,974	-159,505	0	0	0	0	0	0	-159,505
System 2	Block	2,974	-159,505	0	0	0	0	0	0	-159,505

[redacted]

ROOM PSYCHROMETRICS - ALTERNATIVE 1
M181 - BASELINE

---------- P S Y C H R O M E T R I C S T A T E P O I N T S ----------

Room 3

	Dry Bulb (F)	Wet Bulb (F)	Relat. Humid. (%)	Humid. Ratio (GR)	Enthalpy (Btu/Lb)	Temp. Diff. (F)
Space	76.0	65.8	59.1	82.7	31.2	
Main System						
Return Air Heat Pickup						0.0
Return Fan						0.0
Return Air	76.0	65.8	59.1	82.7	31.2	
Outdoor Air	92.3	74.4	44.2	105.0	38.7	
Return/Outdoor Air Mix	77.9	66.9	57.2	85.3	32.0	
Blow through Fan						0.4
Entering Coil	78.3	67.0	56.4	85.3	32.1	
Leaving Coil	65.0	61.9	84.5	81.4	28.3	
Draw Through Fan						0.0
Duct Frictional Heat						0.6
Supply Duct Heat Gain						0.0
Cold Deck Supply Air	65.6	62.1	82.9	81.4	28.4	
Supply Air	65.6	62.1	82.9	81.4	28.4	

Percent Outside Air	11.54	(%)
Sensible Heat Ratio (SHR)	0.907	
Percent Supply Air Bypassing Coil	0.00	(%)
Coil Airflow	25,771	(Cfm)

BUILDING U-VALUES - ALTERNATIVE 1
M181 - BASELINE

---------- 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) Part.	ExFlr	Summr Skylt	Wintr Skylt	Roof	Summr Windo	Wintr Windo	Wall	Ceil.	Room Mass (lb/ sqft)	Room Capac. (Btu/ sqft/F)
1	OFFICE	0.000	0.000	0.000	0.000	0.025	0.000	0.000	0.169	0.317	33.4	13.13
Zone 1	Total/Ave.	0.000	0.000	0.000	0.000	0.025	0.000	0.000	0.169	0.317	33.4	13.13
2	OFFICE	0.000	0.000	0.000	0.000	0.025	0.000	0.000	0.169	0.317	28.5	12.14
Zone 2	Total/Ave.	0.000	0.000	0.000	0.000	0.025	0.000	0.000	0.169	0.317	28.5	12.14
System 1	Total/Ave.	0.000	0.000	0.000	0.000	0.025	0.000	0.000	0.169	0.317	31.3	12.71
3	OFFICE	0.000	0.000	0.000	0.000	0.025	0.000	0.000	0.169	0.317	19.7	7.40
Zone 3	Total/Ave.	0.000	0.000	0.000	0.000	0.025	0.000	0.000	0.169	0.317	19.7	7.40
System 2	Total/Ave.	0.000	0.000	0.000	0.000	0.025	0.000	0.000	0.169	0.317	19.7	7.40
Building		0.000	0.000	0.000	0.000	0.025	0.000	0.000	0.169	0.317	23.7	9.24

BUILDING AREAS - ALTERNATIVE 1
M181 - BASELINE

---------- 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	OFFICE	1	1	7,174	7,174	0	0	0	0	7,174	0	0	3,368
Zone 1	Total/Ave.				7,174	0	0	0	0	7,174	0	0	3,368
2	OFFICE	1	1	5,341	5,341	0	0	0	0	5,341	0	0	1,602
Zone 2	Total/Ave.				5,341	0	0	0	0	5,341	0	0	1,602
System 1	Total/Ave.				12,515	0	0	0	0	12,515	0	0	4,970
3	OFFICE	1	1	23,643	23,643	0	0	0	0	5,894	0	0	8,215
Zone 3	Total/Ave.				23,643	0	0	0	0	5,894	0	0	8,215
System 2	Total/Ave.				23,643	0	0	0	0	5,894	0	0	8,215
Building					36,158	0	0	0	0	18,409	0	0	13,185

ASHRAE 90 ANALYSIS - ALTERNATIVE 1
M181 - BASELINE

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

Overall Roof U-Value = 0.025 (Btu/Hr/Sq Ft/F)
Overall Wall U-Value = 0.169 (Btu/Hr/Sq Ft/F)
Overall Building U-Value = 0.085 (Btu/Hr/Sq Ft/F)

Roof Overall Thermal Transfer Value (OTTVr) = 0.47 (Btu/Hr/Sq Ft)
Wall Overall Thermal Transfer Value (OTTVw) = 6.53 (Btu/Hr/Sq Ft)

SYSTEM LOAD PROFILE - ALTERNATIVE 1

Main System 1 MZ MULTIZONE

Percent Design Load	Cooling Load Cap. (Ton)	Cooling Load Hours (%)	Cooling Load Hours	Heating Load Capacity (Btuh)	Heating Load Hours (%)	Heating Load Hours	Cooling Airflow Cap. (Cfm)	Cooling Airflow Hours (%)	Cooling Airflow Hours	Heating Airflow Cap. (Cfm)	Heating Airflow Hours (%)	Heating Airflow Hours
0 - 5	1.0	5	196	-6,067	7	102	687.0	0	0	0.0	0	0
5 - 10	2.1	7	273	-12,134	8	126	1,374.0	0	0	0.0	0	0
10 - 15	3.1	4	159	-18,201	7	102	2,060.9	0	0	0.0	0	0
15 - 20	4.1	11	446	-24,268	8	112	2,747.9	0	0	0.0	0	0
20 - 25	5.1	9	369	-30,335	9	138	3,434.9	0	0	0.0	0	0
25 - 30	6.2	4	172	-36,402	11	163	4,121.9	0	0	0.0	0	0
30 - 35	7.2	7	275	-42,469	12	177	4,808.9	0	0	0.0	0	0
35 - 40	8.2	6	268	-48,536	13	191	5,495.8	0	0	0.0	0	0
40 - 45	9.3	9	373	-54,603	7	104	6,182.8	0	0	0.0	0	0
45 - 50	10.3	4	166	-60,670	5	73	6,869.8	0	0	0.0	0	0
50 - 55	11.3	7	270	-66,737	4	55	7,556.8	0	0	0.0	0	0
55 - 60	12.3	6	240	-72,804	4	58	8,243.8	0	0	0.0	0	0
60 - 65	13.4	7	292	-78,871	4	65	8,930.7	0	0	0.0	0	0
65 - 70	14.4	7	300	-84,939	1	18	9,617.7	0	0	0.0	0	0
70 - 75	15.4	4	151	-91,006	0	0	10,304.7	0	0	0.0	0	0
75 - 80	16.5	5	195	-97,073	0	0	10,991.7	0	0	0.0	0	0
80 - 85	17.5	0	0	-103,140	0	0	11,678.7	0	0	0.0	0	0
85 - 90	18.5	0	0	-109,207	0	0	12,365.6	0	0	0.0	0	0
90 - 95	19.5	0	0	-115,274	0	0	13,052.6	0	0	0.0	0	0
95 - 100	20.6	0	0	-121,341	0	0	13,739.6	100	8,760	0.0	0	0
Hours Off	0.0	0	4,615	0	0	7,276	0.0	0	0	0.0	0	8,760

Main System 2 FC FAN COIL

Percent Design Load	Cooling Load Cap. (Ton)	Cooling Load Hours (%)	Cooling Load Hours	Heating Load Capacity (Btuh)	Heating Load Hours (%)	Heating Load Hours	Cooling Airflow Cap. (Cfm)	Cooling Airflow Hours (%)	Cooling Airflow Hours	Heating Airflow Cap. (Cfm)	Heating Airflow Hours (%)	Heating Airflow Hours
0 - 5	1.8	6	243	-10,383	4	71	1,288.5	0	0	0.0	0	0
5 - 10	3.6	5	181	-20,766	9	149	2,577.1	0	0	0.0	0	0
10 - 15	5.4	14	553	-31,149	8	133	3,865.6	0	0	0.0	0	0
15 - 20	7.3	10	373	-41,532	7	120	5,154.2	0	0	0.0	0	0
20 - 25	9.1	6	227	-51,915	4	74	6,442.7	0	0	0.0	0	0
25 - 30	10.9	5	199	-62,298	9	154	7,731.3	0	0	0.0	0	0
30 - 35	12.7	7	279	-72,681	9	157	9,019.8	0	0	0.0	0	0
35 - 40	14.5	6	241	-83,064	9	161	10,308.3	0	0	0.0	0	0
40 - 45	16.3	3	125	-93,447	13	232	11,596.9	0	0	0.0	0	0
45 - 50	18.1	6	234	-103,830	9	154	12,885.4	0	0	0.0	0	0
50 - 55	19.9	3	127	-114,213	8	134	14,174.0	0	0	0.0	0	0
55 - 60	21.8	3	129	-124,596	4	70	15,462.5	0	0	0.0	0	0
60 - 65	23.6	7	256	-134,979	4	66	16,751.1	0	0	0.0	0	0
65 - 70	25.4	6	235	-145,362	4	68	18,039.6	0	0	0.0	0	0
70 - 75	27.2	5	190	-155,745	0	0	19,328.2	0	0	0.0	0	0
75 - 80	29.0	3	108	-166,128	0	0	20,616.7	0	0	0.0	0	0
80 - 85	30.8	5	195	-176,511	0	0	21,905.2	0	0	0.0	0	0
85 - 90	32.6	0	0	-186,894	0	0	23,193.8	0	0	0.0	0	0
90 - 95	34.4	0	0	-197,277	0	0	24,482.3	0	0	0.0	0	0
95 - 100	36.3	0	0	-207,660	0	0	25,770.9	100	8,760	0.0	0	0
Hours Off	0.0	0	4,865	0	0	7,017	0.0	0	0	0.0	0	8,760

SYSTEM TOTALS LOAD PROFILE - ALTERNATIVE 1

SYSTEM LOAD PROFILE

System Totals

Percent Design Load	Cooling Load Cap. (Ton)	Cooling Load Hours (%)	Cooling Load Hours	Heating Load Capacity (Btuh)	Heating Load Hours (%)	Heating Load Hours	Cooling Airflow Cap. (Cfm)	Cooling Airflow Hours (%)	Cooling Airflow Hours	Heating Airflow Cap. (Cfm)	Heating Airflow Hours (%)	Heating Airflow Hours
0 - 5	2.8	9	388	-16,450	7	127	1,975.5	0	0	0.0	0	0
5 - 10	5.7	5	187	-32,900	11	200	3,951.0	0	0	0.0	0	0
10 - 15	8.5	10	418	-49,350	7	132	5,926.6	0	0	0.0	0	0
15 - 20	11.4	9	379	-65,800	9	165	7,902.1	0	0	0.0	0	0
20 - 25	14.2	8	313	-82,250	5	86	9,877.6	0	0	0.0	0	0
25 - 30	17.0	5	209	-98,700	8	151	11,853.1	0	0	0.0	0	0
30 - 35	19.9	6	248	-115,150	7	126	13,828.7	0	0	0.0	0	0
35 - 40	22.7	8	324	-131,600	13	231	15,804.2	0	0	0.0	0	0
40 - 45	25.6	5	215	-148,050	11	188	17,779.7	0	0	0.0	0	0
45 - 50	28.4	4	184	-164,500	6	111	19,755.2	0	0	0.0	0	0
50 - 55	31.3	4	172	-180,950	5	96	21,730.8	0	0	0.0	0	0
55 - 60	34.1	4	171	-197,400	2	43	23,706.3	0	0	0.0	0	0
60 - 65	36.9	5	214	-213,850	5	86	25,681.8	0	0	0.0	0	0
65 - 70	39.8	8	320	-230,300	2	37	27,657.3	0	0	0.0	0	0
70 - 75	42.6	4	150	-246,750	0	0	29,632.8	0	0	0.0	0	0
75 - 80	45.5	4	152	-263,200	0	0	31,608.4	0	0	0.0	0	0
80 - 85	48.3	3	106	-279,651	0	0	33,583.9	0	0	0.0	0	0
85 - 90	51.1	0	0	-296,101	0	0	35,559.4	0	0	0.0	0	0
90 - 95	54.0	0	0	-312,551	0	0	37,534.9	0	0	0.0	0	0
95 - 100	56.8	0	0	-329,001	0	0	39,510.5	100	8,760	0.0	0	0
Hours Off	0.0	0	4,610	0	0	6,981	0.0	0	0	0.0	0	8,760

BUILDING COOL-HEAT DEMAND - ALTERNATIVE 1

January			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	33.4	30.4	-198,780	0.0	-42,916	0.0	-82,043	0.0	-200,606	0.0	-205,828	0.0
2	32.1	29.3	-196,597	0.0	-73,225	0.0	-106,692	0.0	-209,477	0.0	-214,122	0.0
3	31.7	29.3	-194,762	0.0	-95,514	0.0	-123,957	0.0	-213,159	0.0	-217,295	0.0
4	31.9	29.5	-192,941	0.0	-111,813	0.0	-135,995	0.0	-213,492	0.0	-217,177	0.0
5	32.6	30.3	-190,340	0.0	-123,135	0.0	-143,701	0.0	-211,103	0.0	-214,389	0.0
6	33.6	31.3	-185,000	0.0	-130,924	0.0	-148,419	0.0	-207,106	0.0	-210,039	0.0
7	35.0	32.6	-177,971	0.0	-134,721	0.0	-149,610	0.0	-200,766	0.0	-203,386	0.0
8	36.6	34.4	-151,442	0.0	-120,696	0.0	-148,583	0.0	-193,225	0.0	-180,356	0.0
9	38.5	36.3	-102,638	0.0	-85,048	0.0	-144,757	0.0	-183,760	0.0	-136,940	0.0
10	40.4	37.7	-51,666	0.0	-47,494	0.0	-139,889	0.0	-174,003	0.0	-92,680	0.0
11	42.3	38.7	-2,773	0.0	-13,309	0.0	-133,873	0.0	-163,745	0.0	-52,700	0.0
12	44.2	39.6	0	0.0	0	0.0	-126,619	0.0	-152,806	0.0	-16,765	0.0
13	45.8	40.5	0	0.0	0	0.0	-120,073	0.0	-143,057	0.0	-2,270	0.0
14	47.2	41.1	0	0.0	0	0.0	-113,822	0.0	-134,017	0.0	0	0.0
15	48.2	41.6	0	0.0	0	0.0	-109,186	0.0	-126,949	0.0	0	0.0
16	48.9	41.8	0	0.0	0	0.0	-105,705	0.0	-121,349	0.0	0	0.0
17	49.1	41.9	0	0.0	0	0.0	-104,689	0.0	-118,480	0.0	0	0.0
18	48.7	41.9	0	0.0	0	0.0	-106,903	0.0	-119,074	0.0	0	0.0
19	47.4	41.7	0	0.0	0	0.0	-114,438	0.0	-125,190	0.0	0	0.0
20	45.5	40.5	0	0.0	0	0.0	-125,681	0.0	-135,191	0.0	0	0.0
21	43.1	38.9	0	0.0	0	0.0	-140,100	0.0	-148,520	0.0	0	0.0
22	40.4	36.7	0	0.0	0	0.0	-156,547	0.0	-164,007	0.0	-8,775	0.0
23	37.7	34.3	0	0.0	-14,761	0.0	-173,247	0.0	-179,865	0.0	-39,751	0.0
24	35.3	32.3	0	0.0	-51,436	0.0	-188,342	0.0	-194,218	0.0	-73,069	0.0

February			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	37.5	34.5	-42,920	0.0	-3,550	0.0	-59,217	0.0	-177,219	0.0	-182,557	0.0
2	36.0	33.0	-61,182	0.0	-26,560	0.0	-84,807	0.0	-187,218	0.0	-191,970	0.0
3	34.7	31.8	-76,799	0.0	-57,149	0.0	-107,172	0.0	-196,148	0.0	-200,383	0.0
4	33.6	30.9	-89,943	0.0	-83,584	0.0	-126,579	0.0	-203,967	0.0	-207,744	0.0
5	32.8	30.1	-100,761	0.0	-105,738	0.0	-142,723	0.0	-210,108	0.0	-213,478	0.0
6	32.2	29.8	-107,564	0.0	-124,607	0.0	-156,450	0.0	-215,190	0.0	-218,199	0.0
7	32.1	29.6	-110,385	0.0	-138,651	0.0	-166,091	0.0	-217,353	0.0	-220,043	0.0
8	32.5	30.3	-93,578	0.0	-132,867	0.0	-171,746	0.0	-216,532	0.0	-203,728	0.0
9	33.9	31.6	-53,978	0.0	-101,135	0.0	-170,481	0.0	-209,656	0.0	-162,896	0.0
10	36.0	33.0	-9,944	0.0	-63,323	0.0	-164,178	0.0	-198,483	0.0	-117,215	0.0
11	38.5	34.8	0	0.0	-26,528	0.0	-154,566	0.0	-184,640	0.0	-73,645	0.0
12	41.3	36.5	0	0.0	0	0.0	-142,105	0.0	-168,501	0.0	-32,505	0.0
13	43.8	38.1	0	0.0	0	0.0	-130,534	0.0	-153,728	0.0	-6,680	0.0
14	45.9	39.5	0	0.0	0	0.0	-120,643	0.0	-141,046	0.0	0	0.0
15	47.2	40.4	0	0.0	0	0.0	-114,903	0.0	-132,871	0.0	0	0.0
16	47.7	40.6	0	0.0	0	0.0	-113,278	0.0	-129,119	0.0	0	0.0
17	47.5	40.2	0	0.0	0	0.0	-115,228	0.0	-129,209	0.0	0	0.0
18	47.0	39.8	0	0.0	0	0.0	-118,402	0.0	-130,753	0.0	0	0.0
19	46.2	39.9	0	0.0	0	0.0	-122,971	0.0	-133,895	0.0	0	0.0
20	45.1	39.7	0	0.0	0	0.0	-129,319	0.0	-138,991	0.0	0	0.0
21	43.8	39.2	0	0.0	0	0.0	-137,095	0.0	-145,666	0.0	0	0.0
22	42.3	38.3	0	0.0	0	0.0	-146,359	0.0	-153,963	0.0	-4,444	0.0
23	40.7	37.2	0	0.0	0	0.0	-156,468	0.0	-163,220	0.0	-28,285	0.0
24	39.1	35.8	0	0.0	-30,660	0.0	-166,772	0.0	-172,773	0.0	-56,073	0.0

[redacted]DING COOL-HEAT DEMAND - ALTERNATIVE 1

[redacted]

March			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	45.4	41.6	-4,402	0.0	0	0.0	0	0.0	-89,546	0.0	-116,613	0.0
2	43.3	39.7	-15,236	0.0	0	0.0	0	0.0	-105,419	0.0	-129,661	0.0
3	41.6	38.6	-24,744	0.0	0	0.0	0	0.0	-118,925	0.0	-140,653	0.0
4	40.6	37.5	-35,026	0.0	0	0.0	0	0.0	-128,266	0.0	-147,750	0.0
5	40.2	37.3	-44,349	0.0	0	0.0	0	0.0	-134,020	0.0	-151,501	0.0
6	40.6	37.8	-49,338	0.0	0	0.0	0	0.0	-135,005	0.0	-150,697	0.0
7	41.6	39.0	-49,458	0.0	0	0.0	-7,276	0.0	-132,468	0.0	-146,561	0.0
8	43.3	40.7	-30,378	0.0	0	0.0	-17,446	0.0	-125,713	0.0	-123,165	0.0
9	45.4	42.5	0	0.0	0	0.0	-23,932	0.0	-116,342	0.0	-78,812	0.0
10	47.9	44.3	0	0.0	0	0.0	-26,898	0.0	-104,100	0.0	-31,140	0.0
11	50.6	45.5	0	0.0	0	0.0	-27,177	0.0	-90,095	0.0	0	0.0
12	53.3	46.8	0	0.0	0	0.0	-25,625	0.0	-75,477	0.0	0	0.0
13	55.8	48.5	0	0.0	0	0.0	-23,161	0.0	-61,484	0.0	0	0.0
14	58.0	49.6	0	0.0	0	0.0	-20,415	0.0	-48,845	0.0	0	0.0
15	59.6	50.3	0	0.0	0	0.0	-18,535	0.0	-41,565	0.0	0	0.0
16	60.7	50.9	0	0.0	0	0.0	-17,363	0.0	-36,847	0.0	0	0.0
17	61.0	50.9	0	0.0	0	0.0	-17,896	0.0	-34,380	0.0	0	0.0
18	60.7	50.7	0	0.0	0	0.0	-19,624	0.0	-33,571	0.0	0	0.0
19	59.6	50.7	0	0.0	0	0.0	-23,492	0.0	-35,292	0.0	0	0.0
20	58.0	50.5	0	0.0	0	0.0	-28,802	0.0	-43,167	0.0	0	0.0
21	55.8	49.4	0	0.0	0	0.0	-36,065	0.0	-55,355	0.0	0	0.0
[redacted]	53.3	47.8	0	0.0	0	0.0	-44,416	0.0	-69,592	0.0	0	0.0
[redacted]	50.6	45.9	0	0.0	0	0.0	-53,640	0.0	-85,349	0.0	0	0.0
24	47.9	43.8	0	0.0	0	0.0	-71,203	0.0	-101,441	0.0	0	0.0

April			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	57.7	53.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2	55.9	52.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
3	54.2	51.3	0	0.0	0	0.0	0	0.0	0	0.0	-11,904	0.0
4	52.9	50.2	0	0.0	0	0.0	0	0.0	0	0.0	-21,121	0.0
5	51.9	49.6	0	0.0	0	0.0	0	0.0	0	0.0	-28,965	0.0
6	51.2	49.2	0	0.0	0	0.0	0	0.0	0	0.0	-35,429	0.0
7	51.0	49.3	0	0.0	0	0.0	0	0.0	0	0.0	-39,940	0.0
8	51.6	49.9	0	0.0	0	0.0	0	0.0	0	0.0	-30,064	0.0
9	53.3	50.6	0	0.0	0	0.0	0	0.0	0	0.0	-2,337	0.0
10	55.9	51.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
11	59.0	53.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
12	62.4	55.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
13	65.5	57.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
14	68.1	59.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
15	69.8	60.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
16	70.4	60.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
17	70.2	60.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
18	69.5	60.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
19	68.5	59.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
[redacted]	67.2	59.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
[redacted]	65.5	59.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
22	63.7	58.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
23	61.7	57.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
24	59.7	55.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0

BUILDING COOL-HEAT DEMAND - ALTERNATIVE 1

May			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	66.6	62.3	0	56.8	0	11.4	0	6.0	0	6.1	0	6.1
2	64.5	60.4	0	53.8	0	9.8	0	4.7	0	4.7	0	4.7
3	62.7	59.1	0	47.6	0	5.7	0	3.4	0	3.4	0	3.4
4	61.2	58.1	0	42.2	0	2.3	0	2.3	0	2.3	0	2.3
5	60.0	57.1	0	37.7	0	1.4	0	1.4	0	1.4	0	1.4
6	59.3	56.6	0	34.0	0	0.8	0	0.8	0	0.8	0	0.8
7	59.0	56.5	0	31.1	0	0.6	0	0.6	0	0.6	0	0.6
8	59.5	56.6	0	30.1	0	16.5	0	0.6	0	0.6	0	16.5
9	60.9	56.6	0	31.5	0	18.3	0	0.8	0	0.8	0	18.3
10	63.0	57.2	0	33.4	0	20.6	0	1.7	0	1.7	0	20.6
11	65.7	58.1	0	35.6	0	23.2	0	3.2	0	3.2	0	23.4
12	68.7	59.8	0	38.7	0	25.6	0	4.7	0	4.7	0	25.6
13	71.7	61.6	0	39.3	0	27.5	0	6.1	0	6.1	0	27.5
14	74.5	63.4	0	39.8	0	29.4	0	7.6	0	7.6	0	29.4
15	76.6	64.8	0	41.4	0	32.7	0	9.0	0	9.0	0	32.7
16	78.0	65.6	0	42.1	0	35.0	0	10.1	0	10.1	0	35.0
17	78.5	65.6	0	40.7	0	35.4	0	11.0	0	11.0	0	35.4
18	78.2	65.8	0	38.3	0	34.0	0	11.4	0	11.4	0	34.0
19	77.5	65.6	0	35.2	0	31.1	0	11.5	0	11.5	0	31.1
20	76.3	66.1	0	31.8	0	28.5	0	11.4	0	11.4	0	28.5
21	74.8	67.2	0	28.9	0	27.3	0	11.4	0	11.4	0	27.3
22	73.0	66.4	0	26.3	0	21.1	0	11.4	0	11.4	0	21.1
23	70.9	65.4	0	24.0	0	11.5	0	10.2	0	10.2	0	11.5
24	68.7	64.0	0	15.0	0	8.0	0	8.2	0	8.2	0	8.0

June			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	73.0	67.9	0	14.8	0	15.8	0	13.7	0	13.5	0	13.5
2	71.2	66.1	0	13.5	0	14.5	0	11.3	0	11.4	0	11.4
3	69.7	65.2	0	12.6	0	9.7	0	9.7	0	9.8	0	9.8
4	68.5	64.3	0	11.9	0	8.0	0	8.1	0	8.1	0	8.1
5	67.8	64.2	0	11.5	0	6.9	0	6.9	0	6.9	0	6.9
6	67.6	64.2	0	11.3	0	6.8	0	6.8	0	6.8	0	6.8
7	68.1	64.8	0	11.6	0	7.1	0	7.1	0	7.1	0	7.1
8	69.4	65.7	0	28.4	0	27.5	0	7.7	0	7.7	0	27.5
9	71.6	66.2	0	31.5	0	28.3	0	9.0	0	9.0	0	28.3
10	74.2	67.2	0	35.5	0	32.4	0	10.4	0	10.4	0	32.4
11	77.2	68.5	0	39.5	0	34.7	0	12.1	0	12.1	0	34.7
12	80.2	70.0	0	42.3	0	38.1	0	14.5	0	14.5	0	38.1
13	82.8	70.8	0	42.9	0	39.1	0	16.6	0	16.6	0	39.1
14	85.0	71.6	0	44.4	0	40.6	0	18.0	0	18.0	0	40.6
15	86.3	72.3	0	46.9	0	44.7	0	20.0	0	20.0	0	44.7
16	86.8	72.1	0	46.7	0	45.1	0	20.4	0	20.4	0	45.1
17	86.6	71.7	0	44.9	0	44.5	0	20.4	0	20.4	0	44.5
18	85.8	71.5	0	42.5	0	42.5	0	20.7	0	20.7	0	42.5
19	84.7	71.2	0	38.9	0	39.2	0	20.5	0	20.5	0	39.2
20	83.2	71.5	0	35.2	0	37.5	0	20.9	0	20.9	0	37.5
21	81.4	71.7	0	32.5	0	35.4	0	20.4	0	20.4	0	35.4
22	79.3	71.4	0	30.1	0	32.8	0	19.0	0	19.0	0	32.8
23	77.2	70.5	0	28.1	0	25.5	0	17.7	0	17.7	0	25.5
24	75.1	69.1	0	23.4	0	18.8	0	15.4	0	15.4	0	18.8

[redacted]ING COOL-HEAT DEMAND - ALTERNATIVE 1

July			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	72.0	69.3	0	16.3	0	17.5	0	13.6	0	14.1	0	14.1
2	70.5	68.0	0	13.9	0	13.7	0	12.3	0	12.4	0	12.4
3	69.4	67.1	0	12.8	0	10.4	0	10.7	0	10.7	0	10.7
4	68.5	66.4	0	12.2	0	9.3	0	9.4	0	9.4	0	9.4
5	67.9	66.0	0	11.9	0	8.6	0	8.6	0	8.6	0	8.6
6	67.7	65.9	0	11.8	0	8.1	0	8.1	0	8.1	0	8.1
7	68.1	66.3	0	12.5	0	8.0	0	8.0	0	8.0	0	8.0
8	69.1	67.3	0	30.8	0	30.1	0	8.5	0	8.5	0	30.1
9	70.8	68.0	0	32.5	0	30.7	0	10.2	0	10.2	0	30.7
10	72.9	69.1	0	37.7	0	35.3	0	12.1	0	12.1	0	35.3
11	75.2	70.5	0	40.3	0	37.0	0	13.7	0	13.7	0	37.0
12	77.5	71.7	0	43.6	0	40.3	0	15.9	0	15.9	0	40.3
13	79.6	72.7	0	44.7	0	41.0	0	17.9	0	17.9	0	41.0
14	81.3	73.5	0	45.8	0	43.6	0	19.9	0	19.9	0	43.6
15	82.3	73.7	0	48.3	0	46.6	0	21.4	0	21.4	0	46.6
16	82.7	73.5	0	48.1	0	46.4	0	21.3	0	21.3	0	46.4
17	82.5	73.1	0	46.1	0	45.9	0	21.2	0	21.2	0	45.9
18	82.0	72.6	0	43.4	0	44.2	0	21.3	0	21.3	0	44.2
19	81.1	73.2	0	39.9	0	40.9	0	21.4	0	21.4	0	40.9
20	79.9	73.8	0	36.7	0	39.3	0	21.7	0	21.7	0	39.3
[redacted]	78.5	73.9	0	34.2	0	38.6	0	22.0	0	22.0	0	38.6
[redacted]	76.9	73.1	0	31.9	0	35.2	0	20.4	0	20.4	0	35.2
23	75.2	71.9	0	30.0	0	25.0	0	18.6	0	18.6	0	25.0
24	73.5	70.8	0	22.4	0	19.0	0	16.5	0	16.5	0	19.0

August			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	72.7	70.2	0	16.8	0	18.7	0	14.7	0	15.1	0	15.1
2	71.2	69.0	0	13.8	0	14.1	0	13.1	0	13.1	0	13.1
3	69.9	68.0	0	12.6	0	11.4	0	11.7	0	11.7	0	11.7
4	68.8	67.1	0	12.0	0	10.0	0	10.0	0	10.0	0	10.0
5	68.0	66.6	0	11.6	0	8.8	0	8.8	0	8.8	0	8.8
6	67.5	66.2	0	12.2	0	8.2	0	8.2	0	8.2	0	8.2
7	67.3	66.1	0	12.9	0	7.7	0	7.7	0	7.7	0	7.7
8	67.8	66.5	0	30.8	0	29.6	0	7.8	0	7.8	0	29.6
9	69.1	67.0	0	33.8	0	28.6	0	8.6	0	8.6	0	28.6
10	71.2	67.8	0	38.0	0	32.8	0	10.0	0	10.0	0	32.8
11	73.8	68.7	0	40.2	0	34.8	0	11.6	0	11.6	0	34.8
12	76.5	70.0	0	42.4	0	38.2	0	13.9	0	13.9	0	38.2
13	79.1	71.2	0	43.0	0	39.1	0	15.9	0	15.9	0	39.1
14	81.1	72.6	0	45.6	0	41.8	0	18.1	0	18.1	0	41.8
15	82.5	73.6	0	48.5	0	44.8	0	19.7	0	19.7	0	44.8
16	83.0	73.7	0	48.1	0	46.1	0	20.7	0	20.7	0	46.1
17	82.8	73.5	0	47.4	0	46.0	0	21.1	0	21.1	0	46.0
18	82.3	73.5	0	43.8	0	44.1	0	21.4	0	21.4	0	44.1
19	81.5	73.1	0	39.9	0	40.9	0	21.3	0	21.3	0	40.9
[redacted]	80.4	73.7	0	36.7	0	39.3	0	21.6	0	21.6	0	39.3
21	79.1	74.9	0	35.3	0	38.7	0	22.0	0	22.0	0	38.7
22	77.6	73.9	0	32.2	0	36.7	0	21.4	0	21.4	0	36.7
23	76.0	72.7	0	29.8	0	24.4	0	19.3	0	19.3	0	24.4
24	74.3	71.3	0	22.0	0	18.6	0	16.8	0	16.8	0	18.6

BUILDING COOL-HEAT DEMAND - ALTERNATIVE 1

September			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	69.8	66.1	0	12.4	0	11.4	0	9.8	0	9.9	0	9.9
2	68.0	64.5	0	10.1	0	7.4	0	8.3	0	8.3	0	8.3
3	66.3	63.0	0	9.2	0	6.3	0	6.5	0	6.5	0	6.5
4	64.9	61.9	0	8.5	0	4.9	0	5.1	0	5.1	0	5.1
5	63.9	61.3	0	8.1	0	3.8	0	3.8	0	3.8	0	3.8
6	63.2	61.0	0	8.0	0	3.2	0	3.2	0	3.2	0	3.2
7	63.0	60.8	0	8.1	0	2.7	0	2.7	0	2.7	0	2.7
8	63.4	61.4	0	24.3	0	21.7	0	2.6	0	2.6	0	21.7
9	64.7	61.8	0	28.5	0	22.9	0	3.1	0	3.1	0	22.9
10	66.6	62.1	0	32.9	0	25.5	0	4.1	0	4.1	0	25.5
11	69.1	62.9	0	35.5	0	27.8	0	5.4	0	5.4	0	27.8
12	71.8	63.7	0	37.6	0	29.9	0	6.9	0	6.9	0	29.9
13	74.5	65.5	0	38.3	0	31.6	0	8.4	0	8.4	0	31.6
14	77.0	67.1	0	39.5	0	33.5	0	10.2	0	10.2	0	33.5
15	78.9	68.2	0	42.0	0	37.6	0	12.4	0	12.4	0	37.6
16	80.2	68.6	0	41.9	0	39.6	0	14.1	0	14.1	0	39.6
17	80.6	68.5	0	41.4	0	39.7	0	15.0	0	15.0	0	39.7
18	80.4	68.9	0	38.6	0	37.9	0	15.4	0	15.4	0	37.9
19	79.7	70.0	0	34.9	0	36.0	0	16.1	0	16.1	0	36.0
20	78.7	71.2	0	32.0	0	34.8	0	16.9	0	16.9	0	34.8
21	77.3	71.6	0	29.4	0	34.0	0	17.3	0	17.3	0	34.0
22	75.6	70.5	0	27.0	0	28.2	0	16.0	0	16.0	0	28.2
23	73.7	69.4	0	24.1	0	17.4	0	14.3	0	14.3	0	17.4
24	71.8	67.7	0	15.8	0	11.8	0	12.4	0	12.4	0	11.8

October			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	54.8	51.3	0	1.2	0	0.0	0	0.0	0	0.0	0	0.1
2	52.9	49.6	0	0.6	0	0.0	0	0.0	0	0.0	0	0.0
3	51.2	48.2	0	0.4	0	0.0	0	0.0	0	0.0	0	0.0
4	49.8	47.2	0	0.2	0	0.0	0	0.0	0	0.0	0	0.0
5	48.8	46.2	0	0.2	0	0.0	0	0.0	0	0.0	0	0.0
6	48.2	45.7	0	0.3	0	0.0	0	0.0	0	0.0	0	0.0
7	47.9	45.6	0	0.4	0	0.0	0	0.0	0	0.0	0	0.0
8	48.5	46.2	0	14.7	0	0.0	0	0.0	0	0.0	0	0.0
9	50.3	47.3	0	18.2	0	9.3	0	0.0	0	0.0	0	0.0
10	52.9	48.7	0	20.9	0	14.2	0	0.0	0	0.0	0	5.1
11	56.2	49.9	0	23.6	0	16.8	0	0.2	0	0.4	0	13.7
12	59.6	51.5	0	26.0	0	19.3	0	0.7	0	0.8	0	17.9
13	62.9	53.5	0	27.6	0	21.2	0	1.2	0	1.3	0	20.0
14	65.5	55.2	0	28.8	0	22.7	0	1.6	0	1.7	0	21.7
15	67.3	56.3	0	30.1	0	24.4	0	1.8	0	1.9	0	23.5
16	67.9	56.6	0	30.9	0	25.7	0	1.9	0	2.0	0	24.9
17	67.7	56.4	0	30.9	0	26.1	0	1.9	0	2.0	0	25.4
18	67.0	56.6	0	29.5	0	25.2	0	1.8	0	1.9	0	24.6
19	66.0	57.6	0	26.6	0	22.9	0	1.6	0	1.7	0	22.4
20	64.6	57.9	0	23.4	0	20.2	0	1.4	0	1.5	0	19.7
21	62.9	57.3	0	20.6	0	11.1	0	1.2	0	1.3	0	7.0
22	61.0	56.0	0	14.2	0	1.6	0	0.9	0	1.0	0	1.6
23	59.0	54.8	0	5.2	0	0.6	0	0.6	0	0.7	0	0.6
24	56.9	53.0	0	2.2	0	0.2	0	0.3	0	0.4	0	0.2

[redacted]ING COOL-HEAT DEMAND - ALTERNATIVE 1

November			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	48.7	45.7	-187,676	0.0	0	0.0	0	0.0	-47,930	0.0	-86,373	0.0
2	46.9	44.1	-174,104	0.0	0	0.0	0	0.0	-56,730	0.0	-98,507	0.0
3	45.5	42.8	-162,591	0.0	0	0.0	0	0.0	-69,361	0.0	-108,442	0.0
4	44.6	41.9	-152,641	0.0	0	0.0	0	0.0	-80,812	0.0	-115,559	0.0
5	44.4	42.0	-142,556	0.0	0	0.0	0	0.0	-87,710	0.0	-118,632	0.0
6	44.8	42.7	-130,723	0.0	0	0.0	0	0.0	-90,761	0.0	-118,302	0.0
7	45.9	43.9	-116,903	0.0	0	0.0	0	0.0	-89,340	0.0	-113,889	0.0
8	47.8	46.0	-84,482	0.0	0	0.0	0	0.0	-82,808	0.0	-89,497	0.0
9	50.2	48.0	-29,902	0.0	0	0.0	0	0.0	-72,984	0.0	-43,622	0.0
10	52.9	49.9	0	0.0	0	0.0	0	0.0	-60,901	0.0	0	0.0
11	55.8	51.1	0	0.0	0	0.0	0	0.0	-49,915	0.0	0	0.0
12	58.5	52.0	0	0.0	0	0.0	0	0.0	-41,723	0.0	0	0.0
13	60.9	52.5	0	0.0	0	0.0	0	0.0	-33,889	0.0	0	0.0
14	62.8	53.4	0	0.0	0	0.0	0	0.0	-27,215	0.0	0	0.0
15	64.0	53.8	0	0.0	0	0.0	0	0.0	-22,381	0.0	0	0.0
16	64.4	53.9	0	0.0	0	0.0	0	0.0	-19,693	0.0	0	0.0
17	64.1	53.7	0	0.0	0	0.0	0	0.0	-18,993	0.0	0	0.0
18	63.2	53.7	0	0.0	0	0.0	0	0.0	-20,142	0.0	0	0.0
19	61.8	54.2	0	0.0	0	0.0	0	0.0	-23,027	0.0	0	0.0
20	60.0	53.6	0	0.0	0	0.0	0	0.0	-27,529	0.0	0	0.0
21	57.9	52.7	0	0.0	0	0.0	-4,464	0.0	-33,348	0.0	0	0.0
[redacted]	55.6	51.2	0	0.0	0	0.0	-15,744	0.0	-41,899	0.0	0	0.0
[redacted]	53.2	49.5	0	0.0	0	0.0	-27,028	0.0	-57,188	0.0	0	0.0
24	50.8	47.6	0	0.0	0	0.0	-38,047	0.0	-72,609	0.0	0	0.0

December			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	37.5	35.3	0	0.0	0	0.0	0	0.0	-165,453	0.0	-174,051	0.0
2	37.1	35.1	0	0.0	0	0.0	-9,156	0.0	-169,765	0.0	-177,419	0.0
3	37.4	35.5	0	0.0	0	0.0	-25,665	0.0	-170,064	0.0	-176,884	0.0
4	38.1	36.2	0	0.0	0	0.0	-43,155	0.0	-168,180	0.0	-174,261	0.0
5	39.3	37.6	0	0.0	0	0.0	-54,536	0.0	-163,383	0.0	-168,809	0.0
6	40.9	39.2	0	0.0	-6,966	0.0	-61,358	0.0	-156,224	0.0	-161,070	0.0
7	42.7	41.2	0	0.0	-18,230	0.0	-65,054	0.0	-147,828	0.0	-152,158	0.0
8	44.7	43.1	0	0.0	-14,634	0.0	-65,787	0.0	-138,093	0.0	-126,755	0.0
9	46.8	45.3	0	0.0	0	0.0	-64,313	0.0	-127,546	0.0	-82,098	0.0
10	48.8	47.0	0	0.0	0	0.0	-61,812	0.0	-117,172	0.0	-37,079	0.0
11	50.7	48.1	0	0.0	0	0.0	-58,221	0.0	-106,771	0.0	0	0.0
12	52.2	48.8	0	0.0	0	0.0	-55,326	0.0	-98,049	0.0	0	0.0
13	53.4	49.2	0	0.0	0	0.0	-53,375	0.0	-90,405	0.0	0	0.0
14	54.1	49.2	0	0.0	0	0.0	-52,240	0.0	-85,255	0.0	0	0.0
15	54.4	48.9	0	0.0	0	0.0	-53,131	0.0	-82,116	0.0	0	0.0
16	54.0	48.2	0	0.0	0	0.0	-57,307	0.0	-82,858	0.0	0	0.0
17	53.0	47.3	0	0.0	0	0.0	-64,351	0.0	-86,898	0.0	0	0.0
18	51.4	46.3	0	0.0	0	0.0	-74,477	0.0	-94,395	0.0	0	0.0
19	49.3	45.4	0	0.0	0	0.0	-87,477	0.0	-105,090	0.0	0	0.0
[redacted]	47.0	43.5	0	0.0	0	0.0	-101,851	0.0	-117,442	0.0	0	0.0
[redacted]	44.5	41.5	0	0.0	0	0.0	-117,704	0.0	-131,519	0.0	0	0.0
22	42.2	39.3	0	0.0	0	0.0	-132,583	0.0	-144,836	0.0	0	0.0
23	40.1	37.6	0	0.0	0	0.0	-146,541	0.0	-157,420	0.0	-5,553	0.0
24	38.5	36.2	0	0.0	0	0.0	-157,720	0.0	-167,387	0.0	-14,546	0.0

BUILDING TEMPERATURE PROFILES - ALTERNATIVE 1

BUILDING TEMPERATURE PROFILES

Temperature Range (F)	Room Number 1	2	3
Max. Temp.	88.3	88.9	93.0
Mo./Hr.	4 18	4 18	4 18
Day Type	2	2	2
	Number of Hours		
Above 100	0	0	0
95 - 100	0	0	0
90 - 95	0	0	176
85 - 90	238	291	430
80 - 85	880	945	1,171
75 - 80	2,105	2,092	1,437
70 - 75	3,106	2,976	2,907
65 - 70	2,431	2,456	2,639
60 - 65	0	0	0
55 - 60	0	0	0
50 - 55	0	0	0
Below 50	0	0	0
Min. Temp.	67.7	67.9	66.9
Mo./Hr.	10 7	10 7	10 11
Day Type	5	5	4

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 1
- BASELINE

MONTHLY ENERGY CONSUMPTION

Month	ELEC On Peak (kWh)	DEMAND On Peak (kW)	GAS On Peak (Therm)	GAS DMND On Peak (Thrm/hr)
Jan	46,717	130	755	3
Feb	42,147	130	649	3
March	47,770	130	179	2
April	43,809	127	8	0
May	65,779	188	0	0
June	72,879	202	0	0
July	72,592	198	0	0
Aug	76,028	198	0	0
Sept	65,904	189	0	0
Oct	56,362	171	0	0
Nov	44,247	130	149	2
Dec	45,414	130	382	2
Total	679,649	202	2,122	3

Building Energy Consumption = 70,021 (Btu/Sq Ft/Year)
Source Energy Consumption = 198,655 (Btu/Sq Ft/Year)

Floor Area = 36,158 (Sq Ft)

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
M181 - BASELINE

EQUIPMENT ENERGY CONSUMPTION

Ref Num	Equip Code	Monthly Consumption Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	14562	13171	15726	13904	15144	15068	13980	15726	13904	15144	13904	13980	174,211
	PK	62.9	62.9	62.9	62.9	62.9	62.9	62.9	62.9	62.9	62.9	62.9	62.9	62.9
1	MISC LD													
	ELEC	7699	6964	8315	7352	8007	7967	7392	8315	7352	8007	7352	7392	92,112
	PK	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3
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	EQ1121L	AIR-CLD RECIP 35-60 TONS												
	ELEC	0	0	0	0	9639	16150	16417	17117	11549	4688	0	0	75,559
	PK	0.0	0.0	0.0	0.0	52.1	52.0	51.7	52.0	43.5	27.0	0.0	0.0	52.1
1	EQ5200	CONDENSER FANS												
	ELEC	0	0	0	0	1176	2032	2087	2153	1438	440	0	0	9,326
	PK	0.0	0.0	0.0	0.0	5.6	10.1	6.0	6.0	5.2	3.7	0.0	0.0	10.1
1	EQ5001	CHILLED WATER PUMP C.V.												
	ELEC	0	0	0	0	8364	8948	9247	9247	8948	4723	0	0	49,477
	PK	0.0	0.0	0.0	0.0	12.4	12.4	12.4	12.4	12.4	12.4	0.0	0.0	12.4
1	EQ5313	CONTROLS												
	ELEC	0	0	0	0	202	216	223	223	216	114	0	0	1,194
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3
1	EQ4003	FC CENTRIF. FAN C.V.												
	ELEC	10938	9879	10938	10585	10938	10585	10938	10938	10585	10938	10585	10938	128,784
	PK	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7

1 EQ4003 FC CENTRIF. FAN C.V.

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
M181 - BASELINE

	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.										
	ELEC	12309	11118	12309	11912	12309	11912	12309	12309	11912	12309	11912	12309	144,933
	PK	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5
2	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
1	EQ2001			GAS FIRE TUBE HOT WATER										
	GAS	755	649	179	8	0	0	0	0	0	0	149	382	2,122
	PK	2.6	2.6	1.8	0.5	0.0	0.0	0.0	0.0	0.0	0.0	2.3	2.1	2.6
1	EQ5020			HEAT WATER CIRC. PUMP C.V.										
	ELEC	777	652	310	36	0	0	0	0	0	0	318	512	2,604
	PK	1.5	1.5	1.5	1.5	0.0	0.0	0.0	0.0	0.0	0.0	1.5	1.5	1.5
1	EQ5240			BOILER FORCED DRAFT FAN										
	ELEC	171	144	68	8	0	0	0	0	0	0	70	113	574
	PK	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.3
1	EQ5307			BOILER CONTROLS										
	ELEC	260	219	104	12	0	0	0	0	0	0	107	172	873
	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

UTILITY PEAK CHECKSUMS - ALTERNATIVE 1
[redacted] BASELINE

UTILITY PEAK CHECKSUMS

Utility ELECTRIC DEMAND

Peak Value 202.2 (kW)
Yearly Time of Peak 15 (hr) 6 (mo)

Hour 15 Month 6

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Percnt Of Tot (%)
Cooling Equipment				
1	EQ1121L	AIR-CLD RECIP 35-60 TONS	74.8	36.98
Sub Total			74.8	36.98
Sub Total			0.0	0.00
Air Moving Equipment				
[redacted]		SUMMATION OF FAN ELECTRICAL DEMAND	14.7	7.27
		SUMMATION OF FAN ELECTRICAL DEMAND	16.5	8.18
Sub Total			31.2	15.45
Sub Total			0.0	0.00
Miscellaneous				
Lights			62.9	31.12
Base Utilities			0.0	0.00
Misc Equipment			33.3	16.45
Sub Total			96.2	47.57
Grand Total			202.2	100.00

CALIFORNIA TITLE 24 COMPLIANCE - ALTERNATIVE 1
M181 - BASELINE

CALIFORNIA TITLE 24 COMPLIANCE REPORT

Weather Name ..... ATLANTA.
Gross Conditioned Floor Area (sqft)..... 36,158
ACM Multiplier 1.025

E N E R G Y U S E S U M M A R Y

	ELEC (kWh/yr)	GAS (kBtu/yr)	PERCENT OF TOTAL ENERGY (%)	TOTAL SOURCE ENERGY (kBtu/yr)	ADJUSTED UNIT SOURCE ENERGY (kBtu/yr-sf)
Primary Heating	1,447.4	212,180.3	8.6	238,169.5	6.8
Primary Cooling					
Compressor	75,559.2	0.0	10.2	773,727.6	21.9
Tower/Cond Fans	9,326.4	0.0	1.3	95,502.4	2.7
Condenser Pump	0.0	0.0	0.0	0.0	0.0
Other Accessories	1,194.3	0.0	0.2	12,229.7	0.3
Auxiliary					
Supply Fans	273,717.4	0.0	36.9	2,802,872.7	79.5
Circulation Pumps	52,081.3	0.0	7.0	533,313.6	15.1
Base Utilities	0.0	0.0	0.0	0.0	0.0
Subtotal	325,798.7	0.0	43.9	3,336,186.2	94.6
Lighting	174,211.4	0.0	23.5	1,783,928.9	49.3
Receptacle	92,111.7	0.0	12.4	943,226.3	26.1
Domestic Hot Water	0.0	0.0	0.0	0.0	0.0
Cogeneration	0.0	0.0	0.0	0.0	0.0
Totals	679,649.1	212,180.3	100.0	7,182,970.5	201.7

[redacted]LY ENERGY CONSUMPTION - ALTERNATIVE 1
[redacted] - ~~BASELINE~~ ECONOMIZER

MONTHLY ENERGY CONSUMPTION

Month	ELEC On Peak (kWh)	DEMAND On Peak (kW)	GAS On Peak (Therm)	GAS DMND On Peak (Thrm/hr)
Jan	46,738	130	755	3
Feb	42,164	130	649	3
March	47,769	130	179	2
April	43,810	127	8	0
May	61,548	188	0	0
June	72,624	202	0	0
July	72,280	198	0	0
Aug	75,684	198	0	0
Sept	63,604	189	0	0
Oct	52,263	170	0	0
Nov	44,256	130	151	2
Dec	45,388	130	382	2
Total	668,127	202	2,123	3

Building Energy Consumption = 68,938 (Btu/Sq Ft/Year)
Source Energy Consumption = 195,396 (Btu/Sq Ft/Year)

Floor Area = 36,158 (Sq Ft)

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
M181 - BASELINE

EQUIPMENT ENERGY CONSUMPTION

Ref Num	Equip Code	Monthly Consumption Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	14562	13171	15726	13904	15144	15068	13980	15726	13904	15144	13904	13980	174,211
	PK	62.9	62.9	62.9	62.9	62.9	62.9	62.9	62.9	62.9	62.9	62.9	62.9	62.9
1	MISC LD													
	ELEC	7699	6964	8315	7352	8007	7967	7392	8315	7352	8007	7352	7392	92,112
	PK	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3
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	EQ1121L	AIR-CLD RECIP 35-60 TONS												
	ELEC	0	0	0	0	7832	15919	16135	16807	10502	2818	0	0	70,012
	PK	0.0	0.0	0.0	0.0	52.1	52.0	51.7	52.0	43.5	26.4	0.0	0.0	52.1
1	EQ5200	CONDENSER FANS												
	ELEC	0	0	0	0	1005	2007	2057	2120	1330	285	0	0	8,804
	PK	0.0	0.0	0.0	0.0	5.6	10.1	6.0	6.0	5.2	3.6	0.0	0.0	10.1
1	EQ5001	CHILLED WATER PUMP C.V.												
	ELEC	0	0	0	0	6164	8948	9247	9247	7830	2697	0	0	44,133
	PK	0.0	0.0	0.0	0.0	12.4	12.4	12.4	12.4	12.4	12.4	0.0	0.0	12.4
1	EQ5313	CONTROLS												
	ELEC	0	0	0	0	149	216	223	223	189	65	0	0	1,065
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3
1	EQ4003	FC CENTRIF. FAN C.V.												
	ELEC	10938	9879	10938	10585	10938	10585	10938	10938	10585	10938	10585	10938	128,784
	PK	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7

1 EQ4003 FC CENTRIF. FAN C.V.

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
M181 - BASELINE

	ELEC	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
2	EQ4003			FC CENTRIF. FAN C.V.									
	ELEC	12309	11118	12309	11912	12309	11912	12309	12309	11912	12309	11912	12309	144,933
	PK	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5
2	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
1	EQ2001			GAS FIRE TUBE HOT WATER									
	GAS	755	649	179	8	0	0	0	0	0	0	151	382	2,123
	PK	2.6	2.6	1.8	0.5	0.0	0.0	0.0	0.0	0.0	0.0	2.5	2.1	2.6
1	EQ5020			HEAT WATER CIRC. PUMP C.V.									
	ELEC	777	652	304	36	0	0	0	0	0	0	318	486	2,573
	PK	1.5	1.5	1.5	1.5	0.0	0.0	0.0	0.0	0.0	0.0	1.5	1.5	1.5
1	EQ5240			BOILER FORCED DRAFT FAN									
	ELEC	192	161	75	9	0	0	0	0	0	0	79	120	636
	PK	0.4	0.4	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.4
1	EQ5307			BOILER CONTROLS									
	ELEC	260	219	102	12	0	0	0	0	0	0	107	163	863
	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

LITY PEAK CHECKSUMS - ALTERNATIVE 1
- BASELINE

UTILITY PEAK CHECKSUMS

Utility ELECTRIC DEMAND

Peak Value 202.2 (kW)
Yearly Time of Peak 15 (hr) 6 (mo)

Hour 15 Month 6

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Percnt Of Tot (%)
Cooling Equipment				
1	EQ1121L	AIR-CLD RECIP 35-60 TONS	74.8	36.98
Sub Total			74.8	36.98
Sub Total			0.0	0.00
Air Moving Equipment				
		SUMMATION OF FAN ELECTRICAL DEMAND	14.7	7.27
2		SUMMATION OF FAN ELECTRICAL DEMAND	16.5	8.18
Sub Total			31.2	15.45
Sub Total			0.0	0.00
Miscellaneous				
Lights			62.9	31.12
Base Utilities			0.0	0.00
Misc Equipment			33.3	16.45
Sub Total			96.2	47.57
Grand Total			202.2	100.00

CALIFORNIA TITLE 24 COMPLIANCE - ALTERNATIVE 1
M181 --BASELINE

---------- CALIFORNIA TITLE 24 COMPLIANCE REPORT ----------

Weather Name ..... ATLANTA.
Gross Conditioned Floor Area (sqft)..... 36,158
ACM Multiplier 1.025

---------- E N E R G Y U S E S U M M A R Y ----------

	ELEC (kWh/yr)	GAS (kBtu/yr)	PERCENT OF TOTAL ENERGY (%)	TOTAL SOURCE ENERGY (kBtu/yr)	ADJUSTED UNIT SOURCE ENERGY (kBtu/yr-sf)
Primary Heating	1,498.6	212,332.9	8.7	238,853.9	6.8
Primary Cooling					
Compressor	70,012.3	0.0	9.6	716,927.6	20.3
Tower/Cond Fans	8,804.4	0.0	1.2	90,156.8	2.6
Condenser Pump	0.0	0.0	0.0	0.0	0.0
Other Accessories	1,065.3	0.0	0.1	10,908.7	0.3
Auxiliary					
Supply Fans	273,717.4	0.0	37.5	2,802,872.7	79.5
Circulation Pumps	46,705.8	0.0	6.4	478,268.2	13.6
Base Utilities	0.0	0.0	0.0	0.0	0.0
Subtotal	320,423.2	0.0	43.9	3,281,141.0	93.0
Lighting	174,211.4	0.0	23.9	1,783,928.9	49.3
Receptacle	92,111.7	0.0	12.6	943,226.3	26.1
Domestic Hot Water	0.0	0.0	0.0	0.0	0.0
Cogeneration	0.0	0.0	0.0	0.0	0.0
Totals	668,126.9	212,332.9	100.0	7,065,143.5	198.4

[redacted]Y ENERGY CONSUMPTION - ALTERNATIVE 1
[redacted] WALL INSULATION

---------- M O N T H L Y E N E R G Y C O N S U M P T I O N ----------

Month	ELEC On Peak (kWh)	DEMAND On Peak (kW)	GAS On Peak (Therm)	GAS DMND On Peak (Thrm/hr)
Jan	46,388	130	413	2
Feb	41,767	130	337	2
March	47,528	130	72	1
April	43,708	127	0	0
May	65,702	188	0	0
June	71,519	199	0	0
July	71,334	194	0	0
Aug	74,800	195	0	0
Sept	65,170	186	0	0
Oct	56,864	170	0	0
Nov	43,946	130	36	2
Dec	45,024	130	181	2
Total	673,750	199	1,039	2

Building Energy Consumption = 66,469 (Btu/Sq Ft/Year)
Source Energy Consumption = 193,832 (Btu/Sq Ft/Year)

Floor Area = 36,158 (Sq Ft)

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
M181 - WALL INSULATION

EQUIPMENT ENERGY CONSUMPTION

Ref Num	Equip Code	Monthly Consumption Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	14562	13171	15726	13904	15144	15068	13980	15726	13904	15144	13904	13980	174,211
	PK	62.9	62.9	62.9	62.9	62.9	62.9	62.9	62.9	62.9	62.9	62.9	62.9	62.9
1	MISC LD													
	ELEC	7699	6964	8315	7352	8007	7967	7392	8315	7352	8007	7352	7392	92,112
	PK	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3
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	EQ1121L	AIR-CLD RECIP 35-60 TONS												
	ELEC	0	0	0	0	9408	14975	15334	16059	10930	5041	0	0	71,748
	PK	0.0	0.0	0.0	0.0	49.3	48.6	48.5	48.8	40.9	26.0	0.0	0.0	49.3
1	EQ5200	CONDENSER FANS												
	ELEC	0	0	0	0	1148	1892	1958	2030	1369	469	0	0	8,866
	PK	0.0	0.0	0.0	0.0	5.3	10.1	5.6	5.7	4.9	3.5	0.0	0.0	10.1
1	EQ5001	CHILLED WATER PUMP C.V.												
	ELEC	0	0	0	0	8588	8948	9247	9247	8948	4884	0	0	49,863
	PK	0.0	0.0	0.0	0.0	12.4	12.4	12.4	12.4	12.4	12.4	0.0	0.0	12.4
1	EQ5313	CONTROLS												
	ELEC	0	0	0	0	207	216	223	223	216	118	0	0	1,204
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3
1	EQ4003	FC CENTRIF. FAN C.V.												
	ELEC	10891	9837	10891	10540	10891	10540	10891	10891	10540	10891	10540	10891	128,233
	PK	14.6	14.6	14.6	14.6	14.6	14.6	14.6	14.6	14.6	14.6	14.6	14.6	14.6

1 EQ4003 FC CENTRIF. FAN C.V.

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
M181 - WALL INSULATION

	ELEC	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
2	EQ4003		FC CENTRIF. FAN C.V.										
	ELEC	12309	11118	12309	11912	12309	11912	12309	12309	11912	12309	11912	12309	144,933
	PK	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5
2	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
1	EQ2001		GAS FIRE TUBE HOT WATER										
	GAS	413	337	72	0	0	0	0	0	0	0	36	181	1,039
	PK	2.1	2.1	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	1.6	2.1
1	EQ5020		HEAT WATER CIRC. PUMP C.V.										
	ELEC	614	449	191	0	0	0	0	0	0	0	158	300	1,712
	PK	1.5	1.5	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	1.5	1.5
1	EQ5240		BOILER FORCED DRAFT FAN										
	ELEC	106	77	33	0	0	0	0	0	0	0	27	52	295
	PK	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.3
1	EQ5307		BOILER CONTROLS										
	ELEC	206	150	64	0	0	0	0	0	0	0	53	100	574
	PK	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5	0.5

ITY PEAK CHECKSUMS - ALTERNATIVE 1
- WALL 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 198.8 (kW)
Yearly Time of Peak 15 (hr) 6 (mo)

Hour 15 Month 6

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Percnt Of Tot (%)
Cooling Equipment				
1	EQ1121L	AIR-CLD RECIP 35-60 TONS	71.4	35.93
Sub Total			71.4	35.93
Sub Total			0.0	0.00
Air Moving Equipment				
		SUMMATION OF FAN ELECTRICAL DEMAND	14.6	7.36
2		SUMMATION OF FAN ELECTRICAL DEMAND	16.5	8.32
Sub Total			31.2	15.69
Sub Total			0.0	0.00
Miscellaneous				
Lights			62.9	31.65
Base Utilities			0.0	0.00
Misc Equipment			33.3	16.73
Sub Total			96.2	48.38
Grand Total			198.8	100.00

CALIFORNIA TITLE 24 COMPLIANCE - ALTERNATIVE 1
M181 - WALL INSULATION

---------- CALIFORNIA TITLE 24 COMPLIANCE REPORT ----------

Weather Name ..... ATLANTA.
Gross Conditioned Floor Area (sqft)..... 36,158
ACM Multiplier 1.025

---------- E N E R G Y U S E S U M M A R Y ----------

	ELEC (kWh/yr)	GAS (kBtu/yr)	PERCENT OF TOTAL ENERGY (%)	TOTAL SOURCE ENERGY (kBtu/yr)	ADJUSTED UNIT SOURCE ENERGY (kBtu/yr-sf)
Primary Heating	869.1	103,892.7	4.4	118,260.3	3.4
Primary Cooling					
Compressor	71,747.6	0.0	10.2	734,696.8	20.8
Tower/Cond Fans	8,866.2	0.0	1.3	90,790.2	2.6
Condenser Pump	0.0	0.0	0.0	0.0	0.0
Other Accessories	1,203.6	0.0	0.2	12,324.9	0.3
Auxiliary					
Supply Fans	273,166.2	0.0	38.8	2,797,228.8	79.3
Circulation Pumps	51,574.7	0.0	7.3	528,126.3	15.0
Base Utilities	0.0	0.0	0.0	0.0	0.0
Subtotal	324,741.0	0.0	46.1	3,325,355.2	94.3
Lighting	174,211.4	0.0	24.7	1,783,928.9	49.3
Receptacle	92,111.7	0.0	13.1	943,226.3	26.1
Domestic Hot Water	0.0	0.0	0.0	0.0	0.0
Cogeneration	0.0	0.0	0.0	0.0	0.0
Totals	673,750.6	103,892.7	100.0	7,008,583.0	196.8

[redacted]LY ENERGY CONSUMPTION - ALTERNATIVE 1
[redacted] - HVAC CONTROLS

MONTHLY ENERGY CONSUMPTION

Month	ELEC On Peak (kWh)	DEMAND On Peak (kW)	GAS On Peak (Therm)	GAS DMND On Peak (Thrm/hr)
Jan	30,401	130	56	4
Feb	27,497	130	43	4
March	32,683	127	2	0
April	28,755	127	0	0
May	41,947	206	0	0
June	45,978	210	0	0
July	42,311	205	0	0
Aug	47,529	206	0	0
Sept	39,346	196	0	0
Oct	37,865	177	0	0
Nov	28,755	127	0	0
Dec	28,885	127	1	0
Total	431,952	210	103	4

Building Energy Consumption = 41,058 (Btu/Sq Ft/Year)
Source Energy Consumption = 122,630 (Btu/Sq Ft/Year)

Floor Area = 36,158 (Sq Ft)

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
M181 - HVAC CONTROLS

EQUIPMENT ENERGY CONSUMPTION

Ref Num	Equip Code	Monthly Consumption Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	14562	13171	15726	13904	15144	15068	13980	15726	13904	15144	13904	13980	174,211
	PK	62.9	62.9	62.9	62.9	62.9	62.9	62.9	62.9	62.9	62.9	62.9	62.9	62.9
1	MISC LD													
	ELEC	7699	6964	8315	7352	8007	7967	7392	8315	7352	8007	7352	7392	92,112
	PK	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3
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	EQ1121L	AIR-CLD RECIP 35-60 TONS												
	ELEC	0	0	0	0	6466	10115	9261	10139	6751	3533	0	0	46,266
	PK	0.0	0.0	0.0	0.0	59.2	59.6	58.4	58.8	50.4	32.3	0.0	0.0	59.6
1	EQ5200	CONDENSER FANS												
	ELEC	0	0	0	0	721	1218	1125	1213	785	323	0	0	5,385
	PK	0.0	0.0	0.0	0.0	7.0	10.1	6.7	6.8	5.9	4.3	0.0	0.0	10.1
1	EQ5001	CHILLED WATER PUMP C.V.												
	ELEC	0	0	0	0	3281	3281	2983	3430	2983	2548	0	0	18,506
	PK	0.0	0.0	0.0	0.0	12.4	12.4	12.4	12.4	12.4	12.4	0.0	0.0	12.4
1	EQ5313	CONTROLS												
	ELEC	0	0	0	0	79	79	72	83	72	61	0	0	447
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3
1	EQ4003	FC CENTRIF. FAN C.V.												
	ELEC	3705	3352	4058	3528	3881	3881	3528	4058	3528	3881	3528	3528	44,457
	PK	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7

1 EQ4003 FC CENTRIF. FAN C.V.

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
M181 - HVAC CONTROLS

	ELEC	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
2	EQ4003		FC CENTRIF. FAN C.V.										
	ELEC	4169	3772	4566	3971	4368	4368	3971	4566	3971	4368	3971	3971	50,032
	PK	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5
2	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
1	EQ2001		GAS FIRE TUBE HOT WATER										
	GAS	56	43	2	0	0	0	0	0	0	0	0	1	103
	PK	4.3	3.7	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	4.3
1	EQ5020		HEAT WATER CIRC. PUMP C.V.										
	ELEC	167	149	12	0	0	0	0	0	0	0	0	9	337
	PK	1.5	1.5	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	1.5
1	EQ5240		BOILER FORCED DRAFT FAN										
	ELEC	43	38	3	0	0	0	0	0	0	0	0	2	86
	PK	0.4	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4
1	EQ5307		BOILER CONTROLS										
	ELEC	56	50	4	0	0	0	0	0	0	0	0	3	113
	PK	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5

[redacted]TY PEAK CHECKSUMS - ALTERNATIVE 1
[redacted] - HVAC CONTROLS

UTILITY PEAK CHECKSUMS

Utility ELECTRIC DEMAND

Peak Value 209.8 (kW)
Yearly Time of Peak 15 (hr) 6 (mo)

Hour 15 Month 6

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Percnt Of Tot (%)
Cooling Equipment				
1	EQ1121L	AIR-CLD RECIP 35-60 TONS	82.3	39.25
Sub Total			82.3	39.25
Sub Total			0.0	0.00
Air Moving Equipment				
[redacted]		SUMMATION OF FAN ELECTRICAL DEMAND	14.7	7.01
2		SUMMATION OF FAN ELECTRICAL DEMAND	16.5	7.89
Sub Total			31.2	14.90
Sub Total			0.0	0.00
Miscellaneous				
Lights			62.9	29.99
Base Utilities			0.0	0.00
Misc Equipment			33.3	15.86
Sub Total			96.2	45.85
Grand Total			209.8	100.00

CALIFORNIA TITLE 24 COMPLIANCE - ALTERNATIVE 1
M181 - HVAC CONTROLS

CALIFORNIA TITLE 24 COMPLIANCE REPORT

Weather Name ..... ATLANTA.
Gross Conditioned Floor Area (sqft)..... 36,158
ACM Multiplier 1.025

E N E R G Y U S E S U M M A R Y

	ELEC (kWh/yr)	GAS (kBtu/yr)	PERCENT OF TOTAL ENERGY (%)	TOTAL SOURCE ENERGY (kBtu/yr)	ADJUSTED UNIT SOURCE ENERGY (kBtu/yr-sf)
Primary Heating	199.1	10,306.4	0.7	12,887.5	0.4
Primary Cooling					
Compressor	46,265.9	0.0	10.6	473,763.9	13.4
Tower/Cond Fans	5,385.4	0.0	1.2	55,146.2	1.6
Condenser Pump	0.0	0.0	0.0	0.0	0.0
Other Accessories	446.7	0.0	0.1	4,574.2	0.1
Auxiliary					
Supply Fans	94,488.7	0.0	21.7	967,566.4	27.4
Circulation Pumps	18,842.9	0.0	4.3	192,951.6	5.5
Base Utilities	0.0	0.0	0.0	0.0	0.0
Subtotal	113,331.6	0.0	26.1	1,160,518.0	32.9
Lighting	174,211.4	0.0	40.1	1,783,928.9	49.3
Receptacle	92,111.7	0.0	21.2	943,226.3	26.1
Domestic Hot Water	0.0	0.0	0.0	0.0	0.0
Cogeneration	0.0	0.0	0.0	0.0	0.0
Totals	431,951.7	10,306.4	100.0	4,434,045.0	123.8

[redacted]Y ENERGY CONSUMPTION - ALTERNATIVE 1
[redacted]- ICE STORAGE

MONTHLY ENERGY CONSUMPTION

Month	ELEC On Peak (kWh)	DEMAND On Peak (kW)	GAS On Peak (Therm)	GAS DMND On Peak (Thrm/hr)
Jan	46,717	130	755	3
Feb	42,147	130	649	3
March	47,770	130	179	2
April	43,809	127	8	0
May	71,097	190	0	0
June	78,873	197	0	0
July	78,961	197	0	0
Aug	82,473	195	0	0
Sept	71,817	190	0	0
Oct	59,640	177	0	0
Nov	44,247	133	149	2
Dec	45,414	130	382	2
Total	712,966	197	2,122	3

Building Energy Consumption = 73,166 (Btu/Sq Ft/Year)
Source Energy Consumption = 208,091 (Btu/Sq Ft/Year)

Floor Area = 36,158 (Sq Ft)

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
M181 - ICE STORAGE

EQUIPMENT ENERGY CONSUMPTION

Ref Num	Equip Code	Monthly Consumption Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	14562	13171	15726	13904	15144	15068	13980	15726	13904	15144	13904	13980	174,211
	PK	62.9	62.9	62.9	62.9	62.9	62.9	62.9	62.9	62.9	62.9	62.9	62.9	62.9
1	MISC LD													
	ELEC	7699	6964	8315	7352	8007	7967	7392	8315	7352	8007	7352	7392	92,112
	PK	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3
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	EQ1750	AIR-CLD CTV ICE-CHILL H2O												
	ELEC	0	0	0	0	14977	21563	22203	22961	16900	7810	0	0	106,413
	PK	0.0	0.0	0.0	0.0	89.8	93.1	92.6	92.4	89.8	89.8	89.8	0.0	93.1
1	EQ5205	CONDENSER FANS												
	ELEC	0	0	0	0	1223	2109	2149	2234	1496	450	0	0	9,660
	PK	0.0	0.0	0.0	0.0	7.1	10.1	10.1	10.1	9.8	5.6	5.1	0.0	10.1
1	EQ5001	CHILLED WATER PUMP C.V.												
	ELEC	0	0	0	0	7867	8948	9247	9247	8948	4611	0	0	48,868
	PK	0.0	0.0	0.0	0.0	12.4	12.4	12.4	12.4	12.4	12.4	0.0	0.0	12.4
1	EQ5309	CONTROLS												
	ELEC	0	0	0	0	633	720	744	744	720	371	0	0	3,932
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0
1	EQ4003	FC CENTRIF. FAN C.V.												
	ELEC	10938	9879	10938	10585	10938	10585	10938	10938	10585	10938	10585	10938	128,784
	PK	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7

1 EQ4003 FC CENTRIF. FAN C.V.

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
M181 - ICE STORAGE

	ELEC	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
2	EQ4003			FC CENTRIF. FAN C.V.									
	ELEC	12309	11118	12309	11912	12309	11912	12309	12309	11912	12309	11912	12309	144,933
	PK	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5
2	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
1	EQ2001			GAS FIRE TUBE HOT WATER									
	GAS	755	649	179	8	0	0	0	0	0	0	149	382	2,122
	PK	2.6	2.6	1.8	0.5	0.0	0.0	0.0	0.0	0.0	0.0	2.3	2.1	2.6
1	EQ5020			HEAT WATER CIRC. PUMP C.V.									
	ELEC	777	652	310	36	0	0	0	0	0	0	318	512	2,604
	PK	1.5	1.5	1.5	1.5	0.0	0.0	0.0	0.0	0.0	0.0	1.5	1.5	1.5
1	EQ5240			BOILER FORCED DRAFT FAN									
	ELEC	171	144	68	8	0	0	0	0	0	0	70	113	574
	PK	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.3
1	EQ5307			BOILER CONTROLS									
	ELEC	260	219	104	12	0	0	0	0	0	0	107	172	873
	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

[redacted]TY PEAK CHECKSUMS - ALTERNATIVE 1
[redacted]T. - ICE STORAGE

---------- 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 196.5 (kW)
Yearly Time of Peak 12 (hr) 7 (mo)

Hour 12 Month 7

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Percnt Of Tot (%)
Cooling Equipment				
1	EQ1750	AIR-CLD CTV ICE-CHILL H2O	69.1	35.17
Sub Total			69.1	35.17
Sub Total			0.0	0.00
Air Moving Equipment				
[redacted]		SUMMATION OF FAN ELECTRICAL DEMAND	14.7	7.48
2		SUMMATION OF FAN ELECTRICAL DEMAND	16.5	8.42
Sub Total			31.2	15.90
Sub Total			0.0	0.00
Miscellaneous				
Lights			62.9	32.01
Base Utilities			0.0	0.00
Misc Equipment			33.3	16.93
Sub Total			96.2	48.94
Grand Total			196.5	100.00

CALIFORNIA TITLE 24 COMPLIANCE - ALTERNATIVE 1
M181 - ICE STORAGE

CALIFORNIA TITLE 24 COMPLIANCE REPORT

Weather Name ..... ATLANTA.
Gross Conditioned Floor Area (sqft)..... 36,158
ACM Multiplier 1.025

E N E R G Y U S E S U M M A R Y

	ELEC (kWh/yr)	GAS (kBtu/yr)	PERCENT OF TOTAL ENERGY (%)	TOTAL SOURCE ENERGY (kBtu/yr)	ADJUSTED UNIT SOURCE ENERGY (kBtu/yr-sf)
Primary Heating	1,447.4	212,180.3	8.2	238,169.5	6.8
Primary Cooling					
Compressor	106,413.2	0.0	13.7	1,089,674.0	30.9
Tower/Cond Fans	9,660.4	0.0	1.2	98,923.2	2.8
Condenser Pump	0.0	0.0	0.0	0.0	0.0
Other Accessories	3,932.0	0.0	0.5	40,263.8	1.1
Auxiliary					
Supply Fans	273,717.4	0.0	35.3	2,802,872.7	79.5
Circulation Pumps	51,472.3	0.0	6.6	527,077.6	14.9
Base Utilities	0.0	0.0	0.0	0.0	0.0
Subtotal	325,189.7	0.0	42.0	3,329,950.0	94.4
Lighting	174,211.4	0.0	22.5	1,783,928.9	49.3
Receptacle	92,111.7	0.0	11.9	943,226.3	26.1
Domestic Hot Water	0.0	0.0	0.0	0.0	0.0
Cogeneration	0.0	0.0	0.0	0.0	0.0
Totals	712,966.0	212,180.3	100.0	7,524,136.0	211.4

BUILDING 184

E M C ENGINEERS, INC.

PROJECT: FORT McPHERSON & FORT GILLEM ESOS STUDY
LOCATION: FORT McPHERSON
ECO: Computer Simulation Summary

CLIENT CONTRACT NO: DACA21-91-C-0097
CLIENT PROJECT ENG: TERRY SEABROOK

EMC PROJECT: #3105.000
DATE: 04/21/92
FILE: M184ECO
PREPARED BY: DENNIS JONES
CHECKED BY:

Bldg: M184 Area: 36,158 ft^2

Run Description	Heating Gas Use (kBtu/yr)	Heating Electric Use (kWh/yr)	Cooling Electric Use (kWh/yr)	Fan Electric Use (kWh/yr)	Pump Electric Use (kWh/yr)	Lighting Electric Use (kWh/yr)	Receot. Electric Use (kWh/yr)	Total Electric Use (kWh/yr)	Peak Electric Demand (kW)	Total Gas Use (MBtu/yr)	Total Energy Use (MBtu/yr)
Baseline	127,447	1,015	61,504	137,786	23,652	158,493	92,865	475,315	180	127	1,750
Insulated Glass	86,309	850	59,744	137,786	23,652	158,493	92,865	473,390	176	86	1,702
Savings (Loss)	41,138	165	1,760	0	0	0	0	1,925	4	41	48
Economizer	127,447	1,015	56,767	137,786	23,652	158,493	92,865	470,578	180	127	1,734
Savings (Loss)	0	0	4,737	0	0	0	0	4,737	0	0	16
HW Pump	7,849	63	61,504	137,786	18,359	158,493	92,865	469,070	180	8	1,609
Savings (Loss)	119,598	952	0	0	5,293	0	0	6,245	0	120	141
HVAC Controls	7,849	63	54,264	47,565	5,788	158,493	92,865	359,038	179	8	1,233
Savings (Loss)	119,598	952	7,240	90,221	17,864	0	0	116,277	1	120	516
Ice Storage	127,447	1,015	81,361	137,786	23,652	158,493	92,865	495,172	114	127	1,817
Savings (Loss)	0	0	(19,857)	0	0	0	0	(19,857)	66	0	(68)
Lighting Control	143,681	1,145	56,256	137,786	23,652	128,716	92,865	440,420	180	144	1,647
Savings (Loss)	(16,234)	(130)	5,248	0	0	29,777	0	34,895	0	(16)	103

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB

SHEET NO. OF

CALCULATED BY DATE

CHECKED BY DATE

SCALE BLDG — 154

INSULATED GLASS ECO (ALT-2)

SOLAR GAIN ACCOUNTS FOR 100,000 Btuh
OF 644,000 Btuh DESIGN COOLING LOAD

HISTORICAL ... → USE CLEAR DOUBLE GLASS

ASHRAE F27.26 SC = 0.82 CLEAR GLASS

27.31 (25) SC = 0.58 CLEAR WITH BLINDS

27.16 U = 0.51 3/8" AIR SPACE

ECONOMIZER CYCLE (ALT-3)

ECONOMIZER CONTROL DRY-BULB } CARD (44)

SET POINT

MAX % OSA 100%

AVAIL (45)

HVAC CONTROLS (ALT-4)

SETBACK T/STATS

CLGBACK (21)

HTG BACK

-CLG FANS FANOFF (26)

HTG " "

VENTILATION "

INFIL INFIL

} OFF 6-6am WEEKDAYS
0-24 SAT-SUN

THERMAL STORAGE

(62) EQ1750 30 TONS

(63) SR 1

(73) CLIMICE

200 TON-HRS

OPTIMIZE

FULL CHARGE

1.07% LOSS

100

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • Germany

JOB ______

SHEET NO. ______ OF ______

CALCULATED BY ______ DATE ______

CHECKED BY ______ DATE ______

SCALE ______

Computer [illegible] Bldg [illegible]

ECO #15

- Present lighting Value [illegible]65 w/ft²
- 19% Reduction 0.31

1.34 w/ft²

[illegible] = 2[illegible] kwh/yr

Cooling [illegible]

Total Electric Savings = [illegible] 5118 kwh/yr

[illegible] Factor **0.17** kwh/kwh

[illegible]

[illegible] 16.2 MBtu/yr

[illegible] Factor **5.4 ×10⁻⁴** MBtu/kwh

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB 3105-006
SHEET NO. _____ OF _____
CALCULATED BY DS DATE 2/20/92
CHECKED BY _____ DATE _____
SCALE MIX

ICE STORAGE <M184A>

CHILLER PERFORMANCE — TANK CHARGING (62)

STORE ICE @ 25°F → 145 btu/ton

STORAGE REFERENCE (63) 1

STORAGE TANK PARAMETERS (73)

STANDARD	COOL STOR TANK	CLIMICE
SCHEDULE	7pm → 9am	CHR7D27A
CAPACITY	62.5 TONS × 8hrs	500 TON-HRS
CONTROL		OPTIMIZE
		FULLCHARGE
LOSS		1%

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

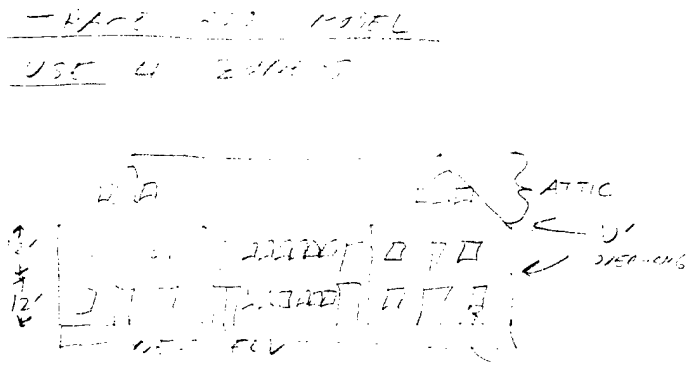
JOB _____

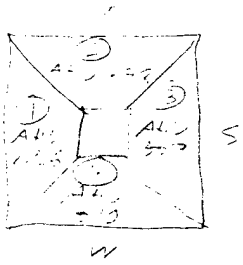
SHEET NO. _____ OF _____

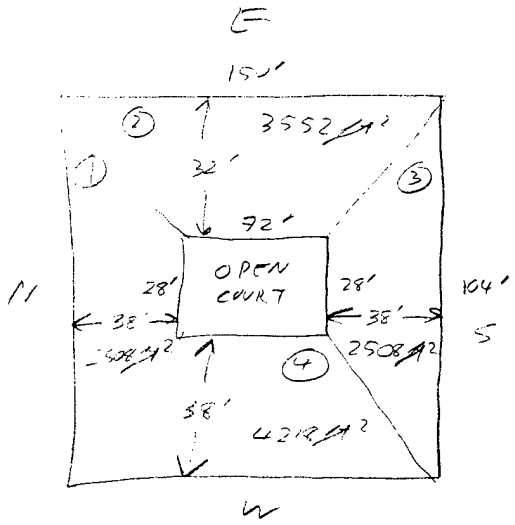
CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____

SCALE 1" = 20'







ZONE	AZ	FLOOR AREA (3 FLOORS)
1	N	7524
2	E	7104
3	S	7424
4	W	12,654
		34,706

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB _____

SHEET NO. _____ OF _____

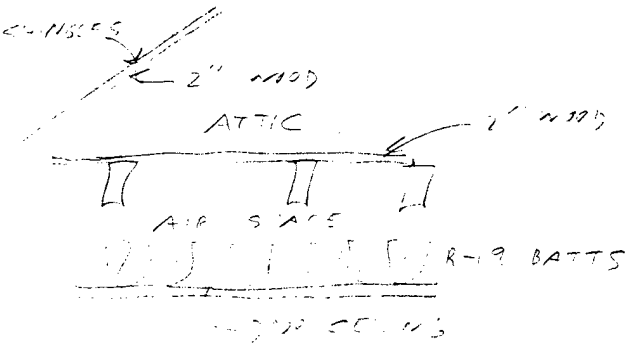
CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____

SCALE 3/16" = 1'-0"

U - VALUES

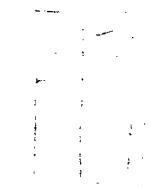
ROOF



	R
[illegible]	0.17
[illegible]	0.81
[illegible]	2.50
ATTIC SPACE	1.25
[illegible]	2.50
[illegible]	1.11
[illegible]	19.00
ACOUSTIC TILE	1.25
[illegible]	0.75
	29.12

$U = 0.034$

WALLS



[illegible]	0.68
½" GYP BOARD	0.45
[illegible] BATTS	11.00
[illegible]	1.48
OUTSIDE FILM	0.25
	13.86

$U = 0.072$

GLASS

SINGLE PANE - WOOD FRAME - CATEGORY C

$U = 0.98$ (1989 FUNDAMENTALS pg 27.16)

INTERNAL SHADING - BLINDS (LIGHT)

SHADING COEF = 0.67

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB ______
SHEET NO. ______ OF ______
CALCULATED BY ______ DATE ______
CHECKED BY ______ DATE ______
SCALE BC 3? — 1?

PEOPLE

NO DATA ON OCCUPANCY
ASHRAE 1? SF/ PERSON CLERICAL
1987 HVAC
p 17.7

OCCUPANCY 100 PEOPLE FROM FIELD NOTES

OFFICE WORK | 250 Btu SENSIBLE .05 Btu LATENT |
ASHRAE FUND p 26.7

ZONE ARE ABOUT THE SAME SIZE
∴ | 35 PEOPLE PER ZONE |

LIGHTS
136 4-TUBE FLUORESCENTS ON 1st FLOOR
4' 3? WATT LAMPS 155 WATTS (SYLVANIA DATA)

12,785 ft² → | 94.0 ft²/FIXTURE
→ | 1.65 WATTS/FT²

RECESSED FLUORESCENT/NOT VENTED/ SA CFM > 0.5 cfm/SF
BALLAST FACTOR = 1 (BALLAST ENERGY INCLUDED IN FIXTURE WATTS)

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB [illegible]

SHEET NO. ______ OF ______

CALCULATED BY [illegible] DATE 2/[illegible]/[illegible]

CHECKED BY ______ DATE ______

SCALE [illegible]

HVAC SYSTEM

1st & 2nd FLOORS

(10) AHUS IN ATTIC DUCTED TO EACH ZONE
PERIMETER [illegible] [illegible]

BASEMENT

FAN COILS (HEATING [illegible] 77°F COOL
68°F HEAT

TERMINAL UNITS

UNIT	CFM	MIN OA CFM	FAN [illegible]	46°TON COOL SC	200°F HEAT BTUH
AHU-1	2170	300	1	[illegible]	17,500
2	1465	200	[illegible]	39,300	15,100
3	2950	250	1 1/2	65,400	"
4	3450	250		72,300	"
5	[illegible]	[illegible]		[illegible]	18,200
6	2300	200	1	54,000	16,000
7	2100	190	1	46,000	10,500
8	2100	190	1	"	"
9	2500	[illegible]	1	5[illegible],20[illegible]	17,600
10	2500	[illegible]	1	52,800	1[illegible],[illegible]00
FAN COILS (11)	~~4~~ 300	390	—	[illegible]	123,000

HEAT EXCH 420,000 Btuh

CHILLER 62.5 TONS 43°F CWT 170 gpm

LOOP PUMP 5 hp

EXHAUST FANS 1100 cfm

BASEMENT DX UNIT (GAS HEAT) SERVES ONE ROOM

COMPUTER ROOM UNIT ON 1st FLOOR 5 HP

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB 3105.000

SHEET NO. _____ OF _____

CALCULATED BY _____ DATE 2/5/82

CHECKED BY _____ DATE _____

SCALE _____

TRACE - 600 INPUT

SYSTEM MODEL

CARD 40

SYSTEM TYPE = VTCV VARIABLE TEMP/CONSTANT VOLUME

PERIM BAD WILL BEHAVE LIKE HEAT COIL IN MODEL
@ AHU WILL SUPPLY HEATING OR COOLING
CONTROL VALVE PROVIDES VARIABLE TEMP

VENTILATION = ROADK DOWN AIR DECK

H/C SCHED = ALWAYS AVAILABLE

CARD 42 FAN SP + DUCT PARAMETERS

AHU MOTOR DOWNSTREAM OF AIRSTREAM

CHILLER PROVIDES 44°F WATER

COIL PEAKING 40,400 BTUH SENSIBLE COOLING @ 2170 cfm & 79.9°F DB

ΔT = 40,400/2170/1.08 = 17.2°F → SA TEMP = 62.9°F

HEATING 18,500 BTUH → ΔT = +7.9°F + 64.3 = 72.2°F

CARD 62

62.5 TON CHILLER

AIR COOLED 95°F

USE EQT1218
1.129 KW/TON

CARD 69

ASSUME FORWARD CURVE CENTRIFUGAL FAN

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB ______
SHEET NO. ______ OF ______
CALCULATED BY ______ DATE ______
CHECKED BY ______ DATE ______
SCALE ______

ROOM AIR FLOWS

VENTILATION

OA CFM FROM HVAC PLANS 2670 CFM (10 AHUs)
SERVING 1st & 2nd FLOORS OF 25,592 ft²

0.10 CFM/ft²
12.8 CFM/PERSON
0.78 ACH

EXHAUST FANS 1100 cfm
ASSUMING 2 EQUAL SIZE ZONES → **568 CFM/ZONE**

NET FORCED FLOW IN IS 2670 − 1100 = 1570 cfm

INFILTRATION (ASHRAE FUND 87 p 23.17)

$$Q = L\left(A\,\Delta T + B\,V^2\right)^{1/2}$$

$A = 0.0471$ (3 STORY)
$B = 0.0101$ (3 STORY, CLASS 3)
$V = 11$ mph
$T = 31.7°F$ AVG WINTER
80°F
$\Delta T = 30°F$ WINTER
10°F SUMMER

$Q = 1.62\,L$ WINTER
$1.30\,L$ SUMMER

COMPONENT	DESCRIPTION	TOTAL AREA	LEAK/TOTAL	LEAK AREA	
WINDOWS	DOUBLE HUNG	2182	0.043	94	
WINDOW FRAMES & DOOR	MASONARY (CAULKED)	2770	0.030	83	28×21 in²
DOORS	NOT WTHSTP	588	0.157	92	

269 in²

INFILTRATION
SUMMER 330 cfm
WINTER 436 cfm

SINCE FORCED VENTILATION IS 3 TIME INFILTRATION,
ASSUME INFILTRATION SUPPRESSED = ZERO

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB ____

SHEET NO. ____ OF ____

CALCULATED BY ____ DATE ____

CHECKED BY ____ DATE ____

SCALE ____

FAN AIRFLOWS

ALL FANS SPECIFIED FOR 1.25 " WC ESP

TOTAL CFM FOR 10 AHUs = 24,500 cfm

TOTAL AREA SERVED (2 FLOORS) = 25,912 ft² } → 0.95 cfm/ft²

[illegible] EXHAUST 100 cfm [illegible] = 275 cfm

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____
SHEET NO. _____ OF _____
CALCULATED BY _____ DATE _____
CHECKED BY _____ DATE _____
SCALE 1/8" = 1'-0"

EQUIPMENT HEAT GAIN

ZONE 1 (1st FLOOR)

OFFICE WITH 1 PC & 1 LASER PRINTER EVERY 225 FT²
ASSUME 1 COFFEE MAKER/FLOOR (1ST FLOOR ONLY)
1 REFRIGERATOR/FLOOR
AREA 2508 FT²/FLOOR

COMPONENT	WATTS	FT²	W/FT²
PC	200	225	0.89
LASER PRINT	100	225	0.44
REFRIG	200	2508	0.08
COFFEE	250	2508	0.10
COPIER	300	"	0.24
			1.75 W/FT²

OTHER ZONES 1st FLOOR

PC	12	1200	3552
LASER		350	"
REFRIG		200	"
COFFEE		250	"
COPIER		300	"
		2560	3552 → 0.75 W/FT²

TOTALS

ZONE-1 IS AVG	1.25 W/FT²
OTHER ZONES	0.75 "

E M C ENGINEERS, INC.

PROJECT: FORT McPHERSON & FORT GILLEM EEAP STUDY
LOCATION:

EMC PROJECT: #3105.000
DATE: 12-Feb-92
FILE:
PREPARED BY:
CHECKED BY:

ECO:15-LIGHTING CONTROL

CLIENT CONTRACT NO: DACA21-9-C-0097
CLIENT PROJECT ENG: TERRY SEABROOK

BUILDING NUMBER: 184

Sheet 1 of 1

% Switchable lights: 0%
Cooling Factor (Power): 1.25
Cooling Factor (Energy) 1.26

							Cost of Switches					
Room No.	Total kW Lighting	Hours 'On' Per Year	Lighting kW Saved Per Month	Lighting kWH Saved/Yr	Total kW / Month	Total kWH Per Yr	No. of New Switches	Cost	No. of Wall Switches	Cost	No. of Ceiling Switches	Cost
B-MENT	8.90	3393	0.00	0	11.125	37747	17	ERR	45		61.66667	
1	0.31	3393	0.00	0	0.3875	1315	0	ERR				
2	0.47	3393	0.00	0	0.58125	1972	0	ERR				
3	0.62	3393	0.00	0	0.775	2630	0	ERR				
4	0.62	3393	0.00	0	0.775	2630	0	ERR				
5	0.31	3393	0.00	0	0.3875	1315	0	ERR				
6	0.00	3393	0.00	0	0	0	0	ERR				
7	1.55	3393	0.00	0	1.9375	6574	0	ERR				
8	0.00	3393	0.00	0	0	0	0	ERR				
9	0.00	3393	0.00	0	0	0	0	ERR				
10	3.72	3393	0.00	0	4.65	15777	0	ERR				
11	1.86	3393	0.00	0	2.325	7888	0	ERR				
12	0.47	3393	0.00	0	0.58125	1972	0	ERR				
12	0.20	3393	0.00	0	0.25	848	0	ERR				
13	0.60	3393	0.00	0	0.75	2545	0	ERR				
14	0.47	3393	0.00	0	0.58125	1972	0	ERR				
15	0.31	3393	0.00	0	0.3875	1315	0	ERR				
16	0.31	3393	0.00	0	0.3875	1315	0	ERR				
17	0.47	3393	0.00	0	0.58125	1972	0	ERR				
18	0.31	3393	0.00	0	0.3875	1315	0	ERR				
19	0.47	3393	0.00	0	0.58125	1972	0	ERR				
20	0.47	3393	0.00	0	0.58125	1972	0	ERR				
21	0.31	3393	0.00	0	0.3875	1315	0	ERR				
22	0.47	3393	0.00	0	0.58125	1972	0	ERR				
22	0.20	3393	0.00	0	0.25	848	0	ERR				
23	0.00	3393	0.00	0	0	0	0	ERR				
24	5.56	3393	0.00	0	6.875	23666	0	ERR				
25	2.33	3393	0.00	0	2.90625	9861	0	ERR				
26	2.17	3393	0.00	0	2.7125	9204	0	ERR				
27	0.47	3393	0.00	0	0.58125	1972	0	ERR				
27	0.20	3393	0.00	0	0.25	848	0	ERR				
A	6.20	3393	0.00	0	7.75	26296	0	ERR				
B	6.20	3393	0.00	0	7.75	26296	0	ERR				
C	4.03	3393	0.00	0	5.0375	17092	0	ERR				
D	0.00	3393	0.00	0	0	0	0	ERR				
E	6.51	3393	0.00	0	8.1375	27611	0	ERR				
ATTIC	3.60	3393	0.00	0	4.5	15269	0	ERR				
0	0.00	3393	0.00	0	0	0	0	ERR				
0	0.00	3393	0.00	0	0	0	0	ERR				
0	0.00	3393	0.00	0	0	0	0	ERR				
0	0.00	3393	0.00	0	0	0	0	ERR				
0	0.00	3393	0.00	0	0	0	0	ERR				
0	0.00	3393	0.00	0	0	0	0	ERR				
0	0.00	3393	0.00	0	0	0	0	ERR				
0	0.00	3393	0.00	0	0	0	0	ERR				
0	0.00	3393	0.00	0	0	0	0	ERR				
0	0.00	3393	0.00	0	0	0	0	ERR				
Total	60.665	159471	0	0	75.8313	257295.4	16.66667					

E M C ENGINEERS, INC.

PROJECT: FORT McPHERSON & FORT GILLEM EEAP STUDY
LOCATION:

ECO:15-LIGHTING CONTROL

CLIENT CONTRACT NO: DACA21-8-C-0097
CLIENT PROJECT ENG: TERRY SEABROOK

EMC PROJECT: #3106.000
DATE: 12-Feb-92

FILE:
PREPARED BY:
CHECKED BY:

BUILDING NUMBER: 184

Sheet 1 of 1

Schedule #: M-F 600 to 1900 S-S 0 to 0
Schedule #: M-F 0 to 0 S-S 0 to 0

Room No.	# of Fixtures	Fixture Description	On/Off During Survey	Switch Yes/No	Good For Occup. Sensor	No. of Switches	Unocc. Lights On
B-MENT	100	4x2-2 lamp flouresscent	on	no	no	0	no
1	2	4x2-4 lamp flouresscent	on	yes	no	0	no
2	3	4x2-4 lamp flouresscent	on	yes	no	0	no
3	4	4x2-4 lamp flouresscent	on	yes	no	0	no
4	4	4x2-4 lamp flouresscent	on	yes	no	0	no
5	2	4x2-4 lamp flouresscent	on	yes	no	0	no
6	2	4x2-4 lamp flouresscent	off	yes	no	0	no
7	10	4x2-4 lamp flouresscent	on	yes	no	0	no
8	4	4x2-4 lamp flouresscent	off	yes	no	0	no
9	1	4x2-4 lamp flouresscent	off	yes	no	0	no
10	24	4x2-4 lamp flouresscent	on	yes	no	0	no
11	12	4x2-4 lamp flouresscent	on	yes	no	0	no
12	8	4x2-4 lamp flouresscent	on	yes	no	0	no
12	1	200 Watt Incandescent	on	yes	no	0	no
13	9	200 Watt Incandescent	on	yes	no	0	no
14	3	4x2-4 lamp flouresscent	on	yes	no	0	no
15	2	4x2-4 lamp flouresscent	on	yes	no	0	no
16	2	4x2-4 lamp flouresscent	on	yes	no	0	no
17	3	4x2-4 lamp flouresscent	on	yes	no	0	no
18	2	4x2-4 lamp flouresscent	on	yes	no	0	no
19	3	4x2-4 lamp flouresscent	on	yes	no	0	no
20	3	4x2-4 lamp flouresscent	on	yes	no	0	no
21	2	4x2-4 lamp flouresscent	on	yes	no	0	no
22	6	4x2-4 lamp flouresscent	on	yes	no	0	no
22	1	200 Watt Incandescent	on	yes	no	0	no
23	3	200 Watt Incandescent	off	yes	no	0	no
24	36	4x2-4 lamp flouresscent	on	yes	no	0	no
25	15	4x2-4 lamp flouresscent	on	yes	no	0	no
26	14	4x2-4 lamp flouresscent	on	yes	no	0	no
27	3	4x2-4 lamp flouresscent	on	yes	no	0	no
27	1	200 Watt Incandescent	on	yes	no	0	no
A	40	4x2-4 lamp flouresscent	on	yes	no	0	no
B	40	4x2-4 lamp flouresscent	on	yes	no	0	no
C	28	4x2-4 lamp flouresscent	on	yes	no	0	no
D	9	200 Watt Incandescent	off	yes	no	0	no
E	42	4x2-4 lamp flouresscent	on	yes	no	0	no
ATTIC	30	120 Watt Incandescent	on	yes	no	0	no
0	0	ERR	off	no	no	0	no
0	0	ERR	off	no	no	0	no
0	0	ERR	off	no	no	0	no
0	0	ERR	off	no	no	0	no
0	0	ERR	off	no	no	0	no
0	0	ERR	off	no	no	0	no
0	0	ERR	off	no	no	0	no
0	0	ERR	off	no	no	0	no
0	0	ERR	off	no	no	0	no
0	0	ERR	off	no	no	0	no

01 Card - Job Information

Project: FORT MCPHERSON & GILLEM EEAP #3105.000
Location: ATLANTA, GA
Client: COE - DACA21-9-C-0097
Program User: DENNIS JONES
Comments: BUILDING 184 - FORT MCPHERSON - BASECASE

-----CARD 08-- Climatic Information ----------

Weather Code	Summer Clearness Number	Winter Clearness Number	Summer Design Dry Bulb	Summer Design Wet Bulb	Winter Design Dry Bulb	Building Orientation	Summer Ground Reflect	Winter Ground Reflect
ATLANTA								

---------- Load Section Alternative #1 ----------

---- Load Alternative ----

Number	Description
1	M184 - BASELINE

-----CARD 20-- General Room Parameters ----------

Room Number	Zone Reference Number	Room Descrip	Floor Length	Floor Width	Const Type	Plenum Height	Acoustic Ceiling Resistance	Floor to Floor Height	Duplicate Floors Multiplier	Duplicate Rooms per Zone	Perimeter Depth
M1	1	NORTH ZONES	75.2	100	1	4		12			
2	2	EAST ZONES	71	100							
3	3	SOUTH ZONES	74.2	100							
4	4	WEST ZONES	126.5	100							

-----CARD 21-- Thermostat Parameters ----------

Room Number	Cooling Room Design DB	Room Design RH	Cooling T'stat Driftpoint	Cooling T'stat Schedule	Heating Room Design DB	Heating T'stat Driftpoint	Heating T'stat Schedule	T'stat Location Flag	Mass / No. Hrs Average	Carpet On Floor
M	76			CLGSTAT	72		HTGSTAT			YES

-----CARD 22-- Roof Parameters ----------

Room Number	Roof Number	Roof Equal to Floor?	Roof Length	Roof Width	Roof U-Value	Const Type	Roof Direction	Roof Tilt	Roof Alpha
M1	1	NO	25.08	100	0.034	41	0	60	0.9
2	1		35.52	100			90		
3	1		25.08	100			180		
4	1		42.18	100			270		

-----CARD 24-- Wall Parameters ----------

Room Number	Wall Number	Wall Length	Wall Height	Wall U-Value	Wall Constuc Type	Wall Direction	Wall Tilt	Wall Alpha	Ground Reflectance Multiplier
M	1			0.072	77	0		0.68	
1	1	104	28						
1	2	28	24			180			
2	1	150	28			90			
2	2	72	24			270			
3	1	104	28			180			
3	2	28	24			0			
4	1	150	28			270			
4	2	72	24			90			

-----CARD 25-- Wall/Glass Parameters ----------

Room Number	Wall Number	Glass Length	Glass Width	Pct Glass or No. of Windows	Glass U-Value	Shading Coefficient	External Shading Type	Internal Shading Type	Percent Solar to Ret. Air	Visible Transmittance	Inside Visible Reflectance
M1	1	3.33	6.42	17	0.98	0.67					
1	2			4							
2	1			19							
2	2			6							
3	1			14							
3	2			4							
4	1			18			3				
4	2			20			3				

-----CARD 26-- Schedules ----------

Room Number	People	Lights	Ventilation	Infiltration	Reheat Minimum	Cooling Fans	Heating Fan	Auxiliary Fan	Room Exhaust	Daylighting Controls
M1	PPL1	LGT1	AVAIL	OFF		AVAIL	AVAIL		AVAIL	

-----CARD 27-- People and Lights ----------

Room Number	People Value	People Units	People Sensible	People Latent	Lighting Value	Lighting Units	Lighting Fixture Type	Ballast Factor	Percent Lights to Ret. Air	--- Daylighting --- Reference Point 1	Reference Point 2
M1	35	PEOPLE	250	200	1.65	WATT-SF	ASHRAE2	1			

-----CARD 28--- Miscellaneous Equipment ----------

Room Number	Misc Equipment Number	Equipment Descrip	Energy Consump Value	Energy Consump Units	Schedule Code	Energy Meter Code	Percent of Load Sensible	Percent Misc. Load to Room	Percent Misc. Sens to Ret. Air	Radiant Fraction	Optional Air Path
M1	1	GENERAL OFFICE	1.75	WATT-SF	LGT1	ELEC					
2	1		0.75	WATT-SF							
3	1		0.75								
4	1		0.75								

-----CARD 29--- Room Airflows ----------

Room	Ventilation				Infiltration					
	Cooling		Heating		Cooling		Heating		Reheat Minimum	
Number	Value	Units	Value	Units	Value	Units	Value	Units	Value	Units
M1	668	CFM	668	CFM	0.5	ACH-HR	0.5	ACH-HR		

-----CARD 30- Fan Airflows ----------

Room	Main				Auxiliary				Room Exhaust	
	Cooling		Heating		Cooling		Heating			
Number	Value	Units	Value	Units	Value	Units	Value	Units	Value	Units
M1	6125	CFM	6125	CFM					275	CFM

-----CARD 33-- External Shading ----------

Shading Type	OVERHANG Glass Height	OVERHANG Height Above Glass	OVERHANG Projection Out	VERTICAL FINS Glass Width	VERTICAL FINS Projection Left	VERTICAL FINS Left Projection Out	VERTICAL FINS Right Projection	VERTICAL FINS Right Projection Out	Adjacent Building Flag
3	6.5	4	10						

---------- System Section Alternative #1 ----------

-----CARD 39-- System Alternative -----

Number	Description
1	M184 - BASELINE

-----CARD 40--- System Type ----------

System Set Number	System Type	Ventil Deck Location	Optional Ventilation System Cooling SADBVh	Optional Ventilation System Heating SADBVh	Optional Ventilation System Cooling Schedule	Optional Ventilation System Heating Schedule	Fan Static Pressure
1	FC						

-----CARD 41-- Zone Assignment ----------

System Set	Ref #1		Ref #2		Ref #3		Ref #4		Ref #5		Ref #6	
Number	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End
1	1	4										

-----CARD 42--- Fan SP and Duct Parameters----------

System Set Number	Cool Fan SP	Heat Fan SP	Return Fan SP	Mn Exh Fan SP	Aux Fan SP	Rm Exh Fan SP	Cool Fan Mtr Loc	Return Fan Mtr Loc	Supply Duct Ht Gn	Supply Duct Loc	Return Air Path
1	1.5	1.5				0.5	OMIT			RETAIR	DUCTED

-----CARD 44-- System Options ----------

System Set Number	Econ Type Flag	Econ On Point	Max Pct Outside Air	Direct Evap Cooling	Indirect Evap Cooling	1st Stage Evap Cooling	Fan Cycling	--------- Exhaust Air Heat Recovery --------- --- Effectiveness --- System	Room	--- Control Method --- System	Room
1	NONE										

-----CARD 45--- Equipment Schedules ----------

System Set Number	Main Cooling Coil	Economizer	Direct Evap Coil	Indirect Evap Coil	Auxiliary Cooling Coil	Main Heating Coil	Main Preheat Coil	Reheat Coil	Mech. Humidity	Auxiliary Heating Coil
1	CLGMAC	OFF	OFF	OFF	OFF	HTGMAC	OFF	OFF	OFF	OFF

-----CARD 46--- EMS/BAS Schedules ----------

System Set Number	Discrim Control Schedule	Night Purge Schedule	Optimum Start Schedule	Optimum Stop Schedule	--------DUTY CYCLING-------- On Period Schedule	Pattern Length	Maximum Off Time	System HR Exhaust Schedule	Room HR Exhaust Schedule
1									

---------- Equipment Section Alternative #1 ----------

-----CARD 59-- Equipment Description / TOD Schedules ----------

Alternative Number	Elec Consump Time of Day Schedule	Elec Demand Time of Day Schedule	Demand Limit Max KW	Alternative Description
1				M184 - BASELINE

-----CARD 60--- Cooling Load Assignment----------

Load Asgn Ref	All Coil Loads To Cool Ref	Cooling Equipment Sizing	-Group 1- Begin	End	-Group 2- Begin	End	-Group 3- Begin	End	-Group 4- Begin	End	-Group 5- Begin	End	-Group 6- Begin	End	-Group 7- Begin	End	-Group 8- Begin	End	-Group 9- Begin	End
1	1		1	1																

-----CARD 62-- Cooling Equipment Parameters ----------

Cool Ref Num	Equip Code Name	Num Of Units	COOLING --Capacity-- Value	Units	COOLING ----Energy---- Value	Units	HEAT RECOVERY --Capacity-- Value	Units	HEAT RECOVERY ----Energy---- Value	Units	Seq Order Num	Seq Type	Demand Limit Number
1	EQ1121L	1	62.5	TONS									

-----CARD 63-- Cooling Pumps and References ----------

Cool Ref Num	---CHILLED WATER---- Full Load Value	Full Load Units	-----CONDENSER------ Full Load Value	Full Load Units	---HT REC or AUX---- Full Load Value	Full Load Units	Switch-over Control	Cold Storage	Cooling Tower	Misc. Access.
1	5	HP								

-----CARD 65-- Heating Load Assignment ----------

Load Assignment Reference	All Coil Loads To Heating Ref	-Group 1- Begin	End	-Group 2- Begin	End	-Group 3- Begin	End	-Group 4- Begin	End	-Group 5- Begin	End	-Group 6- Begin	End	-Group 7- Begin	End	-Group 8- Begin	End	-Group 9- Begin	End
1	1	1	1																

-----CARD 67-- Heating Equipment Parameters ----------

Heat Ref Number	Equip Code Name	Number Of Units	HW Pmp Full Ld Value	Units	Cap'y Value	Units	Energy Rate Value	Units	Seq Order Number	Switch over Control	Hot Strg	Misc. Acc.	Cogen	Demand Limit Number
1	EQ2001	1	2	HP	420	MBH								

-----CARD 69-- Fan Equipment Parameters ----------

System Set Number	Cooling Fan	Heating Fan	Return Fan	Exhaust Fan	Auxiliary Supply	Room Exhaust	Optional Ventilation
1	EQ4003	EQ4003					

Utility Description Reference Table

Schedules:
- AVAIL AVAILABLE (100%)
- CLGMAC COOLING SCHEDULE
- CLGSTAT COOLING TSTAT SCHEDULE
- HTGMAC HEATING SCHEDULE
- HTGSTAT HEATING TSTAT SCHEDULE
- LGT1
- OFF ALWAYS OFF
- PPL1

System:
- FC FAN COIL

Equipment:
- Cooling:
  - EQ1121L AIR-CLD RECIP 35-60 TONS
- Heating:
  - EQ2001 GAS FIRE TUBE HOT WATER
- Fan:
  - EQ4003 FC CENTRIF. FAN C.V.

Schedule Name: AVAIL
Project: AVAILABLE (100)
Location:
Client:
Program User:
Comments:

Starting Month: JAN Ending Month: HTG
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	100
24	

Schedule Name: CLGMAC
Project: COOLING SCHEDULE
Location:
Client:
Program User:
Comments:

Starting Month: JAN Ending Month: APR
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	0
24	

Starting Month: MAY Ending Month: OCT
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	100
24	

Starting Month: NOV Ending Month: HTG
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	0
24	

Schedule Name: CLGSTAT
Project: COOLING TSTAT SCHEDULE
Location:
Client:
Program User:
Comments:

Starting Month: MAY Ending Month: OCT
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Temperature
0	76
24	

Schedule Name: HTGMAC
Project: HEATING SCHEDULE
Location:
Client:
Program User: R. GERRANS
Comments:

Starting Month: JAN Ending Month: APR
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	100
24	

Starting Month: MAY Ending Month: OCT
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	0
24	

Starting Month: NOV Ending Month: HTG
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	100
24	

Schedule Name: HTGSTAT
Project: HEATING TSTAT SCHEDULE
Location:
Client:
Program User:
Comments:

Starting Month: NOV Ending Month: APR
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Temperature
0	72
24	

dule Name: LGT1
Project:
Location:
Client:
Program User:
Comments: OFFICE LIGHTING

Starting Month: JAN Ending Month: DEC
Starting Day Type: DSGN Ending Day Type: WKDY

Hour	Util Percent
0	5
7	80
8	100
12	80
13	100
16	80
17	40
18	5
24	

Starting Month: JAN Ending Month: DEC
Starting Day Type: SAT Ending Day Type: SUN

	Util Percent
0	5
24	

Schedule Name: OFF
Project: ALWAYS OFF
Location:
Client:
Program User:
Comments:

Starting Month: JAN Ending Month: HTG
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	0
24	

Schedule Name: PPL1
Project:
Location:
Client:
Program User: D JONES
Comments: OFFICE PEOPLE SCHEDULE

Starting Month: JAN Ending Month: DEC
Starting Day Type: DSGN Ending Day Type: WKDY

Hour	Util Percent
0	0
7	50
8	100
11	80
12	40
13	80
14	100
16	70
17	30
18	0
24	

Starting Month: JAN Ending Month: DEC
Starting Day Type: SAT Ending Day Type: SUN

Hour	Util Percent
0	0
24	

****
****
**
** TRACE 600 ANALYSIS **
**
** by **
**
****
****

FORT MCPHERSON & GILLEM EEAP #3105.000
ATLANTA, GA
COE - DACA21-9-C-0097
DENNIS JONES
BUILDING 184 - FORT MCPHERSON - BASECASE

Weather File Code:	ATLANTA.	
Location:		
Latitude:	33.0	(deg)
Longitude:	84.0	(deg)
Time Zone:	6	
Elevation:	1,005	(ft)
Barometric Pressure:	28.8	(in. Hg)
Summer Clearness Number:	0.90	
Winter Clearness Number:	0.90	
Summer Design Dry Bulb:	92	(F)
Summer Design Wet Bulb:	74	(F)
Winter Design Dry Bulb:	22	(F)
Summer Ground Relectance:	0.20	
Winter Ground Relectance:	0.20	
Air Density:	0.0731	(Lbm/cuft)
Air Specific Heat:	0.2444	(Btu/lbm/F)
Density-Specific Heat Prod:	1.0727	(Btu-min./hr/cuft/F)
Latent Heat Factor:	4,721.8	(Btu-min./hr/cuft)
Enthalpy Factor:	4.3883	(Lb-min./hr/cuft)

Design Simulation Period: June To November
System Simulation Period: January To December
Cooling Load Methodology: TETD/Time Averaging

Time/Date Program was Run: 18:46:56 3/11/92
Dataset Name: M184 .TM

AIRFLOW - ALTERNATIVE 1
M184 - BASELINE

SYSTEM SUMMARY
(Design Airflow Quantities)

System Number	System Type	Main Outside Airflow (Cfm)	Main Cooling Airflow (Cfm)	Main Heating Airflow (Cfm)	Main Return Airflow (Cfm)	Main Exhaust Airflow (Cfm)	Auxil. Supply Airflow (Cfm)	Room Exhaust Airflow (Cfm)
1	FC	2,672	24,500	24,500	24,500	2,672	0	1,100
Totals		2,672	24,500	24,500	24,500	2,672	0	1,100

CAPACITY - ALTERNATIVE 1
M184 - BASELINE

SYSTEM SUMMARY
(Design Capacity Quantities)

System Number	System Type	Cooling Main Sys. Capacity (Tons)	Cooling Aux. Sys. Capacity (Tons)	Cooling Opt. Vent Capacity (Tons)	Cooling Totals (Tons)	Heating Main Sys. Capacity (Btuh)	Heating Aux. Sys. Capacity (Btuh)	Heating Preheat Capacity (Btuh)	Heating Reheat Capacity (Btuh)	Heating Humidif. Capacity (Btuh)	Heating Opt. Vent Capacity (Btuh)	Heating Totals (Btuh)
1	FC	55.4	0.0	0.0	55.4	-319,002	0	0	0	0	0	-319,002
Totals		55.4	0.0	0.0	55.4	-319,002	0	0	0	0	0	-319,002

The building peaked at hour 16 month 8 with a capacity of 55.4 tons

ENGINEERING CHECKS - ALTERNATIVE 1
M184 - BASELINE

ENGINEERING CHECKS

System Number	Main/ Auxiliary	System Type	Percent Outside Air	Cooling Cfm/ Sq Ft	Cooling Cfm/ Ton	Cooling Sq Ft /Ton	Cooling Btuh/ Sq Ft	Heating Cfm/ Sq Ft	Heating Btuh/ Sq Ft	Floor Area Sq Ft
1	Main	FC	10.91	0.71	442.6	626.6	19.15	0.71	-9.20	34,690

System 1 Block FC - FAN COIL

********** COOLING COIL PEAK **********							CLG SPACE PEAK **********			HEATING COIL PEAK ********		
Peaked at Time ==>		Mo/Hr: 8/15					Mo/Hr: 6/16			Mo/Hr: 13/ 1		
Outside Air ==>		OADB/WB/HR: 92/ 74/105.0					OADB: 96			OADB: 22		
	Space Sens.+Lat. (Btuh)	Ret. Air Sensible (Btuh)	Ret. Air Latent (Btuh)	Net Total (Btuh)	Percnt Of Tot (%)		Space Sensible (Btuh)	Percnt Of Tot (%)		Space Peak Space Sens (Btuh)	Coil Peak Tot Sens (Btuh)	Percnt 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	10,414		10,414	1.57		0	0.00		0	-16,074	5.10
Glass Solar	69,267	0		69,267	10.43		160,489	29.41		0	0	0.00
Glass Cond	34,833	0		34,833	5.24		20,165	3.70		-116,253	-116,253	36.92
Wall Cond	19,491	10,556		30,047	4.52		11,593	2.12		-37,807	-58,832	18.68
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	0.00
Sub Total==>	123,591	20,970		144,561	21.76		192,248	35.24		-154,061	-191,159	60.71
Internal Loads												
Lights	195,355	0		195,355	29.41		195,355	35.80		0	0	0.00
People	63,000			63,000	9.48		33,250	6.09		0	0	0.00
Misc	114,463	0	0	114,463	17.23		114,463	20.98		0	0	0.00
Sub Total==>	372,818	0	0	372,818	56.12		343,068	62.88		0	0	0.00
Ceiling Load	26,563	-26,563		0	0.00		10,297	1.89		-37,548	0	0.00
Outside Air	0	0	0	127,341	19.17		0	0.00		0	-143,310	45.51
Sup. Fan Heat				19,600	2.95			0.00			19,600	-6.
Ret. Fan Heat		0		0	0.00			0.00			0	0.
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==>	522,972	-5,593	0	664,320	100.00		545,613	100.00		-191,609	-314,869	100.00

COOLING COIL SELECTION

	Total Capacity (Tons)	Total Capacity (Mbh)	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
Main Clg	55.4	664.3	555.7	24,500	78.0	62.8	64.8	54.7	53.5	61.6
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	55.4	664.3								

AREAS

	Gross Total	Glass (sf)	(%)
Floor	34,690		
Part	0		
ExFlr	0		
Roof	10,278	0	0
Wall	19,024	2,181	11

HEATING COIL SELECTION

	Capacity (Mbh)	Coil Airfl (cfm)	Ent Deg F	Lvg Deg F
Main Htg	-319.0	24,500	67.2	79.3
Aux Htg	0.0	0	0.0	0.0
Preheat	-0.0	24,500	67.3	55.2
Reheat	0.0	0	0.0	0.0
Humidif	0.0	0	0.0	0.0
Opt Vent	0.0	0	0.0	0.0
Total	-319.0			

AIRFLOWS (cfm)

Type	Cooling	Heating
Vent	2,672	2,672
Infil	0	0
Supply	24,500	24,500
Mincfm	0	0
Return	23,400	23,400
Exhaust	1,572	1,572
Rm Exh	1,100	1,100
Auxil	0	0

ENGINEERING CHECKS

Clg % OA	10.9
Clg Cfm/Sqft	0.71
Clg Cfm/Ton	442.56
Clg Sqft/Ton	626.63
Clg Btuh/Sqft	19.15
No. People	140
Htg % OA	10.9
Htg Cfm/SqFt	0.71
Htg Btuh/SqFt	-9.20

TEMPERATURES (F)

Type	Clg	Htg
SADB	55.2	79.3
Plenum	78.4	68.2
Return	76.0	72.0
Ret/OA	77.8	66.5
Runarnd	76.0	72.0
Fn MtrTD	0.2	0.2
Fn BldTD	0.2	0
Fn Frict	0.6	0

[redacted]NG LOADS AT COIL PEAK - ALTERNATIVE 1
[redacted] - BASELINE

AIRFLOW COOLING LOADS
(At time of Coil Peak)

Room Number	Description	Ventilation Airflow (Cfm)	Ventilation Sensible (Btuh)	Ventilation Latent (Btuh)	Optional Ventilation Airflow (Cfm)	Optional Ventilation Sensible (Btuh)	Optional Ventilation Latent (Btuh)	Bypass Airflow (Cfm)	Bypass Sensible (Btuh)	Bypass Latent (Btuh)	Ov/Undr Sizing (Btuh)
1	NORTH ZONES	668	11,680	18,187	0	0	0	0	0	0	0
Zone	1 Total/Ave.	668	11,680	18,187	0	0	0	0	0	0	0
Zone	1 Block	668	11,680	18,187	0	0	0	0	0	0	0
2	EAST ZONES	668	11,465	18,937	0	0	0	0	0	0	0
Zone	2 Total/Ave.	668	11,465	18,937	0	0	0	0	0	0	0
Zone	2 Block	668	11,465	18,937	0	0	0	0	0	0	0
3	SOUTH ZONES	668	11,680	17,251	0	0	0	0	0	0	0
Zone	3 Total/Ave.	668	11,680	17,251	0	0	0	0	0	0	0
Zone	3 Block	668	11,680	17,251	0	0	0	0	0	0	0
4	WEST ZONES	668	11,321	23,093	0	0	0	0	0	0	0
Zone	4 Total/Ave.	668	11,321	23,093	0	0	0	0	0	0	0
Zone	4 Block	668	11,321	23,093	0	0	0	0	0	0	0
System	1 Total/Ave.	2,672	46,146	77,468	0	0	0	0	0	0	0
[redacted]tem	1 Block	2,672	46,719	80,622	0	0	0	0	0	0	0

[redacted]
HEATING LOADS AT COIL PEAK - ALTERNATIVE 1
M184 - BASELINE

AIRFLOW HEATING LOADS
(At time of Coil Peak)

Room Number	Description	Ventilation Airflow (Cfm)	Ventilation Sensible (Btuh)	Op. Vent. Airflow (Cfm)	Op. Vent. Sensible (Btuh)	Reheat Airflow (Cfm)	Reheat Sensible (Btuh)	Humidif. Airflow (Cfm)	Humidif. Latent (Btuh)	Total (Btuh)
1	NORTH ZONES	668	-35,827	0	0	0	0	0	0	-35,827
Zone	1 Total/Ave.	668	-35,827	0	0	0	0	0	0	-35,827
Zone	1 Block	668	-35,827	0	0	0	0	0	0	-35,827
2	EAST ZONES	668	-35,827	0	0	0	0	0	0	-35,827
Zone	2 Total/Ave.	668	-35,827	0	0	0	0	0	0	-35,827
Zone	2 Block	668	-35,827	0	0	0	0	0	0	-35,827
3	SOUTH ZONES	668	-35,827	0	0	0	0	0	0	-35,827
Zone	3 Total/Ave.	668	-35,827	0	0	0	0	0	0	-35,827
Zone	3 Block	668	-35,827	0	0	0	0	0	0	-35,827
4	WEST ZONES	668	-35,827	0	0	0	0	0	0	-35,827
Zone	4 Total/Ave.	668	-35,827	0	0	0	0	0	0	-35,827
Zone	4 Block	668	-35,827	0	0	0	0	0	0	-35,827
[redacted]em	1 Total/Ave.	2,672	-143,310	0	0	0	0	0	0	-143,310
[redacted]tem	1 Block	2,672	-143,310	0	0	0	0	0	0	-143,310

COOLING AIRFLOW HEAT GAIN/LOSS - ALTERNATIVE 1
M184 - BASELINE

AIRFLOW HEAT GAIN AND LOSS
(At time of Coil Peak)

Room Number	Description	Cooling: Duct Heat Pickup (Btuh)	Supply Fan Heat (Btuh)	Return Fan Heat (Btuh)	System Exhaust Heat Loss (Btuh)	Total (Btuh)	System Exhaust Airflow (Cfm)	Room Exhaust Airflow (Cfm)	Ducted Airflow (Cfm)	Plenum Airflow (Cfm)	Run Around Airflow (Cfm)	Corridr Airflow (Cfm)	System Return Airflow (Cfm)
1	NORTH ZONES	0	4,900	0	0	4,900	393	275	5,850	0	0	0	5,850
Zone 1	Total/Ave.	0	4,900	0	0	4,900	393	275	5,850	0	0	0	5,850
Zone 1	Block	0	4,900	0	0	4,900	393	275	5,850	0	0	0	5,850
2	EAST ZONES	0	4,900	0	0	4,900	393	275	5,850	0	0	0	5,850
Zone 2	Total/Ave.	0	4,900	0	0	4,900	393	275	5,850	0	0	0	5,850
Zone 2	Block	0	4,900	0	0	4,900	393	275	5,850	0	0	0	5,850
3	SOUTH ZONES	0	4,900	0	0	4,900	393	275	5,850	0	0	0	5,850
Zone 3	Total/Ave.	0	4,900	0	0	4,900	393	275	5,850	0	0	0	5,850
Zone 3	Block	0	4,900	0	0	4,900	393	275	5,850	0	0	0	5,850
4	WEST ZONES	0	4,900	0	0	4,900	393	275	5,850	0	0	0	5,850
Zone 4	Total/Ave.	0	4,900	0	0	4,900	393	275	5,850	0	0	0	5,850
Zone 4	Block	0	4,900	0	0	4,900	393	275	5,850	0	0	0	5,850
System 1	Total/Ave.	0	19,600	0	0	19,600	1,572	1,100	23,400	0	0	0	23,400
System 1	Block	0	19,600	0	0	19,600	1,572	1,100	23,400	0	0	0	23,400

HEATING AIRFLOW HEAT GAIN/LOSS - ALTERNATIVE 1
M184 - BASELINE

AIRFLOW HEAT GAIN AND LOSS
(At time of Coil Peak)

Room Number	Description	Heating: Supply Fan Heat (Btuh)	Return Fan Heat (Btuh)	System Exhaust Heat Loss (Btuh)	Total (Btuh)	System Exhaust Airflow (Cfm)	Room Exhaust Airflow (Cfm)	Ducted Airflow (Cfm)	Plenum Airflow (Cfm)	Run Around Airflow (Cfm)	Corridr Airflow (Cfm)	System Return Airflow (Cfm)
1	NORTH ZONES	4,900	0	0	4,900	393	275	5,850	0	0	0	5,850
Zone 1	Total/Ave.	4,900	0	0	4,900	393	275	5,850	0	0	0	5,850
Zone 1	Block	4,900	0	0	4,900	393	275	5,850	0	0	0	5,850
2	EAST ZONES	4,900	0	0	4,900	393	275	5,850	0	0	0	5,850
Zone 2	Total/Ave.	4,900	0	0	4,900	393	275	5,850	0	0	0	5,850
Zone 2	Block	4,900	0	0	4,900	393	275	5,850	0	0	0	5,850
3	SOUTH ZONES	4,900	0	0	4,900	393	275	5,850	0	0	0	5,850
Zone 3	Total/Ave.	4,900	0	0	4,900	393	275	5,850	0	0	0	5,850
Zone 3	Block	4,900	0	0	4,900	393	275	5,850	0	0	0	5,850
4	WEST ZONES	4,900	0	0	4,900	393	275	5,850	0	0	0	5,850
Zone 4	Total/Ave.	4,900	0	0	4,900	393	275	5,850	0	0	0	5,850
Zone 4	Block	4,900	0	0	4,900	393	275	5,850	0	0	0	5,850
System 1	Total/Ave.	19,600	0	0	19,600	1,572	1,100	23,400	0	0	0	23,400
System 1	Block	19,600	0	0	19,600	1,572	1,100	23,400	0	0	0	23,400

[redacted]PSYCHROMETRICS - ALTERNATIVE 1
[redacted]- BASELINE

---------- P S Y C H R O M E T R I C S T A T E P O I N T S ----------

Room 1

	Dry Bulb (F)	Wet Bulb (F)	Relat. Humid. (%)	Humid. Ratio (GR)	Enthalpy (Btu/Lb)	Temp. Diff. (F)
Space	76.0	62.1	46.2	64.4	28.3	
Main System						
Return Air Heat Pickup						0.0
Return Fan						0.0
Return Air	76.0	62.1	46.2	64.4	28.3	
Outdoor Air	92.3	74.4	44.2	105.0	38.7	
Return/Outdoor Air Mix	77.8	63.6	46.5	68.8	29.4	
Blow through Fan						0.2
Entering Coil	78.0	63.7	46.2	68.8	29.5	
Leaving Coil	57.1	54.8	87.2	63.2	23.5	
Draw Through Fan						0.0
Duct Frictional Heat						0.6
Supply Duct Heat Gain						0.0
Cold Deck Supply Air	57.7	55.1	85.5	63.2	23.6	
Supply Air	57.7	55.1	85.5	63.2	23.6	

[redacted]nt Outside Air	10.91	(%)
Sensible Heat Ratio (SHR)	0.945	
Percent Supply Air Bypassing Coil	0.00	(%)
Coil Airflow	6,125	(Cfm)

ROOM PSYCHROMETRICS - ALTERNATIVE 1
M184 - BASELINE

---------- P S Y C H R O M E T R I C S T A T E P O I N T S ----------

Room 2

	Dry Bulb (F)	Wet Bulb (F)	Relat. Humid. (%)	Humid. Ratio (GR)	Enthalpy (Btu/Lb)	Temp. Diff. (F)
Space	76.0	61.6	44.7	62.3	28.0	
Main System						
Return Air Heat Pickup						0.0
Return Fan						0.0
Return Air	76.0	61.6	44.7	62.3	28.0	
Outdoor Air	92.0	74.4	44.6	105.0	38.6	
Return/Outdoor Air Mix	77.7	63.2	45.3	67.0	29.1	
Blow through Fan						0.2
Entering Coil	77.9	63.3	45.0	67.0	29.2	
Leaving Coil	56.0	53.9	88.0	61.1	22.9	
Draw Through Fan						0.0
Duct Frictional Heat						0.6
Supply Duct Heat Gain						0.0
Cold Deck Supply Air	56.5	54.1	86.2	61.1	23.1	
Supply Air	56.5	54.1	86.2	61.1	23.1	

Percent Outside Air	10.91	(%)
Sensible Heat Ratio (SHR)	0.948	
Percent Supply Air Bypassing Coil	0.00	(%)
Coil Airflow	6,125	(Cfm)

PSYCHROMETRICS - ALTERNATIVE 1
- BASELINE

---------- P S Y C H R O M E T R I C S T A T E P O I N T S ----------

Room 3

	Dry Bulb (F)	Wet Bulb (F)	Relat. Humid. (%)	Humid. Ratio (GR)	Enthalpy (Btu/Lb)	Temp. Diff. (F)
Space	76.0	62.5	47.6	66.3	28.6	
Main System						
Return Air Heat Pickup						0.0
Return Fan						0.0
Return Air	76.0	62.5	47.6	66.3	28.6	
Outdoor Air	92.3	74.4	44.2	105.0	38.7	
Return/Outdoor Air Mix	77.8	64.0	47.6	70.6	29.7	
Blow through Fan						0.2
Entering Coil	78.0	64.0	47.3	70.6	29.8	
Leaving Coil	58.2	55.8	86.7	65.5	24.1	
Draw Through Fan						0.0
Duct Frictional Heat						0.6
Supply Duct Heat Gain						0.0
Cold Deck Supply Air	58.8	56.1	85.0	65.5	24.3	
Supply Air	58.8	56.1	85.0	65.5	24.3	

Percent Outside Air	10.91	(%)
Sensible Heat Ratio (SHR)	0.953	
Percent Supply Air Bypassing Coil	0.00	(%)
Coil Airflow	6,125	(Cfm)

ROOM PSYCHROMETRICS - ALTERNATIVE 1
M184 - BASELINE

---------- P S Y C H R O M E T R I C S T A T E P O I N T S ----------

Room 4

	Dry Bulb (F)	Wet Bulb (F)	Relat. Humid. (%)	Humid. Ratio (GR)	Enthalpy (Btu/Lb)	Temp. Diff. (F)
Space	76.0	58.1	33.5	46.5	25.5	
Main System						
Return Air Heat Pickup						0.0
Return Fan						0.0
Return Air	76.0	58.1	33.5	46.5	25.5	
Outdoor Air	91.8	73.2	42.0	98.0	37.5	
Return/Outdoor Air Mix	77.7	60.0	35.4	52.2	26.8	
Blow through Fan						0.2
Entering Coil	77.9	60.1	35.2	52.2	26.9	
Leaving Coil	47.4	45.9	89.9	45.4	18.4	
Draw Through Fan						0.0
Duct Frictional Heat						0.6
Supply Duct Heat Gain						0.0
Cold Deck Supply Air	48.0	46.2	88.1	45.4	18.5	
Supply Air	48.0	46.2	88.1	45.4	18.5	

Percent Outside Air	10.91	(%)
Sensible Heat Ratio (SHR)	0.963	
Percent Supply Air Bypassing Coil	0.00	(%)
Coil Airflow	6,125	(Cfm)

LDING U-VALUES - ALTERNATIVE 1
- BASELINE

BUILDING U-VALUES

Room Number	Description	Room U-Values (Btu/hr/sqft/F) Part.	ExFlr	Summr Skylt	Wintr Skylt	Roof	Summr Windo	Wintr Windo	Wall	Ceil.	Room Mass (lb/ sqft)	Room Capac. (Btu/ sqft/F)
1	NORTH ZONES	0.000	0.000	0.000	0.000	0.000	0.980	1.067	0.072	0.317	18.4	6.14
Zone 1	Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.980	1.067	0.072	0.317	18.4	6.14
2	EAST ZONES	0.000	0.000	0.000	0.000	0.034	0.980	1.067	0.072	0.317	35.0	11.45
Zone 2	Total/Ave.	0.000	0.000	0.000	0.000	0.034	0.980	1.067	0.072	0.317	35.0	11.45
3	SOUTH ZONES	0.000	0.000	0.000	0.000	0.034	0.980	1.067	0.072	0.317	23.2	8.46
Zone 3	Total/Ave.	0.000	0.000	0.000	0.000	0.034	0.980	1.067	0.072	0.317	23.2	8.46
4	WEST ZONES	0.000	0.000	0.000	0.000	0.034	0.980	1.067	0.072	0.317	22.4	8.27
Zone 4	Total/Ave.	0.000	0.000	0.000	0.000	0.034	0.980	1.067	0.072	0.317	22.4	8.27
System 1	Total/Ave.	0.000	0.000	0.000	0.000	0.034	0.980	1.067	0.072	0.317	24.3	8.50
Building		0.000	0.000	0.000	0.000	0.034	0.980	1.067	0.072	0.317	24.3	8.50

BUILDING AREAS - ALTERNATIVE 1
M184 - BASELINE

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	NORTH ZONES	1	1	7,520	7,520	0	0	0	0	0	449	13	3,135
Zone 1	Total/Ave.				7,520	0	0	0	0	0	449	13	3,135
2	EAST ZONES	1	1	7,100	7,100	0	0	0	0	3,552	534	9	5,394
Zone 2	Total/Ave.				7,100	0	0	0	0	3,552	534	9	5,394
3	SOUTH ZONES	1	1	7,420	7,420	0	0	0	0	2,508	385	11	3,199
Zone 3	Total/Ave.				7,420	0	0	0	0	2,508	385	11	3,199
4	WEST ZONES	1	1	12,650	12,650	0	0	0	0	4,218	812	14	5,116
Zone 4	Total/Ave.				12,650	0	0	0	0	4,218	812	14	5,116
System 1	Total/Ave.				34,690	0	0	0	0	10,278	2,181	11	16,843
Building					34,690	0	0	0	0	10,278	2,181	11	16,843

ASHRAE 90 ANALYSIS - ALTERNATIVE 1
M184 - BASELINE

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

Overall Roof U-Value = 0.034 (Btu/Hr/Sq Ft/F)
Overall Wall U-Value = 0.176 (Btu/Hr/Sq Ft/F)
Overall Building U-Value = 0.126 (Btu/Hr/Sq Ft/F)

Roof Overall Thermal Transfer Value (OTTVr) = 0.87 (Btu/Hr/Sq Ft)
Wall Overall Thermal Transfer Value (OTTVw) = 13.69 (Btu/Hr/Sq Ft)

SYSTEM LOAD PROFILE - ALTERNATIVE 1
- BASELINE

Main System 1 FC FAN COIL

Percent Design Load	Cooling Load Cap. (Ton)	Cooling Load Hours (%)	Cooling Load Hours	Heating Load Capacity (Btuh)	Heating Load Hours (%)	Heating Load Hours	Cooling Airflow Cap. (Cfm)	Cooling Airflow Hours (%)	Cooling Airflow Hours	Heating Airflow Cap. (Cfm)	Heating Airflow Hours (%)	Heating Airflow Hours
0 - 5	2.8	14	451	-15,950	8	94	1,225.0	0	0	0.0	0	0
5 - 10	5.5	15	492	-31,900	12	136	2,450.0	0	0	0.0	0	0
10 - 15	8.3	17	568	-47,850	7	79	3,675.0	0	0	0.0	0	0
15 - 20	11.1	9	310	-63,800	15	167	4,900.0	0	0	0.0	0	0
20 - 25	13.8	2	51	-79,751	6	64	6,125.0	0	0	0.0	0	0
25 - 30	16.6	4	136	-95,701	4	46	7,350.0	0	0	0.0	0	0
30 - 35	19.4	1	44	-111,651	8	95	8,575.0	0	0	0.0	0	0
35 - 40	22.1	2	82	-127,601	7	75	9,800.0	0	0	0.0	0	0
40 - 45	24.9	1	42	-143,551	8	84	11,025.0	0	0	0.0	0	0
45 - 50	27.7	1	49	-159,501	5	60	12,250.0	0	0	0.0	0	0
50 - 55	30.4	1	39	-175,451	5	52	13,475.0	0	0	0.0	0	0
55 - 60	33.2	5	162	-191,401	5	56	14,700.0	0	0	0.0	0	0
60 - 65	36.0	3	107	-207,351	4	46	15,925.0	0	0	0.0	0	0
65 - 70	38.8	4	143	-223,301	6	64	17,150.0	0	0	0.0	0	0
70 - 75	41.5	4	136	-239,252	0	0	18,375.0	0	0	0.0	0	0
75 - 80	44.3	8	275	-255,202	0	0	19,600.0	0	0	0.0	0	0
80 - 85	47.1	0	0	-271,152	0	0	20,825.0	0	0	0.0	0	0
85 - 90	49.8	6	195	-287,102	0	0	22,050.0	0	0	0.0	0	0
90 - 95	52.6	0	0	-303,052	0	0	23,275.0	0	0	0.0	0	0
95 - 100	55.4	0	0	-319,002	0	0	24,500.0	100	8,760	0.0	0	0
Hours Off	0.0	0	5,478	0	0	7,642	0.0	0	0	0.0	0	8,760

BUILDING COOL-HEAT DEMAND - ALTERNATIVE 1
M184 - BASELINE

January			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	33.4	30.4	-141,090	0.0	0	0.0	-48,079	0.0	-194,911	0.0	-194,911	0.0
2	32.1	29.3	-148,395	0.0	0	0.0	-55,091	0.0	-205,142	0.0	-205,142	0.0
3	31.7	29.3	-154,944	0.0	0	0.0	-56,619	0.0	-210,831	0.0	-210,831	0.0
4	31.9	29.5	-160,760	0.0	0	0.0	-56,946	0.0	-211,748	0.0	-211,748	0.0
5	32.6	30.3	-163,796	0.0	-19,863	0.0	-57,685	0.0	-212,522	0.0	-212,522	0.0
6	33.6	31.3	-163,553	0.0	-57,210	0.0	-75,809	0.0	-210,828	0.0	-210,828	0.0
7	35.0	32.6	-160,874	0.0	-55,902	0.0	-130,440	0.0	-205,061	0.0	-205,061	0.0
8	36.6	34.4	0	0.0	0	0.0	-154,793	0.0	-154,763	0.0	0	0.0
9	38.5	36.3	0	0.0	0	0.0	-122,564	0.0	-122,564	0.0	0	0.0
10	40.4	37.7	0	0.0	0	0.0	-100,179	0.0	-100,179	0.0	0	0.0
11	42.3	38.7	0	0.0	0	0.0	-99,863	0.0	-99,863	0.0	0	0.0
12	44.2	39.6	0	0.0	0	0.0	-96,146	0.0	-96,146	0.0	0	0.0
13	45.8	40.5	0	0.0	0	0.0	-83,676	0.0	-83,676	0.0	0	0.0
14	47.2	41.1	0	0.0	0	0.0	-75,572	0.0	-75,572	0.0	0	0.0
15	48.2	41.6	0	0.0	0	0.0	-63,285	0.0	-63,285	0.0	0	0.0
16	48.9	41.8	0	0.0	0	0.0	-52,760	0.0	-52,760	0.0	0	0.0
17	49.1	41.9	0	0.0	0	0.0	-93,075	0.0	-93,075	0.0	0	0.0
18	48.7	41.9	0	0.0	0	0.0	-104,322	0.0	-104,322	0.0	0	0.0
19	47.4	41.7	0	0.0	0	0.0	-108,697	0.0	-108,697	0.0	0	0.0
20	45.5	40.5	0	0.0	0	0.0	-119,545	0.0	-119,545	0.0	0	0.0
21	43.1	38.9	0	0.0	0	0.0	-135,084	0.0	-135,084	0.0	0	0.0
22	40.4	36.7	0	0.0	0	0.0	-151,300	0.0	-151,300	0.0	0	0.0
23	37.7	34.3	0	0.0	0	0.0	-168,263	0.0	-168,263	0.0	0	0.0
24	35.3	32.3	0	0.0	0	0.0	-184,121	0.0	-184,121	0.0	0	0.0

February			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	37.5	34.5	-33,300	0.0	0	0.0	-42,316	0.0	-175,909	0.0	-175,909	0.0
2	36.0	33.0	-39,955	0.0	0	0.0	-50,522	0.0	-186,304	0.0	-186,304	0.0
3	34.7	31.8	-41,625	0.0	0	0.0	-52,693	0.0	-194,330	0.0	-194,330	0.0
4	33.6	30.9	-43,153	0.0	0	0.0	-54,487	0.0	-202,493	0.0	-202,493	0.0
5	32.8	30.1	-43,531	0.0	0	0.0	-56,301	0.0	-208,819	0.0	-208,819	0.0
6	32.2	29.8	-49,046	0.0	-22,085	0.0	-57,736	0.0	-214,686	0.0	-214,686	0.0
7	32.1	29.6	-102,355	0.0	-55,940	0.0	-136,767	0.0	-210,790	0.0	-210,790	0.0
8	32.5	30.3	0	0.0	0	0.0	-145,389	0.0	-145,354	0.0	0	0.0
9	33.9	31.6	0	0.0	0	0.0	-139,813	0.0	-139,814	0.0	0	0.0
10	36.0	33.0	0	0.0	0	0.0	-137,864	0.0	-137,864	0.0	0	0.0
11	38.5	34.8	0	0.0	0	0.0	-133,643	0.0	-133,643	0.0	0	0.0
12	41.3	36.5	0	0.0	0	0.0	-115,082	0.0	-115,082	0.0	0	0.0
13	43.8	38.1	0	0.0	0	0.0	-100,047	0.0	-100,047	0.0	0	0.0
14	45.9	39.5	0	0.0	0	0.0	-90,869	0.0	-90,869	0.0	0	0.0
15	47.2	40.4	0	0.0	0	0.0	-64,705	0.0	-64,705	0.0	0	0.0
16	47.7	40.6	0	0.0	0	0.0	-56,460	0.0	-56,460	0.0	0	0.0
17	47.5	40.2	0	0.0	0	0.0	-76,335	0.0	-76,335	0.0	0	0.0
18	47.0	39.8	0	0.0	0	0.0	-116,229	0.0	-116,229	0.0	0	0.0
19	46.2	39.9	0	0.0	0	0.0	-118,427	0.0	-118,427	0.0	0	0.0
20	45.1	39.7	0	0.0	0	0.0	-124,089	0.0	-124,089	0.0	0	0.0
21	43.8	39.2	0	0.0	0	0.0	-133,315	0.0	-133,315	0.0	0	0.0
22	42.3	38.3	0	0.0	0	0.0	-141,916	0.0	-141,916	0.0	0	0.0
23	40.7	37.2	0	0.0	0	0.0	-154,375	0.0	-154,375	0.0	0	0.0
24	39.1	35.8	0	0.0	0	0.0	-164,048	0.0	-164,048	0.0	0	0.0

[redacted]DING COOL-HEAT DEMAND - ALTERNATIVE 1
[redacted] - BASELINE

March			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	45.4	41.6	-15,577	0.0	0	0.0	0	0.0	-12,250	0.0	-117,286	0.0
2	43.3	39.7	-23,894	0.0	0	0.0	0	0.0	-35,539	0.0	-131,764	0.0
3	41.6	38.6	-25,708	0.0	0	0.0	0	0.0	-44,642	0.0	-143,657	0.0
4	40.6	37.5	-27,450	0.0	0	0.0	0	0.0	-72,610	0.0	-151,587	0.0
5	40.2	37.3	-28,835	0.0	0	0.0	0	0.0	-75,155	0.0	-157,117	0.0
6	40.6	37.8	-29,019	0.0	0	0.0	0	0.0	-102,721	0.0	-158,497	0.0
7	41.6	39.0	0	0.0	0	0.0	0	0.0	-78,840	0.0	-99,837	0.0
8	43.3	40.7	0	0.0	0	0.0	0	0.0	-66,328	0.0	0	0.0
9	45.4	42.5	0	0.0	0	0.0	0	0.0	-63,789	0.0	0	0.0
10	47.9	44.3	0	0.0	0	0.0	0	0.0	-72,553	0.0	0	0.0
11	50.6	45.5	0	0.0	0	0.0	0	0.0	-43,209	0.0	0	0.0
12	53.3	46.8	0	0.0	0	0.0	0	0.0	-33,267	0.0	0	0.0
13	55.8	48.5	0	0.0	0	0.0	0	0.0	-20,698	0.0	0	0.0
14	58.0	49.6	0	0.0	0	0.0	0	0.0	-6,983	0.0	0	0.0
15	59.6	50.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
16	60.7	50.9	0	0.0	0	0.0	0	0.0	-3,252	0.0	0	0.0
17	61.0	50.9	0	0.0	0	0.0	0	0.0	-4,286	0.0	0	0.0
18	60.7	50.7	0	0.0	0	0.0	0	0.0	-10,795	0.0	0	0.0
19	59.6	50.7	0	0.0	0	0.0	0	0.0	-16,573	0.0	0	0.0
20	58.0	50.5	0	0.0	0	0.0	0	0.0	-21,255	0.0	0	0.0
21	55.8	49.4	0	0.0	0	0.0	0	0.0	-41,400	0.0	0	0.0
[redacted]	53.3	47.8	0	0.0	0	0.0	0	0.0	-59,433	0.0	0	0.0
23	50.6	45.9	0	0.0	0	0.0	0	0.0	-85,093	0.0	0	0.0
24	47.9	43.8	0	0.0	0	0.0	0	0.0	-101,822	0.0	0	0.0

April			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	57.7	53.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2	55.9	52.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
3	54.2	51.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
4	52.9	50.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
5	51.9	49.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
6	51.2	49.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
7	51.0	49.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
8	51.6	49.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
9	53.3	50.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
10	55.9	51.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
11	59.0	53.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
12	62.4	55.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
13	65.5	57.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
14	68.1	59.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
15	69.8	60.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
16	70.4	60.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
17	70.2	60.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
18	69.5	60.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
19	68.5	59.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
[redacted]	67.2	59.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
[redacted]	65.5	59.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
22	63.7	58.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
23	61.7	57.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
24	59.7	55.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0

BUILDING COOL-HEAT DEMAND - ALTERNATIVE 1
M184 - BASELINE

May			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	66.6	62.3	0	55.4	0	0.0	0	0.0	0	0.0	0	0.0
2	64.5	60.4	0	55.4	0	0.0	0	0.0	0	0.0	0	0.0
3	62.7	59.1	0	53.0	0	0.0	0	0.0	0	0.0	0	0.0
4	61.2	58.1	0	36.6	0	0.0	0	0.0	0	0.0	0	0.0
5	60.0	57.1	0	16.1	0	0.0	0	0.0	0	0.0	0	0.0
6	59.3	56.6	0	5.3	0	0.0	0	0.0	0	0.0	0	0.0
7	59.0	56.5	0	10.3	0	0.0	0	0.0	0	0.0	0	0.0
8	59.5	56.6	0	31.2	0	10.3	0	0.0	0	0.0	0	10.3
9	60.9	56.6	0	38.4	0	28.3	0	0.8	0	0.8	0	29.2
10	63.0	57.2	0	40.1	0	31.7	0	2.0	0	2.0	0	32.0
11	65.7	58.1	0	41.7	0	32.0	0	1.4	0	1.4	0	32.1
12	68.7	59.8	0	42.2	0	32.0	0	1.4	0	1.4	0	32.0
13	71.7	61.6	0	35.1	0	26.0	0	3.1	0	3.1	0	26.0
14	74.5	63.4	0	45.9	0	36.5	0	4.2	0	4.2	0	36.5
15	76.6	64.8	0	46.3	0	38.7	0	6.9	0	6.9	0	38.7
16	78.0	65.6	0	48.6	0	39.6	0	8.5	0	8.5	0	39.6
17	78.5	65.6	0	40.2	0	32.4	0	9.6	0	9.6	0	32.4
18	78.2	65.8	0	24.3	0	18.0	0	8.1	0	8.1	0	18.0
19	77.5	65.6	0	8.8	0	5.2	0	5.2	0	5.2	0	5.2
20	76.3	66.1	0	7.7	0	4.8	0	4.8	0	4.8	0	4.8
21	74.8	67.2	0	6.3	0	4.0	0	4.0	0	4.0	0	4.0
22	73.0	66.4	0	5.0	0	3.0	0	3.0	0	3.0	0	3.0
23	70.9	65.4	0	3.8	0	2.0	0	2.0	0	2.0	0	2.0
24	68.7	64.0	0	2.7	0	0.6	0	0.7	0	0.7	0	0.6

June			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	73.0	67.9	0	6.7	0	3.1	0	3.4	0	3.5	0	3.5
2	71.2	66.1	0	5.9	0	2.2	0	2.3	0	2.4	0	2.4
3	69.7	65.2	0	5.2	0	1.1	0	1.3	0	1.3	0	1.3
4	68.5	64.3	0	4.6	0	0.0	0	0.3	0	0.3	0	0.3
5	67.8	64.2	0	4.4	0	0.0	0	0.0	0	0.0	0	0.0
6	67.6	64.2	0	10.8	0	3.1	0	3.1	0	3.1	0	3.1
7	68.1	64.8	0	15.6	0	5.8	0	6.0	0	6.1	0	6.1
8	69.4	65.7	0	43.9	0	34.4	0	6.1	0	6.2	0	35.5
9	71.6	66.2	0	47.9	0	40.3	0	6.0	0	6.0	0	40.3
10	74.2	67.2	0	48.7	0	43.0	0	9.4	0	9.4	0	43.0
11	77.2	68.5	0	49.9	0	42.7	0	9.6	0	9.6	0	42.7
12	80.2	70.0	0	50.1	0	43.5	0	10.8	0	10.8	0	43.5
13	82.8	70.8	0	42.1	0	35.6	0	12.4	0	12.4	0	35.6
14	85.0	71.6	0	53.9	0	48.5	0	14.2	0	14.2	0	48.5
15	86.3	72.3	0	53.7	0	49.1	0	15.4	0	15.4	0	49.1
16	86.8	72.1	0	54.6	0	48.8	0	15.6	0	15.6	0	48.8
17	86.6	71.7	0	49.1	0	39.7	0	15.7	0	15.7	0	39.7
18	85.8	71.5	0	29.9	0	23.4	0	14.1	0	14.1	0	23.4
19	84.7	71.2	0	13.5	0	9.6	0	9.8	0	9.8	0	9.6
20	83.2	71.5	0	12.3	0	9.0	0	9.3	0	9.3	0	9.0
21	81.4	71.7	0	11.1	0	8.1	0	8.6	0	8.6	0	8.1
22	79.3	71.4	0	9.7	0	7.1	0	7.4	0	7.4	0	7.1
23	77.2	70.5	0	8.6	0	6.1	0	6.3	0	6.3	0	6.1
24	75.1	69.1	0	7.5	0	4.7	0	4.8	0	4.8	0	4.7

[redacted]NG COOL-HEAT DEMAND - ALTERNATIVE 1
[redacted] BASELINE

July			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	72.0	69.3	0	6.3	0	2.7	0	3.3	0	3.3	0	3.3
2	70.5	68.0	0	5.6	0	1.7	0	2.0	0	2.0	0	2.0
3	69.4	67.1	0	5.0	0	0.8	0	1.0	0	1.0	0	1.0
4	68.5	66.4	0	4.6	0	0.0	0	0.0	0	0.0	0	0.0
5	67.9	66.0	0	4.4	0	0.0	0	0.0	0	0.0	0	0.0
6	67.7	65.9	0	8.9	0	1.9	0	2.1	0	2.1	0	2.1
7	68.1	66.3	0	16.3	0	6.2	0	6.6	0	6.6	0	6.6
8	69.1	67.3	0	46.4	0	37.8	0	6.7	0	6.7	0	38.4
9	70.8	68.0	0	48.1	0	41.6	0	6.2	0	6.2	0	41.5
10	72.9	69.1	0	49.5	0	43.4	0	9.2	0	9.2	0	43.4
11	75.2	70.5	0	50.8	0	43.4	0	9.7	0	9.7	0	43.4
12	77.5	71.7	0	50.2	0	43.7	0	10.7	0	10.7	0	43.7
13	79.6	72.7	0	42.2	0	35.6	0	12.5	0	12.5	0	35.6
14	81.3	73.5	0	54.1	0	49.4	0	14.3	0	14.3	0	49.4
15	82.3	73.7	0	53.7	0	48.8	0	15.0	0	15.0	0	48.8
16	82.7	73.5	0	54.6	0	49.0	0	15.3	0	15.3	0	49.0
17	82.5	73.1	0	48.2	0	39.4	0	15.3	0	15.3	0	39.4
18	82.0	72.6	0	28.0	0	22.4	0	13.6	0	13.6	0	22.4
19	81.1	73.2	0	11.9	0	7.9	0	8.9	0	8.9	0	7.9
20	79.9	73.8	0	11.0	0	8.1	0	9.1	0	9.1	0	8.1
21	78.5	73.9	0	9.9	0	8.0	0	8.9	0	8.9	0	8.0
[redacted]	76.9	73.1	0	8.8	0	7.4	0	7.8	0	7.8	0	7.4
[redacted]	75.2	71.9	0	7.8	0	6.2	0	6.4	0	6.4	0	6.2
24	73.5	70.8	0	6.9	0	4.6	0	4.7	0	4.7	0	4.6

August			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	72.7	70.2	0	7.0	0	2.8	0	3.6	0	3.6	0	3.6
2	71.2	69.0	0	5.6	0	2.0	0	2.4	0	2.4	0	2.4
3	69.9	68.0	0	4.9	0	1.2	0	1.3	0	1.3	0	1.3
4	68.8	67.1	0	4.5	0	0.0	0	0.0	0	0.0	0	0.0
5	68.0	66.6	0	4.2	0	0.0	0	0.0	0	0.0	0	0.0
6	67.5	66.2	0	5.6	0	0.5	0	0.6	0	0.6	0	0.6
7	67.3	66.1	0	15.2	0	5.1	0	5.6	0	5.6	0	5.6
8	67.8	66.5	0	47.2	0	37.4	0	6.0	0	6.0	0	38.1
9	69.1	67.0	0	49.6	0	40.5	0	5.6	0	5.6	0	40.5
10	71.2	67.8	0	49.6	0	41.8	0	8.1	0	8.1	0	41.8
11	73.8	68.7	0	51.5	0	41.8	0	8.4	0	8.4	0	41.8
12	76.5	70.0	0	50.0	0	42.5	0	9.7	0	9.7	0	42.5
13	79.1	71.2	0	42.0	0	35.4	0	12.2	0	12.2	0	35.4
14	81.1	72.6	0	54.0	0	49.0	0	14.2	0	14.2	0	49.0
15	82.5	73.6	0	54.0	0	48.7	0	15.0	0	15.0	0	48.7
16	83.0	73.7	0	55.4	0	47.8	0	14.2	0	14.2	0	47.8
17	82.8	73.5	0	48.5	0	39.1	0	14.8	0	14.8	0	39.1
18	82.3	73.5	0	26.0	0	20.5	0	11.4	0	11.4	0	20.5
19	81.5	73.1	0	11.9	0	7.8	0	8.9	0	8.9	0	7.8
[redacted]	80.4	73.7	0	10.9	0	8.1	0	9.1	0	9.1	0	8.1
[redacted]	79.1	74.9	0	9.7	0	8.0	0	8.9	0	8.9	0	8.0
22	77.6	73.9	0	8.6	0	7.9	0	8.2	0	8.2	0	7.9
23	76.0	72.7	0	7.5	0	6.6	0	6.7	0	6.7	0	6.6
24	74.3	71.3	0	6.7	0	5.0	0	5.0	0	5.0	0	5.0

BUILDING COOL-HEAT DEMAND - ALTERNATIVE 1
M184 - BASELINE

September			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	69.8	66.1	0	4.1	0	0.8	0	1.1	0	1.1	0	1.1
2	68.0	64.5	0	3.2	0	0.0	0	0.0	0	0.0	0	0.0
3	66.3	63.0	0	2.8	0	0.0	0	0.0	0	0.0	0	0.0
4	64.9	61.9	0	2.0	0	0.0	0	0.0	0	0.0	0	0.0
5	63.9	61.3	0	1.6	0	0.0	0	0.0	0	0.0	0	0.0
6	63.2	61.0	0	1.6	0	0.0	0	0.0	0	0.0	0	0.0
7	63.0	60.8	0	9.5	0	0.0	0	0.0	0	0.0	0	0.0
8	63.4	61.4	0	41.2	0	19.6	0	0.8	0	0.8	0	20.8
9	64.7	61.8	0	47.9	0	38.3	0	2.8	0	2.8	0	39.2
10	66.6	62.1	0	45.6	0	35.0	0	1.9	0	1.9	0	35.1
11	69.1	62.9	0	46.8	0	38.2	0	4.9	0	4.9	0	38.2
12	71.8	63.7	0	46.8	0	37.5	0	7.0	0	7.0	0	37.5
13	74.5	65.5	0	39.4	0	30.5	0	8.7	0	8.7	0	30.5
14	77.0	67.1	0	50.6	0	42.5	0	9.9	0	9.9	0	42.5
15	78.9	68.2	0	52.7	0	43.2	0	10.3	0	10.3	0	43.2
16	80.2	68.6	0	51.8	0	43.7	0	10.7	0	10.7	0	43.7
17	80.6	68.5	0	40.2	0	33.1	0	9.6	0	9.6	0	33.1
18	80.4	68.9	0	20.9	0	16.5	0	6.6	0	6.6	0	16.5
19	79.7	70.0	0	10.2	0	6.4	0	6.4	0	6.4	0	6.4
20	78.7	71.2	0	8.8	0	5.9	0	6.0	0	6.0	0	5.9
21	77.3	71.6	0	7.6	0	5.3	0	5.5	0	5.5	0	5.3
22	75.6	70.5	0	6.3	0	4.5	0	4.7	0	4.7	0	4.5
23	73.7	69.4	0	5.2	0	3.5	0	3.6	0	3.6	0	3.5
24	71.8	67.7	0	4.3	0	2.3	0	2.4	0	2.4	0	2.3

October			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	54.8	51.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2	52.9	49.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
3	51.2	48.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
4	49.8	47.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
5	48.8	46.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
6	48.2	45.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
7	47.9	45.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
8	48.5	46.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
9	50.3	47.3	0	27.6	0	0.0	0	0.0	0	0.0	0	0.0
10	52.9	48.7	0	33.8	0	4.0	0	0.0	0	0.0	0	0.0
11	56.2	49.9	0	34.0	0	19.3	0	0.0	0	0.0	0	0.0
12	59.6	51.5	0	34.8	0	26.2	0	0.0	0	0.0	0	3.6
13	62.9	53.5	0	30.1	0	21.2	0	0.0	0	0.0	0	11.5
14	65.5	55.2	0	38.9	0	28.7	0	0.0	0	0.0	0	17.3
15	67.3	56.3	0	41.2	0	31.0	0	0.0	0	0.0	0	25.2
16	67.9	56.6	0	40.0	0	31.3	0	0.0	0	0.0	0	27.0
17	67.7	56.4	0	27.2	0	21.6	0	0.0	0	0.0	0	21.6
18	67.0	56.6	0	13.4	0	9.0	0	0.0	0	0.0	0	9.0
19	66.0	57.6	0	2.4	0	0.0	0	0.0	0	0.0	0	0.0
20	64.6	57.9	0	0.9	0	0.0	0	0.0	0	0.0	0	0.0
21	62.9	57.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
22	61.0	56.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
23	59.0	54.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
24	56.9	53.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0

[redacted]G COOL-HEAT DEMAND - ALTERNATIVE 1
M[redacted] - BASELINE

November			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	48.7	45.7	0	0.0	0	0.0	0	0.0	0	0.0	-47,795	0.0
2	46.9	44.1	0	0.0	0	0.0	0	0.0	0	0.0	-85,169	0.0
3	45.5	42.8	0	0.0	0	0.0	0	0.0	0	0.0	-95,145	0.0
4	44.6	41.9	0	0.0	0	0.0	0	0.0	-27,678	0.0	-101,392	0.0
5	44.4	42.0	0	0.0	0	0.0	0	0.0	-35,691	0.0	-104,357	0.0
6	44.8	42.7	0	0.0	0	0.0	0	0.0	-36,644	0.0	-107,187	0.0
7	45.9	43.9	0	0.0	0	0.0	0	0.0	-32,875	0.0	-122,784	0.0
8	47.8	46.0	0	0.0	0	0.0	0	0.0	-12,862	0.0	0	0.0
9	50.2	48.0	0	0.0	0	0.0	0	0.0	-19,311	0.0	0	0.0
10	52.9	49.9	0	0.0	0	0.0	0	0.0	-15,677	0.0	0	0.0
11	55.8	51.1	0	0.0	0	0.0	0	0.0	-15,372	0.0	0	0.0
12	58.5	52.0	0	0.0	0	0.0	0	0.0	-10,905	0.0	0	0.0
13	60.9	52.5	0	0.0	0	0.0	0	0.0	-4,249	0.0	0	0.0
14	62.8	53.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
15	64.0	53.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
16	64.4	53.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
17	64.1	53.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
18	63.2	53.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
19	61.8	54.2	0	0.0	0	0.0	0	0.0	-6,505	0.0	0	0.0
20	60.0	53.6	0	0.0	0	0.0	0	0.0	-10,431	0.0	0	0.0
[redacted]	57.9	52.7	0	0.0	0	0.0	0	0.0	-20,557	0.0	0	0.0
[redacted]	55.6	51.2	0	0.0	0	0.0	0	0.0	-27,638	0.0	0	0.0
23	53.2	49.5	0	0.0	0	0.0	0	0.0	-34,414	0.0	0	0.0
24	50.8	47.6	0	0.0	0	0.0	0	0.0	-41,450	0.0	0	0.0

December			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	37.5	35.3	0	0.0	0	0.0	0	0.0	-138,102	0.0	-174,603	0.0
2	37.1	35.1	0	0.0	0	0.0	0	0.0	-167,257	0.0	-180,216	0.0
3	37.4	35.5	0	0.0	0	0.0	0	0.0	-180,692	0.0	-180,688	0.0
4	38.1	36.2	0	0.0	0	0.0	-27,898	0.0	-178,568	0.0	-178,568	0.0
5	39.3	37.6	0	0.0	0	0.0	-48,096	0.0	-176,033	0.0	-176,033	0.0
6	40.9	39.2	0	0.0	0	0.0	-46,412	0.0	-169,566	0.0	-169,566	0.0
7	42.7	41.2	0	0.0	0	0.0	-44,588	0.0	-160,887	0.0	-160,887	0.0
8	44.7	43.1	0	0.0	0	0.0	-23,215	0.0	-99,206	0.0	0	0.0
9	46.8	45.3	0	0.0	0	0.0	-14,779	0.0	-62,318	0.0	0	0.0
10	48.8	47.0	0	0.0	0	0.0	-14,978	0.0	-52,074	0.0	0	0.0
11	50.7	48.1	0	0.0	0	0.0	-19,688	0.0	-56,044	0.0	0	0.0
12	52.2	48.8	0	0.0	0	0.0	-22,378	0.0	-56,364	0.0	0	0.0
13	53.4	49.2	0	0.0	0	0.0	-18,033	0.0	-45,267	0.0	0	0.0
14	54.1	49.2	0	0.0	0	0.0	-13,480	0.0	-29,827	0.0	0	0.0
15	54.4	48.9	0	0.0	0	0.0	-11,727	0.0	-20,896	0.0	0	0.0
16	54.0	48.2	0	0.0	0	0.0	-12,971	0.0	-27,657	0.0	0	0.0
17	53.0	47.3	0	0.0	0	0.0	-21,599	0.0	-61,358	0.0	0	0.0
18	51.4	46.3	0	0.0	0	0.0	-23,636	0.0	-66,891	0.0	0	0.0
19	49.3	45.4	0	0.0	0	0.0	-26,146	0.0	-76,274	0.0	0	0.0
[redacted]	47.0	43.5	0	0.0	0	0.0	-29,569	0.0	-106,258	0.0	0	0.0
[redacted]	44.5	41.5	0	0.0	0	0.0	-50,304	0.0	-122,306	0.0	0	0.0
22	42.2	39.3	0	0.0	0	0.0	-93,216	0.0	-137,878	0.0	0	0.0
23	40.1	37.6	0	0.0	0	0.0	-120,424	0.0	-152,013	0.0	0	0.0
24	38.5	36.2	0	0.0	0	0.0	-130,039	0.0	-164,302	0.0	0	0.0

BUILDING TEMPERATURE PROFILES - ALTERNATIVE 1
M184 - BASELINE

BUILDING TEMPERATURE PROFILES

Temperature Range (F)	Room Number 1	2	3	4
Max. Temp.	100.8	88.9	91.4	93.1
Mo./Hr.	4 17	4 18	4 18	4 18
Day Type	2	2	2	2
	Number of Hours			
Above 100	32	0	0	0
95 - 100	165	0	0	0
90 - 95	487	0	96	181
85 - 90	690	255	561	483
80 - 85	1,069	598	1,196	993
75 - 80	4,641	5,233	5,402	5,420
70 - 75	1,561	2,649	1,505	1,683
65 - 70	115	25	0	0
60 - 65	0	0	0	0
55 - 60	0	0	0	0
50 - 55	0	0	0	0
Below 50	0	0	0	0
Min. Temp.	67.8	69.3	71.1	70.1
Mo./Hr.	10 7	10 7	10 7	10 7
Day Type	5	5	5	5

[redacted]HLY ENERGY CONSUMPTION - ALTERNATIVE 1
[redacted]- BASELINE

---------- M O N T H L Y E N E R G Y C O N S U M P T I O N ----------

Month	ELEC On Peak (kWh)	DEMAND On Peak (kW)	GAS On Peak (Therm)	GAS DMND On Peak (Thrm/hr)
Jan	33,640	107	454	3
Feb	30,356	107	388	3
March	34,718	107	98	2
April	31,386	107	0	0
May	44,153	168	0	0
June	49,980	182	0	0
July	48,000	178	0	0
Aug	51,224	179	0	0
Sept	43,318	175	0	0
Oct	38,159	155	0	0
Nov	31,773	107	61	1
Dec	32,658	107	273	2
Total	469,367	182	1,274	3

Building Energy Consumption = 49,853 (Btu/Sq Ft/Year) Floor Area = 34,690 (Sq Ft)
Source Energy Consumption = 142,418 (Btu/Sq Ft/Year)

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
M184 - BASELINE

------- E Q U I P M E N T   E N E R G Y   C O N S U M P T I O N -------

Ref Num	Equip Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
		Monthly Consumption												
0	LIGHTS													
	ELEC	13248	11983	14307	12650	13777	13709	12718	14307	12650	13777	12650	12718	158,493
	PK	57.2	57.2	57.2	57.2	57.2	57.2	57.2	57.2	57.2	57.2	57.2	57.2	57.2
1	MISC LD													
	ELEC	7762	7021	8383	7412	8072	8032	7452	8383	7412	8072	7412	7452	92,865
	PK	33.5	33.5	33.5	33.5	33.5	33.5	33.5	33.5	33.5	33.5	33.5	33.5	33.5
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	EQ1121L			AIR-CLD RECIP 35-60 TONS										
	ELEC	0	0	0	0	7247	12049	11288	11941	8264	3313	0	0	54,100
	PK	0.0	0.0	0.0	0.0	51.4	61.9	59.7	60.7	56.6	38.3	0.0	0.0	61.9
1	EQ5200			CONDENSER FANS										
	ELEC	0	0	0	0	835	1482	1408	1460	979	304	0	0	6,468
	PK	0.0	0.0	0.0	0.0	6.0	7.9	6.8	6.9	6.5	5.0	0.0	0.0	7.9
1	EQ5001			CHILLED WATER PUMP C.V. 5 hp x .75 x [illegible]/.839 = 3.8 kw										
	ELEC	0	0	0	0	2376	3192	3236	3236	2535	935	0	0	15,511
	PK	0.0	0.0	0.0	0.0	5.0	5.0	5.0	5.0	5.0	5.0	0.0	0.0	5.0
1	EQ5313			CONTROLS										
	ELEC	0	0	0	0	143	193	195	195	153	56	0	0	936
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3
1	EQ4003			FC CENTRIF. FAN C.V.										
	ELEC	11702	10570	11702	11325	11702	11325	11702	11702	11325	11702	11325	11702	137,786
	PK	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7

1 EQ4003 FC CENTRIF. FAN C.V.

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
M184 - BASELINE

	ELEC	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
1	EQ2001		GAS FIRE TUBE HOT WATER										
	GAS	454	388	98	0	0	0	0	0	0	61	273	1,274
	PK	2.6	2.6	1.9	0.0	0.0	0.0	0.0	0.0	0.0	1.5	2.2	2.6
1	EQ5020		HEAT WATER CIRC. PUMP C.V.										
	ELEC	634	535	223	0	0	0	0	0	0	264	537	2,193
	PK	2.0	2.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	2.0
1	EQ5240		BOILER FORCED DRAFT FAN										
	ELEC	134	113	47	0	0	0	0	0	0	56	113	463
	PK	0.4	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.4
1	EQ5307		BOILER CONTROLS										
	ELEC	159	134	56	0	0	0	0	0	0	67	135	551
	PK	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5	0.5

[redacted]LITY PEAK CHECKSUMS - ALTERNATIVE 1
[redacted] - BASELINE

UTILITY PEAK CHECKSUMS

Utility ELECTRIC DEMAND

Peak Value 181.5 (kW)
Yearly Time of Peak 16 (hr) 6 (mo)

Hour 16 Month 6

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Percnt Of Tot (%)
Cooling Equipment				
1	EQ1121L	AIR-CLD RECIP 35-60 TONS	75.0	41.32
Sub Total			75.0	41.32
Sub Total			0.0	0.00
Air Moving Equipment				
[redacted]		SUMMATION OF FAN ELECTRICAL DEMAND	15.7	8.67
Sub Total			15.7	8.67
Sub Total			0.0	0.00
Miscellaneous				
Lights			57.2	31.53
Base Utilities			0.0	0.00
Misc Equipment			33.5	18.48
Sub Total			90.8	50.01
Grand Total			181.5	100.00

CALIFORNIA TITLE 24 COMPLIANCE - ALTERNATIVE 1
M184 - BASELINE

---------- CALIFORNIA TITLE 24 COMPLIANCE REPORT ----------

Weather Name ..... ATLANTA.
Gross Conditioned Floor Area (sqft)..... 34,690
ACM Multiplier 1.025

---------- E N E R G Y U S E S U M M A R Y ----------

	ELEC (kWh/yr)	GAS (kBtu/yr)	PERCENT OF TOTAL ENERGY (%)	TOTAL SOURCE ENERGY (kBtu/yr)	ADJUSTED UNIT SOURCE ENERGY (kBtu/yr-sf)
Primary Heating	1,014.8	127,447.1	7.6	144,546.0	4.3
Primary Cooling					
Compressor	54,099.9	0.0	10.7	553,984.4	16.4
Tower/Cond Fans	6,467.6	0.0	1.3	66,228.7	2.0
Condenser Pump	0.0	0.0	0.0	0.0	0.0
Other Accessories	936.0	0.0	0.2	9,584.7	0.3
Auxiliary					
Supply Fans	137,786.0	0.0	27.2	1,410,931.6	41.7
Circulation Pumps	17,704.0	0.0	3.5	181,289.1	5.4
Base Utilities	0.0	0.0	0.0	0.0	0.0
Subtotal	155,489.9	0.0	30.7	1,592,220.6	47.0
Lighting	158,493.3	0.0	31.3	1,622,974.9	46.8
Receptacle	92,865.3	0.0	18.3	950,942.9	27.4
Domestic Hot Water	0.0	0.0	0.0	0.0	0.0
Cogeneration	0.0	0.0	0.0	0.0	0.0
Totals	469,366.8	127,447.1	100.0	4,940,482.5	144.1

[redacted]HLY ENERGY CONSUMPTION - ALTERNATIVE 1
[redacted] - INSULATED GLASS

MONTHLY ENERGY CONSUMPTION

Month	ELEC On Peak (kWh)	DEMAND On Peak (kW)	GAS On Peak (Therm)	GAS DMND On Peak (Thrm/hr)
Jan	33,530	107	338	2
Feb	30,240	107	278	2
March	34,659	107	48	2
April	31,386	107	0	0
May	44,009	165	0	0
June	49,490	178	0	0
July	47,736	175	0	0
Aug	50,896	175	0	0
Sept	43,182	171	0	0
Oct	38,449	152	0	0
Nov	31,610	107	22	1
Dec	32,585	107	176	2
Total	467,773	178	863	2

Building Energy Consumption = 48,510 (Btu/Sq Ft/Year)
Source Energy Consumption = 140,699 (Btu/Sq Ft/Year)

Floor Area = 34,690 (Sq Ft)

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
M184 - INSULATED GLASS

EQUIPMENT ENERGY CONSUMPTION

Ref Num	Equip Code	Monthly Consumption Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	13248	11983	14307	12650	13777	13709	12718	14307	12650	13777	12650	12718	158,493
	PK	57.2	57.2	57.2	57.2	57.2	57.2	57.2	57.2	57.2	57.2	57.2	57.2	57.2
1	MISC LD													
	ELEC	7762	7021	8383	7412	8072	8032	7452	8383	7412	8072	7412	7452	92,865
	PK	33.5	33.5	33.5	33.5	33.5	33.5	33.5	33.5	33.5	33.5	33.5	33.5	33.5
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	EQ1121L	AIR-CLD RECIP 35-60 TONS												
	ELEC	0	0	0	0	7119	11469	10832	11501	8002	3582	0	0	52,505
	PK	0.0	0.0	0.0	0.0	48.4	58.3	56.3	57.1	53.0	35.9	0.0	0.0	58.3
1	EQ5200	CONDENSER FANS												
	ELEC	0	0	0	0	818	1413	1352	1408	948	324	0	0	6,262
	PK	0.0	0.0	0.0	0.0	5.6	7.9	6.4	6.5	6.1	4.7	0.0	0.0	7.9
1	EQ5001	CHILLED WATER PUMP C.V.												
	ELEC	0	0	0	0	2376	3341	3470	3390	2685	935	0	0	16,197
	PK	0.0	0.0	0.0	0.0	5.0	5.0	5.0	5.0	5.0	5.0	0.0	0.0	5.0
1	EQ5313	CONTROLS												
	ELEC	0	0	0	0	143	202	209	205	162	56	0	0	977
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3
1	EQ4003	FC CENTRIF. FAN C.V.												
	ELEC	11702	10570	11702	11325	11702	11325	11702	11702	11325	11702	11325	11702	137,786
	PK	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7

1 EQ4003 FC CENTRIF. FAN C.V.

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
M184 - INSULATED GLASS

	ELEC	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
1	EQ2001			GAS FIRE TUBE HOT WATER									
	GAS	338	278	48	0	0	0	0	0	0	22	176	863
	PK	2.2	2.2	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.6	1.8	2.2
1	EQ5020			HEAT WATER CIRC. PUMP C.V.									
	ELEC	559	455	183	0	0	0	0	0	0	153	487	1,837
	PK	2.0	2.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	2.0
1	EQ5240			BOILER FORCED DRAFT FAN									
	ELEC	118	96	39	0	0	0	0	0	0	32	103	388
	PK	0.4	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.4
1	EQ5307			BOILER CONTROLS									
	ELEC	141	115	46	0	0	0	0	0	0	38	123	462
	PK	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5	0.5

ITY PEAK CHECKSUMS - ALTERNATIVE 1
- INSULATED GLASS

---------- 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 178.0 (kW)
Yearly Time of Peak 16 (hr) 6 (mo)

Hour 16 Month 6

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Percnt Of Tot (%)
Cooling Equipment				
1	EQ1121L	AIR-CLD RECIP 35-60 TONS	71.5	40.16
Sub Total			71.5	40.16
Sub Total			0.0	0.00
Air Moving Equipment				
		SUMMATION OF FAN ELECTRICAL DEMAND	15.7	8.84
Sub Total			15.7	8.84
Sub Total			0.0	0.00
Miscellaneous				
Lights			57.2	32.16
Base Utilities			0.0	0.00
Misc Equipment			33.5	18.84
Sub Total			90.8	51.00
Grand Total			178.0	100.00

CALIFORNIA TITLE 24 COMPLIANCE - ALTERNATIVE 1
M184 - INSULATED GLASS

---------- CALIFORNIA TITLE 24 COMPLIANCE REPORT ----------

Weather Name ..... ATLANTA.
Gross Conditioned Floor Area (sqft)..... 34,690
ACM Multiplier 1.025

---------- E N E R G Y U S E S U M M A R Y ----------

	ELEC (kWh/yr)	GAS (kBtu/yr)	PERCENT OF TOTAL ENERGY (%)	TOTAL SOURCE ENERGY (kBtu/yr)	ADJUSTED UNIT SOURCE ENERGY (kBtu/yr-sf)
Primary Heating	850.1	86,308.5	5.3	99,555.9	2.9
Primary Cooling					
Compressor	52,504.9	0.0	10.6	537,651.1	15.9
Tower/Cond Fans	6,262.0	0.0	1.3	64,123.5	1.9
Condenser Pump	0.0	0.0	0.0	0.0	0.0
Other Accessories	977.4	0.0	0.2	10,008.6	0.3
Auxiliary					
Supply Fans	137,786.0	0.0	27.9	1,410,931.6	41.7
Circulation Pumps	18,034.1	0.0	3.7	184,669.3	5.5
Base Utilities	0.0	0.0	0.0	0.0	0.0
Subtotal	155,820.0	0.0	31.6	1,595,600.8	47.1
Lighting	158,493.3	0.0	32.1	1,622,974.9	46.8
Receptacle	92,865.3	0.0	18.8	950,942.9	27.4
Domestic Hot Water	0.0	0.0	0.0	0.0	0.0
Cogeneration	0.0	0.0	0.0	0.0	0.0
Totals	467,773.0	86,308.5	100.0	4,880,858.0	142.4

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 1
- ECONOMIZER

MONTHLY ENERGY CONSUMPTION

Month	ELEC On Peak (kWh)	DEMAND On Peak (kW)	GAS On Peak (Therm)	GAS DMND On Peak (Thrm/hr)
Jan	33,640	107	454	3
Feb	30,356	107	388	3
March	34,718	107	98	2
April	31,386	107	0	0
May	42,533	168	0	0
June	48,782	182	0	0
July	46,531	178	0	0
Aug	50,006	179	0	0
Sept	42,278	175	0	0
Oct	36,162	155	0	0
Nov	31,773	107	61	1
Dec	32,658	107	273	2
Total	460,823	182	1,274	3

Building Energy Consumption = 49,012 (Btu/Sq Ft/Year)
Source Energy Consumption = 139,896 (Btu/Sq Ft/Year)

Floor Area = 34,690 (Sq Ft)

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
M184 - ECONOMIZER

EQUIPMENT ENERGY CONSUMPTION

Ref Num	Equip Code	Monthly Consumption Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	13248	11983	14307	12650	13777	13709	12718	14307	12650	13777	12650	12718	158,493
	PK	57.2	57.2	57.2	57.2	57.2	57.2	57.2	57.2	57.2	57.2	57.2	57.2	57.2
1	MISC LD													
	ELEC	7762	7021	8383	7412	8072	8032	7452	8383	7412	8072	7412	7452	92,865
	PK	33.5	33.5	33.5	33.5	33.5	33.5	33.5	33.5	33.5	33.5	33.5	33.5	33.5
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	EQ1121L	AIR-CLD RECIP 35-60 TONS												
	ELEC	0	0	0	0	6338	11636	10757	11512	7800	1954	0	0	49,997
	PK	0.0	0.0	0.0	0.0	51.4	61.9	59.7	60.7	56.6	38.3	0.0	0.0	61.9
1	EQ5200	CONDENSER FANS												
	ELEC	0	0	0	0	756	1434	1345	1409	930	191	0	0	6,064
	PK	0.0	0.0	0.0	0.0	6.0	7.9	6.8	6.9	6.5	5.0	0.0	0.0	7.9
1	EQ5001	CHILLED WATER PUMP C.V.												
	ELEC	0	0	0	0	1780	2496	2411	2540	2038	437	0	0	11,703
	PK	0.0	0.0	0.0	0.0	5.0	5.0	5.0	5.0	5.0	5.0	0.0	0.0	5.0
1	EQ5313	CONTROLS												
	ELEC	0	0	0	0	107	151	146	153	123	26	0	0	706
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3
1	EQ4003	FC CENTRIF. FAN C.V.												
	ELEC	11702	10570	11702	11325	11702	11325	11702	11702	11325	11702	11325	11702	137,786
	PK	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7

1 EQ4003 FC CENTRIF. FAN C.V.

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
M184 - ECONOMIZER

	ELEC	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
1	EQ2001		GAS FIRE TUBE HOT WATER										
	GAS	454	388	98	0	0	0	0	0	0	61	273	1,274
	PK	2.6	2.6	1.9	0.0	0.0	0.0	0.0	0.0	0.0	1.5	2.2	2.6
1	EQ5020		HEAT WATER CIRC. PUMP C.V.										
	ELEC	634	535	223	0	0	0	0	0	0	264	537	2,193
	PK	2.0	2.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	2.0
1	EQ5240		BOILER FORCED DRAFT FAN										
	ELEC	134	113	47	0	0	0	0	0	0	56	113	463
	PK	0.4	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.4
1	EQ5307		BOILER CONTROLS										
	ELEC	159	134	56	0	0	0	0	0	0	67	135	551
	PK	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5	0.5

ITY PEAK CHECKSUMS - ALTERNATIVE 1
- ECONOMIZER

---------- 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 181.5 (kW)
Yearly Time of Peak 16 (hr) 6 (mo)

Hour 16 Month 6

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Percnt Of Tot (%)
Cooling Equipment				
1	EQ1121L	AIR-CLD RECIP 35-60 TONS	75.0	41.32
Sub Total			75.0	41.32
Sub Total			0.0	0.00
Air Moving Equipment				
		SUMMATION OF FAN ELECTRICAL DEMAND	15.7	8.67
Sub Total			15.7	8.67
Sub Total			0.0	0.00
Miscellaneous				
Lights			57.2	31.53
Base Utilities			0.0	0.00
Misc Equipment			33.5	18.48
Sub Total			90.8	50.01
Grand Total			181.5	100.00

CALIFORNIA TITLE 24 COMPLIANCE - ALTERNATIVE 1
M184 - ECONOMIZER

---------- CALIFORNIA TITLE 24 COMPLIANCE REPORT ----------

Weather Name ..... ATLANTA.
Gross Conditioned Floor Area (sqft)..... 34,690
ACM Multiplier 1.025

---------- E N E R G Y U S E S U M M A R Y ----------

	ELEC (kWh/yr)	GAS (kBtu/yr)	PERCENT OF TOTAL ENERGY (%)	TOTAL SOURCE ENERGY (kBtu/yr)	ADJUSTED UNIT SOURCE ENERGY (kBtu/yr-sf)
Primary Heating	1,014.8	127,447.1	7.7	144,546.0	4.3
Primary Cooling					
Compressor	49,997.3	0.0	10.0	511,973.6	15.1
Tower/Cond Fans	6,064.0	0.0	1.2	62,095.2	1.8
Condenser Pump	0.0	0.0	0.0	0.0	0.0
Other Accessories	706.2	0.0	0.1	7,231.5	0.2
Auxiliary					
Supply Fans	137,786.0	0.0	27.7	1,410,931.6	41.7
Circulation Pumps	13,895.9	0.0	2.8	142,294.4	4.2
Base Utilities	0.0	0.0	0.0	0.0	0.0
Subtotal	151,681.9	0.0	30.4	1,553,226.0	45.9
Lighting	158,493.3	0.0	31.8	1,622,974.9	46.8
Receptacle	92,865.3	0.0	18.6	950,942.9	27.4
Domestic Hot Water	0.0	0.0	0.0	0.0	0.0
Cogeneration	0.0	0.0	0.0	0.0	0.0
Totals	460,822.7	127,447.1	100.0	4,852,990.0	141.5

[redacted]HLY ENERGY CONSUMPTION - ALTERNATIVE 1
[redacted] - HVAC CONTROLS

---------- M O N T H L Y E N E R G Y C O N S U M P T I O N ----------

Month	ELEC On Peak (kWh)	DEMAND On Peak (kW)	GAS On Peak (Therm)	GAS DMND On Peak (Thrm/hr)
Jan	25,067	109	40	2
Feb	22,660	109	30	2
March	27,031	107	0	1
April	23,836	107	0	0
May	35,423	177	0	0
June	39,080	181	0	0
July	35,773	177	0	0
Aug	39,990	177	0	0
Sept	33,126	173	0	0
Oct	30,949	154	0	0
Nov	23,836	107	0	0
Dec	23,980	109	8	1
Total	360,751	181	78	2

Building Energy Consumption = 35,719 (Btu/Sq Ft/Year)
Source Energy Consumption = 106,727 (Btu/Sq Ft/Year)

Floor Area = 34,690 (Sq Ft)

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
M184 - HVAC CONTROLS

EQUIPMENT ENERGY CONSUMPTION

Ref Num	Equip Code	Monthly Consumption Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	13248	11983	14307	12650	13777	13709	12718	14307	12650	13777	12650	12718	158,493
	PK	57.2	57.2	57.2	57.2	57.2	57.2	57.2	57.2	57.2	57.2	57.2	57.2	57.2
1	MISC LD													
	ELEC	7762	7021	8383	7412	8072	8032	7452	8383	7412	8072	7412	7452	92,865
	PK	33.5	33.5	33.5	33.5	33.5	33.5	33.5	33.5	33.5	33.5	33.5	33.5	33.5
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	EQ1121L	AIR-CLD RECIP 35-60 TONS												
	ELEC	0	0	0	0	7258	10547	9435	10293	7211	3582	0	0	48,326
	PK	0.0	0.0	0.0	0.0	58.5	61.0	58.9	58.8	54.5	37.0	0.0	0.0	61.0
1	EQ5200	CONDENSER FANS												
	ELEC	0	0	0	0	771	1249	1128	1211	813	321	0	0	5,493
	PK	0.0	0.0	0.0	0.0	6.8	7.9	6.7	6.7	6.3	4.8	0.0	0.0	7.9
1	EQ5001	CHILLED WATER PUMP C.V.												
	ELEC	0	0	0	0	1312	1312	1193	1372	1193	984	0	0	7,368
	PK	0.0	0.0	0.0	0.0	5.0	5.0	5.0	5.0	5.0	5.0	0.0	0.0	5.0
1	EQ5313	CONTROLS												
	ELEC	0	0	0	0	79	79	72	83	72	59	0	0	445
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3
1	EQ4003	FC CENTRIF. FAN C.V.												
	ELEC	3964	3586	4341	3775	4152	4152	3775	4341	3775	4152	3775	3775	47,565
	PK	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7

1 EQ4003 FC CENTRIF. FAN C.V.

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
M184 - HVAC CONTROLS

	ELEC	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
1	EQ2001		GAS FIRE TUBE HOT WATER										
	GAS	40	30	0	0	0	0	0	0	0	0	8	78
	PK	1.9	1.9	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	1.9
1	EQ5020		HEAT WATER CIRC. PUMP C.V.										
	ELEC	64	48	0	0	0	0	0	0	0	0	24	135
	PK	2.0	2.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0
1	EQ5240		BOILER FORCED DRAFT FAN										
	ELEC	13	10	0	0	0	0	0	0	0	0	5	29
	PK	0.4	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4
1	EQ5307		BOILER CONTROLS										
	ELEC	16	12	0	0	0	0	0	0	0	0	6	34
	PK	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5

UTILITY PEAK CHECKSUMS - ALTERNATIVE 1
- HVAC CONTROLS

---------- 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 180.7 (kW)
Yearly Time of Peak 16 (hr) 6 (mo)

Hour 16 Month 6

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Percnt Of Tot (%)
Cooling Equipment				
1	EQ1121L	AIR-CLD RECIP 35-60 TONS	74.2	41.05
Sub Total			74.2	41.05
Sub Total			0.0	0.00
Air Moving Equipment				
		SUMMATION OF FAN ELECTRICAL DEMAND	15.7	8.71
Sub Total			15.7	8.71
Sub Total			0.0	0.00
Miscellaneous				
Lights			57.2	31.68
Base Utilities			0.0	0.00
Misc Equipment			33.5	18.56
Sub Total			90.8	50.25
Grand Total			180.7	100.00

CALIFORNIA TITLE 24 COMPLIANCE - ALTERNATIVE 1
M184 - HVAC CONTROLS

CALIFORNIA TITLE 24 COMPLIANCE REPORT

Weather Name ..... ATLANTA.
Gross Conditioned Floor Area (sqft)..... 34,690
ACM Multiplier 1.025

E N E R G Y U S E S U M M A R Y

	ELEC (kWh/yr)	GAS (kBtu/yr)	PERCENT OF TOTAL ENERGY (%)	TOTAL SOURCE ENERGY (kBtu/yr)	ADJUSTED UNIT SOURCE ENERGY (kBtu/yr-sf)
Primary Heating	62.6	7,848.9	0.7	8,902.6	0.3
Primary Cooling					
Compressor	48,325.8	0.0	13.3	494,857.1	14.6
Tower/Cond Fans	5,492.9	0.0	1.5	56,247.2	1.7
Condenser Pump	0.0	0.0	0.0	0.0	0.0
Other Accessories	444.6	0.0	0.1	4,552.7	0.1
Auxiliary					
Supply Fans	47,564.5	0.0	13.1	487,061.7	14.4
Circulation Pumps	7,502.8	0.0	2.1	76,828.4	2.3
Base Utilities	0.0	0.0	0.0	0.0	0.0
Subtotal	55,067.3	0.0	15.2	563,890.0	16.7
Lighting	158,493.3	0.0	43.7	1,622,974.9	46.8
Receptacle	92,865.3	0.0	25.6	950,942.9	27.4
Domestic Hot Water	0.0	0.0	0.0	0.0	0.0
Cogeneration	0.0	0.0	0.0	0.0	0.0
Totals	360,751.7	7,848.9	100.0	3,702,367.8	107.5

M[redacted]Y ENERGY CONSUMPTION - ALTERNATIVE 1
M[redacted] ICE STORAGE

MONTHLY ENERGY CONSUMPTION

Month	ELEC On Peak (kWh)	DEMAND On Peak (kW)	GAS On Peak (Therm)	GAS DMND On Peak (Thrm/hr)
Jan	33,640	107	454	3
Feb	30,356	107	388	3
March	34,718	107	98	2
April	31,386	107	0	0
May	47,367	162	0	0
June	53,660	175	0	0
July	51,816	174	0	0
Aug	54,935	175	0	0
Sept	46,942	169	0	0
Oct	40,282	152	0	0
Nov	31,773	107	61	1
Dec	32,658	107	273	2
Total	489,533	175	1,274	3

Building Energy Consumption = 51,837 (Btu/Sq Ft/Year)
Source Energy Consumption = 148,371 (Btu/Sq Ft/Year)

Floor Area = 34,690 (Sq Ft)

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
M184 - ICE STORAGE

EQUIPMENT ENERGY CONSUMPTION

Ref Num	Equip Code	Monthly Consumption Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	13248	11983	14307	12650	13777	13709	12718	14307	12650	13777	12650	12718	158,493
	PK	57.2	57.2	57.2	57.2	57.2	57.2	57.2	57.2	57.2	57.2	57.2	57.2	57.2
1	MISC LD													
	ELEC	7762	7021	8383	7412	8072	8032	7452	8383	7412	8072	7412	7452	92,865
	PK	33.5	33.5	33.5	33.5	33.5	33.5	33.5	33.5	33.5	33.5	33.5	33.5	33.5
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	EQ1750	AIR-CLD CTV ICE-CHILL H2O												
	ELEC	0	0	0	0	10146	15136	14525	15182	11402	5302	0	0	71,694
	PK	0.0	0.0	0.0	0.0	67.3	69.8	69.5	69.3	67.3	67.3	67.3	0.0	69.8
1	EQ5205	CONDENSER FANS												
	ELEC	0	0	0	0	814	1494	1411	1473	989	305	0	0	6,485
	PK	0.0	0.0	0.0	0.0	5.8	7.6	7.6	7.6	7.4	4.2	3.9	0.0	7.6
1	EQ5001	CHILLED WATER PUMP C.V.												
	ELEC	0	0	0	0	2376	3301	3336	3236	2635	935	0	0	15,819
	PK	0.0	0.0	0.0	0.0	5.0	5.0	5.0	5.0	5.0	5.0	0.0	0.0	5.0
1	EQ5309	CONTROLS												
	ELEC	0	0	0	0	478	664	671	651	530	188	0	0	3,182
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0
1	EQ4003	FC CENTRIF. FAN C.V.												
	ELEC	11702	10570	11702	11325	11702	11325	11702	11702	11325	11702	11325	11702	137,786
	PK	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7

1 EQ4003 FC CENTRIF. FAN C.V.

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
M184 - ICE STORAGE

	ELEC	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
1	EQ2001		GAS FIRE TUBE HOT WATER										
	GAS	454	388	98	0	0	0	0	0	0	61	273	1,274
	PK	2.6	2.6	1.9	0.0	0.0	0.0	0.0	0.0	0.0	1.5	2.2	2.6
1	EQ5020		HEAT WATER CIRC. PUMP C.V.										
	ELEC	634	535	223	0	0	0	0	0	0	264	537	2,193
	PK	2.0	2.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	2.0
1	EQ5240		BOILER FORCED DRAFT FAN										
	ELEC	134	113	47	0	0	0	0	0	0	56	113	463
	PK	0.4	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.4
1	EQ5307		BOILER CONTROLS										
	ELEC	159	134	56	0	0	0	0	0	0	67	135	551
	PK	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5	0.5

[redacted]ITY PEAK CHECKSUMS - ALTERNATIVE 1
[redacted] - ICE STORAGE

---------- 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 175.2 (kW)
Yearly Time of Peak 12 (hr) 6 (mo)

Hour 12 Month 6

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Percnt Of Tot (%)
Cooling Equipment				
1	EQ1750	AIR-CLD CTV ICE-CHILL H2O	68.7	39.20
Sub Total			68.7	39.20
Sub Total			0.0	0.00
Air Moving Equipment				
[redacted]		SUMMATION OF FAN ELECTRICAL DEMAND	15.7	8.98
Sub Total			15.7	8.98
Sub Total			0.0	0.00
Miscellaneous				
Lights			57.2	32.67
Base Utilities			0.0	0.00
Misc Equipment			33.5	19.15
Sub Total			90.8	51.82
Grand Total			175.2	100.00

CALIFORNIA TITLE 24 COMPLIANCE - ALTERNATIVE 1
M184 - ICE STORAGE

---------- CALIFORNIA TITLE 24 COMPLIANCE REPORT ----------

Weather Name ..... ATLANTA.
Gross Conditioned Floor Area (sqft)..... 34,690
ACM Multiplier 1.025

---------- E N E R G Y U S E S U M M A R Y ----------

	ELEC (kWh/yr)	GAS (kBtu/yr)	PERCENT OF TOTAL ENERGY (%)	TOTAL SOURCE ENERGY (kBtu/yr)	ADJUSTED UNIT SOURCE ENERGY (kBtu/yr-sf)
Primary Heating	1,014.8	127,447.1	7.3	144,546.0	4.3
Primary Cooling					
Compressor	71,694.0	0.0	13.6	734,148.2	21.7
Tower/Cond Fans	6,485.4	0.0	1.2	66,410.2	2.0
Condenser Pump	0.0	0.0	0.0	0.0	0.0
Other Accessories	3,182.0	0.0	0.6	32,583.8	1.0
Auxiliary					
Supply Fans	137,786.0	0.0	26.2	1,410,931.6	41.7
Circulation Pumps	18,012.2	0.0	3.4	184,445.3	5.4
Base Utilities	0.0	0.0	0.0	0.0	0.0
Subtotal	155,798.2	0.0	29.6	1,595,376.7	47.1
Lighting	158,493.3	0.0	30.1	1,622,974.9	46.8
Receptacle	92,865.3	0.0	17.6	950,942.9	27.4
Domestic Hot Water	0.0	0.0	0.0	0.0	0.0
Cogeneration	0.0	0.0	0.0	0.0	0.0
Totals	489,532.9	127,447.1	100.0	5,146,983.0	150.2

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 1
M184 - ECO#15

M O N T H L Y E N E R G Y C O N S U M P T I O N

Month	ELEC On Peak (kWh)	DEMAND On Peak (kW)	GAS On Peak (Therm)	GAS DMND On Peak (Thrm/hr)
Jan	31,262	96	502	3
Feb	28,262	96	433	3
March	32,053	96	116	2
April	29,010	96	0	0
May	40,652	153	0	0
June	46,389	167	0	0
July	44,740	163	0	0
Aug	47,460	164	0	0
Sept	40,033	160	0	0
Oct	34,750	141	0	0
Nov	29,437	96	81	2
Dec	30,347	96	307	2
Total	434,395	167	1,438	3

Building Energy Consumption = 46,885 (Btu/Sq Ft/Year)
Source Energy Consumption = 132,592 (Btu/Sq Ft/Year)

Floor Area = 34,690 (Sq Ft)

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
M184 - ECO#15

EQUIPMENT ENERGY CONSUMPTION

Ref Num	Equip Code	Monthly Consumption Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	10759	9732	11619	10273	11189	11133	10329	11619	10273	11189	10273	10329	128,716
	PK	46.5	46.5	46.5	46.5	46.5	46.5	46.5	46.5	46.5	46.5	46.5	46.5	46.5
1	MISC LD													
	ELEC	7762	7021	8383	7412	8072	8032	7452	8383	7412	8072	7412	7452	92,865
	PK	33.5	33.5	33.5	33.5	33.5	33.5	33.5	33.5	33.5	33.5	33.5	33.5	33.5
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
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	EQ1121L	AIR-CLD RECIP 35-60 TONS												
	ELEC	0	0	0	0	6461	11193	10507	11064	7489	2661	0	0	49,376
	PK	0.0	0.0	0.0	0.0	48.0	57.8	55.7	56.6	52.8	35.0	0.0	0.0	57.8
1	EQ5200	CONDENSER FANS												
	ELEC	0	0	0	0	755	1384	1318	1361	898	250	0	0	5,966
	PK	0.0	0.0	0.0	0.0	5.6	7.9	6.4	6.5	6.1	4.6	0.0	0.0	7.9
1	EQ5001	CHILLED WATER PUMP C.V.												
	ELEC	0	0	0	0	2332	3132	3236	3142	2486	825	0	0	15,153
	PK	0.0	0.0	0.0	0.0	5.0	5.0	5.0	5.0	5.0	5.0	0.0	0.0	5.0
1	EQ5313	CONTROLS												
	ELEC	0	0	0	0	141	189	195	190	150	50	0	0	914
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3
1	EQ4003	FC CENTRIF. FAN C.V.												
	ELEC	11702	10570	11702	11325	11702	11325	11702	11702	11325	11702	11325	11702	137,786
	PK	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
M184 - ECO#15

1	EQ4003		FC CENTRIF. FAN C.V.										
	ELEC	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
1	EQ2001		GAS FIRE TUBE HOT WATER										
	GAS	502	433	116	0	0	0	0	0	0	81	307	1,438
	PK	2.6	2.6	1.9	0.0	0.0	0.0	0.0	0.0	0.0	1.6	2.2	2.6
1	EQ5020		HEAT WATER CIRC. PUMP C.V.										
	ELEC	710	642	239	0	0	0	0	0	0	292	591	2,474
	PK	2.0	2.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	2.0
1	EQ5240		BOILER FORCED DRAFT FAN										
	ELEC	150	136	50	0	0	0	0	0	0	62	125	522
	PK	0.4	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.4
1	EQ5307		BOILER CONTROLS										
	ELEC	178	161	60	0	0	0	0	0	0	73	149	622
	PK	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5	0.5

UTILITY PEAK CHECKSUMS - ALTERNATIVE 1
M184 - ECO#15

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 166.6 (kW)
Yearly Time of Peak 16 (hr) 6 (mo)

Hour 16 Month 6

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Percnt Of Tot (%)
Cooling Equipment				
1	EQ1121L	AIR-CLD RECIP 35-60 TONS	70.9	42.54
Sub Total			70.9	42.54
Sub Total			0.0	0.00
Air Moving Equipment				
1		SUMMATION OF FAN ELECTRICAL DEMAND	15.7	9.44
Sub Total			15.7	9.44
Sub Total			0.0	0.00
Miscellaneous				
Lights			46.5	27.90
Base Utilities			0.0	0.00
Misc Equipment			33.5	20.13
Sub Total			80.0	48.02
Grand Total			166.6	100.00

CALIFORNIA TITLE 24 COMPLIANCE - ALTERNATIVE 1
M184 - ECO#15

CALIFORNIA TITLE 24 COMPLIANCE REPORT

Weather Name ..... ATLANTA.
Gross Conditioned Floor Area (sqft)..... 34,690
ACM Multiplier 1.025

E N E R G Y U S E S U M M A R Y

	ELEC (kWh/yr)	GAS (kBtu/yr)	PERCENT OF TOTAL ENERGY (%)	TOTAL SOURCE ENERGY (kBtu/yr)	ADJUSTED UNIT SOURCE ENERGY (kBtu/yr-sf)
Primary Heating	1,144.5	143,680.8	9.1	163,132.8	4.8
Primary Cooling					
Compressor	49,375.5	0.0	10.4	505,606.3	14.9
Tower/Cond Fans	5,966.5	0.0	1.3	61,096.9	1.8
Condenser Pump	0.0	0.0	0.0	0.0	0.0
Other Accessories	914.4	0.0	0.2	9,363.5	0.3
Auxiliary					
Supply Fans	137,786.0	0.0	28.9	1,410,931.6	41.7
Circulation Pumps	17,626.4	0.0	3.7	180,494.9	5.3
Base Utilities	0.0	0.0	0.0	0.0	0.0
Subtotal	155,412.4	0.0	32.6	1,591,426.5	47.0
Lighting	128,715.8	0.0	27.0	1,318,053.0	38.0
Receptacle	92,865.3	0.0	19.5	950,942.9	27.4
Domestic Hot Water	0.0	0.0	0.0	0.0	0.0
Cogeneration	0.0	0.0	0.0	0.0	0.0
Totals	434,394.4	143,842.6	100.0	4,599,622.0	134.3

BUILDING 200

E M C ENGINEERS, INC.

PROJECT: FORT McPHERSON & FORT GILLEM ESOS STUDY
LOCATION: FORT McPHERSON
ECO: Computer Simulation Summary

CLIENT CONTRACT NO: DACA21-91-C-0097
CLIENT PROJECT ENG: TERRY SEABROOK

EMC PROJECT: #3105.000
DATE: 04/09/92
FILE: M200ECO
PRPARED BY: DENNIS JONES
CHECKED BY:

Bldg: M200 Area: 274,244 ft^2

Run Description	Heating Gas Use (kBtu/yr)	Heating Electric Use (kWh/yr)	Cooling Electric Use (kWh/yr)	Fan Electric Use (kWh/yr)	Pump Electric Use (kWh/yr)	Lighting Electric Use (kWh/yr)	Receot. Electric Use (kWh/yr)	Total Electric Use (kWh/yr)	Peak Electric Demand (kW)	Total Gas Use (MBtu/yr)	Total Energy Use (MBtu/yr)
Baseline	0	22,773	3,538,947	3,261,616	716,492	4,140,593	2,952,151	14,632,572	3,188	0	49,941
Reduced Ventilation	0	20,688	3,543,461	3,261,616	717,486	4,140,593	2,952,151	14,635,995	3,188	0	49,953
Savings (Loss)	0	2,085	(4,514)	0	(994)	0	0	(3,423)	0	0	(12)
Ice Storage	0	22,773	3,400,663	3,261,616	716,492	4,140,593	2,952,151	14,494,288	~~1,713~~ 2515	0	49,469
Savings (Loss)	0	0	138,284	0	0	0	0	138,284	1,475	0	472
Lighting Controls	0	28,559	3,451,761	3,205,009	715,523	3,518,059	2,952,151	13,871,062	3,025	0	47,342
Savings (Loss)	0	(5,786)	87,186	56,607	969	622,534	0	761,510	163	0	2,599

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____

SHEET NO. _____ OF _____

CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____

SCALE _____

B-22 ECO 2

IENTILATION

DDC VENTILATION RATE TO 5 [illegible] 6pm TO 6 a.m.

<VENT 22>

2	0
4	[illegible]
6	[illegible]
18	[illegible]
21	0

ALT - 3

CHILLER YORK YT-L3L3-E3 CWA 750 TONS

0.672 KW/TON BASELINE

[illegible] " ICE STOR

~~4000~~ TON HRS

BUILDING 200 FAN DATA
EMC PROJECT: #3105.000
DATE: 03/19/92
FILE: M200.WK3
PRPARED BY: DENNIS JONES
CHECKED BY:

	SUPPLY FAN			SPECIFIED MEASURED		RETURN FAN		
COOLING UNIT	TOTAL CFM	EXTERNAL STATIC	TOTAL STATIC	OSA CFM	OSA CFM	TOTAL CFM	EXTERNAL STATIC	COOLING CAPAC
FIRST FLOOR								
AHU-1	13,525	5.40	6.40	1,915	2,692	14,780	3.10	477
4	13,710	6.60	7.60	1,090	0	12,200	3.20	401
7	16,680	5.90	6.90	2,150	1,417	15,060	3.10	515
10	18,010	4.90	5.90	2,440	3,435	17,025	2.80	519
17	1,910	2.80	3.80	125	0	1,590	2.10	47
	63,835			7,720	7,544	60,655		1,959
SECOND FLOOR								
AHU-2	13,525	5.40	6.40	1,410	2,692	12,875	2.70	412
5	19,795	5.30	6.30	1,945	478	18,105	3.00	582
8	19,750	5.80	6.80	2,200	814	17,920	3.00	599
11	19,730	5.10	6.10	2,095	3,010	18,670	2.60	595
	72,800			7,650	6,994	67,570		2,188
THIRD FLOOR								
AHU-3	18,350	4.90	5.90	2,200	265	17,445	2.80	632
6	20,590	5.90	6.90	2,575	2,656	18,920	2.70	676
9	15,370	5.60	6.60	2,220	915	13,690	2.80	520
12	22,240	6.70	7.70	2,200	2,904	21,215	2.70	730
	76,550			9,195	6,740	71,270		2,558
BASEMENT								
AHU-13	2,040	3.40	4.40	2,040	2,040	245	2.10	88
14	53,465	6.70	7.70	5,570	3,465	29,850	3.40	1,178
15	24,075	5.50	6.50	3,540	744	23,245	3.20	954
16	2,040	4.70	5.70	2,040	2,040	1,856	1.70	88
	81,620			13,190	8,289	55,196		2,308
BLDG TOTALS	294,805			37,755	29,567	254,691		9,013

BUILDING 200 FAN DATA
EMC PROJECT: #3105.000
DATE: 03/19/92
FILE: M200.WK3
PRPARED BY: DENNIS JONES
CHECKED BY:

	SUPPLY FAN			SPECIFIED MEASURED		RETURN FAN		
COOLING UNIT	TOTAL CFM	EXTERNAL STATIC	TOTAL STATIC	OSA CFM	OSA CFM	TOTAL CFM	EXTERNAL STATIC	COOLING CAPAC
BASEMENT COMPUTER ROOMS								
AC-1	12,000	0.50	1.50	0				103
2	12,000	0.50	1.50	0				103
3	12,000	0.50	1.50	0				103
4	12,000	0.50	1.50	0				103
5	12,000	0.50	1.50	0				103
6	12,000	0.50	1.50	0				103
7	12,000	0.50	1.50	0				103
8	12,000	0.50	1.50	0				103
9	12,000	0.50	1.50	0				103
10	12,000	0.50	1.50	0				103
11	12,000	0.50	1.50	0				103
12	12,000	0.50	1.50	0				103
13	12,000	0.50	1.50	0				103
14	3,000	0.50	1.50	0				15
15	3,000	0.50	1.50	0				15
16	3,000	0.50	1.50	0				15
17	3,000	0.50	1.50	0				33
18	3,000	0.50	1.50	0				33
19	600	0.25	1.25	0				8
20	600	0.25	1.25	0				8
21	3,000	0.50	1.50	0				13
22	3,000	0.50	1.50	0				13
23	3,000	0.50	1.50	0				16
24	3,000	0.50	1.50	0				16
25	9,000	0.50	1.50	0				104
26	9,000	0.50	1.50	0				104
27	9,000	0.50	1.50	0				104
28	9,000	0.50	1.50	0				104
29	9,000	0.50	1.50	0				104
30	9,000	0.50	1.50	0				104
31	9,000	0.25	1.25	0				104
32	800	0.25	1.25	0				11
33	800	0.25	1.25	0				11
34	9,000	0.50	1.50	0				123
35	9,000	0.50	1.50	0				123
36	9,000	0.50	1.50	0				123
37	12,000	0.50	1.50	0				200
38	12,000	0.50	1.50	0				200
39	12,000	0.50	1.50	0				200
40	12,000	0.50	1.50	0				200
41	12,000	0.50	1.50	0				200
42	12,000	0.50	1.50	0				200
43	12,000	0.50	1.50	0				158
44	12,000	0.50	1.50	0				158
45	12,000	0.50	1.50	0				158
46	12,000	0.50	1.50	0				158
47	3,000	0.50	1.50	0				41
48	3,000	0.50	1.50	0				41
49	3,000	0.50	1.50	0				41
50	6,000	0.50	1.50	0				29
51	9,000	0.50	1.50	0				104
52	3,000	0.50	1.50	0				36
53	3,000	0.50	1.50	0				36
54	6,000	0.50	1.50	0				91
55	6,000	0.50	1.50	0				91
56	6,000	0.50	1.50	0				91
57	6,000	0.50	1.50	0				91
58	6,000	0.50	1.50	0				91
59	6,000	0.50	1.50	0				91
60	6,000	0.50	1.50	0				91
61	6,000	0.50	1.50	0				91
62	6,000	0.50	1.50	0				91
63	6,000	0.50	1.50	0				91
64	6,000	0.50	1.50	0				91
65	6,000	0.50	1.50	0				91
66	6,000	0.50	1.50	0				91
67	3,000	0.50	1.50	0				35
68	3,000	0.50	1.50	0				35
69	3,000	0.50	1.50	0				24
70	3,000	0.50	1.50	0				24
71	3,000	0.50	1.50	0				40
72	3,000	0.50	1.50	0				40
73	3,000	0.50	1.50	0				28
74	3,000	0.50	1.50	0				28
75	3,000	0.50	1.50	0				40
76	3,000	0.50	1.50	0				40
	533,800							6,320

JOB

SHEET NO. OF

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

CALCULATED BY DATE

CHECKED BY DATE

SCALE

COOLING EQUIPMENT

[illegible] TYPE = TABVAV

VENTILATION 1800 PEOPLE

SPECIFIED 37,755 CFM

MEASURED 29,557 CFM (78%) [illegible] LOW

37,755/1800 = 21 CFM/PERSON USE 20 CFM/PERSON

SUPPLY FANS 71,060 cfm/68,544 ft² = 1.04 cfm/ft²

UPPER FLOORS

BASEMENT AHUs 81,520 cfm/34,300 ft² = 2.38 cfm/ft² BASE

ACs 533,[illegible] " /34,300 ft² = 15.56 " COMPUTER

FAN SELECT [illegible] TO [illegible] / FAN200

CHILLER

(3) CENTRIFUGALS

COOL 1285 GPM FROM 56°F TO 42°F

WITH 85°F CONDENSER ENT

CAPACITY 1285 × 500 (56−42) = 9,000,000 Btuh

@ 750 tons

CQ1001L CENTRIFUGAL > 555 tons

0.748 kW/ton

PUMPS

CHILLED WATER

(1) 30 HP } OPERATING

(1) 50 HP }

CONDENSER

(1) 75 HP

HEATING

(2) 10 HP

JOB 955.003

SHEET NO. ______ OF ______

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

CALCULATED BY [signature] DATE 2/25/93

CHECKED BY ______ DATE ______

SCALE 1"=200

INTERNAL HEAT GAIN

PEOPLE

TYPICAL 8-5 SCHEDULE 1700 PEOPLE/3 = 567/FLOOR

BASEMENT 24 HRS 100 PEOPLE

USE 250 BTUH SENSIBLE
200 LATENT

DENSITY 68,544 ft²/567 = 120 ft²/PERSON

EQUIPMENT PER PERSON

	%	WATTS	WATTS/PERS
PC	100	200	200
PRINTER	25	100	25
COPIER	5	600	30
COFFEE	5	260	13
...	5	200	10

278/120 ft² → 2.32 W/SF

PPL 1

LIGHTS - OVERHEAD

... FIXTURES IN 24×24 = 576 ft² } 1.88 W/SF
... WATTS/FIXT → 1080 WATTS

600.6 KW / 274,200 ft² → 2.19 W/SF ←

TASK

(2) 40 (WITH BALLAST) = 80 W / 120 ft² → 0.67 W/SF ←

TOTAL LIGHTING 2.86 W/SF

OUTDOOR

5.6 KW TOTAL

SHED 600-2200 200

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB

SHEET NO. OF

CALCULATED BY DATE

CHECKED BY DATE

SCALE 17 2[illegible]

HEAT PUMP

HEAT RECOVERY CAPACITY = HEATING CAPACITY @ [illegible]°F / [illegible] @ [illegible]°F

ENERGY RATE [illegible] MBH [illegible] COOLING / KW/MBH HEATING

FROM MECH. PLANS

320 gpm [illegible] gpm

[illegible]°F 95°F

1600 MBH HEAT PUMP 2800 MBH

55°F 130°F

POWER = 2800 − 1600 = 1200 MBH = 352 KW

CASE 6?

HEAT RECOVERY CAPACITY = 2800 MBH

ENERGY RATE = 352 KW

[illegible] SURVEY

[illegible]56 MBH OUT

99 KW

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

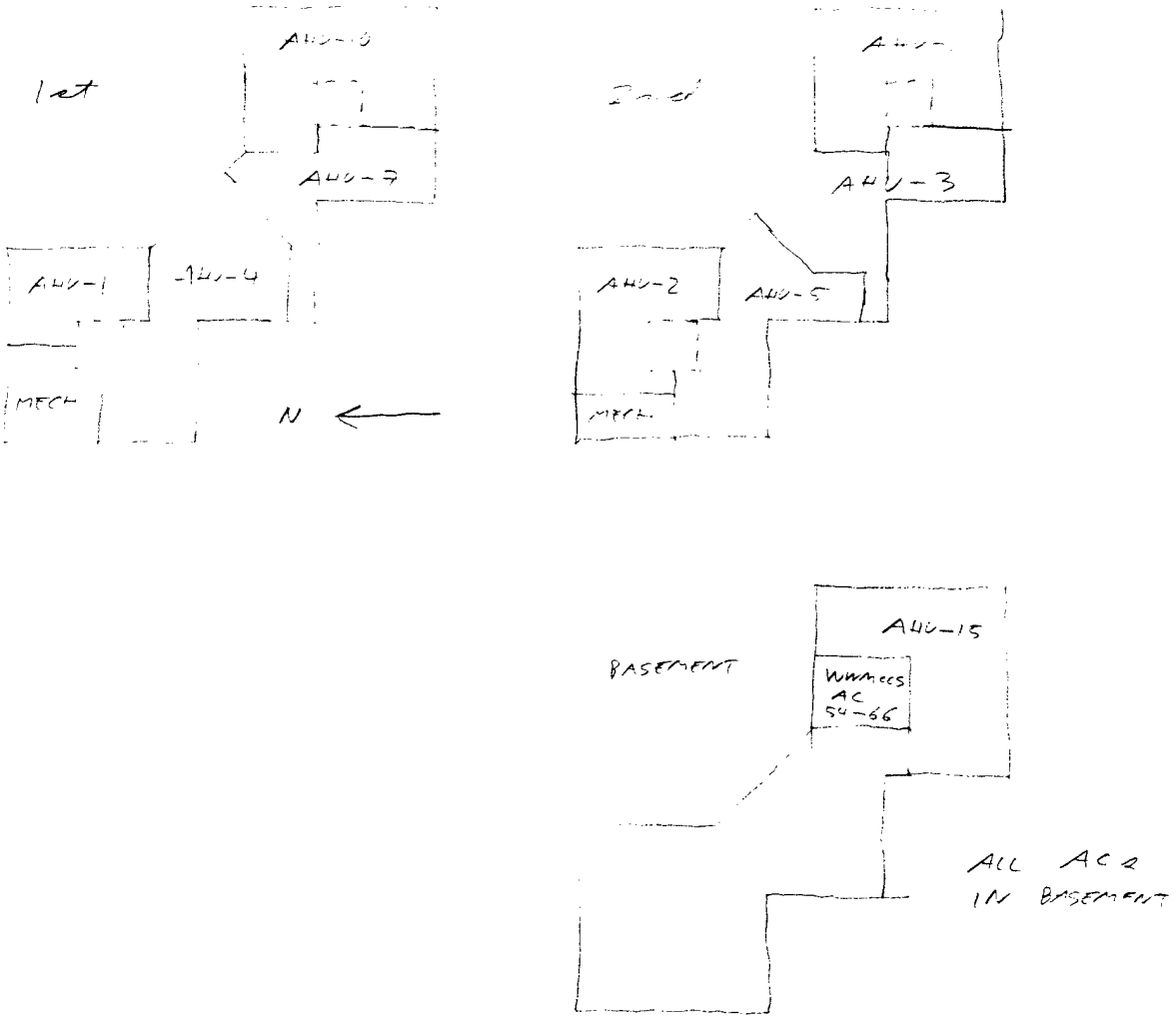
JOB 3105.000

SHEET NO. _____ OF _____

CALCULATED BY DS DATE 3/29/82

CHECKED BY _____ DATE _____

SCALE 1" = 200'



TOO COMPLEX TO ZONE AS SHOWN

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB 3125.000

SHEET NO. ____ OF ____

CALCULATED BY DB DATE 2/25/92

CHECKED BY ____ DATE ____

SCALE M200

TRACE-600 INPUT

UPPER FLOORS

SYSTEM TERMINAL AIR BLENDER VAV [TABVAV]

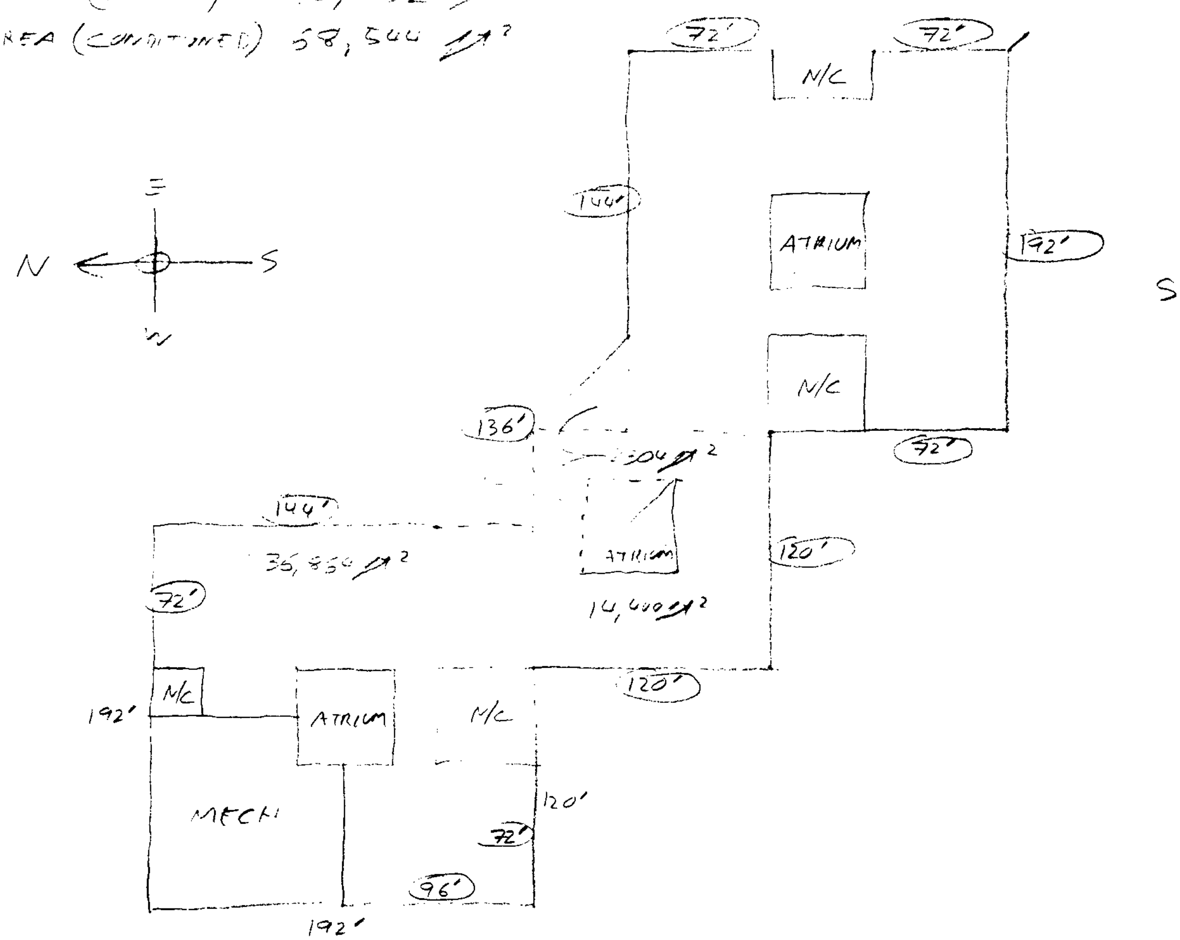
MODEL AS 3 DUPLICATE FLOORS

PERIMETER ZONES ARE 4 FT DEEP

PERIMETER (CONDITIONED) 1312 FT

AREA (GROSS) 90,432 FT²

AREA (CONDITIONED) 58,544 FT²



ZONE	PERIM	AREA
NORTH	216 FT	864
EAST	424	1696
SOUTH	384	1536
WEST	288	1152
CORE	—	63,276
BASEMENT	1312	68,544

DUPLICATE FLOORS (North through Core)

68,544 × 3 FLOORS = 205,632 FT²

68,544

[274,200 FT²]

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

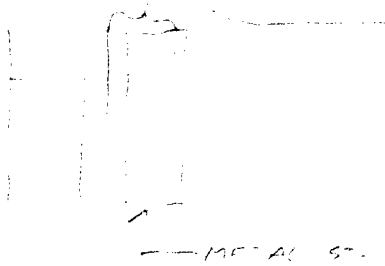
JOB 3195.000
SHEET NO. ____ OF ____
CALCULATED BY DB DATE 2/25/92
CHECKED BY ____ DATE ____
SCALE NTS

TABLE 5 WALLS

U-VALUES

WALL

OUTER FILM		0.25
FACE BRICK	6"	0.80
FOAM CORE	2"	10.0 (POLYSTYR.)
AIR SPACE	4"	1.01
GYP BOARD	5/8"	0.56
INNER FILM		0.68
		13.31



U = 0.076

UNDER GROUND WALL

CONC	14"	1.40
AIR SPACE	7/8"	1.01
GYP BOARD	5/8"	0.56
INNER FILM		0.68
		3.65

U = 0.27

ROOF

OUTER FILM		0.25
BUILT UP ROOFING		0.33
INSULATING CONC	1"	0.23
INSULATION BOARD	4"	16.00 (FG BOARD)
4" CONC		0.40
INNER FILM		0.92
		18.13

U = 0.055

GLASS

1" INSULATING WITH OUTER LAYER

THRE-C ALUM FRAME W/ THERMAL BREAK

U = 0.59
SC = 0.58

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • Germany

JOB _____

SHEET NO. _____ OF _____

CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____

SCALE _____

THERMAL STORAGE DEMAND SAVINGS

CHILLER — 598 KW
COND W. PUMP — 75 KW
673 KW

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB
SHEET NO. OF
CALCULATED BY JW DATE 2/25/92
CHECKED BY DATE
SCALE

FT. MAC.

BLDG 200 EXTERIOR LIGHTING

QUANTITY	WATTS/FIX	TOTAL WATTS
36	100 (MERC. VAPOR)	3600
8	250 (MET. HALIDE)	~~1750~~ 2000
	TOTAL	5.6kW

BUILDING–M184 TRACE–600 INPUT DATA

EMC PROJECT: #3105.000
DATE: 02/21/92
FILE:
PREPARED BY: DENNIS JONES
CHECKED BY:

DUPLICATE ICONS

	CARD DESCRIPTION	1	2	3	4	5	6	7			
20	ROOM NUMBER	1	2	3	4	5	6	7			
	ROOM DESCRIPTION	NORTH	EAST	SOUTH	WEST	CORE	BASEMENT	COMPUTER			
	FLOOR LENGTH	216	424	384	288	633		—			
	FLOOR WIDTH	4	4	4	4	100		—			
	CONSTRUCTION TYPE	6"	CONC					—			
21	PLENUM HEIGHT	5.5'	→				3.5	—			
	FLOOR-TO-FLOOR HEIGHT	9					20	—			
	DESIGN COOLING DRY BULB	76									
	COOLING THERMOSTAT SCHEDULE	ON									
	DESIGN HEATING DRY BULB	42									
	HEATING THERMOSTAT SCHEDULE	ON									
	CARPET?	YES									
22	ROOF NUMBER	1	2	3	4	5	—	—			
	ROOF AREA = FLOOR AREA?	YES									
	ROOF LENGTH	—									
	ROOF WIDTH	—									
	ROOF U-VALUE	0.055	→				—	—			
	ROOF TYPE/DESCRIPTION	4" CONC									
	ROOF DIRECTION	—									
	ROOF TILT	90°									
	ROOF ALPHA	MED									
24	WALL NUMBER	1	1 2	1	1	1	1				
	WALL LENGTH	216	288 136			—	1312				
	WALL WIDTH	15.5	→			—	23.5				
	WALL U-VALUE	0.076	—			—	0.27				
	WALL TYPE/DESCRIPTION	8" CONC					UD6				
	WALL DIRECTION	0	90 45	180	270						
	WALL ALPHA	MED									
25	GLASS LENGTH	216	288 136	384	288	633	—				
	GLASS HEIGHT	5'	→				—				
	NUMBER OF WINDOWS	1	→				—				
	GLASS U-VALUE	0.59	→				—	—			
	SHADING COEFFICIENT	0.58	→				—	—			
26	SCHEDULES							—			
	PEOPLE	OFFICE						24HRS			
	LIGHTS	11						11			
	VENTILATION	AVAL									
	INFILTRATION	—									
	COOLING FAN	ALAS									
	HEATING FAN										
27	PEOPLE HEAT GAIN	100 BTU/HR PERSON					50	50			
	PEOPLE SENSIBLE	25									
	PEOPLE LATENT	75									
	LIGHTING HEAT GAIN	~~2.55~~ 1.5	11								
28	EQUIPMENT HEAT GAIN	2.2	11								
	EQUIPMENT SCHEDULE	OFFICE						24HRS			
	ENERGY METER CODE	ELECTRIC									
29	VENTILATION COOLING RATE	.119 CFM/FT²					.192	.192			
	VENTILATION HEATING RATE	11					11				
	INFILTRATION COOLING RATE	—									
	INFILTRATION HEATING RATE	—									
30	COOLING AIRFLOW	1.04 CFM/FT²					2.38	15.56			
	HEATING AIRFLOW	—					—	—			
	EXHAUST AIRFLOW	0					0	0			
32	PERIMETER LENGTH	—									
	PERIMETER LOSS COEFFICIENT	—									
40	SYSTEM SET NUMBER	1						2			
	SYSTEM TYPE	TABVAV						FC			
	VENTILATION DECK LOCATION	ROOF						DUCT			
	COOLING SCHEDULE										
	HEATING SCHEDULE										
42	COOLING FAN STATIC PRESSURE	6.5						1.5			
	~~HEATING~~ FAN STATIC PRESSURE	3.0						—			
44	ECONOMIZER TYPE	DRY BULB						NONE			
	ECONOMIZER ON POINT	65									
	MAXIMUM % OUTSIDE AIR	100									
62	COOLING EQUIPMENT CODE NAME	EQ1001L									
	COOLING CAPACITY	2250	TONS								
	ENERGY RATE	0.745	KW/TON								
	CHILLED WATER PUMP CONSUMPTION	5375 GPM	2	90'							
	CONDENSER PUMP CONSUMPTION	4500 11		100'							
67	HEATING EQUIPMENT CODE NAME										
	HOT WATER PUMP CONSUMPTION	76 11		75'							
69	COOLING FAN CODE	CTC-4									
	HEATING FAN CODE	1									

01 Card - Job Information

Project: FORT MCPHERSON & GILLEM EEAP #3105.000
Location: ATLANTA
Client: COE - DACA21-9-C-0097
Program User: DENNIS JONES
Comments: BUILDING 200 - FORT MCPHERSON

-----CARD 08-- Climatic Information

Weather Code	Summer Clearness Number	Winter Clearness Number	Summer Design Dry Bulb	Summer Design Wet Bulb	Winter Design Dry Bulb	Building Orientation	Summer Ground Reflect	Winter Ground Reflect
ATLANTA								

---------- Load Section Alternative #1 ----------

---- Load Alternative ----

Number	Description
1	BASELINE

-----CARD 20-- General Room Parameters

Room Number	Zone Reference Number	Room Descrip	Floor Length	Floor Width	Const Type	Plenum Height	Acoustic Ceiling Resistance	Floor to Floor Height	Duplicate Floors Multiplier	Duplicate Rooms per Zone	Perimeter Depth
1	1	NORTH ZONES	216	4		5		14	3		
2	2	EAST ZONES	424	4		5		14	3		
3	3	SOUTH ZONES	384	4		5		14	3		
4	4	WEST ZONES	288	4		5		14	3		
5	5	CORE ZONES	633	100		5		14	3		
6	6	BASEMENT	34.3	1000		5		14			
7	7	BASEMENT COMPUTE	34.3	1000		5		14			

-----CARD 21-- Thermostat Parameters

Room Number	Cooling Room Design DB	Room Design RH	Cooling T'stat Driftpoint	Cooling T'stat Schedule	Heating Room Design DB	Heating T'stat Driftpoint	Heating T'stat Schedule	T'stat Location Flag	Mass / No. Hrs Average	Carpet On Floor
1	76			CLG76	72	65	HTG72			

-----CARD 22-- Roof Parameters ----------

Room Number	Roof Number	Roof Equal to Floor?	Roof Length	Roof Width	Roof U-Value	Const Type	Roof Direction	Roof Tilt	Roof Alpha
1	1	YES			0.055	11			0.45
2	1	YES			0.055	11			0.45
3	1	YES			0.055	11			0.45
4	1	YES			0.055	11			0.45
5	1	YES			0.055	11			0.45

-----CARD 23-- Skylight Parameters----------

Room Number	Roof Number	Skylight Length	Skylight Width	Pct Glass or No. of Windows	Skylight U-Value	Shading Coefficient	External Shading Type	Internal Shading Type	Percent Solar to Ret. Air	Visible Transmittance	Inside Visible Reflectance
5	1	24	24	1	0.59	0.58					

-----CARD 24-- Wall Parameters ----------

Room Number	Wall Number	Wall Length	Wall Height	Wall U-Value	Wall Constuc Type	Wall Direction	Wall Tilt	Wall Alpha	Ground Reflectance Multiplier
1	1	216	15.5	0.076	58	0		0.68	
2	1	288	15.5	0.076	58	90		0.68	
2	2	136	15.5	0.076	58	45		0.68	
3	1	384	15.5	0.076	58	180		0.68	
4	1	288	15.5	0.076	58	270		0.68	

-----CARD 25-- Wall/Glass Parameters ----------

Room Number	Wall Number	Glass Length	Glass Width	Pct Glass or No. of Windows	Glass U-Value	Shading Coefficient	External Shading Type	Internal Shading Type	Percent Solar to Ret. Air	Visible Transmittance	Inside Visible Reflectance
1	1	216	5	1	0.59	0.58					
2	1	288	5	1	0.59	0.58					
2	2	136	5	1	0.59	0.58					
3	1	384	5	1	0.59	0.58					
4	1	288	5	1	0.59	0.58					

-----CARD 26-- Schedules ----------

Room Number	People	Lights	Ventilation	Infiltration	Reheat Minimum	Cooling Fans	Heating Fan	Auxiliary Fan	Room Exhaust	Daylighting Controls
M1	PPL1	LGT200	FAN200			FAN200	FAN200		AVAIL	
7	AVAIL	AVAIL	AVAIL			AVAIL	AVAIL		AVAIL	

-----CARD 27-- People and Lights ----------

Room Number	People Value	People Units	People Sensible	People Latent	Lighting Value	Lighting Units	Lighting Fixture Type	Ballast Factor	Percent Lights to Ret. Air	--- Daylighting ---- Reference Point 1	Reference Point 2
M1	120	SF-PERS	250	200	2.86	WATT-SF		1			

-----CARD 28--- Miscellaneous Equipment ----------

Room Number	Misc Equipment Number	Equipment Descrip	Energy Consump Value	Energy Consump Units	Schedule Code	Energy Meter Code	Percent of Load Sensible	Percent Misc. Load to Room	Percent Misc. Sens to Ret. Air	Radiant Fraction	Optional Air Path
M1	1	GENERAL OFFICE	1.40	WATT-SF	LGT1	ELEC					
7	1	GENERAL OFFICE	1.40	WATT-SF	AVAIL	ELEC					
7	2	COMPUTERS	180	KW	AVAIL	ELEC	100				
7	3	OUTDOOR LIGHTS	5.6	KW	OUTLITE	ELEC	0				

-----CARD 29--- Room Airflows ----------

Room Number	Ventilation -----Cooling----- Value	Units	-----Heating----- Value	Units	Infiltration -----Cooling----- Value	Units	-----Heating----- Value	Units	--Reheat Minimum-- Value	Units
M1	20	CFM-P	20	CFM-P						
2	0.119	CFM-SF	0.119	CFM-SF						

-----CARD 30- Fan Airflows ----------

Room Number	Main ----Cooling---- Value	Units	----Heating---- Value	Units	Auxiliary ----Cooling---- Value	Units	----Heating---- Value	Units	--Room Exhaust-- Value	Units
M1										
7	15.56	CFM-SF	15.56	CFM-SF						

-----CARD 31-- Partition Parameters ----------

Room Number	Partition Number	Partition Length	Partition Height	Partition U-Value	Const Type	Temp Flag	Cooling Temp	Heating Temp	Adjacent Room No
6	1	1312	23.5	0.27	108	SINE-FIT	65	55	

-----CARD 32-- Exposed Floor Parameters----------

Room Number	Exposed Floor Number	-----Slab------ Perimeter Length	Loss Coefficient	Exposed Floor Area	Floor U-Value	Const Type	Temp Flag	Cooling Temp	Heating Temp	Adjacent Room No
6	1									

---------- System Section Alternative #1 ----------

-----CARD 39-- System Alternative -----

Number	Description
1	BASELINE

-----CARD 40--- System Type ----------

System Set Number	System Type	Ventil Deck Location	OPTIONAL VENTILATION SYSTEM Cooling SADBVh	Heating SADBVh	Cooling Schedule	Heating Schedule	Fan Static Pressure
1	FPVAV						
2	COMP						

-----CARD 41-- Zone Assignment ----------

System Set Number	Ref #1 Begin	Ref #1 End	Ref #2 Begin	Ref #2 End	Ref #3 Begin	Ref #3 End	Ref #4 Begin	Ref #4 End	Ref #5 Begin	Ref #5 End	Ref #6 Begin	Ref #6 End
1	1	6										
2	7	7										

-----CARD 42--- Fan SP and Duct Parameters----------

System Set Number	Cool Fan SP	Heat Fan SP	Return Fan SP	Mn Exh Fan SP	Aux Fan SP	Rm Exh Fan SP	Cool Fan Mtr Loc	Return Fan Mtr Loc	Supply Duct Ht Gn	Supply Duct Loc	Return Air Path
1	6.5	1.0	3.0				SUPPLY				
2	1.0						SUPPLY				

-----CARD 44-- System Options ----------

System Set Number	Econ Type Flag	Econ On Point	Max Pct Outside Air	Direct Evap Cooling	Indirect Evap Cooling	1st Stage Evap Cooling	Fan Cycling	Exhaust Air Heat Recovery --- Effectiveness --- System	Room	--- Control Method --- System	Room
1	DRY-BULB		100								
2	NONE		0.4								

-----CARD 45--- Equipment Schedules ----------

System Set Number	Main Cooling Coil	Economizer	Direct Evap Coil	Indirect Evap Coil	Auxiliary Cooling Coil	Main Heating Coil	Main Preheat Coil	Reheat Coil	Mech. Humidity	Auxiliary Heating Coil
1		AVAIL								
2		OFF								

-----CARD 47-- Fan Overrides ----------

Sys Set Num	Clg Fan Eff	Htg Fan Eff	Ret Fan Eff	Mn Exh Fan Eff	Aux Fan Eff	Rm Exh Fan Eff	Opt Vnt Sys Fan Eff	Mech Eff	MAIN COOLING FAN Air Value	Air Units	Size Meth	Confg
1									290720	CFM		
2									533708	CFM		

---------- Equipment Section Alternative #1 ----------

-----CARD 59-- Equipment Description / TOD Schedules ----------

Alternative Number	Elec Consump Time of Day Schedule	Elec Demand Time of Day Schedule	Demand Limit Max KW	Alternative Description
1				M200 - BASELINE

-----CARD 60--- Cooling Load Assignment----------

Load Asgn Ref	All Coil Loads To Cool Ref	Cooling Equipment Sizing	-Group 1- Begin	End	-Group 2- Begin	End	-Group 3- Begin	End	-Group 4- Begin	End	-Group 5- Begin	End	-Group 6- Begin	End	-Group 7- Begin	End	-Group 8- Begin	End	-Group 9- Begin	End
1	1	BLKPLANT	1	2																

-----CARD 62-- Cooling Equipment Parameters ----------

Cool Equip Ref	Equip Code	Num Of	COOLING --Capacity-- Value	Units	----Energy---- Value	Units	HEAT RECOVERY --Capacity-- Value	Units	----Energy---- Value	Units	Seq Order Num	Seq Type	Demand Limit Number
1	EQ1010L	3	2250	TONS	0.672	KW-TON							

-----CARD 63-- Cooling Pumps and References ----------

Cool Ref Num	CHILLED WATER Full Load Value	Full Load Units	CONDENSER Full Load Value	Full Load Units	HT REC or AUX Full Load Value	Full Load Units	Switch-over Control	Cold Storage	Cooling Tower	Misc. Access.
1	80	HP	75	HP						

-----CARD 64-- Cooling Equipment Options ----------

Cool Ref Num	Max CW Reset	Load Shed Economizer	Evap Precool	Free Cooling Type	Heat Source	Cond Entering Temp	Cond Min Oper Temp	Cond Rej To Ref Type	Cond Rej To Ref Number	Cond Rej @ HW Temp
1						85		HEATING	1	95

-----CARD 65-- Heating Load Assignment ----------

Load Assignment	All Coil Loads To	-Group 1-	-Group 2-	-Group 3-	-Group 4-	-Group 5-	-Group 6-	-Group 7-	-Group 8-	-Group 9-

Reference 1	Heating Ref	Begin 1	End 2	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End

-----CARD 67-- Heating Equipment Parameters ----------

Heat Ref Number	Equip Code Name	Number Of Units	HW Pmp Full Ld Value	Units	Cap'y Value	Units	Energy Rate Value	Units	Seq Order Number	Switch over Control	Hot Strg	Misc. Acc.	Cogen	Demand Limit Number
1	HEATPUMP	1							1					
2	EQ2051	1	21	HP	1600	MBH	100	PCTEFF	2					

-----CARD 69-- Fan Equipment Parameters ----------

System Set Number	Cooling Fan	Heating Fan	Return Fan	Exhaust Fan	Auxiliary Supply	Room Exhaust	Optional Ventilation
1	CECAFVAR	CECFCFAN	CECAFVAR				
2	CECFCFAN						

-----CARD 74--- Condenser / Cooling Tower Parameters ----------

Tower Ref	Cooling Tower Code	Capacity Value	Capacity Units	Energy Consump Value	Energy Consump Units	Fluid Type	Tower Type	Number Of Cells	Percent Airflow Low Spd	Low Spd Energy Value	Low Spd Energy Units
1	CECTOWER	33750	MBH								

---------- Equipment Section Alternative #2 ----------

-----CARD 59-- Equipment Description / TOD Schedules ----------

Alternative Number	Elec Consump Time of Day Schedule	Elec Demand Time of Day Schedule	Demand Limit Max KW	Alternative Description
2				M200 - ICE STORAGE

-----CARD 60--- Cooling Load Assignment----------

Load Asgn Ref	All Coil Loads To Cool Ref	Cooling Equipment Sizing	-Group 1- Begin	End	-Group 2- Begin	End	-Group 3- Begin	End	-Group 4- Begin	End	-Group 5- Begin	End	-Group 6- Begin	End	-Group 7- Begin	End	-Group 8- Begin	End	-Group 9- Begin	End
1	1	BLKPLANT	1	2																

-----CARD 62-- Cooling Equipment Parameters ----------

Cool Ref Num	Equip Code Name	Num Of Units	----------COOLING---------- --Capacity-- Value	Units	----Energy---- Value	Units	---------HEAT RECOVERY---------- --Capacity-- Value	Units	----Energy---- Value	Units	Seq Order Num	Seq Type	Demand Limit Number
1	EQ1010L	3	2250	TONS	0.672	KW-TON							

----------CARD 62-- Cooling Equipment Parameters ----------

----------TANK CHARGE----------		----------TANK & HT REC----------	
---Capacity---	----Energy----	---Capacity---	----Energy----
Value Units	Value Units	Value Units	Value Units
1600 TONS	0.840 KW-TON		

-----CARD 63-- Cooling Pumps and References ----------

Cool Ref Num	---CHILLED WATER---- Full Load Value	Full Load Units	-----CONDENSER------ Full Load Value	Full Load Units	---HT REC or AUX---- Full Load Value	Full Load Units	Switch-over Control	Cold Storage	Cooling Tower	Misc. Access.
1	80	HP	75	HP				1		

-----CARD 64-- Cooling Equipment Options ----------

Cool Ref Num	Max CW Reset	Load Shed Economizer	Evap Precool	Free Cooling Type	Heat Source	Cond Entering Temp	Cond Min Oper Temp	Cond Rej To Ref Type	Cond Rej To Ref Number	Cond Rej @ HW Temp
1						85		HEATING	1	95

-----CARD 65-- Heating Load Assignment ----------

Load Assignment Reference	All Coil Loads To Heating Ref	-Group 1- Begin	End	-Group 2- Begin	End	-Group 3- Begin	End	-Group 4- Begin	End	-Group 5- Begin	End	-Group 6- Begin	End	-Group 7- Begin	End	-Group 8- Begin	End	-Group 9- Begin	End
1		1	2																

-----CARD 67-- Heating Equipment Parameters ----------

Heat Ref Number	Equip Code Name	Number Of Units	HW Pmp Full Ld Value	Units	Cap'y Value	Units	Energy Rate Value	Units	Seq Order Number	Switch over Control	Hot Strg	Misc. Acc.	Cogen	Demand Limit Number
1	HEATPUMP	1							1					
2	EQ2051	1	21	HP	1600	MBH	100	PCTEFF	2					

-----CARD 69-- Fan Equipment Parameters ----------

System Set Number	Cooling Fan	Heating Fan	Return Fan	Exhaust Fan	Auxiliary Supply	Room Exhaust	Optional Ventilation
1	CECAFVAR	CECFCFAN	CECAFVAR				
2	CECFCFAN						

-----CARD 73-- Storage Tank Parameters ------------------------------

Strg Ref	Strg Tank Code	Size Value	Units	Sched Code	Disch Control Type	Limit Value	Units
1	CLIMAICE	4000	TON-HRS	ICE	OPTIMIZE		

-----CARD 73-- Storage Tank Parameters ------------------------------

Charge Control Type	Mx Ls Value	Units	Warning Value	Units	Loss Value	Units
FULLCHG					0.07	PERCENT

-----CARD 74--- Condenser / Cooling Tower Parameters --

Tower Ref	Cooling Tower Code	Capacity Value	Capacity Units	Energy Consump Value	Energy Consump Units	Fluid Type	Tower Type	Number Of Cells	Percent Airflow Low Spd	Low Spd Energy Value	Low Spd Energy Units
1	CECTOWER	33750	MBH								

Utility Description Reference Table

Schedules:
- AVAIL AVAILABLE (100%)
- AVAIL (Utility file not found)
- CLG76 COOLING TSTAT SCHEDULE - 76
- FAN200
- HTG72 HEATING ONLY (T-STAT AT 72)
- ICE
- LGT1
- LGT200
- OFF (Utility file not found)
- OUTLITE (Utility file not found)
- PPL1

System:
- COMP COMPUTER ROOM UNIT
- FPVAV FAN POWERED VAV

Equipment:

Cooling:
- EQ1010L HR CTV >190 TONS 95 F

Heating:
- EQ2051 ELECTRIC HOT WATER BOILER
- HEATPUMP

Fan:
- CECAFVAR AIR FOIL CENTRIFUGAL W\VAR SPEED DRIVE
- CECFCFAN FORWARD CURVE CENT. FAN CONSTANT VOLUME

Accessories:

Storage:
- CLIMAICE TRANE CALMAC THERMAL STORAGE SYSTEM

Tower:
- CECTOWER COOLING TOWER

Schedule Name: AVAIL
Project: AVAILABLE (100)
Location:
Client:
Program User:
Comments:

Starting Month: JAN Ending Month: HTG
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	100
24	

Schedule Name: CLG76
Project: COOLING TSTAT SCHEDULE - 76
Location:
Client:
Program User:
Comments: COOLING THERMOSTAT - SET AT 76

Starting Month: JAN Ending Month: DEC
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Temperature
0	76
24	

Schedule Name: FAN200
Project:
Location:
Client:
Program User:
Comments: BLDG-200 FAN SCHEDULE

Starting Month: JAN Ending Month: DEC
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	0
4	100
21	0
24	

ule Name: HTG72
Project: HEATING ONLY (T-STAT AT 72)
Location:
Client:
Program User:
Comments: HEATING ONLY SCHEDULE - T-STAT

Starting Month: JAN Ending Month: DEC
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Temperature
0	72
24	

Schedule Name: ICE
Project:
Location:
Client:
Program User:
Comments: ICE STORAGE

Starting Month: APR Ending Month: NOV
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Tank Cntrl
0	CHARGE
6	SATLOAD
12	DISCHARG
16	SATLOAD
24	

[redacted]ule Name: LGT1
Project:
Location:
Client:
Program User:
Comments: OFFICE LIGHTING

Starting Month: JAN Ending Month: DEC
Starting Day Type: DSGN Ending Day Type: WKDY

Hour	Util Percent
0	5
7	80
8	100
12	80
13	100
16	80
17	40
18	5
24	

Starting Month: JAN Ending Month: DEC
Starting Day Type: SAT Ending Day Type: SUN

[redacted]	Util Percent
0	5
24	

Schedule Name: LGT200
Project:
Location:
Client:
Program User:
Comments: BLDG-200 OFFICE LIGHTING

Starting Month: JAN Ending Month: DEC
Starting Day Type: DSGN Ending Day Type: WKDY

Hour	Util Percent
0	5
7	80
8	100
12	80
13	100
16	80
17	60
21	30
23	5
24	

Starting Month: JAN Ending Month: DEC
Starting Day Type: SAT Ending Day Type: SUN

Hour	Util Percent
0	5
8	30
17	5
24	

[redacted]dule Name: PPL1
Project:
Location:
Client:
Program User: D JONES
Comments: OFFICE PEOPLE SCHEDULE

Starting Month: JAN Ending Month: DEC
Starting Day Type: DSGN Ending Day Type: WKDY

Hour	Util Percent
0	0
7	50
8	100
11	80
12	40
13	80
14	100
16	70
17	30
18	0
24	

Starting Month: JAN Ending Month: DEC
[redacted]ing Day Type: SAT Ending Day Type: SUN

Hour	Util Percent
0	0
24	

01 Card - Job Information

Project: FORT MCPHERSON & GILLEM EEAP #3105.000
Location: ATLANTA
Client: COE - DACA21-9-C-0097
Program User: DENNIS JONES
Comments: BUILDING 200 - FORT MCPHERSON

-----CARD 08-- Climatic Information

Weather Code	Summer Clearness Number	Winter Clearness Number	Summer Design Dry Bulb	Summer Design Wet Bulb	Winter Design Dry Bulb	Building Orientation	Summer Ground Reflect	Winter Ground Reflect
ATLANTA								

---------- Load Section Alternative #1 ----------

---- Load Alternative ----

Number	Description
1	BASELINE

-----CARD 20-- General Room Parameters

Room Number	Zone Reference Number	Room Descrip	Floor Length	Floor Width	Const Type	Plenum Height	Acoustic Ceiling Resistance	Floor to Floor Height	Duplicate Floors Multiplier	Duplicate Rooms per Zone	Perimeter Depth
1	1	NORTH ZONES	216	4		5		14	3		
2	2	EAST ZONES	424	4		5		14	3		
3	3	SOUTH ZONES	384	4		5		14	3		
4	4	WEST ZONES	288	4		5		14	3		
5	5	CORE ZONES	633	100		5		14	3		
6	6	BASEMENT	34.3	1000		5		14			
7	7	BASEMENT COMPUTE	34.3	1000		5		14			

-----CARD 21-- Thermostat Parameters

Room Number	Cooling Room Design DB	Room Design RH	Cooling T'stat Driftpoint	Cooling T'stat Schedule	Heating Room Design DB	Heating T'stat Driftpoint	Heating T'stat Schedule	T'stat Location Flag	Mass / No. Hrs Average	Carpet On Floor
1	76			CLG76	72	65	HTG72			

-----CARD 22-- Roof Parameters ----------

Room Number	Roof Number	Roof Equal to Floor?	Roof Length	Roof Width	Roof U-Value	Const Type	Roof Direction	Roof Tilt	Roof Alpha
1	1	YES			0.055	11			0.45
2	1	YES			0.055	11			0.45
3	1	YES			0.055	11			0.45
4	1	YES			0.055	11			0.45
5	1	YES			0.055	11			0.45

-----CARD 23-- Skylight Parameters----------

Room Number	Roof Number	Skylight Length	Skylight Width	Pct Glass or No. of Windows	Skylight U-Value	Shading Coefficient	External Shading Type	Internal Shading Type	Percent Solar to Ret. Air	Visible Transmittance	Inside Visible Reflectance
5	1	24	24	1	0.59	0.58					

-----CARD 24-- Wall Parameters ----------

Room Number	Wall Number	Wall Length	Wall Height	Wall U-Value	Wall Constuc Type	Wall Direction	Wall Tilt	Wall Alpha	Ground Reflectance Multiplier
1	1	216	15.5	0.076	58	0		0.68	
2	1	288	15.5	0.076	58	90		0.68	
2	2	136	15.5	0.076	58	45		0.68	
3	1	384	15.5	0.076	58	180		0.68	
4	1	288	15.5	0.076	58	270		0.68	

-----CARD 25-- Wall/Glass Parameters ----------

Room Number	Wall Number	Glass Length	Glass Width	Pct Glass or No. of Windows	Glass U-Value	Shading Coefficient	External Shading Type	Internal Shading Type	Percent Solar to Ret. Air	Visible Transmittance	Inside Visible Reflectance
1	1	216	5	1	0.59	0.58					
2	1	288	5	1	0.59	0.58					
2	2	136	5	1	0.59	0.58					
3	1	384	5	1	0.59	0.58					
4	1	288	5	1	0.59	0.58					

-----CARD 26-- Schedules ----------

Room Number	People	Lights	Ventilation	Infiltration	Reheat Minimum	Cooling Fans	Heating Fan	Auxiliary Fan	Room Exhaust	Daylighting Controls
M1	PPL1	LGT200	FAN200			FAN200	FAN200		AVAIL	
7	AVAIL	AVAIL	AVAIL			AVAIL	AVAIL		AVAIL	

-----CARD 27-- People and Lights ----------

Room Number	People Value	People Units	People Sensible	People Latent	Lighting Value	Lighting Units	Lighting Fixture Type	Ballast Factor	Percent Lights to Ret. Air	--- Daylighting ---- Reference Point 1	Reference Point 2
M1	120	SF-PERS	250	200	2.86	WATT-SF		1			

-----CARD 28--- Miscellaneous Equipment ----------

Room Number	Misc Equipment Number	Equipment Descrip	Energy Consump Value	Energy Consump Units	Schedule Code	Energy Meter Code	Percent of Load Sensible	Percent Misc. Load to Room	Percent Misc. Sens to Ret. Air	Radiant Fraction	Optional Air Path
M1	1	GENERAL OFFICE	1.40	WATT-SF	LGT1	ELEC					
7	1	GENERAL OFFICE	1.40	WATT-SF	AVAIL	ELEC					
7	2	COMPUTERS	180	KW	AVAIL	ELEC	100				
7	3	OUTDOOR LIGHTS	5.6	KW	OUTLITE	ELEC	0				

-----CARD 29--- Room Airflows ----------

Room	Ventilation Cooling Value	Ventilation Cooling Units	Ventilation Heating Value	Ventilation Heating Units	Infiltration Cooling Value	Infiltration Cooling Units	Infiltration Heating Value	Infiltration Heating Units	Reheat Minimum Value	Reheat Minimum Units
Number										
M1	20	CFM-P	20	CFM-P						
2	0.119	CFM-SF	0.119	CFM-SF						

-----CARD 30- Fan Airflows ----------

Room	Main Cooling Value	Main Cooling Units	Main Heating Value	Main Heating Units	Auxiliary Cooling Value	Auxiliary Cooling Units	Auxiliary Heating Value	Auxiliary Heating Units	Room Exhaust Value	Room Exhaust Units
Number										
M1										
7	15.56	CFM-SF	15.56	CFM-SF						

-----CARD 31-- Partition Parameters ----------

Room Number	Partition Number	Partition Length	Partition Height	Partition U-Value	Const Type	Temp Flag	Cooling Temp	Heating Temp	Adjacent Room No
6	1	1312	23.5	0.27	108	SINE-FIT	65	55	

-----CARD 32-- Exposed Floor Parameters----------

Room Number	Exposed Floor Number	Slab Perimeter Length	Slab Loss Coefficient	Exposed Floor Area	Exposed Floor U-Value	Exposed Floor Const Type	Exposed Floor Temp Flag	Cooling Temp	Heating Temp	Adjacent Room No
6	1									

---------- System Section Alternative #1 ----------

-----CARD 39-- System Alternative -----

Number	Description
1	BASELINE

-----CARD 40--- System Type ----------

System Set Number	System Type	Ventil Deck Location	Cooling SADBVh	Heating SADBVh	Cooling Schedule	Heating Schedule	Fan Static Pressure
			OPTIONAL VENTILATION SYSTEM				
1	FPVAV						
2	COMP						

-----CARD 41-- Zone Assignment ----------

System Set Number	Ref #1 Begin	Ref #1 End	Ref #2 Begin	Ref #2 End	Ref #3 Begin	Ref #3 End	Ref #4 Begin	Ref #4 End	Ref #5 Begin	Ref #5 End	Ref #6 Begin	Ref #6 End
1	1	6										
2	7	7										

-----CARD 42--- Fan SP and Duct Parameters----------

System Set Number	Cool Fan SP	Heat Fan SP	Return Fan SP	Mn Exh Fan SP	Aux Fan SP	Rm Exh Fan SP	Cool Fan Mtr Loc	Return Fan Mtr Loc	Supply Duct Ht Gn	Supply Duct Loc	Return Air Path
1	6.5	1.0	3.0				SUPPLY				
2	1.0						SUPPLY				

-----CARD 44-- System Options ----------

System Set Number	Econ Type Flag	Econ On Point	Max Pct Outside Air	Direct Evap Cooling	Indirect Evap Cooling	1st Stage Evap Cooling	Fan Cycling	Exhaust Air Heat Recovery --- Effectiveness --- System	Exhaust Air Heat Recovery --- Effectiveness --- Room	Exhaust Air Heat Recovery --- Control Method --- System	Exhaust Air Heat Recovery --- Control Method --- Room
1	DRY-BULB		100								
2	NONE		0.4								

-----CARD 45--- Equipment Schedules ----------

System Set Number	Main Cooling Coil	Economizer	Direct Evap Coil	Indirect Evap Coil	Auxiliary Cooling Coil	Main Heating Coil	Main Preheat Coil	Reheat Coil	Mech. Humidity	Auxiliary Heating Coil
1		AVAIL								
2		OFF								

-----CARD 47-- Fan Overrides ----------

Sys Set Num	Clg Fan Eff	Htg Fan Eff	Ret Fan Eff	Mn Exh Fan Eff	Aux Fan Eff	Rm Exh Fan Eff	Opt Vnt Sys Fan Eff	Opt Vnt Mech Eff	MAIN COOLING FAN Air Value	MAIN COOLING FAN Air Units	MAIN COOLING FAN Size Meth	MAIN COOLING FAN Confg
1									290720	CFM		
2									533708	CFM		

---------- Equipment Section Alternative #1 ----------

-----CARD 59-- Equipment Description / TOD Schedules ----------

Alternative Number	Elec Consump Time of Day Schedule	Elec Demand Time of Day Schedule	Demand Limit Max KW	Alternative Description
1				M200 - BASELINE

-----CARD 60--- Cooling Load Assignment----------

Load Asgn Ref	All Coil Loads To Cool Ref	Cooling Equipment Sizing	-Group 1- Begin	-Group 1- End	-Group 2- Begin	-Group 2- End	-Group 3- Begin	-Group 3- End	-Group 4- Begin	-Group 4- End	-Group 5- Begin	-Group 5- End	-Group 6- Begin	-Group 6- End	-Group 7- Begin	-Group 7- End	-Group 8- Begin	-Group 8- End	-Group 9- Begin	-Group 9- End
1	1	BLKPLANT	1	2																

-----CARD 62-- Cooling Equipment Parameters ----------

Cool Ref Num	Equip Code Name	Num Of Units	COOLING --Capacity-- Value	COOLING --Capacity-- Units	COOLING ----Energy---- Value	COOLING ----Energy---- Units	HEAT RECOVERY --Capacity-- Value	HEAT RECOVERY --Capacity-- Units	HEAT RECOVERY ----Energy---- Value	HEAT RECOVERY ----Energy---- Units	Seq Order Num	Seq Type	Demand Limit Number
1	EQ1010L	3	2250	TONS	0.672	KW-TON							

-----CARD 63-- Cooling Pumps and References ----------

Cool Ref Num	CHILLED WATER Full Load Value	CHILLED WATER Full Load Units	CONDENSER Full Load Value	CONDENSER Full Load Units	HT REC or AUX Full Load Value	HT REC or AUX Full Load Units	Switch-over Control	Cold Storage	Cooling Tower	Misc. Access.
1	80	HP	75	HP						

-----CARD 64-- Cooling Equipment Options ----------

Cool Ref Num	Max CW Reset	Load Shed Economizer	Evap Precool	Free Cooling Type	Heat Source	Cond Entering Temp	Cond Min Oper Temp	Cond Rej To Ref Type	Cond Rej To Ref Number	Cond Rej @ HW Temp
1						85		HEATING	1	95

-----CARD 65-- Heating Load Assignment ----------

Load Assignment	All Coil Loads To	-Group 1-	-Group 2-	-Group 3-	-Group 4-	-Group 5-	-Group 6-	-Group 7-	-Group 8-	-Group 9-

Reference	Heating Ref	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End
1		1	2														

-----CARD 67-- Heating Equipment Parameters ----------

Heat Ref Number	Equip Code Name	Number Of Units	HW Pmp Full Ld Value	Units	Cap'y Value	Units	Energy Rate Value	Units	Seq Order Number	Switch over Control	Hot Strg	Misc. Acc.	Cogen	Demand Limit Number
1	HEATPUMP	1							1					
2	EQ2051	1	21	HP	1600	MBH	100	PCTEFF	2					

-----CARD 69-- Fan Equipment Parameters ----------

System Set Number	Cooling Fan	Heating Fan	Return Fan	Exhaust Fan	Auxiliary Supply	Room Exhaust	Optional Ventilation
1	CECAFVAR	CECFCFAN	CECAFVAR				
2	CECFCFAN						

-----CARD 74--- Condenser / Cooling Tower Parameters ----------

Tower Ref	Cooling Tower Code	Capacity Value	Capacity Units	Energy Consump Value	Energy Consump Units	Fluid Type	Tower Type	Number Of Cells	Percent Airflow Low Spd	Low Spd Energy Value	Low Spd Energy Units
1	CECTOWER	33750	MBH								

---------- Equipment Section Alternative #2 ----------

-----CARD 59-- Equipment Description / TOD Schedules ----------

Alternative Number	Elec Consump Time of Day Schedule	Elec Demand Time of Day Schedule	Demand Limit Max KW	Alternative Description
2				M200 - ICE STORAGE

-----CARD 60--- Cooling Load Assignment----------

Load Asgn Ref	All Coil Loads To Cool Ref	Cooling Equipment Sizing	-Group 1- Begin	End	-Group 2- Begin	End	-Group 3- Begin	End	-Group 4- Begin	End	-Group 5- Begin	End	-Group 6- Begin	End	-Group 7- Begin	End	-Group 8- Begin	End	-Group 9- Begin	End
1	1	BLKPLANT	1	2																

-----CARD 62-- Cooling Equipment Parameters ----------

Cool Ref Num	Equip Code Name	Num Of Units	----------COOLING---------- --Capacity-- Value	Units	----Energy---- Value	Units	---------HEAT RECOVERY---------- --Capacity-- Value	Units	----Energy---- Value	Units	Seq Order Num	Seq Type	Demand Limit Number
1	EQ1010L	3	2250	TONS	0.672	KW-TON							

----------CARD 62-- Cooling Equipment Parameters ----------

----------TANK CHARGE----------		----------TANK & HT REC----------	
---Capacity---	----Energy----	---Capacity---	----Energy----
Value Units	Value Units	Value Units	Value Units
1600 TONS	0.840 KW-TON		

-----CARD 63-- Cooling Pumps and References ----------

Cool Ref Num	---CHILLED WATER---- Full Load Value	Full Load Units	-----CONDENSER------ Full Load Value	Full Load Units	---HT REC or AUX---- Full Load Value	Full Load Units	Switch-over Control	Cold Storage	Cooling Tower	Misc. Access.
1	80	HP	75	HP				1		

-----CARD 64-- Cooling Equipment Options ----------

Cool Ref Num	Max CW Reset	Load Shed Economizer	Evap Precool	Free Cooling Type	Heat Source	Cond Entering Temp	Cond Min Oper Temp	Cond Rej To Ref Type	Cond Rej To Ref Number	Cond Rej @ HW Temp
1						85		HEATING	1	95

-----CARD 65-- Heating Load Assignment ----------

Load Assignment Reference	All Coil Loads To Heating Ref	-Group 1- Begin	End	-Group 2- Begin	End	-Group 3- Begin	End	-Group 4- Begin	End	-Group 5- Begin	End	-Group 6- Begin	End	-Group 7- Begin	End	-Group 8- Begin	End	-Group 9- Begin	End
1		1	2																

-----CARD 67-- Heating Equipment Parameters ----------

Heat Ref Number	Equip Code Name	Number Of Units	HW Pmp Full Ld Value	Units	Cap'y Value	Units	Energy Rate Value	Units	Seq Order Number	Switch over Control	Hot Strg	Misc. Acc.	Cogen	Demand Limit Number
1	HEATPUMP	1							1					
2	EQ2051	1	21	HP	1600	MBH	100	PCTEFF	2					

-----CARD 69-- Fan Equipment Parameters ----------

System Set Number	Cooling Fan	Heating Fan	Return Fan	Exhaust Fan	Auxiliary Supply	Room Exhaust	Optional Ventilation
1	CECAFVAR	CECFCFAN	CECAFVAR				
2	CECFCFAN						

-----CARD 73-- Storage Tank Parameters ------------------------------

Strg Ref	Strg Tank Code	Size Value	Units	Sched Code	Disch Control Type	Limit Value	Units
1	CLIMAICE	4000	TON-HRS	ICE	OPTIMIZE		

-----CARD 73-- Storage Tank Parameters ------------------------------

Charge Control Type	Mx Ls Value	Units	Warning Value	Units	Loss Value	Units
FULLCHG					0.07	PERCENT

-----CARD 74--- Condenser / Cooling Tower Parameters --

Tower Ref	Cooling Tower Code	Capacity Value	Capacity Units	Energy Consump Value	Energy Consump Units	Fluid Type	Tower Type	Number Of Cells	Percent Airflow Low Spd	Low Spd Energy Value	Low Spd Energy Units
1	CECTOWER	33750	MBH								

Utility Description Reference Table

Schedules:
- AVAIL AVAILABLE (100%)
- AVAIL (Utility file not found)
- CLG76 (Utility file not found)
- FAN200
- HTG72 (Utility file not found)
- ICE
- LGT1
- LGT200
- OFF (Utility file not found)
- OUTLITE (Utility file not found)
- PPL1

System:
- COMP COMPUTER ROOM UNIT
- FPVAV FAN POWERED VAV

Equipment:
- Cooling:
  - EQ1010L HR CTV >190 TONS 95 F
- Heating:
  - EQ2051 ELECTRIC HOT WATER BOILER
  - HEATPUMP
- Fan:
  - CECAFVAR AIR FOIL CENTRIFUGAL W\VAR SPEED DRIVE
  - CECFCFAN FORWARD CURVE CENT. FAN CONSTANT VOLUME
- Accessories:
  - Storage:
    - CLIMAICE TRANE CALMAC THERMAL STORAGE SYSTEM
  - Tower:
    - CECTOWER COOLING TOWER

Schedule Name: AVAIL
Project: AVAILABLE (100)
Location:
Client:
Program User:
Comments:

Starting Month: JAN Ending Month: HTG
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	100
24	

Schedule Name: FAN200
Project:
Location:
Client:
Program User:
Comments: BLDG-200 FAN SCHEDULE

Starting Month: JAN Ending Month: DEC
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	0
4	100
21	0
24	

Schedule Name: ICE
Project:
Location:
Client:
Program User:
Comments: ICE STORAGE

Starting Month: APR Ending Month: NOV
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Tank Cntrl
0	CHARGE
6	SATLOAD
12	DISCHARG
16	SATLOAD
24	

Schedule Name: LGT1
Project:
Location:
Client:
Program User:
Comments: OFFICE LIGHTING

Starting Month: JAN Ending Month: DEC
Starting Day Type: DSGN Ending Day Type: WKDY

Hour	Util Percent
0	5
7	80
8	100
12	80
13	100
16	80
17	40
18	5
24	

Starting Month: JAN Ending Month: DEC
Starting Day Type: SAT Ending Day Type: SUN

Hour	Util Percent
0	5
24	

Schedule Name: LGT200
Project:
Location:
Client:
Program User:
Comments: BLDG-200 OFFICE LIGHTING

Starting Month: JAN Ending Month: DEC
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	5
7	80
8	100
12	80
13	100
16	80
21	5
24	

Schedule Name: PPL1
Project:
Location:
Client:
Program User: D JONES
Comments: OFFICE PEOPLE SCHEDULE

Starting Month: JAN Ending Month: DEC
Starting Day Type: DSGN Ending Day Type: WKDY

Hour	Util Percent
0	0
7	50
8	100
11	80
12	40
13	80
14	100
16	70
17	30
18	0
24	

Starting Month: JAN Ending Month: DEC
Starting Day Type: SAT Ending Day Type: SUN

Hour	Util Percent
0	0
24	

```
******************************************************************************
******************************************************************************
**                                                                          **
**              T R A C E   6 0 0   A N A L Y S I S                         **
**                                                                          **
**              by            **
**                                                                          **
******************************************************************************
******************************************************************************
```

FORT MCPHERSON & GILLEM EEAP #3105.000
ATLANTA
COE - DACA21-9-C-0097
DENNIS JONES
BUILDING 200 - FORT MCPHERSON

Weather File Code:	ATLANTA.	
Location:		
Latitude:	33.0	(deg)
Longitude:	84.0	(deg)
Time Zone:	6	
Elevation:	1,005	(ft)
Barometric Pressure:	28.8	(in. Hg)
Summer Clearness Number:	0.90	
Winter Clearness Number:	0.90	
Summer Design Dry Bulb:	92	(F)
Summer Design Wet Bulb:	74	(F)
Winter Design Dry Bulb:	22	(F)
Summer Ground Relectance:	0.20	
Winter Ground Relectance:	0.20	
Air Density:	0.0731	(Lbm/cuft)
Air Specific Heat:	0.2444	(Btu/lbm/F)
Density-Specific Heat Prod:	1.0727	(Btu-min./hr/cuft/F)
Latent Heat Factor:	4,721.8	(Btu-min./hr/cuft)
Enthalpy Factor:	4.3883	(Lb-min./hr/cuft)

Design Simulation Period: June To November
System Simulation Period: January To December
Cooling Load Methodology: TETD/Time Averaging

Time/Date Program was Run: 15:35: 7 3/13/92
Dataset Name: M200 .TM

[redacted]OW - ALTERNATIVE 1
[redacted]INE

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

System Number	System Type	Main Outside Airflow (Cfm)	Main Cooling Airflow (Cfm)	Main Heating Airflow (Cfm)	Main Return Airflow (Cfm)	Main Exhaust Airflow (Cfm)	Auxil. Supply Airflow (Cfm)	Room Exhaust Airflow (Cfm)
1	FPVAV	39,748	290,720	15,621	290,720	290,720	0	0
2	COMP	5,717	533,708	533,708	533,708	5,717	0	0
Totals		45,465	824,428	549,329	824,428	296,437	0	0

CAPACITY - ALTERNATIVE 1
BASELINE

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

System Number	System Type	Cooling Main Sys. Capacity (Tons)	Cooling Aux. Sys. Capacity (Tons)	Cooling Opt. Vent Capacity (Tons)	Cooling Totals (Tons)	Heating Main Sys. Capacity (Btuh)	Heating Aux. Sys. Capacity (Btuh)	Heating Preheat Capacity (Btuh)	Heating Reheat Capacity (Btuh)	Heating Humidif. Capacity (Btuh)	Heating Opt. Vent Capacity (Btuh)	Heating Totals (Btuh)
[redacted]1	FPVAV	781.7	0.0	0.0	781.7	-998,255	0	-1,383,473	0	0	0	-2,381,728
2	COMP	146.6	0.0	0.0	146.6	0	0	-2,725,540	0	0	0	-2,725,540
Totals		928.3	0.0	0.0	928.3	-998,255	0	-4,109,012	0	0	0	-5,107,268

The building peaked at hour 15 month 8 with a capacity of 928.3 tons

ENGINEERING CHECKS - ALTERNATIVE 1
BASELINE

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 Cfm/ Sq Ft	Cooling Cfm/ Ton	Cooling Sq Ft /Ton	Cooling Btuh/ Sq Ft	Heating Cfm/ Sq Ft	Heating Btuh/ Sq Ft	Floor Area Sq Ft
1	Main	FPVAV	13.67	1.21	371.9	306.9	39.10	0.07	-9.93	239,944
2	Main	COMP	1.07	15.56	3,640.6	234.0	51.29	15.56	-79.46	34,300

System 1 Block FPVAV - FAN POWERED VAV

	COOLING COIL PEAK					CLG SPACE PEAK		HEATING COIL PEAK		
Peaked at Time ==>	Mo/Hr: 8/15					Mo/Hr: 9/15		Mo/Hr: 13/ 1		
Outside Air ==>	OADB/WB/HR: 92/ 74/105.0					OADB: 90		OADB: 22		
	Space Sens.+Lat.	Ret. Air Sensible	Ret. Air Latent	Net Total	Percnt Of Tot	Space Sensible	Percnt Of Tot	Space Peak Space Sens	Coil Peak Tot Sens	Percnt Of Tot
Envelope Loads	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)	(Btuh)	(%)	(Btuh)	(Btuh)	(%)
Skylite Solr	58,752	0		58,752	0.63	47,232	0.93	0	0	0.00
Skylite Cond	0	5,695		5,695	0.06	0	0.00	0	-15,512	1.56
Roof Cond	0	156,484		156,484	1.67	0	0.00	0	-161,641	16.27
Glass Solar	814,080	0		814,080	8.68	915,360	18.04	0	0	0.00
Glass Cond	198,962	0		198,962	2.12	171,095	3.37	-570,011	-570,011	57.38
Wall Cond	27,307	29,976		57,283	0.61	22,365	0.44	-69,288	-138,045	13.90
Partition	-89,074			-89,074	-0.95	-104,058	-2.05	-108,220	-108,220	10.89
Exposed Floor	0			0	0.00	0	0.00	0	0	0.00
Infiltration	0			0	0.00	0	0.00	0	0	0.00
Sub Total==>	1,010,027	192,154		1,202,181	12.82	1,051,994	20.74	-747,519	-993,429	100.00
Internal Loads										
Lights	2,342,136	0		2,342,136	24.97	2,342,136	46.17	0	0	0.00
People	899,790			899,790	9.59	499,883	9.85	0	0	0.00
Misc	1,146,500	0	0	1,146,500	12.22	1,146,500	22.60	0	0	0.00
Sub Total==>	4,388,427	0	0	4,388,427	46.78	3,988,520	78.62	0	0	0.00
Ceiling Load	40,487	-40,487		0	0.00	32,497	0.64	-198,688	0	0.00
Outside Air	0	0	0	1,933,531	20.61	0	0.00	0	0	0.00
Sup. Fan Heat				1,343,772	14.32		0.00		0	0.0
Ret. Fan Heat		620,203		620,203	6.61		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		-107,499	0	-107,499	-1.15		0.00		0	0.00
Terminal Bypass		0	0	0	-0.00		0.00		0	0.00
Grand Total==>	5,438,941	664,371	0	9,380,615	100.00	5,073,010	100.00	-946,207	-993,429	100.00

COOLING COIL SELECTION

	Total Capacity (Tons)	(Mbh)	Sens Cap. (Mbh)	Coil Airfl (cfm)	Entering DB/WB/HR Deg F	Deg F	Grains	Leaving DB/WB/HR Deg F	Deg F	Grains
Main Clg	781.7	9,380.6	7,784.3	290,720	79.6	63.7	66.5	54.4	52.6	58.6
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	781.7	9,380.6								

AREAS

	Gross Total	Glass (sf)	(%)
Floor	239,944		
Part	30,832		
ExFlr	0		
Roof	68,548	576	1
Wall	61,008	19,680	32

HEATING COIL SELECTION

	Capacity (Mbh)	Coil Airfl (cfm)	Ent Deg F	Lvg Deg F
Main Htg	-998.3	15,621	65.4	125.0
Aux Htg	0.0	0	0.0	0.0
Preheat	-1,383.5	39,748	22.0	54.4
Reheat	-0.0	0	0.0	0.0
Humidif	0.0	0	0.0	0.0
Opt Vent	0.0	0	0.0	0.0
Total	-2,381.7			

AIRFLOWS (cfm)

Type	Cooling	Heating
Vent	39,748	0
Infil	0	0
Supply	290,720	15,621
Mincfm	0	0
Return	290,720	0
Exhaust	39,748	0
Rm Exh	0	0
Auxil	0	0

ENGINEERING CHECKS

Clg % OA	13.7
Clg Cfm/Sqft	1.21
Clg Cfm/Ton	371.90
Clg Sqft/Ton	306.94
Clg Btuh/Sqft	39.10
No. People	2,000
Htg % OA	0.0
Htg Cfm/SqFt	0.07
Htg Btuh/SqFt	-9.93

TEMPERATURES (F)

Type	Clg	Htg
SADB	58.8	125.0
Plenum	75.5	65.6
Return	77.5	68.0
Ret/OA	79.6	22.0
Runarnd	75.5	64.5
Fn MtrTD	1.1	0.2
Fn BldTD	0.8	0.
Fn Frict	2.4	0.

[redacted] 2 Peak COMP - COMPUTER ROOM UNIT

********** COOLING COIL PEAK **********							CLG SPACE PEAK **********			HEATING COIL PEAK ********		
Peaked at Time ==>	Mo/Hr: 8/15						Mo/Hr: 6/ 9			Mo/Hr: 13/ 1		
Outside Air ==>	OADB/WB/HR: 92/ 74/105.0						OADB: 83			OADB: 22		
	Space Sens.+Lat.	Ret. Air Sensible	Ret. Air Latent	Net Total	Percnt Of Tot		Space Sensible	Percnt Of Tot		Space Peak Space Sens	Coil Peak Tot Sens	Percnt Of Tot
Envelope Loads	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
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	-0.00
Sub Total==>	0	0		0	0.00		0	0.00		0	0	-0.00
Internal Loads												
Lights	334,808	0		334,808	19.03		334,808	28.27		334,808	334,808	26.12
People	128,625			128,625	7.31		71,458	6.03		71,458	71,458	5.57
Misc	778,232	0	0	778,232	44.24		778,232	65.70		778,232	778,232	60.71
Sub Total==>	1,241,666	0	0	1,241,666	70.58		1,184,499	100.00		1,184,499	1,184,499	92.40
Ceiling Load	0	0		0	0.00		0	0.00		0	0	0.00
Outside Air	0	0	0	138,003	7.84		0	0.00		0	-282,079	-22.00
[redacted]Fan Heat				379,526	21.57			0.00			379,526	29.61
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==>	1,241,666	0	0	1,759,195	100.00		1,184,499	100.00		1,184,499	1,281,946	100.00

COOLING COIL SELECTION

	Total Capacity (Tons)	Total Capacity (Mbh)	Sens Cap. (Mbh)	Coil Airfl (cfm)	Entering DB (F)	Entering WB (F)	Entering Grains	Leaving DB (F)	Leaving WB (F)	Leaving Grains
Main Clg	146.6	1,759.2	1,670.1	533,708	75.2	68.1	96.4	72.3	67.2	96.2
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	146.6	1,759.2								

AREAS

	Gross Total	Glass (sf)	(%)
Floor	34,300		
Part	0		
ExFlr	0		
Roof	0	0	0
Wall	0	0	0

HEATING COIL SELECTION

	Capacity (Mbh)	Coil Airfl (cfm)	Ent Deg F	Lvg Deg F
Main Htg	-0.0	533,708	68.1	68.1
Aux Htg	0.0	0	0.0	0.0
Preheat	-2,725.5	533,708	67.5	72.3
Reheat	-0.0	533,708	72.9	68.0
Humidif	0.0	0	0.0	0.0
[redacted]nt	0.0	0	0.0	0.0
[redacted]	-2,725.5			

AIRFLOWS (cfm)

Type	Cooling	Heating
Vent	5,717	5,717
Infil	0	0
Supply	533,708	533,708
Mincfm	0	533,708
Return	533,708	533,708
Exhaust	5,717	5,717
Rm Exh	0	0
Auxil	0	0

ENGINEERING CHECKS

Clg % OA	1.1
Clg Cfm/Sqft	15.56
Clg Cfm/Ton	3640.58
Clg Sqft/Ton	233.97
Clg Btuh/Sqft	51.29
No. People	286
Htg % OA	1.1
Htg Cfm/SqFt	15.56
Htg Btuh/SqFt	-79.46

TEMPERATURES (F)

Type	Clg	Htg
SADB	72.9	68.1
Plenum	75.0	68.0
Return	75.0	68.0
Ret/OA	75.2	67.5
Runarnd	75.0	68.0
Fn MtrTD	0.2	0.0
Fn BldTD	0.1	0.0
Fn Frict	0.4	0.0

COOLING AIRFLOW HEAT GAIN/LOSS - ALTERNATIVE 1
BASELINE

AIRFLOW HEAT GAIN AND LOSS

(At time of Coil Peak)

Room Number	Description	Cooling Duct Heat Pickup (Btuh)	Supply Fan Heat (Btuh)	Return Fan Heat (Btuh)	System Exhaust Heat Loss (Btuh)	Total (Btuh)	System Exhaust Airflow (Cfm)	Room Exhaust Airflow (Cfm)	Ducted Airflow (Cfm)	Plenum Airflow (Cfm)	Run Around Airflow (Cfm)	Corridr Airflow (Cfm)	System Return Airflow (Cfm)
1	NORTH ZONES	0	38,435	17,739	-698	55,477	432	0	0	8,315	0	0	8,315
Zone 1	Total/Ave.	0	38,435	17,739	-698	55,477	432	0	0	8,315	0	0	8,315
Zone 1	Block	0	38,435	17,739	-698	55,477	432	0	0	8,315	0	0	8,315
2	EAST ZONES	0	206,095	95,121	-1,410	299,806	605	0	0	44,588	0	0	44,588
Zone 2	Total/Ave.	0	206,095	95,121	-1,410	299,806	605	0	0	44,588	0	0	44,588
Zone 2	Block	0	206,095	95,121	-1,410	299,806	605	0	0	44,588	0	0	44,588
3	SOUTH ZONES	0	210,827	97,305	-1,586	306,546	768	0	0	45,612	0	0	45,612
Zone 3	Total/Ave.	0	210,827	97,305	-1,586	306,546	768	0	0	45,612	0	0	45,612
Zone 3	Block	0	210,827	97,305	-1,586	306,546	768	0	0	45,612	0	0	45,612
4	WEST ZONES	0	162,279	74,898	-1,404	235,773	576	0	0	35,108	0	0	35,108
Zone 4	Total/Ave.	0	162,279	74,898	-1,404	235,773	576	0	0	35,108	0	0	35,108
Zone 4	Block	0	162,279	74,898	-1,404	235,773	576	0	0	35,108	0	0	35,108
5	CORE ZONES	0	863,699	398,630	-90,299	1,172,029	31,650	0	0	186,858	0	0	186,858
Zone 5	Total/Ave.	0	863,699	398,630	-90,299	1,172,029	31,650	0	0	186,858	0	0	186,858
Zone 5	Block	0	863,699	398,630	-90,299	1,172,029	31,650	0	0	186,858	0	0	186,858
6	BASEMENT	0	129,169	59,617	-12,196	176,590	5,717	0	0	27,945	0	0	27,945
Zone 6	Total/Ave.	0	129,169	59,617	-12,196	176,590	5,717	0	0	27,945	0	0	27,945
Zone 6	Block	0	129,169	59,617	-12,196	176,590	5,717	0	0	27,945	0	0	27,945
System 1	Total/Ave.	0	1,610,505	743,310	-107,593	2,246,222	39,748	0	0	348,426	0	0	348,426
System 1	Block	0	1,343,772	620,203	-107,499	1,856,476	39,748	0	0	290,720	0	0	290,720
7	BASEMENT COMPUTE	0	379,526	0	0	379,526	5,717	0	0	533,708	0	0	533,708
Zone 7	Total/Ave.	0	379,526	0	0	379,526	5,717	0	0	533,708	0	0	533,708
Zone 7	Block	0	379,526	0	0	379,526	5,717	0	0	533,708	0	0	533,708
System 2	Total/Ave.	0	379,526	0	0	379,526	5,717	0	0	533,708	0	0	533,708
System 2	Block	0	379,526	0	0	379,526	5,717	0	0	533,708	0	0	533,708

[redacted]ING AIRFLOW HEAT GAIN/LOSS - ALTERNATIVE 1
[redacted]INE

AIRFLOW HEAT GAIN AND LOSS

(At time of Coil Peak)

Room Number	Description	Heating: Supply Fan Heat (Btuh)	Return Fan Heat (Btuh)	System Exhaust Heat Loss (Btuh)	Total (Btuh)	System Exhaust Airflow (Cfm)	Room Exhaust Airflow (Cfm)	Ducted Airflow (Cfm)	Plenum Airflow (Cfm)	Run Around Airflow (Cfm)	Corridr Airflow (Cfm)	System Return Airflow (Cfm)
1	NORTH ZONES	0	0	0	0	0	0	0	2,079	2,079	0	0
Zone	1 Total/Ave.	0	0	0	0	0	0	0	2,079	2,079	0	0
Zone	1 Block	0	0	0	0	0	0	0	2,079	2,079	0	0
2	EAST ZONES	0	0	0	0	0	0	0	3,399	3,399	0	0
Zone	2 Total/Ave.	0	0	0	0	0	0	0	3,399	3,399	0	0
Zone	2 Block	0	0	0	0	0	0	0	3,399	3,399	0	0
3	SOUTH ZONES	0	0	0	0	0	0	0	3,079	3,079	0	0
Zone	3 Total/Ave.	0	0	0	0	0	0	0	3,079	3,079	0	0
Zone	3 Block	0	0	0	0	0	0	0	3,079	3,079	0	0
4	WEST ZONES	0	0	0	0	0	0	0	2,309	2,309	0	0
Zone	4 Total/Ave.	0	0	0	0	0	0	0	2,309	2,309	0	0
Zone	4 Block	0	0	0	0	0	0	0	2,309	2,309	0	0
5	CORE ZONES	0	0	0	0	0	0	0	2,529	2,529	0	0
Zone	5 Total/Ave.	0	0	0	0	0	0	0	2,529	2,529	0	0
[redacted]	5 Block	0	0	0	0	0	0	0	2,529	2,529	0	0
6	BASEMENT	0	0	0	0	0	0	0	2,227	2,227	0	0
Zone	6 Total/Ave.	0	0	0	0	0	0	0	2,227	2,227	0	0
Zone	6 Block	0	0	0	0	0	0	0	2,227	2,227	0	0
System	1 Total/Ave.	0	0	0	0	0	0	0	15,621	15,621	0	0
System	1 Block	0	0	0	0	0	0	0	15,621	15,621	0	0
7	BASEMENT COMPUTE	379,526	0	0	379,526	5,717	0	0	533,708	0	0	533,708
Zone	7 Total/Ave.	379,526	0	0	379,526	5,717	0	0	533,708	0	0	533,708
Zone	7 Block	379,526	0	0	379,526	5,717	0	0	533,708	0	0	533,708
System	2 Total/Ave.	379,526	0	0	379,526	5,717	0	0	533,708	0	0	533,708
System	2 Block	379,526	0	0	379,526	5,717	0	0	533,708	0	0	533,708

ROOM PSYCHROMETRICS - ALTERNATIVE 1
BASELINE

---------- P S Y C H R O M E T R I C S T A T E P O I N T S ----------

Room 7

	Dry Bulb (F)	Wet Bulb (F)	Relat. Humid. (%)	Humid. Ratio (GR)	Enthalpy (Btu/Lb)	Temp. Diff. (F)
Space	75.0	68.1	70.9	96.3	33.1	
Main System						
Return Air Heat Pickup						0.0
Return Fan						0.0
Return Air	75.0	68.1	70.9	96.3	33.1	
Outdoor Air	92.3	74.4	44.2	105.0	38.7	
Return/Outdoor Air Mix	75.2	68.1	70.6	96.4	33.1	
Blow through Fan						0.0
Entering Coil	75.2	68.1	70.6	96.4	33.1	
Leaving Coil	72.3	67.2	77.7	96.3	32.4	
Draw Through Fan						0.3
Duct Frictional Heat						0.4
Supply Duct Heat Gain						0.0
Cold Deck Supply Air	72.9	67.4	76.0	96.3	32.5	
Supply Air	72.9	67.4	76.0	96.3	32.5	

Percent Outside Air	1.07	(%)
Sensible Heat Ratio (SHR)	0.954	
Percent Supply Air Bypassing Coil	0.00	(%)
Coil Airflow	533,708	(Cfm)

S[redacted] PSYCHROMETRICS - ALTERNATIVE 1
BA[redacted]NE

---------- P S Y C H R O M E T R I C S T A T E P O I N T S ----------

System 1

	Dry Bulb (F)	Wet Bulb (F)	Relat. Humid. (%)	Humid. Ratio (GR)	Enthalpy (Btu/Lb)	Temp. Diff. (F)
Space	75.0	60.9	44.8	60.4	27.4	
Main System						
Return Air Heat Pickup						0.4
Return Fan						2.0
Return Air	77.4	61.7	41.3	60.4	28.0	
Outdoor Air	92.3	74.4	44.2	105.0	38.7	
Return/Outdoor Air Mix	79.5	63.7	42.5	66.5	29.5	
Blow through Fan						0.0
Entering Coil	79.5	63.7	42.5	66.5	29.5	
Leaving Coil	54.4	52.6	89.3	58.7	22.2	
Draw Through Fan						1.9
Duct Frictional Heat						2.4
Supply Duct Heat Gain						0.0
Cold Deck Supply Air	58.8	54.4	76.4	58.7	23.2	
Supply Air	58.8	54.4	76.4	58.7	23.2	

P[redacted]t Outside Air 13.67 (%)
Sensible Heat Ratio (SHR) 0.927
Percent Supply Air Bypassing Coil 0.00 (%)
Coil Airflow 290,720 (Cfm)

BUILDING U-VALUES - ALTERNATIVE 1
BASELINE

BUILDING U-VALUES

Room Number	Description	Room U-Values (Btu/hr/sqft/F) Part.	ExFlr	Summr Skylt	Wintr Skylt	Roof	Summr Windo	Wintr Windo	Wall	Ceil.	Room Mass (lb/ sqft)	Room Capac. (Btu/ sqft/F)
1	NORTH ZONES	0.000	0.000	0.000	0.000	0.055	0.590	0.620	0.076	0.317	287.9	57.24
Zone 1	Total/Ave.	0.000	0.000	0.000	0.000	0.055	0.590	0.620	0.076	0.317	287.9	57.24
2	EAST ZONES	0.000	0.000	0.000	0.000	0.055	0.590	0.620	0.076	0.317	287.9	57.24
Zone 2	Total/Ave.	0.000	0.000	0.000	0.000	0.055	0.590	0.620	0.076	0.317	287.9	57.24
3	SOUTH ZONES	0.000	0.000	0.000	0.000	0.055	0.590	0.620	0.076	0.317	287.9	57.24
Zone 3	Total/Ave.	0.000	0.000	0.000	0.000	0.055	0.590	0.620	0.076	0.317	287.9	57.24
4	WEST ZONES	0.000	0.000	0.000	0.000	0.055	0.590	0.620	0.076	0.317	287.9	57.24
Zone 4	Total/Ave.	0.000	0.000	0.000	0.000	0.055	0.590	0.620	0.076	0.317	287.9	57.24
5	CORE ZONES	0.000	0.000	0.590	0.620	0.055	0.000	0.000	0.000	0.317	19.2	4.14
Zone 5	Total/Ave.	0.000	0.000	0.590	0.620	0.055	0.000	0.000	0.000	0.317	19.2	4.14
6	BASEMENT	0.270	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.317	97.2	19.45
Zone 6	Total/Ave.	0.270	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.317	97.2	19.45
System 1	Total/Ave.	0.270	0.000	0.590	0.620	0.055	0.590	0.620	0.076	0.317	48.0	9.81
7	BASEMENT COMPUTE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.317	13.3	2.67
Zone 7	Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.317	13.3	2.67
System 2	Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.317	13.3	2.67
Building		0.270	0.000	0.590	0.620	0.055	0.590	0.620	0.076	0.317	43.7	8.92

BUILDING AREAS - ALTERNATIVE 1
BASELINE

---------- 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	NORTH ZONES	3	1	864	2,592	0	0	0	0	864	3,240	32	6,804
Zone 1	Total/Ave.				2,592	0	0	0	0	864	3,240	32	6,804
2	EAST ZONES	3	1	1,696	5,088	0	0	0	0	1,696	6,360	32	13,356
Zone 2	Total/Ave.				5,088	0	0	0	0	1,696	6,360	32	13,356
3	SOUTH ZONES	3	1	1,536	4,608	0	0	0	0	1,536	5,760	32	12,096
Zone 3	Total/Ave.				4,608	0	0	0	0	1,536	5,760	32	12,096
4	WEST ZONES	3	1	1,152	3,456	0	0	0	0	1,152	4,320	32	9,072
Zone 4	Total/Ave.				3,456	0	0	0	0	1,152	4,320	32	9,072
5	CORE ZONES	3	1	63,300	189,900	0	0	576	1	62,724	0	0	0
Zone 5	Total/Ave.				189,900	0	0	576	1	62,724	0	0	0
6	BASEMENT	1	1	34,300	34,300	30,832	0	0	0	0	0	0	0
Zone 6	Total/Ave.				34,300	30,832	0	0	0	0	0	0	0
System 1	Total/Ave.				239,944	30,832	0	576	1	67,972	19,680	32	41,328
7	BASEMENT COMPUTE	1	1	34,300	34,300	0	0	0	0	0	0	0	0
[redacted] 7	Total/Ave.				34,300	0	0	0	0	0	0	0	0
[redacted]em 2	Total/Ave.				34,300	0	0	0	0	0	0	0	0
Building					274,244	30,832	0	576	1	67,972	19,680	32	41,328

ASHRAE 90 ANALYSIS - ALTERNATIVE 1
BASELINE

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

Overall Roof U-Value = 0.059 (Btu/Hr/Sq Ft/F)
Overall Wall U-Value = 0.242 (Btu/Hr/Sq Ft/F)
Overall Building U-Value = 0.145 (Btu/Hr/Sq Ft/F)

Roof Overall Thermal Transfer Value (OTTVr) = 3.59 (Btu/Hr/Sq Ft)
Wall Overall Thermal Transfer Value (OTTVw) = 26.97 (Btu/Hr/Sq Ft)

SYSTEM LOAD PROFILE - ALTERNATIVE 1
BASELINE

Main System 1 FPVAV FAN POWERED VAV

Percent Design Load	Cooling Load Cap. (Ton)	Cooling Load Hours (%)	Cooling Load Hours	Heating Load Capacity (Btuh)	Heating Load Hours (%)	Heating Load Hours	Cooling Airflow Cap. (Cfm)	Cooling Airflow Hours (%)	Cooling Airflow Hours	Heating Airflow Cap. (Cfm)	Heating Airflow Hours (%)	Heating Airflow Hours
0 - 5	39.1	17	542	-119,086	48	731	14,536.0	15	704	781.1	53	867
5 - 10	78.2	6	182	-238,173	38	577	29,072.0	1	58	1,562.1	6	98
10 - 15	117.3	4	121	-357,259	6	87	43,608.0	4	176	2,343.2	33	548
15 - 20	156.3	3	94	-476,346	4	66	58,144.0	17	826	3,124.2	1	24
20 - 25	195.4	3	111	-595,432	3	44	72,680.0	4	188	3,905.3	1	10
25 - 30	234.5	4	132	-714,518	0	5	87,216.0	1	27	4,686.4	0	4
30 - 35	273.6	4	140	-833,605	0	0	101,752.0	0	0	5,467.4	1	16
35 - 40	312.7	3	105	-952,691	0	0	116,288.0	0	0	6,248.5	2	38
40 - 45	351.8	2	59	-1,071,778	0	0	130,824.0	2	102	7,029.6	0	3
45 - 50	390.9	2	58	-1,190,864	0	0	145,360.0	1	32	7,810.6	2	34
50 - 55	429.9	5	161	-1,309,950	0	0	159,896.0	1	71	8,591.7	0	0
55 - 60	469.0	6	182	-1,429,037	0	0	174,432.0	2	82	9,372.7	0	0
60 - 65	508.1	3	111	-1,548,123	0	0	188,968.0	5	250	10,153.8	0	0
65 - 70	547.2	6	198	-1,667,210	0	0	203,504.0	4	167	10,934.9	0	0
70 - 75	586.3	3	110	-1,786,296	0	0	218,040.0	6	291	11,715.9	0	0
75 - 80	625.4	4	115	-1,905,382	0	0	232,576.0	8	363	12,497.0	0	0
80 - 85	664.5	4	119	-2,024,469	0	0	247,112.0	7	319	13,278.1	0	0
85 - 90	703.5	8	257	-2,143,555	0	0	261,648.0	10	466	14,059.1	0	0
90 - 95	742.6	7	222	-2,262,642	0	0	276,184.1	7	354	14,840.2	0	0
95 - 100	781.7	5	170	-2,381,728	0	0	290,720.0	6	275	15,621.2	0	0
Hours Off	0.0	0	5,571	0	0	7,250	0.0	0	4,009	0.0	0	7,118

Main System 2 COMP COMPUTER ROOM UNIT

Percent Design Load	Cooling Load Cap. (Ton)	Cooling Load Hours (%)	Cooling Load Hours	Heating Load Capacity (Btuh)	Heating Load Hours (%)	Heating Load Hours	Cooling Airflow Cap. (Cfm)	Cooling Airflow Hours (%)	Cooling Airflow Hours	Heating Airflow Cap. (Cfm)	Heating Airflow Hours (%)	Heating Airflow Hours
0 - 5	7.3	0	0	-136,277	100	345	26,685.4	0	0	0.0	0	0
5 - 10	14.7	0	0	-272,554	0	0	53,370.8	0	0	0.0	0	0
10 - 15	22.0	0	0	-408,831	0	0	80,056.2	0	0	0.0	0	0
15 - 20	29.3	0	0	-545,108	0	0	106,741.6	0	0	0.0	0	0
20 - 25	36.6	0	0	-681,385	0	0	133,427.0	0	0	0.0	0	0
25 - 30	44.0	0	0	-817,662	0	0	160,112.4	0	0	0.0	0	0
30 - 35	51.3	0	0	-953,939	0	0	186,797.8	0	0	0.0	0	0
35 - 40	58.6	0	0	-1,090,216	0	0	213,483.2	0	0	0.0	0	0
40 - 45	66.0	0	0	-1,226,493	0	0	240,168.6	0	0	0.0	0	0
45 - 50	73.3	0	21	-1,362,770	0	0	266,854.0	0	0	0.0	0	0
50 - 55	80.6	0	0	-1,499,047	0	0	293,539.4	0	0	0.0	0	0
55 - 60	88.0	0	34	-1,635,324	0	0	320,224.8	0	0	0.0	0	0
60 - 65	95.3	1	46	-1,771,601	0	0	346,910.2	0	0	0.0	0	0
65 - 70	102.6	0	29	-1,907,878	0	0	373,595.7	0	0	0.0	0	0
70 - 75	109.9	1	99	-2,044,155	0	0	400,281.1	0	0	0.0	0	0
75 - 80	117.3	24	2,122	-2,180,432	0	0	426,966.5	0	0	0.0	0	0
80 - 85	124.6	30	2,613	-2,316,709	0	0	453,651.9	0	0	0.0	0	0
85 - 90	131.9	14	1,231	-2,452,987	0	0	480,337.3	0	0	0.0	0	0
90 - 95	139.3	3	287	-2,589,263	0	0	507,022.7	0	0	0.0	0	0
95 - 100	146.6	26	2,278	-2,725,540	0	0	533,708.1	100	8,760	0.0	0	0
Hours Off	0.0	0	0	0	0	8,415	0.0	0	0	0.0	0	8,760

[redacted]EM TOTALS LOAD PROFILE - ALTERNATIVE 1
[redacted]INE

---------- S Y S T E M L O A D P R O F I L E ----------

System Totals

Percent Design Load	Cooling Load Cap. (Ton)	Cooling Load Hours (%)	Cooling Load Hours	Heating Load Capacity (Btuh)	Heating Load Hours (%)	Heating Load Hours	Cooling Airflow Cap. (Cfm)	Cooling Airflow Hours (%)	Cooling Airflow Hours	Heating Airflow Cap. (Cfm)	Heating Airflow Hours (%)	Heating Airflow Hours
0 - 5	46.4	0	0	-255,363	89	1,657	41,221.4	0	0	781.1	53	867
5 - 10	92.8	0	34	-510,727	9	165	82,442.8	0	0	1,562.1	6	98
10 - 15	139.2	55	4,806	-766,090	2	33	123,664.2	0	0	2,343.2	33	548
15 - 20	185.7	16	1,358	-1,021,454	0	0	164,885.6	0	0	3,124.2	1	24
20 - 25	232.1	2	209	-1,276,817	0	0	206,107.0	0	0	3,905.3	1	10
25 - 30	278.5	1	78	-1,532,181	0	0	247,328.4	0	0	4,686.4	0	4
30 - 35	324.9	1	98	-1,787,544	0	0	288,549.8	0	0	5,467.4	1	16
35 - 40	371.3	2	151	-2,042,907	0	0	329,771.2	0	0	6,248.5	2	38
40 - 45	417.7	2	191	-2,298,271	0	0	370,992.6	0	0	7,029.6	0	3
45 - 50	464.2	1	96	-2,553,634	0	0	412,214.1	0	0	7,810.6	2	34
50 - 55	510.6	1	70	-2,808,998	0	0	453,435.4	0	0	8,591.7	0	0
55 - 60	557.0	2	202	-3,064,361	0	0	494,656.9	0	0	9,372.7	0	0
60 - 65	603.4	2	172	-3,319,725	0	0	535,878.2	52	4,553	10,153.8	0	0
65 - 70	649.8	2	185	-3,575,088	0	0	577,099.7	4	359	10,934.9	0	0
[redacted] 75	696.2	2	161	-3,830,452	0	0	618,321.1	12	1,076	11,715.9	0	0
[redacted] 80	742.7	2	142	-4,085,815	0	0	659,542.5	1	85	12,497.0	0	0
80 - 85	789.1	2	153	-4,341,178	0	0	700,763.9	2	185	13,278.1	0	0
85 - 90	835.5	2	210	-4,596,542	0	0	741,985.3	5	473	14,059.1	0	0
90 - 95	881.9	3	271	-4,851,905	0	0	783,206.8	12	1,021	14,840.2	0	0
95 - 100	928.3	2	173	-5,107,268	0	0	824,428.1	12	1,008	15,621.2	0	0
Hours Off	0.0	0	0	0	0	6,905	0.0	0	0	0.0	0	7,118

BUILDING COOL-HEAT DEMAND - ALTERNATIVE 1
BASELINE

January			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	33.4	30.4	0	0.0	0	111.9	0	111.6	0	111.4	0	111.4
2	32.1	29.3	-275	109.3	0	111.4	0	110.8	0	110.7	0	110.6
3	31.7	29.3	0	112.3	0	111.3	0	110.5	0	110.4	0	110.4
4	31.9	29.5	0	112.2	0	111.5	0	110.5	0	110.4	0	110.4
5	32.6	30.3	-125,185	112.1	-129,370	111.9	-130,809	110.8	-130,809	110.7	-130,809	110.7
6	33.6	31.3	-124,615	112.3	-128,938	112.5	-130,334	111.2	-130,334	111.0	-130,334	111.0
7	35.0	32.6	-124,056	112.7	-128,496	113.2	-129,851	111.6	-129,851	111.5	-129,851	111.5
8	36.6	34.4	-791,156	113.6	-348,549	114.0	-128,968	112.4	-541,273	112.3	-513,803	112.3
9	38.5	36.3	-148,248	114.9	-163,765	115.0	-127,837	113.4	-277,956	113.4	-512,479	113.4
10	40.4	37.7	-396,814	116.5	-122,755	115.9	-126,566	114.5	-174,593	114.4	-510,986	114.4
11	42.3	38.7	0	118.1	-8,150	116.8	-125,002	115.5	-125,002	115.4	-480,404	115.4
12	44.2	39.6	0	119.7	0	117.7	-50,825	116.5	-50,825	116.4	-387,820	116.4
13	45.8	40.5	0	401.4	-10,980	118.4	-22,613	117.3	-231,888	117.3	-389,727	117.3
14	47.2	41.1	0	486.0	0	119.0	-18,982	118.0	-18,982	118.0	-374,817	118.0
15	48.2	41.6	0	484.4	0	119.5	-78,377	118.6	-20,053	118.5	-253,511	118.5
16	48.9	41.8	0	460.7	-5,633	119.7	-23,068	118.9	-23,068	118.9	-221,762	118.9
17	49.1	41.9	0	339.9	-22,804	119.8	-121,369	119.0	-119,203	119.0	-155,408	119.0
18	48.7	41.9	0	121.2	-31,834	119.5	-146,241	118.9	-146,251	118.9	-73,267	118.9
19	47.4	41.7	0	120.2	-39,983	118.9	-211,757	118.4	-211,757	118.4	-39,983	118.4
20	45.5	40.5	0	119.3	-44,307	118.0	-302,259	117.6	-302,259	117.6	-44,307	117.6
21	43.1	38.9	0	118.6	-48,627	116.8	-416,636	116.5	-416,636	116.5	-48,627	116.5
22	40.4	36.7	0	117.9	0	115.5	0	115.2	0	115.2	0	115.2
23	37.7	34.3	0	117.4	0	114.1	0	113.8	0	113.8	0	113.8
24	35.3	32.3	0	117.0	0	112.7	0	112.5	0	112.5	0	112.5

February			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	37.5	34.5	0	116.1	0	112.9	0	113.9	0	113.9	0	113.9
2	36.0	33.0	0	115.6	0	112.3	0	113.1	0	113.1	0	113.1
3	34.7	31.8	0	115.2	0	111.6	0	112.3	0	112.3	0	112.3
4	33.6	30.9	0	114.9	0	111.0	0	111.6	0	111.6	0	111.6
5	32.8	30.1	-128,187	114.7	-128,764	110.5	-130,220	111.1	-130,220	111.1	-130,220	111.1
6	32.2	29.8	-127,324	114.8	-128,356	110.1	-129,769	110.6	-129,769	110.6	-129,769	110.6
7	32.1	29.6	-126,679	114.9	-127,977	109.8	-129,349	110.3	-129,349	110.3	-129,349	110.3
8	32.5	30.3	-500,358	115.4	-337,511	109.9	-128,531	110.3	-697,249	110.3	-513,366	110.3
9	33.9	31.6	-306,435	116.3	-126,109	110.4	-127,674	110.8	-467,838	110.8	-512,316	110.8
10	36.0	33.0	-158,008	117.5	-121,314	111.3	-126,502	111.7	-362,073	111.7	-510,496	111.7
11	38.5	34.8	-45,041	119.0	-17,593	112.7	-125,061	112.9	-235,444	112.9	-486,171	112.9
12	41.3	36.5	0	120.4	-5,820	114.3	-62,331	114.5	-62,331	114.5	-381,833	114.5
13	43.8	38.1	0	523.7	-11,437	115.8	-23,071	115.9	-311,202	115.9	-381,752	115.9
14	45.9	39.5	0	534.8	0	116.9	-20,104	117.1	-20,104	117.1	-235,214	117.1
15	47.2	40.4	0	523.6	0	117.7	-112,401	117.8	-17,246	117.8	-172,625	117.8
16	47.7	40.6	0	502.0	0	118.0	-20,810	118.1	-20,810	118.1	0	118.1
17	47.5	40.2	0	416.5	-20,929	118.0	-183,179	118.0	-181,221	118.0	-25,937	118.0
18	47.0	39.8	0	120.4	-38,597	117.9	-222,894	117.9	-222,894	117.9	-88,510	117.9
19	46.2	39.9	0	119.4	-44,575	117.7	-264,933	117.7	-264,933	117.7	-44,575	117.7
20	45.1	39.7	0	118.4	-46,736	117.3	-321,743	117.3	-321,743	117.3	-46,736	117.3
21	43.8	39.2	0	117.6	-46,736	116.8	-382,320	116.8	-382,320	116.8	-46,736	116.8
22	42.3	38.3	0	116.8	0	116.1	0	116.1	0	116.1	0	116.1
23	40.7	37.2	0	116.2	0	115.4	0	115.4	0	115.4	0	115.4
24	39.1	35.8	0	115.8	0	114.6	0	114.6	0	114.6	0	114.6

[redacted]ING COOL-HEAT DEMAND - ALTERNATIVE 1
[redacted]INE

March			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	45.4	41.6	0	121.1	0	118.4	0	117.4	0	114.8	0	114.7
2	43.3	39.7	0	120.6	0	117.4	0	116.2	0	113.6	0	113.7
3	41.6	38.6	0	120.3	0	116.6	0	115.4	0	112.7	0	112.8
4	40.6	37.5	0	120.0	0	116.0	0	115.0	0	112.2	0	112.3
5	40.2	37.3	-124,402	119.9	0	115.8	-124,289	114.9	-125,583	112.0	-125,583	112.1
6	40.6	37.8	-123,523	120.1	-28,962	116.0	-123,710	115.2	-124,965	112.3	-124,965	112.3
7	41.6	39.0	-122,565	120.5	-58,555	116.5	-123,073	115.8	-124,291	112.9	-124,291	112.8
8	43.3	40.7	-143,516	121.5	-18,953	117.4	-92,632	116.7	-553,964	113.7	-123,310	113.6
9	45.4	42.5	0	444.8	0	118.4	-18,062	117.8	-73,674	114.7	-44,864	114.7
10	47.9	44.3	0	477.6	0	119.7	-9,504	119.0	-9,503	115.8	0	116.0
11	50.6	45.5	0	548.6	0	121.1	0	120.3	0	117.2	0	117.3
12	53.3	46.8	0	589.4	0	122.5	0	121.6	0	118.6	0	118.7
13	55.8	48.5	0	576.6	0	514.5	0	122.7	0	144.0	0	563.1
14	58.0	49.6	0	589.3	0	532.1	0	123.8	0	190.1	0	565.1
15	59.6	50.3	0	597.6	0	520.5	0	149.0	0	195.1	0	566.3
16	60.7	50.9	0	643.5	0	549.2	0	201.0	0	198.6	0	571.1
17	61.0	50.9	0	508.8	0	428.1	0	164.3	0	162.0	0	531.5
18	60.7	50.7	0	350.4	0	317.2	0	161.9	0	159.7	0	464.6
19	59.6	50.7	0	127.4	0	125.4	0	156.5	0	154.6	0	122.0
20	58.0	50.5	0	126.0	0	124.4	0	148.9	0	147.3	0	121.2
21	55.8	49.4	0	124.8	0	123.1	0	139.1	0	137.8	0	120.1
[redacted]	53.3	47.8	0	123.7	0	121.7	0	119.6	0	118.7	0	118.8
[redacted]	50.6	45.9	0	122.9	0	120.2	0	117.9	0	117.4	0	117.4
24	47.9	43.8	0	122.2	0	118.7	0	116.3	0	116.0	0	116.1

April			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	57.7	53.9	0	123.6	0	121.4	0	121.7	0	121.8	0	121.8
2	55.9	52.7	0	123.1	0	120.5	0	120.8	0	120.8	0	120.9
3	54.2	51.3	0	122.7	0	119.6	0	119.9	0	120.0	0	120.0
4	52.9	50.2	0	122.4	0	119.0	0	119.2	0	119.3	0	119.3
5	51.9	49.6	-98,235	122.3	0	118.5	0	118.7	-16,124	118.8	-16,124	118.8
6	51.2	49.2	-9,265	122.5	0	118.1	0	118.3	0	118.4	0	118.4
7	51.0	49.3	0	123.0	0	118.0	0	118.2	0	118.3	0	118.3
8	51.6	49.9	0	611.4	0	118.3	0	118.5	0	118.5	0	118.6
9	53.3	50.6	0	599.4	0	119.2	0	119.3	0	119.4	0	119.4
10	55.9	51.8	0	654.4	0	544.4	0	120.7	0	179.6	0	736.5
11	59.0	53.4	0	678.0	0	575.6	0	122.2	0	198.5	0	694.0
12	62.4	55.6	0	694.7	0	596.8	0	124.0	0	214.3	0	688.1
13	65.5	57.7	0	688.2	0	599.3	0	125.6	0	200.0	0	688.1
14	68.1	59.4	0	734.1	0	646.5	0	143.9	0	248.8	0	703.7
15	69.8	60.7	0	752.7	0	680.6	0	267.4	0	267.0	0	724.3
16	70.4	60.9	0	731.0	0	659.2	0	267.8	0	267.9	0	697.4
17	70.2	60.2	0	620.9	0	545.8	0	216.7	0	216.7	0	666.2
18	69.5	60.1	0	441.2	0	407.8	0	212.3	0	212.3	0	602.4
19	68.5	59.4	0	129.1	0	127.1	0	207.1	0	207.1	0	127.2
[redacted]	67.2	59.7	0	127.8	0	126.4	0	212.5	0	212.5	0	126.6
[redacted]	65.5	59.3	0	126.7	0	125.6	0	204.9	0	204.9	0	125.7
22	63.7	58.8	0	125.7	0	124.7	0	124.8	0	124.8	0	124.8
23	61.7	57.3	0	124.9	0	123.7	0	123.8	0	123.8	0	123.8
24	59.7	55.6	0	124.4	0	122.7	0	122.8	0	122.8	0	122.8

BUILDING COOL-HEAT DEMAND - ALTERNATIVE 1
BASELINE

May			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	66.6	62.3	0	128.5	0	126.4	0	128.0	0	129.1	0	129.8
2	64.5	60.4	0	128.0	0	125.4	0	126.9	0	126.7	0	124.8
3	62.7	59.1	0	127.6	0	124.5	0	125.9	0	130.0	0	136.5
4	61.2	58.1	0	127.3	0	123.7	0	125.1	0	114.3	0	93.3
5	60.0	57.1	0	127.2	0	123.1	0	124.0	0	160.3	0	160.3
6	59.3	56.6	0	127.4	0	122.7	0	124.6	0	66.3	0	135.6
7	59.0	56.5	0	127.9	0	122.6	0	120.3	0	131.7	0	85.9
8	59.5	56.6	0	679.4	0	617.9	0	133.1	0	144.4	0	928.3
9	60.9	56.6	0	770.2	0	646.5	0	91.5	0	238.1	0	924.8
10	63.0	57.2	0	797.1	0	664.2	0	146.6	0	217.3	0	862.6
11	65.7	58.1	0	790.2	0	663.2	-9	128.9	0	242.8	0	872.3
12	68.7	59.8	0	775.1	0	661.9	0	133.3	-90	272.3	-4,111	826.2
13	71.7	61.6	0	758.7	0	658.1	0	136.8	0	251.1	0	767.3
14	74.5	63.4	0	795.7	0	702.6	0	215.2	0	302.2	0	768.2
15	76.6	64.8	0	813.4	0	739.2	0	323.4	0	322.9	0	794.3
16	78.0	65.6	0	810.5	0	731.6	0	325.4	0	325.4	0	778.5
17	78.5	65.6	0	719.2	0	645.6	0	288.4	0	293.9	0	751.8
18	78.2	65.8	0	531.8	0	501.8	0	285.7	0	302.8	0	699.9
19	77.5	65.6	0	138.2	0	132.1	0	275.1	0	275.1	0	132.4
20	76.3	66.1	0	132.5	0	131.5	0	282.0	0	282.2	0	132.1
21	74.8	67.2	0	131.4	0	130.8	0	289.8	0	289.9	0	131.9
22	73.0	66.4	0	130.4	0	129.9	0	131.3	0	131.4	0	131.4
23	70.9	65.4	0	129.6	0	129.5	0	130.7	0	130.9	0	130.9
24	68.7	64.0	0	129.0	0	128.8	0	129.8	0	129.7	0	129.7

June			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	73.0	67.9	0	136.2	0	117.2	0	123.6	0	135.0	0	133.8
2	71.2	66.1	0	131.8	0	146.6	0	146.6	0	134.9	0	135.7
3	69.7	65.2	0	144.1	0	127.1	0	142.9	0	134.6	0	131.1
4	68.5	64.3	0	101.6	0	146.6	0	112.0	0	129.0	0	146.6
5	67.8	64.2	0	151.5	0	94.4	0	146.6	0	193.3	0	149.0
6	67.6	64.2	0	159.6	0	151.4	0	140.9	0	105.9	0	153.7
7	68.1	64.8	0	145.6	0	152.5	0	112.6	0	158.0	0	158.0
8	69.4	65.7	0	892.1	0	850.6	0	154.4	0	291.1	0	900.3
9	71.6	66.2	0	866.5	0	815.2	0	156.3	0	325.8	0	928.3
10	74.2	67.2	0	911.9	0	831.6	0	126.7	0	369.5	0	906.7
11	77.2	68.5	0	923.8	0	778.4	0	165.4	0	394.2	0	928.3
12	80.2	70.0	0	912.5	0	823.4	0	170.6	0	390.2	0	906.9
13	82.8	70.8	0	874.0	0	803.6	0	171.6	0	387.3	0	928.3
14	85.0	71.6	0	888.2	0	843.6	0	369.5	0	449.7	0	928.3
15	86.3	72.3	0	918.9	0	879.9	0	438.2	0	495.7	0	928.3
16	86.8	72.1	0	905.1	0	853.9	0	422.4	0	471.0	0	923.4
17	86.6	71.7	0	844.5	0	772.7	0	381.4	0	420.2	0	928.3
18	85.8	71.5	0	629.0	0	611.2	0	377.1	0	404.5	0	839.0
19	84.7	71.2	0	140.7	0	156.9	0	360.2	0	366.6	0	156.9
20	83.2	71.5	0	156.6	0	152.2	0	370.0	0	359.7	0	153.2
21	81.4	71.7	0	154.1	0	155.1	0	358.0	0	364.9	0	154.4
22	79.3	71.4	0	113.2	0	133.4	0	146.6	0	146.6	0	132.1
23	77.2	70.5	0	146.6	0	146.6	0	132.2	0	146.6	0	146.6
24	75.1	69.1	0	146.6	0	146.6	0	146.6	0	141.3	0	146.6

[redacted]NG COOL-HEAT DEMAND - ALTERNATIVE 1
[redacted]NE

July			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	72.0	69.3	0	125.2	0	146.6	-812	146.6	-1,873	146.6	-2,711	146.6
2	70.5	68.0	0	146.6	0	146.6	0	146.6	-723	146.6	0	146.6
3	69.4	67.1	0	141.2	0	146.6	-194	146.6	0	146.6	0	146.6
4	68.5	66.4	0	122.9	0	124.9	0	146.6	0	146.6	0	146.6
5	67.9	66.0	0	158.7	0	146.6	0	146.6	0	202.0	0	202.0
6	67.7	65.9	0	139.1	0	131.1	0	146.6	0	151.3	0	151.3
7	68.1	66.3	0	162.2	0	148.6	0	130.2	0	153.9	0	153.9
8	69.1	67.3	0	890.6	0	847.3	0	154.4	0	303.2	0	928.3
9	70.8	68.0	0	928.3	0	859.7	0	120.4	0	364.9	0	928.3
10	72.9	69.1	0	928.3	0	843.7	0	163.0	0	379.3	0	928.3
11	75.2	70.5	0	928.3	0	813.4	0	165.5	0	391.7	0	928.3
12	77.5	71.7	0	928.3	0	841.2	0	169.4	0	430.0	0	928.3
13	79.6	72.7	0	928.3	0	826.8	0	169.9	-61	400.9	-157	928.3
14	81.3	73.5	0	928.3	0	863.8	0	401.0	0	461.9	0	928.3
15	82.3	73.7	0	928.3	0	885.6	0	452.4	-935	475.4	-1,040	928.3
16	82.7	73.5	0	928.3	0	863.2	-244	435.2	-3,031	480.3	-3,153	928.3
17	82.5	73.1	0	892.4	0	778.5	-130	395.2	-422	430.0	-489	928.3
18	82.0	72.6	0	781.9	0	619.4	0	391.8	0	415.0	0	872.6
19	81.1	73.2	0	157.9	0	155.7	-1,096	380.0	-1,182	381.2	-1,113	155.7
20	79.9	73.8	0	156.4	0	155.6	0	390.2	0	390.5	0	155.6
21	78.5	73.9	0	155.6	0	155.4	-249	399.6	-635	399.6	-677	155.4
[redacted]	76.9	73.1	0	146.6	-1,858	146.6	-3,486	146.6	0	146.6	0	146.6
23	75.2	71.9	0	146.6	-610	146.6	-1,840	146.6	0	146.6	0	146.6
24	73.5	70.8	0	146.6	-1,903	146.6	-2,335	146.6	-5,858	146.6	0	146.6

August			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	72.7	70.2	-3,874	146.6	0	146.6	-54	146.6	-879	146.6	-449	146.6
2	71.2	69.0	-1,160	146.6	0	146.6	-542	146.6	-1,193	146.6	0	146.6
3	69.9	68.0	0	146.6	0	146.6	0	146.6	0	146.6	0	146.6
4	68.8	67.1	0	146.6	0	146.6	0	146.6	0	146.6	0	146.6
5	68.0	66.6	0	154.5	0	146.6	0	146.6	0	202.9	0	202.9
6	67.5	66.2	0	146.6	-42	146.6	0	146.6	0	151.1	-121	151.1
7	67.3	66.1	0	155.0	0	146.6	0	135.1	0	151.8	0	151.8
8	67.8	66.5	0	928.3	0	869.4	0	124.6	0	290.7	0	928.3
9	69.1	67.0	0	928.3	0	828.2	0	154.5	0	342.3	0	928.3
10	71.2	67.8	0	928.3	0	786.0	0	142.6	0	356.4	0	902.5
11	73.8	68.7	-33	928.3	0	816.9	0	161.4	0	369.1	0	928.3
12	76.5	70.0	-167	928.3	0	828.7	0	140.5	0	395.8	0	928.3
13	79.1	71.2	-373	928.3	0	821.5	0	168.1	0	371.8	0	908.0
14	81.1	72.6	-66	928.3	0	864.3	0	376.4	0	418.7	0	928.3
15	82.5	73.6	-1,351	928.3	0	873.3	0	436.4	0	464.2	0	928.3
16	83.0	73.7	-3,043	928.3	0	852.4	0	432.9	0	471.8	0	928.3
17	82.8	73.5	-1,183	906.8	0	769.7	0	392.4	0	425.1	0	928.3
18	82.3	73.5	-762	778.7	0	603.6	0	387.5	0	402.6	0	846.6
19	81.5	73.1	-81	157.8	0	155.7	-521	381.0	0	382.1	-276	155.7
[redacted]	80.4	73.7	0	156.4	0	155.6	-44	391.5	-4	391.9	-79	155.6
[redacted]	79.1	74.9	0	156.4	0	155.4	-509	401.3	-421	401.3	-530	155.4
22	77.6	73.9	0	146.6	0	146.6	-2,561	146.6	-2,488	146.6	-2,566	146.6
23	76.0	72.7	0	146.6	-1,537	146.6	-3,257	146.6	-3,346	146.6	-3,218	146.6
24	74.3	71.3	0	146.6	-1,238	146.6	-2,579	146.6	-2,180	146.6	-2,472	146.6

BUILDING COOL-HEAT DEMAND - ALTERNATIVE 1
BASELINE

September			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	69.8	66.1	-1,397	146.6	0	146.6	0	146.6	0	146.6	0	123.7
2	68.0	64.5	0	146.6	0	146.6	0	118.2	0	121.0	0	146.6
3	66.3	63.0	-695	146.6	0	81.3	0	146.6	0	146.6	0	117.4
4	64.9	61.9	0	146.6	0	135.2	0	124.2	0	114.5	0	146.6
5	63.9	61.3	0	146.6	0	104.5	0	145.0	0	173.4	0	135.6
6	63.2	61.0	0	146.6	0	146.6	0	82.5	0	108.2	0	146.6
7	63.0	60.8	0	105.9	0	119.6	0	133.8	0	146.6	0	111.6
8	63.4	61.4	0	895.5	0	725.7	0	105.0	0	204.1	0	928.3
9	64.7	61.8	0	899.6	0	643.6	0	146.6	0	276.8	0	876.8
10	66.6	62.1	0	869.8	0	718.0	0	120.6	0	253.2	0	928.3
11	69.1	62.9	0	905.9	0	717.8	0	146.6	0	300.9	0	928.3
12	71.8	63.7	0	890.1	0	758.0	0	93.2	0	275.6	0	858.1
13	74.5	65.5	0	875.1	0	753.7	0	150.1	0	334.9	0	913.3
14	77.0	67.1	0	879.7	0	740.2	0	230.1	0	394.1	0	895.7
15	78.9	68.2	0	895.8	0	801.6	0	370.3	0	355.5	0	871.2
16	80.2	68.6	0	846.0	0	789.0	0	372.2	0	384.3	0	810.7
17	80.6	68.5	0	804.4	0	681.0	0	292.8	0	336.3	0	802.0
18	80.4	68.9	0	598.9	0	499.6	0	328.4	0	310.2	0	732.7
19	79.7	70.0	0	135.3	0	152.9	0	340.1	0	340.1	0	138.8
20	78.7	71.2	0	152.9	0	152.9	0	351.3	0	334.2	0	152.9
21	77.3	71.6	0	120.4	0	137.7	0	346.8	0	361.2	0	134.8
22	75.6	70.5	0	146.6	0	146.6	0	146.6	0	146.6	0	146.6
23	73.7	69.4	0	142.0	0	146.5	0	146.6	0	135.8	0	146.6
24	71.8	67.7	0	103.4	0	131.1	0	127.8	0	146.1	0	146.6

October			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	54.8	51.3	0	107.9	0	120.2	0	120.1	0	120.1	0	120.1
2	52.9	49.6	0	136.1	0	119.2	0	119.1	0	119.1	0	119.1
3	51.2	48.2	0	125.4	0	118.3	0	118.2	0	118.2	0	118.2
4	49.8	47.2	0	124.1	0	117.6	0	117.5	0	117.5	0	117.5
5	48.8	46.2	0	117.7	0	117.1	0	117.0	-135,161	117.0	-135,161	117.0
6	48.2	45.7	0	124.8	0	116.8	0	116.7	-63,048	116.6	-63,049	116.6
7	47.9	45.6	0	122.9	0	116.6	-6,965	116.5	-44,782	116.5	-44,782	116.5
8	48.5	46.2	0	654.2	0	116.9	-16,378	116.8	-181,598	116.8	0	116.8
9	50.3	47.3	0	671.1	0	117.8	0	117.7	0	117.7	0	117.7
10	52.9	48.7	0	685.6	0	119.1	0	119.0	0	119.0	0	119.0
11	56.2	49.9	0	695.4	0	554.0	0	120.7	0	179.2	0	646.4
12	59.6	51.5	0	704.1	0	584.5	0	122.4	0	195.4	0	669.3
13	62.9	53.5	0	695.9	0	560.8	0	124.1	0	172.5	0	658.2
14	65.5	55.2	0	725.0	0	580.1	0	125.4	0	219.5	0	654.3
15	67.3	56.3	0	726.0	0	620.4	0	218.8	0	230.0	0	662.4
16	67.9	56.6	0	697.4	0	615.2	0	232.9	0	232.4	0	651.7
17	67.7	56.4	0	545.7	0	449.2	0	189.6	0	189.6	0	583.2
18	67.0	56.6	0	385.5	0	357.9	0	190.1	0	190.0	0	512.2
19	66.0	57.6	0	128.2	0	125.7	0	194.4	0	194.4	0	125.7
20	64.6	57.9	0	126.8	0	125.1	0	188.5	0	188.5	0	125.0
21	62.9	57.3	0	125.7	0	124.2	0	181.1	0	181.1	0	124.1
22	61.0	56.0	0	124.6	0	123.3	0	123.2	0	123.2	0	123.2
23	59.0	54.8	0	123.8	0	122.2	0	122.2	0	122.2	0	122.2
24	56.9	53.0	0	123.1	0	121.2	0	121.1	0	121.1	0	121.1

[redacted]NG COOL-HEAT DEMAND - ALTERNATIVE 1
BA[redacted]INE

November			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	48.7	45.7	0	120.7	0	116.7	0	116.7	0	116.7	0	116.7
2	46.9	44.1	0	120.1	0	115.7	0	115.8	0	115.8	0	115.8
3	45.5	42.8	0	119.7	0	115.0	0	115.1	0	115.1	0	115.1
4	44.6	41.9	0	119.4	0	114.5	0	114.6	0	114.6	0	114.6
5	44.4	42.0	0	119.2	0	114.4	-122,628	114.5	-124,097	114.5	-124,097	114.5
6	44.8	42.7	-28,499	119.4	0	114.6	-121,946	114.7	-123,371	114.7	-123,371	114.7
7	45.9	43.9	-36,730	119.9	-22,907	115.2	-97,988	115.2	-122,653	115.2	-122,653	115.2
8	47.8	46.0	0	464.6	-12,724	116.1	-24,792	116.2	-372,912	116.2	-88,876	116.2
9	50.2	48.0	0	504.8	0	117.4	-8,802	117.4	-8,806	117.4	0	117.4
10	52.9	49.9	0	646.9	0	118.7	0	118.8	0	118.8	0	118.8
11	55.8	51.1	0	658.0	0	545.1	0	120.3	0	175.8	0	632.6
12	58.5	52.0	0	660.0	0	557.0	0	121.6	0	188.0	0	633.5
13	60.9	52.5	0	635.2	0	537.6	0	122.9	0	162.1	0	597.0
14	62.8	53.4	0	678.2	0	549.8	0	123.8	0	206.8	0	595.9
15	64.0	53.8	0	675.5	0	550.8	0	159.4	0	211.2	0	588.5
16	64.4	53.9	0	637.7	0	557.5	0	212.1	0	212.1	0	585.9
17	64.1	53.7	0	452.5	0	411.1	0	173.4	0	173.5	0	524.3
18	63.2	53.7	0	359.0	0	328.0	0	169.4	0	169.4	0	474.0
19	61.8	54.2	0	125.8	0	123.3	0	163.1	0	163.1	0	123.4
20	60.0	53.6	0	124.5	0	122.4	0	159.2	0	159.2	0	122.5
[redacted]	57.9	52.7	0	123.4	0	121.4	0	150.6	0	150.6	0	121.4
[redacted]	55.6	51.2	0	122.3	0	120.2	0	120.3	0	120.3	0	120.3
23	53.2	49.5	0	121.5	0	119.0	0	119.0	0	119.0	0	119.0
24	50.8	47.6	0	120.9	0	117.8	0	117.8	0	117.8	0	117.8

December			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	37.5	35.3	0	116.5	0	110.7	0	110.7	0	110.7	0	110.7
2	37.1	35.1	0	116.0	0	110.5	0	110.5	0	110.5	0	110.5
3	37.4	35.5	0	115.6	0	110.7	0	110.7	0	110.7	0	110.7
4	38.1	36.2	0	115.3	0	111.0	0	111.0	0	111.0	0	111.0
5	39.3	37.6	-122,860	115.2	-125,917	111.6	-129,068	111.6	-129,068	111.6	-129,068	111.6
6	40.9	39.2	-122,163	115.4	-125,157	112.4	-128,215	112.4	-128,215	112.4	-128,215	112.4
7	42.7	41.2	-98,697	115.8	-124,604	113.3	-127,570	113.3	-127,570	113.3	-127,570	113.3
8	44.7	43.1	-10,264	116.6	-113,464	114.3	-126,522	114.3	-400,818	114.3	-509,719	114.3
9	46.8	45.3	0	117.7	-5,497	115.4	-125,190	115.4	-125,190	115.4	-505,463	115.4
10	48.8	47.0	0	119.0	0	116.4	-118,087	116.5	-118,087	116.5	-446,517	116.5
11	50.7	48.1	0	570.3	0	117.4	-8,270	117.4	-8,270	117.4	-366,329	117.4
12	52.2	48.8	0	580.6	0	118.2	0	118.2	0	118.2	-228,247	118.2
13	53.4	49.2	0	563.6	0	118.8	-5,825	118.8	-5,825	118.8	0	118.8
14	54.1	49.2	0	572.0	0	119.2	0	119.2	0	119.2	0	119.2
15	54.4	48.9	0	597.6	0	119.4	-5,457	119.4	-5,457	119.4	0	119.4
16	54.0	48.2	0	562.8	0	119.2	-12,276	119.2	-12,276	119.2	0	119.2
17	53.0	47.3	0	388.5	0	118.7	-27,595	118.7	-27,595	118.7	0	118.7
18	51.4	46.3	0	306.1	0	117.9	-29,761	117.9	-29,761	117.9	0	117.9
19	49.3	45.4	0	120.9	-12,224	116.8	-114,523	116.8	-114,523	116.8	-15,522	116.8
[redacted]	47.0	43.5	0	119.8	-38,391	115.6	-224,654	115.6	-224,654	115.6	-38,392	115.6
[redacted]	44.5	41.5	0	118.8	-42,976	114.3	-343,564	114.4	-343,564	114.4	-42,976	114.4
22	42.2	39.3	0	117.9	0	113.2	0	113.2	0	113.2	0	113.2
23	40.1	37.6	0	117.2	0	112.1	0	112.1	0	112.1	0	112.1
24	38.5	36.2	0	116.6	0	111.3	0	111.3	0	111.3	0	111.3

BUILDING TEMPERATURE PROFILES - ALTERNATIVE 1
BASELINE

BUILDING TEMPERATURE PROFILES

Temperature Range (F)	Room Number 1	2	3	4	5	6	7
Max. Temp.	76.4	90.0	90.0	90.0	90.5	81.8	78.1
Mo./Hr.	6 24	6 11	9 14	5 17	6 4	7 21	7 21
Day Type	1	4	4	4	4	4	5
	Number of Hours						
Above 100	0	0	0	0	0	0	0
95 - 100	0	0	0	0	0	0	0
90 - 95	0	0	0	0	318	0	0
85 - 90	0	635	519	703	2,308	0	0
80 - 85	0	566	825	414	536	235	0
75 - 80	4,010	1,868	2,357	1,870	4,847	4,397	2,166
70 - 75	4,290	3,865	4,850	4,439	751	4,128	6,594
65 - 70	460	1,290	209	1,049	0	0	0
60 - 65	0	499	0	285	0	0	0
55 - 60	0	37	0	0	0	0	0
50 - 55	0	0	0	0	0	0	0
Below 50	0	0	0	0	0	0	0
Min. Temp.	68.2	58.0	65.5	60.4	68.0	67.1	74.0
Mo./Hr.	1 4	1 7	1 7	1 7	1 1	1 7	5 9
Day Type	3	5	1	5	1	1	5

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 1
- BASELINE

M O N T H L Y E N E R G Y C O N S U M P T I O N

Month	ELEC On Peak (kWh)	DEMAND On Peak (kW)	WATER (1000 Gl)
Jan	1,067,950	2,351	357
Feb	963,976	2,473	319
March	1,154,577	2,788	568
April	1,230,076	2,910	723
May	1,326,991	3,073	952
June	1,352,913	3,152	1,127
July	1,384,404	3,188	1,162
Aug	1,407,292	3,163	1,190
Sept	1,299,865	3,122	981
Oct	1,222,233	2,944	684
Nov	1,149,309	2,879	615
Dec	1,072,982	2,716	357
Total	14,632,569	3,188	9,035

Building Energy Consumption = 182,104 (Btu/Sq Ft/Year) Floor Area = 274,244 (Sq Ft)
Source Energy Consumption = 546,367 (Btu/Sq Ft/Year)

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
M200 - BASELINE

EQUIPMENT ENERGY CONSUMPTION

Ref Num	Equip Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
		Monthly Consumption												
0	LIGHTS													
	ELEC	351667	317634	351667	340323	351667	340323	351667	351667	340323	351667	340323	351667	4,140,593
	PK	784.3	784.3	784.3	784.3	784.3	784.3	784.3	784.3	784.3	784.3	784.3	784.3	784.3
1	MISC LD													
	ELEC	249479	225436	255694	240429	252587	246644	246372	255694	240429	252586	240429	246372	2,952,151
	PK	563.9	563.9	563.9	563.9	563.9	563.9	563.9	563.9	563.9	563.9	563.9	563.9	563.9
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	EQ1010L	HR CTV >190 TONS 95 F												
	ELEC	91708	82114	125470	147412	184959	220954	233979	236611	194385	142595	131328	91210	1,882,724
	PK	333.9	348.4	389.9	446.8	507.0	584.9	597.6	595.7	555.2	422.5	403.5	372.1	597.6
1	EQ5100	COOLING TOWER												
	ELEC	0	0	44368	127356	131601	127355	131601	131601	127356	87734	74291	10967	994,228
	PK	3.5	14.7	176.9	176.9	176.9	176.9	176.9	176.9	176.9	176.9	176.9	176.9	176.9
1	EQ5100	COOLING TOWER												
	WATER	357	319	568	723	952	1127	1162	1190	981	684	615	357	9,035
	PK	1.9	2.0	2.4	2.8	3.4	3.5	3.5	3.5	3.4	2.7	2.5	2.3	3.5
1	EQ5001	CHILLED WATER PUMP C.V. 60 hp × .746 × .85/.91 = 55.74 kW												
	ELEC	59179	53452	59179	57270	59179	57270	59179	59179	57270	59179	57270	59179	696,784
	PK	79.5	79.5	79.5	79.5	79.5	79.5	79.5	79.5	79.5	79.5	79.5	79.5	79.5
1	EQ5010	CONDENSER WATER PUMP C.V. 75 hp × .746 × .85/.91 = 52.03 kW												
	ELEC	55480	50111	55480	53691	55480	53691	55480	55480	53691	55480	53691	55480	653,235
	PK	74.6	74.6	74.6	74.6	74.6	74.6	74.6	74.6	74.6	74.6	74.6	74.6	74.6

1 EQ5300 CONTROL PANEL & INTERLOCK

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
M200 - BASELINE

	ELEC	744	672	744	720	744	720	744	744	720	744	720	744	8,760
	PK	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
1	CECAFVAR				AIR FOIL CENTRIFUGAL W\VAR SPEED DRIVE									
	ELEC	31275	28323	40179	46897	61405	76546	70282	78534	62681	48358	37622	33109	615,210
	PK	184.7	240.3	306.9	422.3	422.3	422.3	422.3	422.3	422.3	391.5	359.7	269.4	422.3
1	CECFCFAN				FORWARD CURVE CENT. FAN CONSTANT VOLUME									
	ELEC	409	340	72	0	0	0	0	0	0	21	59	232	1,132
	PK	6.6	3.9	1.2	0.9	0.0	0.0	0.0	0.0	0.0	1.0	1.0	3.9	6.6
1	CECAFVAR				AIR FOIL CENTRIFUGAL W\VAR SPEED DRIVE									
	ELEC	14435	13072	18544	21645	28341	35329	32438	36246	28930	22319	17364	15281	283,943
	PK	85.3	110.9	141.6	194.9	194.9	194.9	194.9	194.9	194.9	180.7	166.0	124.3	194.9
2	CECFCFAN				FORWARD CURVE CENT. FAN CONSTANT VOLUME									
	ELEC	200551	181143	200551	194082	200551	194082	200551	200551	194082	200552	194082	200551	2,361,330
	PK	269.6	269.6	269.6	269.6	269.6	269.6	269.6	269.6	269.6	269.6	269.6	269.6	269.6
1	HEATPUMP													
	ELEC	7230	6579	849	0	0	0	0	0	0	363	1014	4161	20,196
	PK	64.6	64.5	18.0	12.3	0.0	0.0	0.0	0.0	0.0	22.8	46.9	64.1	64.6
1	EQ5020				HEAT WATER CIRC. PUMP C.V.									
	ELEC	2300	1958	684	65	124	0	546	255	0	211	575	1674	8,391
	PK	7.3	7.3	7.3	7.3	7.3	0.0	7.3	7.3	7.3	7.3	7.3	7.3	7.3
2	EQ2051				ELECTRIC HOT WATER BOILER									
	ELEC	967	949	53	0	0	0	0	0	0	131	0	477	2,577
	PK	14.9	13.7	13.1	0.0	0.0	0.0	0.0	0.0	0.0	13.1	10.8	12.6	14.9
2	EQ5020				HEAT WATER CIRC. PUMP C.V.									
	ELEC	2526	2192	1044	188	355	0	1566	731	0	292	543	1879	11,317
	PK	20.9	20.9	20.9	20.9	20.9	0.0	20.9	20.9	20.9	20.9	20.9	20.9	20.9

[redacted]LITY PEAK CHECKSUMS - ALTERNATIVE 1
[redacted] - BASELINE

---------- 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 3,187.8 (kW)
Yearly Time of Peak 14 (hr) 7 (mo)

Hour 14 Month 7

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Percnt Of Tot (%)
Cooling Equipment				
1	EQ1010L	HR CTV >190 TONS 95 F	924.5	29.00
Sub Total			924.5	29.00
Heating Equipment				
1	HEATPUMP		7.3	0.23
2	EQ2051	ELECTRIC HOT WATER BOILER	20.9	0.65
[redacted]Total			28.2	0.88
Air Moving Equipment				
1		SUMMATION OF FAN ELECTRICAL DEMAND	617.2	19.36
2		SUMMATION OF FAN ELECTRICAL DEMAND	269.6	8.46
Sub Total			886.8	27.82
Sub Total			0.0	0.00
Miscellaneous				
Lights			784.3	24.60
Base Utilities			0.0	0.00
Misc Equipment			563.9	17.69
Sub Total			1,348.3	42.30
Grand Total			3,187.8	100.00

CALIFORNIA TITLE 24 COMPLIANCE - ALTERNATIVE 1
M200 - BASELINE

CALIFORNIA TITLE 24 COMPLIANCE REPORT

Weather Name ..... ATLANTA.
Gross Conditioned Floor Area (sqft)..... 274,244
ACM Multiplier 1.025

E N E R G Y U S E S U M M A R Y

	ELEC (kWh/yr)	WATER (1000 gal)	PERCENT OF TOTAL ENERGY (%)	TOTAL SOURCE ENERGY (kBtu/yr)	ADJUSTED UNIT SOURCE ENERGY (kBtu/yr-sf)
Primary Heating	22,772.7	0.0	0.2	233,193.3	0.9
Primary Cooling					
Compressor	1,882,724.4	0.0	12.9	19,279,142.0	72.1
Tower/Cond Fans	994,227.9	9,035.0	6.8	10,180,917.0	38.1
Condenser Pump	653,235.2	0.0	4.5	6,689,144.5	25.0
Other Accessories	8,760.0	0.0	0.1	89,702.6	0.3
Auxiliary					
Supply Fans	3,261,615.8	0.0	22.3	33,399,022.0	124.8
Circulation Pumps	716,491.8	0.0	4.9	7,336,892.5	27.4
Base Utilities	0.0	0.0	0.0	0.0	0.0
Subtotal	3,978,107.5	0.0	27.2	40,735,916.0	152.3
Lighting	4,140,592.8	0.0	28.3	42,399,768.0	154.6
Receptacle	2,952,151.2	0.0	20.2	30,230,098.0	110.2
Domestic Hot Water	0.0	0.0	0.0	0.0	0.0
Cogeneration	0.0	0.0	0.0	0.0	0.0
Totals	14,632,572.0	9,035.0	100.0	149837888.0	553.4

[redacted]LY ENERGY CONSUMPTION - ALTERNATIVE 1
[redacted] BASELINE

MONTHLY ENERGY CONSUMPTION

Month	ELEC On Peak (kWh)	DEMAND On Peak (kW)	WATER (1000 Gl)
Jan	1,067,578	2,351	357
Feb	963,611	2,473	319
March	1,156,645	2,788	576
April	1,230,951	2,910	729
May	1,327,100	3,071	952
June	1,352,587	3,152	1,124
July	1,383,551	3,188	1,154
Aug	1,406,642	3,163	1,185
Sept	1,299,508	3,122	978
Oct	1,223,519	2,944	691
Nov	1,151,593	2,879	625
Dec	1,072,629	2,716	357
Total	14,635,913	3,188	9,047

Building Energy Consumption = 182,146 (Btu/Sq Ft/Year) Floor Area = 274,244 (Sq Ft)
Source Energy Consumption = 546,492 (Btu/Sq Ft/Year)

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
M200 - BASELINE

EQUIPMENT ENERGY CONSUMPTION

Ref Num	Equip Code	Monthly Consumption Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	351667	317634	351667	340323	351667	340323	351667	351667	340323	351667	340323	351667	4,140,593
	PK	784.3	784.3	784.3	784.3	784.3	784.3	784.3	784.3	784.3	784.3	784.3	784.3	784.3
1	MISC LD													
	ELEC	249479	225436	255694	240429	252587	246644	246372	255694	240429	252586	240429	246372	2,952,151
	PK	563.9	563.9	563.9	563.9	563.9	563.9	563.9	563.9	563.9	563.9	563.9	563.9	563.9
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	EQ1010L	HR CTV >190 TONS 95 F												
	ELEC	91708	82114	127538	148287	185076	220633	233141	235983	194056	143881	133612	91210	1,887,238
	PK	333.9	348.4	389.9	446.8	507.0	584.9	597.6	595.7	555.2	422.5	403.5	372.1	597.6
1	EQ5100	COOLING TOWER												
	ELEC	0	0	44368	127356	131601	127355	131601	131601	127356	87734	74291	10967	994,228
	PK	3.5	14.7	176.9	176.9	176.9	176.9	176.9	176.9	176.9	176.9	176.9	176.9	176.9
1	EQ5100	COOLING TOWER												
	WATER	357	319	576	729	952	1124	1154	1185	978	691	625	357	9,047
	PK	1.9	2.0	2.4	2.8	3.4	3.5	3.5	3.5	3.4	2.7	2.5	2.3	3.5
1	EQ5001	CHILLED WATER PUMP C.V.												
	ELEC	59179	53452	59179	57270	59179	57270	59179	59179	57270	59179	57270	59179	696,784
	PK	79.5	79.5	79.5	79.5	79.5	79.5	79.5	79.5	79.5	79.5	79.5	79.5	79.5
1	EQ5010	CONDENSER WATER PUMP C.V.												
	ELEC	55480	50111	55480	53691	55480	53691	55480	55480	53691	55480	53691	55480	653,235
	PK	74.6	74.6	74.6	74.6	74.6	74.6	74.6	74.6	74.6	74.6	74.6	74.6	74.6

1 EQ5300 CONTROL PANEL & INTERLOCK

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
M200 - BASELINE

	ELEC	744	672	744	720	744	720	744	744	720	744	720	744	8,760
	PK	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
1	CECAFVAR				AIR FOIL CENTRIFUGAL W\VAR SPEED DRIVE									
	ELEC	31275	28323	40179	46897	61399	76542	70271	78518	62662	48358	37622	33109	615,155
	PK	184.7	240.3	306.9	422.3	422.3	422.3	422.3	422.3	422.3	391.5	359.7	269.4	422.3
1	CECFCFAN				FORWARD CURVE CENT. FAN CONSTANT VOLUME									
	ELEC	409	340	72	0	0	0	0	0	0	21	59	232	1,132
	PK	6.6	3.9	1.2	0.9	0.0	0.0	0.0	0.0	0.0	1.0	1.0	3.9	6.6
1	CECAFVAR				AIR FOIL CENTRIFUGAL W\VAR SPEED DRIVE									
	ELEC	14435	13072	18544	21645	28338	35327	32433	36239	28921	22319	17364	15281	283,918
	PK	85.3	110.9	141.6	194.9	194.9	194.9	194.9	194.9	194.9	180.7	166.0	124.3	194.9
2	CECFCFAN				FORWARD CURVE CENT. FAN CONSTANT VOLUME									
	ELEC	200551	181143	200551	194082	200551	194082	200551	200551	194082	200552	194082	200551	2,361,330
	PK	269.6	269.6	269.6	269.6	269.6	269.6	269.6	269.6	269.6	269.6	269.6	269.6	269.6
1	HEATPUMP													
	ELEC	6060	5482	849	0	0	0	0	0	0	363	1014	3216	16,986
	PK	64.6	64.5	18.0	12.3	0.0	0.0	0.0	0.0	0.0	22.8	46.9	64.1	64.6
1	EQ5020				HEAT WATER CIRC. PUMP C.V.									
	ELEC	2081	1761	684	65	124	0	546	255	0	211	575	1434	7,736
	PK	7.3	7.3	7.3	7.3	7.3	0.0	7.3	7.3	7.3	7.3	7.3	7.3	7.3
2	EQ2051				ELECTRIC HOT WATER BOILER									
	ELEC	1356	1313	53	0	0	0	0	0	0	131	0	849	3,702
	PK	14.9	13.7	13.1	0.0	0.0	0.0	0.0	0.0	0.0	13.1	10.8	12.6	14.9
2	EQ5020				HEAT WATER CIRC. PUMP C.V.									
	ELEC	3153	2756	1044	188	355	0	1566	731	0	292	543	2339	12,966
	PK	20.9	20.9	20.9	20.9	20.9	0.0	20.9	20.9	20.9	20.9	20.9	20.9	20.9

UTILITY PEAK CHECKSUMS - ALTERNATIVE 1
[redacted] - BASELINE

---------- 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 3,187.8 (kW)
Yearly Time of Peak 14 (hr) 7 (mo)

Hour 14 Month 7

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Percnt Of Tot (%)
Cooling Equipment				
1	EQ1010L	HR CTV >190 TONS 95 F	924.5	29.00
Sub Total			924.5	29.00
Heating Equipment				
1	HEATPUMP		7.3	0.23
2	EQ2051	ELECTRIC HOT WATER BOILER	20.9	0.65
[redacted]otal			28.2	0.88
Air Moving Equipment				
1		SUMMATION OF FAN ELECTRICAL DEMAND	617.2	19.36
2		SUMMATION OF FAN ELECTRICAL DEMAND	269.6	8.46
Sub Total			886.8	27.82
Sub Total			0.0	0.00
Miscellaneous				
Lights			784.3	24.60
Base Utilities			0.0	0.00
Misc Equipment			563.9	17.69
Sub Total			1,348.3	42.30
Grand Total			3,187.8	100.00

CALIFORNIA TITLE 24 COMPLIANCE - ALTERNATIVE 1
M200 - BASELINE

CALIFORNIA TITLE 24 COMPLIANCE REPORT

Weather Name ..... ATLANTA.
Gross Conditioned Floor Area (sqft)..... 274,244
ACM Multiplier 1.025

E N E R G Y U S E S U M M A R Y

	ELEC (kWh/yr)	WATER (1000 gal)	PERCENT OF TOTAL ENERGY (%)	TOTAL SOURCE ENERGY (kBtu/yr)	ADJUSTED UNIT SOURCE ENERGY (kBtu/yr-sf)
Primary Heating	20,687.8	0.0	0.1	211,844.0	0.8
Primary Cooling					
Compressor	1,887,238.4	0.0	12.9	19,325,366.0	72.2
Tower/Cond Fans	994,227.9	9,046.8	6.8	10,180,917.0	38.1
Condenser Pump	653,235.2	0.0	4.5	6,689,144.5	25.0
Other Accessories	8,760.0	0.0	0.1	89,702.6	0.3
Auxiliary					
Supply Fans	3,261,535.5	0.0	22.3	33,398,200.0	124.8
Circulation Pumps	717,486.3	0.0	4.9	7,347,077.0	27.5
Base Utilities	0.0	0.0	0.0	0.0	0.0
Subtotal	3,979,021.8	0.0	27.2	40,745,276.0	152.3
Lighting	4,140,592.8	0.0	28.3	42,399,768.0	154.6
Receptacle	2,952,151.2	0.0	20.2	30,230,098.0	110.2
Domestic Hot Water	0.0	0.0	0.0	0.0	0.0
Cogeneration	0.0	0.0	0.0	0.0	0.0
Totals	14,635,915.0	9,046.8	100.0	149872112.0	553.5

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 2
- ICE STORAGE

MONTHLY ENERGY CONSUMPTION

Month	ELEC On Peak (kWh)	DEMAND On Peak (kW)	WATER (1000 Gl)
Jan	1,067,950	2,351	357
Feb	963,976	2,473	319
March	1,154,577	2,788	568
April	1,211,244	2,853	746
May	1,310,015	3,073	974
June	1,336,183	3,140	1,141
July	1,365,903	3,158	1,175
Aug	1,391,788	3,151	1,213
Sept	1,285,354	3,108	1,011
Oct	1,201,578	2,846	704
Nov	1,132,736	2,793	629
Dec	1,072,982	2,716	357
Total	14,494,284	3,158	9,194

Building Energy Consumption = 180,383 (Btu/Sq Ft/Year) Floor Area = 274,244 (Sq Ft)
Source Energy Consumption = 541,203 (Btu/Sq Ft/Year)

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2
M200 - ICE STORAGE

EQUIPMENT ENERGY CONSUMPTION

Ref Num	Equip Code	Monthly Consumption Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	351667	317634	351667	340323	351667	340323	351667	351667	340323	351667	340323	351667	4,140,593
	PK	784.3	784.3	784.3	784.3	784.3	784.3	784.3	784.3	784.3	784.3	784.3	784.3	784.3
1	MISC LD													
	ELEC	249479	225436	255694	240429	252587	246644	246372	255694	240429	252586	240429	246372	2,952,151
	PK	563.9	563.9	563.9	563.9	563.9	563.9	563.9	563.9	563.9	563.9	563.9	563.9	563.9
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	EQ1010L	HR CTV >190 TONS 95 F												
	ELEC	91708	82114	125470	149806	189916	225450	237411	243040	201099	143874	130471	91210	1,911,567
	PK	333.9	348.4	389.9	1076.0	1145.3	1202.4	1217.4	1227.2	1183.5	1076.0	1076.0	372.1	1227.2
1	EQ5100	COOLING TOWER												
	ELEC	0	0	44368	106130	109667	106130	109667	109667	106130	65800	58575	10967	827,101
	PK	3.5	14.7	176.9	176.9	176.9	176.9	176.9	176.9	176.9	176.9	176.9	176.9	176.9
1	EQ5100	COOLING TOWER												
	WATER	357	319	568	746	974	1141	1175	1213	1011	704	629	357	9,194
	PK	1.9	2.0	2.4	6.1	6.2	6.2	6.2	6.2	6.2	6.1	6.1	2.3	6.2
1	EQ5001	CHILLED WATER PUMP C.V.												
	ELEC	59179	53452	59179	57270	59179	57270	59179	59179	57270	59179	57270	59179	696,784
	PK	79.5	79.5	79.5	79.5	79.5	79.5	79.5	79.5	79.5	79.5	79.5	79.5	79.5
1	EQ5010	CONDENSER WATER PUMP C.V.												
	ELEC	55480	50111	55480	53691	55480	53691	55480	55480	53691	55480	53691	55480	653,235
	PK	74.6	74.6	74.6	74.6	74.6	74.6	74.6	74.6	74.6	74.6	74.6	74.6	74.6

1 EQ5300 CONTROL PANEL & INTERLOCK

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2
M200 - ICE STORAGE

	ELEC	744	672	744	720	744	720	744	744	720	744	720	744	8,760
	PK	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
1	CECAFVAR				AIR FOIL CENTRIFUGAL W\VAR SPEED DRIVE									
	ELEC	31275	28323	40179	46897	61405	76546	70282	78534	62681	48358	37622	33109	615,210
	PK	184.7	240.3	306.9	422.3	422.3	422.3	422.3	422.3	422.3	391.5	359.7	269.4	422.3
1	CECFCFAN				FORWARD CURVE CENT. FAN CONSTANT VOLUME									
	ELEC	409	340	72	0	0	0	0	0	0	21	59	232	1,132
	PK	6.6	3.9	1.2	0.9	0.0	0.0	0.0	0.0	0.0	1.0	1.0	3.9	6.6
1	CECAFVAR				AIR FOIL CENTRIFUGAL W\VAR SPEED DRIVE									
	ELEC	14435	13072	18544	21645	28341	35329	32438	36246	28930	22319	17364	15281	283,943
	PK	85.3	110.9	141.6	194.9	194.9	194.9	194.9	194.9	194.9	180.7	166.0	124.3	194.9
2	CECFCFAN				FORWARD CURVE CENT. FAN CONSTANT VOLUME									
	ELEC	200551	181143	200551	194082	200551	194082	200551	200551	194082	200552	194082	200551	2,361,330
	PK	269.6	269.6	269.6	269.6	269.6	269.6	269.6	269.6	269.6	269.6	269.6	269.6	269.6
1	HEATPUMP													
	ELEC	7230	6579	849	0	0	0	0	0	0	363	1014	4161	20,196
	PK	64.6	64.5	18.0	12.3	0.0	0.0	0.0	0.0	0.0	22.8	46.9	64.1	64.6
1	EQ5020				HEAT WATER CIRC. PUMP C.V.									
	ELEC	2300	1958	684	65	124	0	546	255	0	211	575	1674	8,391
	PK	7.3	7.3	7.3	7.3	7.3	0.0	7.3	7.3	7.3	7.3	7.3	7.3	7.3
2	EQ2051				ELECTRIC HOT WATER BOILER									
	ELEC	967	949	53	0	0	0	0	0	0	131	0	477	2,577
	PK	14.9	13.7	13.1	0.0	0.0	0.0	0.0	0.0	0.0	13.1	10.8	12.6	14.9
2	EQ5020				HEAT WATER CIRC. PUMP C.V.									
	ELEC	2526	2192	1044	188	355	0	1566	731	0	292	543	1879	11,317
	PK	20.9	20.9	20.9	20.9	20.9	0.0	20.9	20.9	20.9	20.9	20.9	20.9	20.9

UT[redacted] PEAK CHECKSUMS - ALTERNATIVE 2
M200[redacted] ICE STORAGE

UTILITY PEAK CHECKSUMS

Utility ELECTRIC DEMAND

Peak Value 3,158.3 (kW)
Yearly Time of Peak 12 (hr) 7 (mo)

Hour 12 Month 7

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Percnt Of Tot (%)
Cooling Equipment				
1	EQ1010L	HR CTV >190 TONS 95 F	923.2	29.23
Sub Total			923.2	29.23
Sub Total			0.0	******
Air Moving Equipment				
[redacted]		SUMMATION OF FAN ELECTRICAL DEMAND	617.2	19.54
2		SUMMATION OF FAN ELECTRICAL DEMAND	269.6	8.53
Sub Total			886.8	28.08
Sub Total			0.0	0.00
Miscellaneous				
Lights			784.3	24.83
Base Utilities			0.0	0.00
Misc Equipment			563.9	17.86
Sub Total			1,348.3	42.69
Grand Total			3,158.3	100.00

CALIFORNIA TITLE 24 COMPLIANCE - ALTERNATIVE 2
M200 - ICE STORAGE

CALIFORNIA TITLE 24 COMPLIANCE REPORT

Weather Name ..... ATLANTA.
Gross Conditioned Floor Area (sqft)..... 274,244
ACM Multiplier 1.025

E N E R G Y U S E S U M M A R Y

	ELEC (kWh/yr)	WATER (1000 gal)	PERCENT OF TOTAL ENERGY (%)	TOTAL SOURCE ENERGY (kBtu/yr)	ADJUSTED UNIT SOURCE ENERGY (kBtu/yr-sf)
Primary Heating	22,772.7	0.0	0.2	233,193.3	0.9
Primary Cooling					
Compressor	1,911,567.2	0.0	13.2	19,574,494.0	73.2
Tower/Cond Fans	827,100.8	9,193.6	5.7	8,469,532.0	31.7
Condenser Pump	653,235.2	0.0	4.5	6,689,144.5	25.0
Other Accessories	8,760.0	0.0	0.1	89,702.6	0.3
Auxiliary					
Supply Fans	3,261,615.8	0.0	22.5	33,399,022.0	124.8
Circulation Pumps	716,491.8	0.0	4.9	7,336,892.5	27.4
Base Utilities	0.0	0.0	0.0	0.0	0.0
Subtotal	3,978,107.5	0.0	27.4	40,735,916.0	152.3
Lighting	4,140,592.8	0.0	28.6	42,399,768.0	154.6
Receptacle	2,952,151.2	0.0	20.4	30,230,098.0	110.2
Domestic Hot Water	0.0	0.0	0.0	0.0	0.0
Cogeneration	0.0	0.0	0.0	0.0	0.0
Totals	14,494,288.0	9,193.6	100.0	148421856.0	548.1

[redacted]LY ENERGY CONSUMPTION - ALTERNATIVE 1
[redacted] - 5% LIGHTING REDUCTION

---------- M O N T H L Y E N E R G Y C O N S U M P T I O N ----------

Month	ELEC On Peak (kWh)	DEMAND On Peak (kW)	WATER (1000 Gl)
Jan	1,008,039	2,215	343
Feb	911,229	2,287	306
March	1,089,625	2,621	532
April	1,165,805	2,768	671
May	1,261,346	2,931	891
June	1,289,094	3,015	1,067
July	1,314,895	3,023	1,089
Aug	1,338,447	3,025	1,119
Sept	1,236,230	2,985	922
Oct	1,155,798	2,807	637
Nov	1,086,303	2,745	572
Dec	1,014,114	2,557	344
Total	13,870,925	3,025	8,493

Building Energy Consumption = 172,625 (Btu/Sq Ft/Year) Floor Area = 274,244 (Sq Ft)
Source Energy Consumption = 517,928 (Btu/Sq Ft/Year)

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
M200 - 5% LIGHTING REDUCTION

EQUIPMENT ENERGY CONSUMPTION

Ref Num	Equip Code	Monthly Consumption Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	298794	269878	298794	289155	298794	289156	298794	298794	289155	298794	289155	298794	3,518,059
	PK	666.4	666.4	666.4	666.4	666.4	666.4	666.4	666.4	666.4	666.4	666.4	666.4	666.4
1	MISC LD													
	ELEC	249479	225436	255694	240429	252587	246644	246372	255694	240429	252586	240429	246372	2,952,151
	PK	563.9	563.9	563.9	563.9	563.9	563.9	563.9	563.9	563.9	563.9	563.9	563.9	563.9
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	EQ1010L	HR CTV >190 TONS 95 F												
	ELEC	88870	79580	118910	138886	176623	212151	222791	225811	185599	134583	123902	87894	1,795,601
	PK	333.9	333.9	374.0	429.9	482.0	565.7	578.0	576.2	535.5	406.8	392.5	351.8	578.0
1	EQ5100	COOLING TOWER												
	ELEC	0	0	44174	127356	131601	127355	131601	131601	127356	87734	74291	10967	994,034
	PK	0.0	4.4	176.9	176.9	176.9	176.9	176.9	176.9	176.9	176.9	176.9	176.9	176.9
1	EQ5100	COOLING TOWER												
	WATER	343	306	532	671	891	1067	1089	1119	922	637	572	344	8,493
	PK	1.8	1.9	2.3	2.7	3.2	3.4	3.4	3.4	3.3	2.6	2.4	2.1	3.4
1	EQ5001	CHILLED WATER PUMP C.V.												
	ELEC	59179	53452	59179	57270	59179	57270	59179	59179	57270	59179	57270	59179	696,784
	PK	79.5	79.5	79.5	79.5	79.5	79.5	79.5	79.5	79.5	79.5	79.5	79.5	79.5
1	EQ5010	CONDENSER WATER PUMP C.V.												
	ELEC	55480	50111	55480	53691	55480	53691	55480	55480	53691	55480	53691	55480	653,235
	PK	74.6	74.6	74.6	74.6	74.6	74.6	74.6	74.6	74.6	74.6	74.6	74.6	74.6

1 EQ5300 CONTROL PANEL & INTERLOCK

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
M200 - 5% LIGHTING REDUCTION

	ELEC	744	672	744	720	744	720	744	744	720	744	720	744	8,760
	PK	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
1	CECAFVAR	AIR FOIL CENTRIFUGAL W\VAR SPEED DRIVE												
	ELEC	27435	25501	36393	43671	58446	73913	67421	75072	60162	44308	34135	29944	576,402
	PK	176.2	233.6	284.1	422.3	422.3	422.3	422.3	422.3	422.3	389.4	355.9	255.1	422.3
1	CECFCFAN	FORWARD CURVE CENT. FAN CONSTANT VOLUME												
	ELEC	447	364	83	0	0	0	0	0	0	27	69	255	1,245
	PK	6.6	3.9	1.5	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	3.9	6.6
1	CECAFVAR	AIR FOIL CENTRIFUGAL W\VAR SPEED DRIVE												
	ELEC	12662	11770	16797	20156	26975	34114	31117	34649	27767	20450	15755	13820	266,032
	PK	81.3	107.8	131.1	194.9	194.9	194.9	194.9	194.9	194.9	179.7	164.3	117.8	194.9
2	CECFCFAN	FORWARD CURVE CENT. FAN CONSTANT VOLUME												
	ELEC	200551	181143	200551	194082	200551	194082	200551	200551	194082	200552	194082	200551	2,361,330
	PK	269.6	269.6	269.6	269.6	269.6	269.6	269.6	269.6	269.6	269.6	269.6	269.6	269.6
1	HEATPUMP													
	ELEC	8623	7488	1383	100	0	0	0	0	0	450	1139	5486	24,669
	PK	64.6	65.6	58.2	20.0	0.0	0.0	0.0	0.0	0.0	35.5	44.8	64.2	65.6
1	EQ5020	HEAT WATER CIRC. PUMP C.V.												
	ELEC	2023	1914	881	102	95	0	218	226	0	247	691	1652	8,049
	PK	7.3	7.3	7.3	7.3	7.3	0.0	7.3	7.3	0.0	7.3	7.3	7.3	7.3
2	EQ2051	ELECTRIC HOT WATER BOILER												
	ELEC	1391	1371	0	0	0	0	0	0	0	184	34	909	3,890
	PK	15.1	16.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.2	11.7	13.5	16.2
2	EQ5020	HEAT WATER CIRC. PUMP C.V.												
	ELEC	2359	2547	564	188	271	0	626	647	0	480	940	2067	10,690
	PK	20.9	20.9	20.9	20.9	20.9	0.0	20.9	20.9	0.0	20.9	20.9	20.9	20.9

[redacted]TY PEAK CHECKSUMS - ALTERNATIVE 1
[redacted]- 5% LIGHTING REDUCTION

---------- 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 3,025.3 (kW)
Yearly Time of Peak 15 (hr) 8 (mo)

Hour 15 Month 8

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Percnt Of Tot (%)
Cooling Equipment				
1	EQ1010L	HR CTV >190 TONS 95 F	908.2	30.02
Sub Total			908.2	30.02
Sub Total			0.0	******
Air Moving Equipment				
[redacted]		SUMMATION OF FAN ELECTRICAL DEMAND	617.2	20.40
[redacted]		SUMMATION OF FAN ELECTRICAL DEMAND	269.6	8.91
Sub Total			886.8	29.31
Sub Total			0.0	0.00
Miscellaneous				
Lights			666.4	22.03
Base Utilities			0.0	0.00
Misc Equipment			563.9	18.64
Sub Total			1,230.4	40.67
Grand Total			3,025.3	100.00

CALIFORNIA TITLE 24 COMPLIANCE - ALTERNATIVE 1
M200 - 5% LIGHTING REDUCTION

---------- CALIFORNIA TITLE 24 COMPLIANCE REPORT ----------

Weather Name ..... ATLANTA.
Gross Conditioned Floor Area (sqft)..... 274,244
ACM Multiplier 1.025

---------- E N E R G Y U S E S U M M A R Y ----------

	ELEC (kWh/yr)	WATER (1000 gal)	PERCENT OF TOTAL ENERGY (%)	TOTAL SOURCE ENERGY (kBtu/yr)	ADJUSTED UNIT SOURCE ENERGY (kBtu/yr-sf)
Primary Heating	28,559.0	0.0	0.2	292,445.1	1.1
Primary Cooling					
Compressor	1,795,600.9	0.0	12.9	18,386,996.0	68.7
Tower/Cond Fans	994,033.9	8,493.2	7.2	10,178,930.0	38.0
Condenser Pump	653,235.2	0.0	4.7	6,689,144.5	25.0
Other Accessories	8,760.0	0.0	0.1	89,702.6	0.3
Auxiliary					
Supply Fans	3,205,008.5	0.0	23.1	32,819,362.0	122.7
Circulation Pumps	715,523.3	0.0	5.2	7,326,975.5	27.4
Base Utilities	0.0	0.0	0.0	0.0	0.0
Subtotal	3,920,531.7	0.0	28.3	40,146,336.0	150.0
Lighting	3,518,058.5	0.0	25.4	36,025,000.0	131.4
Receptacle	2,952,151.2	0.0	21.3	30,230,098.0	110.2
Domestic Hot Water	0.0	0.0	0.0	0.0	0.0
Cogeneration	0.0	0.0	0.0	0.0	0.0
Totals	13,870,931.0	8,493.2	100.0	142038656.0	524.8

BUILDING 246

E M C ENGINEERS, INC.

PROJECT: FORT McPHERSON & FORT GILLEM EEAP STUDY
LOCATION: FORT McPHERSON
ECO: Computer Simulation Summary

CLIENT CONTRACT NO: DACA21-9-C-0097
CLIENT PROJECT ENG: TERRY SEABROOK

EMC PROJECT: #3105.000
DATE: 03/30/92
FILE: M246ECO
PRPARED BY: DENNIS JONES
CHECKED BY:

Bldg: M246 Area: 23,072 ft^2

Run Description	Heating Gas Use (kBtu/yr)	Heating Electric Use (kWh/yr)	Cooling Electric Use (kWh/yr)	Fan Electric Use (kWh/yr)	Pump Electric Use (kWh/yr)	Lighting Electric Use (kWh/yr)	Receot. Electric Use (kWh/yr)	Total Electric Use (kWh/yr)	Peak Electric Demand (kW)	Total Gas Use (MBtu/yr)	Total Energy Use (MBtu/yr)
Baseline	47,364	1,057	53,680	231,647	17,958	105,413	44,082	453,837	139	47	1,596
Economizer	47,364	1,057	52,110	231,647	17,958	105,413	44,082	452,267	139	47	1,591
Savings (Loss)	0	0	1,570	0	0	0	0	1,570	0	0	5
HVAC Controls	5,293	52	37,376	79,966	5,537	105,413	44,082	272,426	139	5	935
Savings (Loss)	42,071	1,005	16,304	151,681	12,421	0	0	181,411	0	42	661
Lighting (15% reduction)	54,491	1,183	50,722	231,647	17,958	89,441	44,082	435,033	130	54	1,539
Savings (Loss)	(7,127)	(126)	2,958	0	0	15,972	0	18,804	9	(7)	57
Ice Storage	47,364	1,057	73,527	231,647	17,958	105,413	44,082	473,684	56	47	1,664
Savings (Loss)	0	0	(19,847)	0	0	0	0	(19,847)	83	0	(68)

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB
SHEET NO. OF
CALCULATED BY [illegible] DATE 2/28/92
CHECKED BY DATE
SCALE M246

VENTILATION

20 CFM/PERSON (ASSUMED, NO DATA AVAILABLE)

FAN AIRFLOW

NO DATA — LET [illegible] CALC

EXPOSED [illegible]

LENGTH [illegible]

[illegible] AREA 2,6[illegible] 8" BLOCK WALL - UNINSULATED)

SYSTEM TYPE

MULTIZONE (1-Z)

BOILER & CHILLER SHARE COMMON COIL → COIL DECK

BYPASS DECK

FANS

15 HP SUPPLY FAN MOTOR

NO RETURN FAN

[illegible] 2.0" SP

CHILLER

TRANE CGAC65E.

6 ECONO + MN VENT
[illegible] SC + BACK ON/OFF
[illegible] STOR

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB

SHEET NO. OF

CALCULATED BY DATE

CHECKED BY DATE

SCALE

BLDG — [illegible] ECOs

ECONOMIZER + MINIMUM VENTILATION (ACT-2)

o ENABLE DRY-BULB ECONOMIZER

(40) DRY-BULB
65°F ON
100% OSA MAX

(45) ECONO — AVAIL

HVAC CONTROLS (ACT-2)

[illegible] THERMOSTAT
0–6 [illegible] 78°F 18–24 95°F

[illegible] THERMOSTAT
0–6 [illegible] 80°F 18–24 55°F

<CLG BACK>
<HTG BACK>

FANS, [illegible], [illegible]
0–6 OFF [illegible] ON 18–24 OFF
<FANOFF>
(26)

[illegible]
[illegible] ON [illegible] OFF [illegible] ON

DISCRIMINATOR — RESETS [illegible] TEMPS TO LOAD (46)

THERMAL STORAGE (ACT-4)

CHILLER TRANE CGAC 65E

COULD MAKE ICE 45°F + 25°F
1.20 1.45 KW/TON
25% DROP IN TONNAGE

ROGER HUBERT

([illegible]) CHILLER <EQ1770>

([illegible]) STOR REF – 1

([illegible]) ICE STOR
[illegible] 0–6 CHARGING 6–12 CLG 12–16 DISCHARGE
16–24 CLG

LOSS 1%

CAPACITY 154 TON-HR (JUL 4?) – (NOON – 4pm)

USE 190 TON-HR ICE BANK
30 TON CHILLER

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____
SHEET NO. _____ OF _____
CALCULATED BY _____ DATE _____
CHECKED BY _____ DATE _____
SCALE 1/2"=1'-0"

PEOPLE

ASSUME 225 FT² / PERSON (LIKE 3600—184)

LIGHTS

45,883 WATTS / 23,072 FT² = 2.00 W/SF

EQUIPMENT

FLOOR AREAS

ZONE - 1	7,691	TOTAL	23,072 FT²
2	5,280	AVG	7,691 FT²
3	10,500		

EQUIP	WATTS	FT²	W/FT²
PC	200	450	0.44
PRINTER	100	900	0.11
COPIER	200	7691	0.03
COFFEE	260	7,691	0.03
COPIER	600	7,691	0.08

0.69 W/SF

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB ______

SHEET NO. ______ OF ______

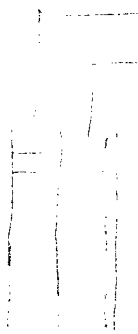
CALCULATED BY ______ DATE ______

CHECKED BY ______ DATE ______

SCALE M246

U-VALUES

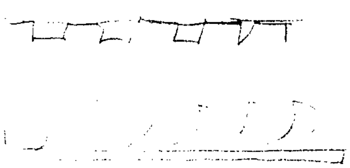
WALL



OUTER FILM	0.25
8" CONC BLOCK	1.00
FRAME WALL (R-11 BATTS)	12.00
GYP BD	0.45
INNER FILM	0.68
	13.88

U = 0.072

ROOF



OUTER FILM	0.25
B.U. ROOFING	0.33
DECK	
AIR SPACE	1.24
6" #6 BATTS	18.00
ACOUSTIC CEILING	1.25
INNER FILM	0.75
	21.8

U = 0.046

GLASS

DOUBLE PANE METAL TYPE R
THERMAL BREAK

U = 0.66

SC = 0.88

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB _____

SHEET NO. _____ OF _____

CALCULATED BY DS DATE 3/3/82

CHECKED BY _____ DATE _____

SCALE 1/24"=1'-0"

HVAC CONTROLS

55°F HEAT/COOL CHANGEOVER

THERMOSTAT SETTING

CALL FOR HEAT ⟶ BYPASS FULLY OPEN

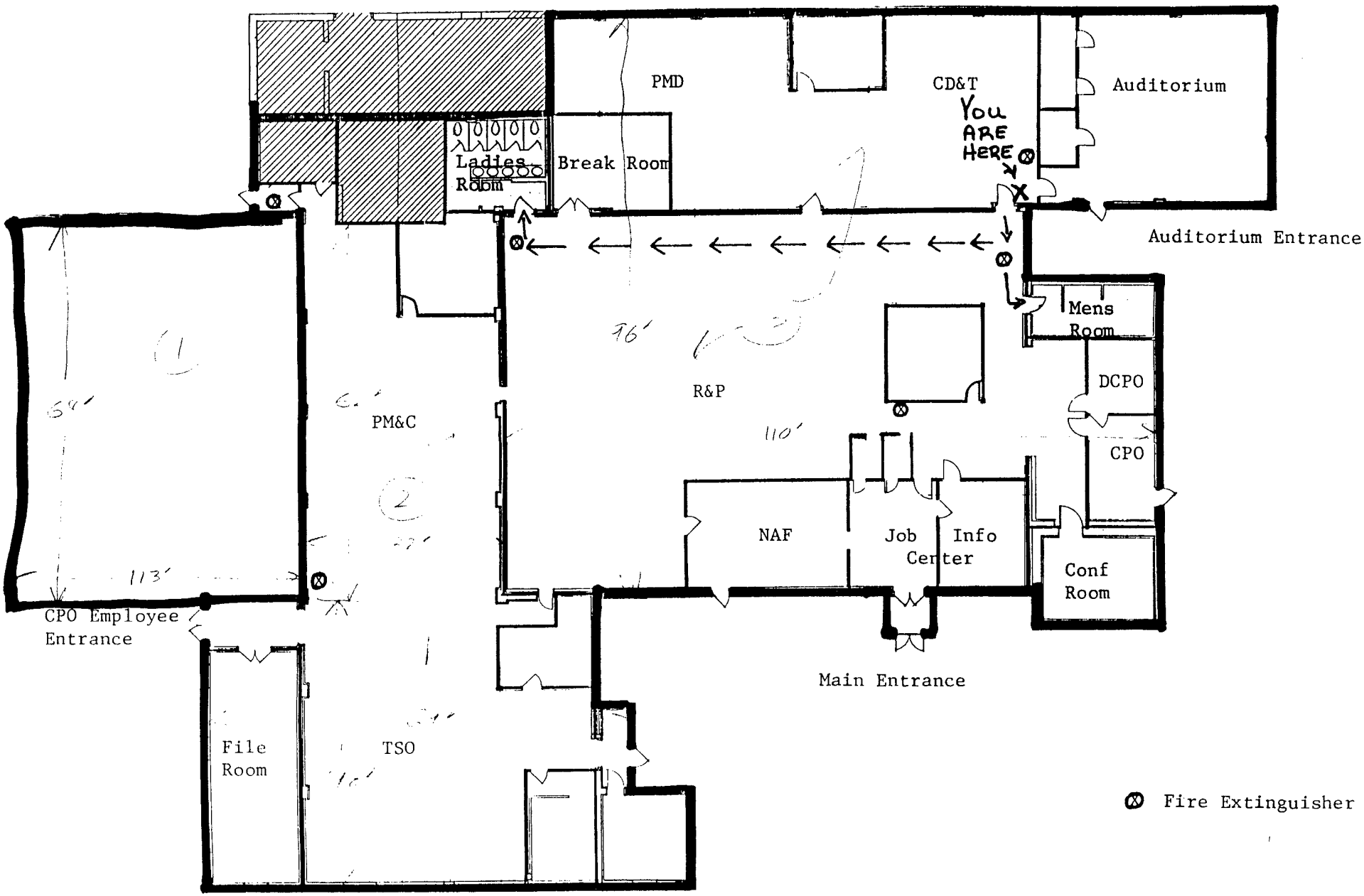
CALL FOR COOL ⟶ COIL " "

" " NEITHER ⟶ COIL/BYPASS MIX

CONTROLS DO NOT MAKE START

MUST BE SOME LOGIC SOMEWHERE TO SENSE THERMOSTAT CALLS FOR HEATING/COOLING

MODEL AS NORMAL MULTIZONE WITH NO SIMULTANEOUS HEATING & COOLING


PMD
CD&T
You ARE HERE
Auditorium
Ladies Room
Break Room
Auditorium Entrance
Mens Room
DCPO
CPO
R&P
PM&C
NAF
Job Info Center
Conf Room
CPO Employee Entrance
Main Entrance
File Room
TSO
Fire Extinguisher

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

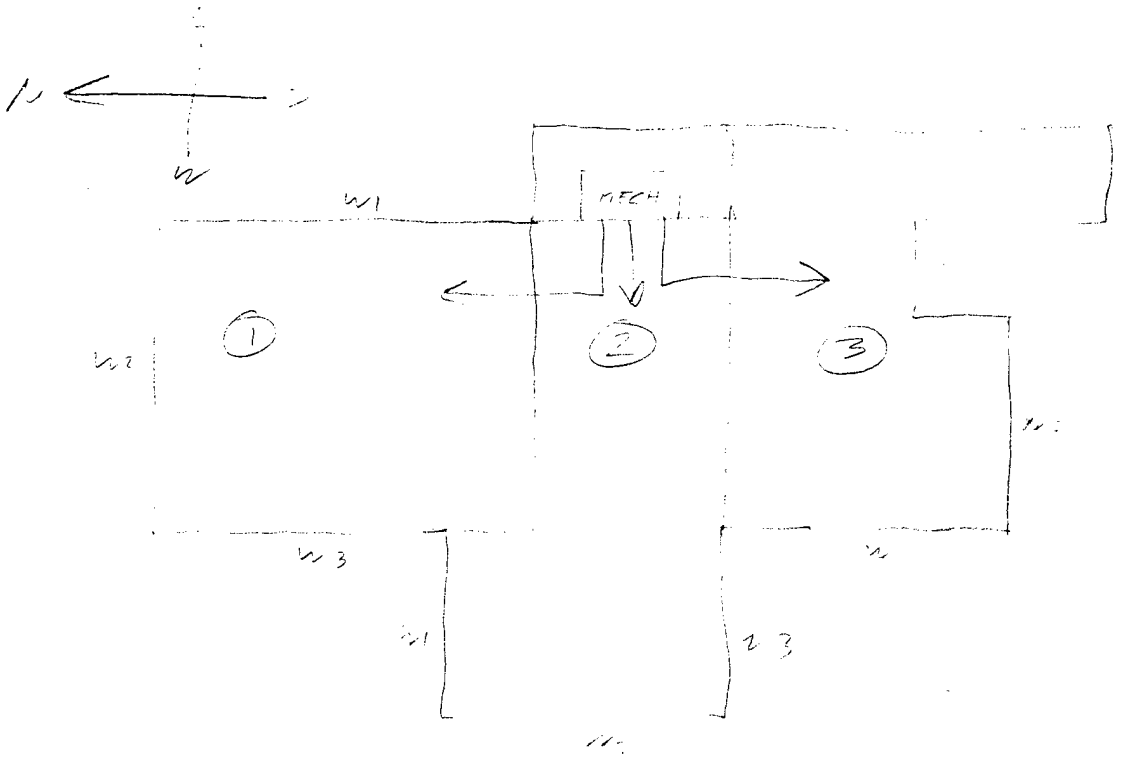
JOB 3105.000

SHEET NO. _____ OF _____

CALCULATED BY DS DATE 2/28/92

CHECKED BY _____ DATE _____

SCALE M246



E M C ENGINEERS, INC.

PROJECT: FORT McPHERSON & FORT GILLEM EEAP STUDY
LOCATION:

EMC PROJECT: #3105.000
DATE: 17-Feb-92

ECO:15-LIGHTING CONTROL

FILE: 246LITE.WK3
PREPARED BY: JW
CHECKED BY: CEL

CLIENT CONTRACT NO: DACA21-9-C-0097
CLIENT PROJECT ENG: TERRY SEABROOK

BUILDING NUMBER: 246

Schedule #: M-F 600 to 1900 S-S 0 to 0
Schedule #1 M-F 0 to 0 S-S 0 to 0

Room No.	# of Fixtures	Fixture Description	On/Off During Survey	Switch Yes/No	Good For Occup. Sensor	No. of Switches	Unocc. Lights On
154	4	4x2-4 lamp flouresecent	on	yes	yes	1	no
153	2	4x2-4 lamp flouresecent	on	yes	yes	1	no
152	2	4x2-4 lamp flouresecent	on	yes	yes	1	no
151	3	4x2-4 lamp flouresecent	on	yes	no	1	no
155	4	4x2-4 lamp flouresecent	on	yes	no	1	no
102	4	4x2-4 lamp flouresecent	on	yes	no	1	no
105	6	4x2-4 lamp flouresecent	on	yes	no	1	no
106	4	4x2-4 lamp flouresecent	off	yes	yes	1	no
107	58	4x2-4 lamp flouresecent	on	yes	no	10	no
145	16	4x2 4 lamp flouresecent	on	yes	no	2	yes
147	22	4x2-4 lamp flouresecent	off	yes	yes	1	no
149	1	4x2-4 lamp flouresecent	off	yes	yes	1	no
148	16	4x2-4 lamp flouresecent	on	yes	no	4	no
144	12	4x2-4 lamp flouresecent	on	yes	no	2	no
143	6	4x2-4 lamp flouresecent	on	yes	yes	1	yes
142	4	4x2-4 lamp flouresecent	on	yes	no	1	no
141	4	4x2-2 lamp flouresecent	on	yes	yes	1	no
136	2	4x2-4 lamp flouresecent	off	yes	yes	1	no
139	2	8'-2 lamp flouresecent	off	yes	no	1	no
135	2	8'-2 lamp flouresecent	off	yes	no	1	no
109	31	4x2-4 lamp flouresecent	on	yes	no	4	no
110	6	4x2-4 lamp flouresecent	on	yes	yes	1	yes
111	16	4x2-4 lamp flouresecent	on	yes	no	4	no
115	3	4x2-4 lamp flouresecent	on	yes	no	1	no
113	4	4x2-4 lamp flouresecent	on	yes	yes	1	yes
116	8	4x2-4 lamp flouresecent	on	yes	no	2	no
124	34	4x2-4 lamp flouresecent	on	yes	no	5	no
119	4	4x2-4 lamp flouresecent	on	yes	yes	1	yes
120	4	4x2-4 lamp flouresecent	on	yes	yes	1	yes
122	1	4x2-4 lamp flouresecent	off	yes	yes	1	yes
123	2	4x2-4 lamp flouresecent	on	yes	yes	2	no
125	4	4x2-4 lamp flouresecent	on	yes	no	1	no
126	2	4x2-4 lamp flouresecent	on	yes	no	1	no
134	24	4x2-4 lamp flouresecent	on	yes	no	4	no
133	1	4x2-4 lamp flouresecent	on	yes	no	1	no
132	3	4x2-4 lamp flouresecent	on	yes	yes	1	yes
131	3	4x2-4 lamp flouresecent	on	yes	yes	1	yes
130	3	4x2-4 lamp flouresecent	on	yes	no	1	yes
128	4	4x2-4 lamp flouresecent	on	yes	no	1	no
0	0	ERR	off	no	no	0	no
0	0	ERR	off	no	no	0	no
0	0	ERR	off	no	no	0	no
0	0	ERR	off	no	no	0	no
0	0	ERR	off	no	no	0	no
0	0	ERR	off	no	no	0	no
0	0	ERR	off	no	no	0	no
0	0	ERR	off	no	no	0	no

E M C ENGINEERS, INC.

PROJECT: FORT McPHERSON & FORT GILLEM EEAP STUDY
LOCATION:

EMC PROJECT: #3105.000
DATE: 17-Feb-92
FILE: 246LITE.WK3
PREPARED BY: JW
CHECKED BY: CEL

ECO:15-LIGHTING CONTROL

CLIENT CONTRACT NO: DACA21-9-C-0097
CLIENT PROJECT ENG: TERRY SEABROOK

BUILDING NUMBER: 246

Sheet 1 of 1

% Switchable lights: 15%
Cooling Factor (Power): 1.25
Cooling Factor (Energy) 1.25

Room No.	Total kW Lighting	Hours "On" Per Year	Lighting kW Saved Per Month	Lighting KWH Saved/Yr	Total kW / Month	Total kWH Per Yr	Cost of Switches: No. of New Switches	Cost	No. of Wall Switches	Cost	No. of Ceiling Switches	Cost
154	0.62	3393	0.09	312	0.775	2630	0	ERR	45		45	
153	0.31	3393	0.05	156	0.3875	1315	0	ERR				
152	0.31	3393	0.05	156	0.3875	1315	0	ERR				
151	0.47	3393	0.00	0	0.58125	1972	0	ERR				
155	0.62	3393	0.00	0	0.775	2630	0	ERR				
102	0.62	3393	0.00	0	0.775	2630	0	ERR				
103	0.93	3393	0.00	0	1.1625	3944	0	ERR				
108	0.00	3393	0.00	0	0	0	0	ERR				
107	8.99	3393	0.00	0	11.2375	38129	0	ERR				
148	2.48	3393	0.00	0	3.1	10518	0	ERR				
147	0.00	3393	0.00	0	0	0	0	ERR				
149	0.00	3393	0.00	0	0	0	0	ERR				
146	2.48	3393	0.00	0	3.1	10518	0	ERR				
144	1.86	3393	0.00	0	2.325	7889	0	ERR				
143	0.93	3393	0.14	468	1.1625	3944	0	ERR				
142	0.62	3393	0.00	0	0.775	2630	0	ERR				
141	0.36	3393	0.05	179	0.446	1510	0	ERR				
136	0.00	3393	0.00	0	0	0	0	ERR				
139	0.00	3393	0.00	0	0	0	0	ERR				
138	0.00	3393	0.00	0	0	0	0	ERR				
109	4.81	3393	0.00	0	6.00625	20379	0	ERR				
110	0.78	3393	0.12	390	0.96875	3287	0	ERR				
111	2.48	3393	0.00	0	3.1	10518	0	ERR				
115	0.47	3393	0.00	0	0.58125	1972	0	ERR				
113	0.62	3393	0.09	312	0.775	2630	0	ERR				
116	1.24	3393	0.00	0	1.55	5259	0	ERR				
124	5.27	3393	0.00	0	6.5875	22351	0	ERR				
119	0.62	3393	0.09	312	0.775	2630	0	ERR				
120	0.62	3393	0.09	312	0.775	2630	0	ERR				
122	0.00	3393	0.00	0	0	0	0	ERR				
123	0.31	3393	0.05	156	0.3875	1315	0	ERR				
125	0.62	3393	0.00	0	0.775	2630	0	ERR				
128	0.31	3393	0.00	0	0.3875	1315	0	ERR				
134	3.72	3393	0.00	0	4.65	15777	0	ERR				
133	0.16	3393	0.00	0	0.19375	657	0	ERR				
132	0.47	3393	0.07	234	0.58125	1972	0	ERR				
131	0.47	3393	0.07	234	0.58125	1972	0	ERR				
130	0.47	3393	0.00	0	0.58125	1972	0	ERR				
126	0.62	3393	0.00	0	0.775	2630	0	ERR				
0	0.00	3393	0.00	0	0	0	0	ERR				
0	0.00	3393	0.00	0	0	0	0	ERR				
0	0.00	3393	0.00	0	0	0	0	ERR				
0	0.00	3393	0.00	0	0	0	0	ERR				
0	0.00	3393	0.00	0	0	0	0	ERR				
0	0.00	3393	0.00	0	0	0	0	ERR				
0	0.00	3393	0.00	0	0	0	0	ERR				
0	0.00	3393	0.00	0	0	0	0	ERR				
Total	45.816		0.950452	3224.882	57.02	193466.9	0					

01 Card - Job Information

Project: FORT MCPHERSON & GILLEM EEAP #3105.000
Location: ATLANTA
Client: COE - DACA21-9-C-0097
Program User: DENNIS JONES
Comments: BUILDING 246 - FORT MCPHERSON

-----CARD 08-- Climatic Information

Weather Code	Summer Clearness Number	Winter Clearness Number	Summer Design Dry Bulb	Summer Design Wet Bulb	Winter Design Dry Bulb	Building Orientation	Summer Ground Reflect	Winter Ground Reflect
ATLANTA								

---------- Load Section Alternative #1 ----------

---- Load Alternative ----

Number	Description
1	ICE STORAGE

-----CARD 20-- General Room Parameters

Room Number	Zone Reference Number	Room Descrip	Floor Length	Floor Width	Const Type	Plenum Height	Acoustic Ceiling Resistance	Floor to Floor Height	Duplicate Floors Multiplier	Duplicate Rooms per Zone	Perimeter Depth
1	1	OFFICE	64	113		0		8			
2	2	OFFICE	60	88		0		8			
3	3	OFFICE	96	110		0		8			

-----CARD 21-- Thermostat Parameters

Room Number	Cooling Room Design DB	Room Design RH	Cooling T'stat Driftpoint	Cooling T'stat Schedule	Heating Room Design DB	Heating T'stat Driftpoint	Heating T'stat Schedule	T'stat Location Flag	Mass / No. Hrs Average	Carpet On Floor
M1	76			CLG	72		HTG			YES

-----CARD 22-- Roof Parameters

Room Number	Roof Number	Roof Equal to Floor?	Roof Length	Roof Width	Roof U-Value	Const Type	Roof Direction	Roof Tilt	Roof Alpha
1	1	YES			0.046	47			0.45

-----CARD 22-- Roof Parameters ----------

Room Number	Roof Number	Roof Equal to Floor?	Roof Length	Roof Width	Roof U-Value	Const Type	Roof Direction	Roof Tilt	Roof Alpha
2	1	YES			0.046	47			0.45
3	1	YES			0.046	47			0.45

-----CARD 24-- Wall Parameters ----------

Room Number	Wall Number	Wall Length	Wall Height	Wall U-Value	Wall Constuc Type	Wall Direction	Wall Tilt	Wall Alpha	Ground Reflectance Multiplier
1	1	100	8	0.072	89	90		0.45	
1	2	64	8	0.072	89	0		0.45	
1	3	100	8	0.072	89	270		0.45	
2	1	48	8	0.072	89	0		0.45	
2	2	79	8	0.072	89	270		0.45	
2	3	48	8	0.072	89	180		0.45	
3	1	133	8	0.072	89	270		0.45	
3	2	102	8	0.072	89	180		0.45	
3	3	120	8	0.072	89	180		0.45	

-----CARD 25-- Wall/Glass Parameters ----------

Room Number	Wall Number	Glass Length	Glass Width	Pct Glass or No. of Windows	Glass U-Value	Shading Coefficient	External Shading Type	Internal Shading Type	Percent Solar to Ret. Air	Visible Transmittance	Inside Visible Reflectance
1	1	3.75	4.17	11	0.66	0.88					
1	2	3.75	4.17	5	0.66	0.88					
1	3	3.75	4.17	10	0.66	0.88					
2	1	3.75	4.17	5	0.66	0.88					
2	2	3.75	4.17	8	0.66	0.88					
2	3	3.75	4.17	4	0.66	0.88					
3	1	3.75	4.17	8	0.66	0.88					
3	2	3.75	4.17	4	0.66	0.88					

-----CARD 26-- Schedules ----------

Room Number	People	Lights	Ventilation	Infiltration	Reheat Minimum	Cooling Fans	Heating Fan	Auxiliary Fan	Room Exhaust	Daylighting Controls
M1	PPL1	LGT1	AVAIL	OFF		AVAIL	AVAIL			

-----CARD 27-- People and Lights ----------

Room Number	People Value	People Units	People Sensible	People Latent	Lighting Value	Lighting Units	Lighting Fixture Type	Ballast Factor	Percent Lights to Ret. Air	--- Daylighting ---- Reference Point 1	Reference Point 2
1	225	SF-PERS	250	200	1.65	WATT-SF	ASHRAE2	1			
2	225	SF-PERS	250	200	1.65	WATT-SF	ASHRAE2	1			
3	225	SF-PERS	250	200	1.65	WATT-SF	ASHRAE2	1			

-----CARD 28--- Miscellaneous Equipment ----------

Room Number	Misc Equipment Number	Equipment Descrip	Energy Consump Value	Energy Consump Units	Schedule Code	Energy Meter Code	Percent of Load Sensible	Percent Misc. Load to Room	Percent Misc. Sens to Ret. Air	Radiant Fraction	Optional Air Path
1	1	OFFICE EQUIPMENT	0.69	WATT-SF	LGT1	ELEC					
2	1	OFFICE EQUIPMENT	0.69	WATT-SF	LGT1	ELEC					
3	1	OFFICE EQUIPMENT	0.69	WATT-SF	LGT1	ELEC					

-----CARD 29--- Room Airflows ----------

Room	Ventilation Cooling Value	Ventilation Cooling Units	Ventilation Heating Value	Ventilation Heating Units	Infiltration Cooling Value	Infiltration Cooling Units	Infiltration Heating Value	Infiltration Heating Units	Reheat Minimum Value	Reheat Minimum Units
Number										
M1	20	CFM-P	20	CFM-P	0.5	ACH-HR	0.5	ACH-HR		

-----CARD 30- Fan Airflows ----------

Room	Main Cooling Value	Main Cooling Units	Main Heating Value	Main Heating Units	Auxiliary Cooling Value	Auxiliary Cooling Units	Auxiliary Heating Value	Auxiliary Heating Units	Room Exhaust Value	Room Exhaust Units
Number										
M1	1.0	CFM-SF	1.0	CFM-SF						

-----CARD 32-- Exposed Floor Parameters----------

Room Number	Exposed Floor Number	Slab Perimeter Length	Slab Loss Coefficient	Exposed Floor Area	Exposed Floor U-Value	Exposed Floor Const Type	Exposed Floor Temp Flag	Cooling Temp	Heating Temp	Adjacent Room No
1	1	264	0.80							
2	1	175	0.80							
3	1	355	0.80							

---------- System Section Alternative #1 ----------

-----CARD 39-- System Alternative -----

Number	Description
1	ICE STORAGE

-----CARD 40--- System Type ----------

System Set Number	System Type	Ventil Deck Location	Cooling SADBVh	Heating SADBVh	Cooling Schedule	Heating Schedule	Fan Static Pressure
		----------OPTIONAL VENTILATION SYSTEM----------					
1	SZ	ROADK					

-----CARD 41-- Zone Assignment ----------

System Set	Ref #1		Ref #2		Ref #3		Ref #4		Ref #5		Ref #6	
Number	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End
1	1	3										

-----CARD 42--- Fan SP and Duct Parameters----------

System Set Number	Cool Fan SP	Heat Fan SP	Return Fan SP	Mn Exh Fan SP	Aux Fan SP	Rm Exh Fan SP	Cool Fan Mtr Loc	Return Fan Mtr Loc	Supply Duct Ht Gn	Supply Duct Loc	Return Air Path
1	2.5										DUCTED

-----CARD 44-- System Options ----------

System Set Number	Econ Type Flag	Econ On Point	Max Pct Outside Air	Direct Evap Cooling	Indirect Evap Cooling	1st Stage Evap Cooling	Fan Cycling	--------- Exhaust Air Heat Recovery --------- --- Effectiveness --- System	Room	--- Control Method --- System	Room
1	NONE										

-----CARD 45--- Equipment Schedules ----------

System Set Number	Main Cooling Coil	Economizer	Direct Evap Coil	Indirect Evap Coil	Auxiliary Cooling Coil	Main Heating Coil	Main Preheat Coil	Reheat Coil	Mech. Humidity	Auxiliary Heating Coil
1	CLG	OFF	OFF	OFF	OFF	HTG	OFF	OFF	OFF	OFF

-----CARD 46--- EMS/BAS Schedules ----------

System Set Number	Discrim Control Schedule	Night Purge Schedule	Optimum Start Schedule	Optimum Stop Schedule	--------DUTY CYCLING-------- On Period Schedule	Pattern Length	Maximum Off Time	System HR Exhaust Schedule	Room HR Exhaust Schedule
1	OFF								

---------- Equipment Section Alternative #1 ----------

-----CARD 59-- Equipment Description / TOD Schedules ----------

Alternative	Elec Consump Time of Day	Elec Demand Time of Day	Demand Limit

Number	Schedule	Schedule	Max KW	Alternative Description
1				ICE STORAGE

-----CARD 60--- Cooling Load Assignment----------

Load Asgn Ref	All Coil Loads To Cool Ref	Cooling Equipment Sizing	-Group 1- Begin	End	-Group 2- Begin	End	-Group 3- Begin	End	-Group 4- Begin	End	-Group 5- Begin	End	-Group 6- Begin	End	-Group 7- Begin	End	-Group 8- Begin	End	-Group 9- Begin	End
1	1	BLKPLANT	1	1																

-----CARD 62-- Cooling Equipment Parameters ----------

Cool Ref Num	Equip Code Name	Num Of Units	COOLING Capacity Value	COOLING Capacity Units	COOLING Energy Value	COOLING Energy Units	HEAT RECOVERY Capacity Value	HEAT RECOVERY Capacity Units	HEAT RECOVERY Energy Value	HEAT RECOVERY Energy Units	Seq Order Num	Seq Type	Demand Limit Number
1	EQ1122L	1	65	TONS							1	PAR	
2	EQ1750	1	30	TONS							2	PAR	

-----CARD 63-- Cooling Pumps and References ----------

Cool Ref Num	CHILLED WATER Full Load Value	CHILLED WATER Full Load Units	CONDENSER Full Load Value	CONDENSER Full Load Units	HT REC or AUX Full Load Value	HT REC or AUX Full Load Units	Switch-over Control	Cold Storage	Cooling Tower	Misc. Access.
1	5	HP								
2	5	HP						1		

-----CARD 65-- Heating Load Assignment ----------

Load Assignment Reference	All Coil Loads To Heating Ref	-Group 1- Begin	End	-Group 2- Begin	End	-Group 3- Begin	End	-Group 4- Begin	End	-Group 5- Begin	End	-Group 6- Begin	End	-Group 7- Begin	End	-Group 8- Begin	End	-Group 9- Begin	End
1	1	1	1																

-----CARD 67-- Heating Equipment Parameters ----------

Heat Ref Number	Equip Code Name	Number Of Units	HW Pmp Full Ld Value	HW Pmp Full Ld Units	Cap'y Value	Cap'y Units	Energy Rate Value	Energy Rate Units	Seq Order Number	Switch over Control	Hot Strg	Misc. Acc.	Cogen	Demand Limit Number
1	EQ2001	1	0.33	HP	1675	MBH	80	PCTEFF						

-----CARD 69-- Fan Equipment Parameters ----------

System Set Number	Cooling Fan	Heating Fan	Return Fan	Exhaust Fan	Auxiliary Supply	Room Exhaust	Optional Ventilation
1	EQ4003						

-----CARD 73-- Storage Tank Parameters ------------------------------

Strg Ref	Strg Tank Code	Size Value	Units	Sched Code	Disch Control Type	Limit Value	Units
1	CLIMAICE	120	TON-HRS	ICE	OPTIMIZE		

-----CARD 73-- Storage Tank Parameters ------------------------------

Charge Control Type	Mx Ls Value	Units	Warning Value	Units	Loss Value	Units
FULLCHG					1	PERCENT

Utility Description Reference Table

Schedules:
- AVAIL AVAILABLE (100%)
- CLG COOLING TSTAT SCHEDULE
- HTG HEATING ONLY (T-STAT AT 65)
- ICE
- LGT1
- OFF ALWAYS OFF
- PPL1

System:
- SZ SINGLE ZONE

Equipment:
- Cooling:
  - EQ1122L (Utility file not found)
  - EQ1750 (Utility file not found)
- Heating:
  - EQ2001 GAS FIRE TUBE HOT WATER
- Fan:
  - EQ4003 FC CENTRIF. FAN C.V.
- Accessories:
  - Storage:
    - CLIMAICE TRANE CALMAC THERMAL STORAGE SYSTEM

Schedule Name: AVAIL
Project: AVAILABLE (100)
Location:
Client:
Program User:
Comments:

Starting Month: JAN Ending Month: HTG
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	100
24	

ule Name: CLG
Project: COOLING TSTAT SCHEDULE
Location:
Client:
Program User:
Comments: COOLING THERMOSTAT

Starting Month: JAN Ending Month: DEC
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Temperature
0	78
24	

Schedule Name: HTG
Project: HEATING ONLY (T-STAT AT 65)
Location:
Client:
Program User:
Comments: HEATING ONLY SCHEDULE - T-STAT

Starting Month: JAN Ending Month: MAY
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Temperature
0	65
24	

Starting Month: JUN Ending Month: SEP
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Temperature
0	35
24	

Starting Month: OCT Ending Month: DEC
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Temperature
0	65
24	

dule Name: ICE
Project:
Location:
Client:
Program User:
Comments: ICE STORAGE

Starting Month: APR Ending Month: NOV
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Tank Cntrl
0	CHARGE
6	SATLOAD
12	DISCHARG
16	SATLOAD
24	

Schedule Name: LGT1
Project:
Location:
Client:
Program User:
Comments: OFFICE LIGHTING

Starting Month: JAN Ending Month: DEC
Starting Day Type: DSGN Ending Day Type: WKDY

Hour	Util Percent
0	5
7	80
8	100
12	80
13	100
16	80
17	40
18	5
24	

Starting Month: JAN Ending Month: DEC
Starting Day Type: SAT Ending Day Type: SUN

Hour	Util Percent
0	5
24	

Schedule Name: OFF
Project: ALWAYS OFF
Location:
Client:
Program User:
Comments:

Starting Month: JAN Ending Month: HTG
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	0
24	

Schedule Name: PPL1
Project:
Location:
Client:
Program User: D JONES
Comments: OFFICE PEOPLE SCHEDULE

Starting Month: JAN Ending Month: DEC
Starting Day Type: DSGN Ending Day Type: WKDY

Hour	Util Percent
0	0
7	50
8	100
11	80
12	40
13	80
14	100
16	70
17	30
18	0
24	

Starting Month: JAN Ending Month: DEC
Starting Day Type: SAT Ending Day Type: SUN

Hour	Util Percent
0	0
24	

```
**********************************************************************
**********************************************************************
**                                                                  **
**              T R A C E   6 0 0   A N A L Y S I S                 **
**                                                                  **
**              by          **                                      **
**                                                                  **
**********************************************************************
**********************************************************************
```

FORT MCPHERSON & GILLEM EEAP #3105.000
ATLANTA
COE - DACA21-9-C-0097
DENNIS JONES
BUILDING M246 - BASELINE

Weather File Code:	ATLANTA.	
Location:		
Latitude:	33.0	(deg)
Longitude:	84.0	(deg)
Time Zone:	6	
Elevation:	1,005	(ft)
Barometric Pressure:	28.8	(in. Hg)
Summer Clearness Number:	0.90	
Winter Clearness Number:	0.90	
Summer Design Dry Bulb:	92	(F)
Summer Design Wet Bulb:	74	(F)
Winter Design Dry Bulb:	22	(F)
Summer Ground Relectance:	0.20	
Winter Ground Relectance:	0.20	
Air Density:	0.0731	(Lbm/cuft)
Air Specific Heat:	0.2444	(Btu/lbm/F)
Density-Specific Heat Prod:	1.0727	(Btu-min./hr/cuft/F)
Latent Heat Factor:	4,721.8	(Btu-min./hr/cuft)
Enthalpy Factor:	4.3883	(Lb-min./hr/cuft)

Design Simulation Period: June To November
System Simulation Period: January To December
Cooling Load Methodology: TETD/Time Averaging

Time/Date Program was Run: 18:49:43 3/10/92
Dataset Name: M246 .TM

AIRFLOW - ALTERNATIVE 1

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

System Number	System Type	Main: Outside Airflow (Cfm)	Main: Cooling Airflow (Cfm)	Main: Heating Airflow (Cfm)	Main: Return Airflow (Cfm)	Main: Exhaust Airflow (Cfm)	Auxil. Supply Airflow (Cfm)	Room Exhaust Airflow (Cfm)
1	SZ	2,051	24,714	24,714	24,714	2,051	0	0
Totals		2,051	24,714	24,714	24,714	2,051	0	0

CAPACITY - ALTERNATIVE 1

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

System Number	System Type	Cooling: Main Sys. Capacity (Tons)	Cooling: Aux. Sys. Capacity (Tons)	Cooling: Opt. Vent Capacity (Tons)	Cooling Totals (Tons)	Heating: Main Sys. Capacity (Btuh)	Heating: Aux. Sys. Capacity (Btuh)	Heating: Preheat Capacity (Btuh)	Heating: Reheat Capacity (Btuh)	Heating: Humidif. Capacity (Btuh)	Heating: Opt. Vent Capacity (Btuh)	Heating Totals (Btuh)
1	SZ	41.6	0.0	0.0	41.6	-200,684	0	0	0	0	0	-200,684
Totals		41.6	0.0	0.0	41.6	-200,684	0	0	0	0	0	-200,68

The building peaked at hour 15 month 8 with a capacity of 41.6 tons

ENGINEERING CHECKS - ALTERNATIVE 1

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: Cfm/ Sq Ft	Cooling: Cfm/ Ton	Cooling: Sq Ft /Ton	Cooling: Btuh/ Sq Ft	Heating: Cfm/ Sq Ft	Heating: Btuh/ Sq Ft	Floor Area Sq Ft
1	Main	SZ	8.30	1.07	594.3	554.8	21.63	1.07	-8.70	23,072

System 1 Peak SZ - SINGLE ZONE

	COOLING COIL PEAK					CLG SPACE PEAK		HEATING COIL PEAK		
Peaked at Time ==>	Mo/Hr: 8/15					Mo/Hr: 6/16		Mo/Hr: 13/ 1		
Outside Air ==>	OADB/WB/HR: 92/ 74/105.0					OADB: 96		OADB: 22		
	Space Sens.+Lat. (Btuh)	Ret. Air Sensible (Btuh)	Ret. Air Latent (Btuh)	Net Total (Btuh)	Percnt Of Tot (%)	Space Sensible (Btuh)	Percnt Of Tot (%)	Space Peak Space Sens (Btuh)	Coil Peak Tot Sens (Btuh)	Percnt 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	47,721	0		47,721	9.56	48,396	13.47	-53,066	-53,066	26.44
Glass Solar	79,642	0		79,642	15.96	82,988	23.10	0	0	0.00
Glass Cond	9,172	0		9,172	1.84	11,126	3.10	-30,028	-30,028	14.96
Wall Cond	5,737	0		5,737	1.15	6,924	1.93	-19,771	-19,771	9.85
Partition	0			0	0.00	0	0.00	0	0	0.00
Exposed Floor	0			0	0.00	0	0.00	-31,760	-31,760	15.83
Infiltration	0			0	0.00	0	0.00	0	0	0.00
Sub Total==>	142,272	0		142,272	28.51	149,434	41.59	-134,625	-134,625	67.08
Internal Loads										
Lights	129,929	0		129,929	26.04	129,929	36.16	0	0	0.00
People	46,144			46,144	9.25	25,636	7.13	0	0	0.00
Misc	54,334	0	0	54,334	10.89	54,334	15.12	0	0	0.00
Sub Total==>	230,407	0	0	230,407	46.17	209,898	58.41	0	0	0.00
Ceiling Load	0	0		0	0.00	0	0.00	0	0	0.00
Outside Air	0	0	0	82,420	16.52	0	0.00	0	-109,995	54.81
[illegible] Fan Heat				43,935	8.80		0.00		43,935	-21.89
[illegible] 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==>	372,678	0	0	499,034	100.00	359,332	100.00	-134,625	-200,684	100.00

COOLING COIL SELECTION

	Total Capacity (Tons)	(Mbh)	Sens Cap. (Mbh)	Coil Airfl (cfm)	Entering DB/WB/HR Deg F	Deg F	Grains	Leaving DB/WB/HR Deg F	Deg F	Grains
Main Clg	41.6	499.0	431.8	24,714	77.3	64.5	73.9	60.8	58.0	70.4
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	41.6	499.0								

AREAS

Gross Total		Glass (sf)	(%)
Floor	23,072		
Part	0		
ExFlr	794		
Roof	23,072	0	0
Wall	6,352	860	14

HEATING COIL SELECTION

	Capacity (Mbh)	Coil Airfl (cfm)	Ent Deg F	Lvg Deg F
Main Htg	-200.7	24,714	67.9	75.4
Aux Htg	0.0	0	0.0	0.0
Preheat	-0.0	24,714	67.9	60.8
Reheat	0.0	0	0.0	0.0
Humidif	0.0	0	0.0	0.0
Opt Vent	0.0	0	0.0	0.0
[illegible]	-200.7			

AIRFLOWS (cfm)

Type	Cooling	Heating
Vent	2,051	2,051
Infil	0	0
Supply	24,714	24,714
Mincfm	0	0
Return	24,714	24,714
Exhaust	2,051	2,051
Rm Exh	0	0
Auxil	0	0

ENGINEERING CHECKS

Clg % OA	8.3
Clg Cfm/Sqft	1.07
Clg Cfm/Ton	594.28
Clg Sqft/Ton	554.80
Clg Btuh/Sqft	21.63
No. People	103
Htg % OA	8.3
Htg Cfm/SqFt	1.07
Htg Btuh/SqFt	-8.70

TEMPERATURES (F)

Type	Clg	Htg
SADB	62.4	77.1
Plenum	76.0	72.0
Return	76.0	72.0
Ret/OA	77.3	67.9
Runarnd	76.0	72.0
Fn MtrTD	0.4	0.0
Fn BldTD	0.3	0.0
Fn Frict	0.9	0.0

ZONE PSYCHROMETRICS - ALTERNATIVE 1

---------- P S Y C H R O M E T R I C S T A T E P O I N T S ----------

Zone 1

	Dry Bulb (F)	Wet Bulb (F)	Relat. Humid. (%)	Humid. Ratio (GR)	Enthalpy (Btu/Lb)	Temp. Diff. (F)
Space	76.0	63.2	50.0	69.8	29.2	
Main System						
Return Air Heat Pickup						0.0
Return Fan						0.0
Return Air	76.0	63.2	50.0	69.8	29.2	
Outdoor Air	92.0	74.4	44.6	105.0	38.6	
Return/Outdoor Air Mix	77.3	64.2	49.8	72.6	29.9	
Blow through Fan						0.0
Entering Coil	77.3	64.2	49.8	72.6	29.9	
Leaving Coil	60.4	57.5	84.7	69.1	25.2	
Draw Through Fan						0.7
Duct Frictional Heat						0.9
Supply Duct Heat Gain						0.0
Cold Deck Supply Air	62.0	58.1	79.8	69.1	25.6	
Supply Air	62.0	58.1	79.8	69.1	25.6	

Percent Outside Air	7.87	(%)
Sensible Heat Ratio (SHR)	0.950	
Percent Supply Air Bypassing Coil	0.00	(%)
Coil Airflow	8,164	(Cfm)

[redacted] PSYCHROMETRICS - ALTERNATIVE 1

---------- P S Y C H R O M E T R I C S T A T E P O I N T S ----------

Zone 2

	Dry Bulb (F)	Wet Bulb (F)	Relat. Humid. (%)	Humid. Ratio (GR)	Enthalpy (Btu/Lb)	Temp. Diff. (F)
Space	76.0	63.2	50.0	69.8	29.2	
Main System						
Return Air Heat Pickup						0.0
Return Fan						0.0
Return Air	76.0	63.2	50.0	69.8	29.2	
Outdoor Air	92.3	74.4	44.2	105.0	38.7	
Return/Outdoor Air Mix	77.3	64.2	49.8	72.6	29.9	
Blow through Fan						0.0
Entering Coil	77.3	64.2	49.8	72.6	29.9	
Leaving Coil	60.4	57.5	84.6	69.1	25.2	
Draw Through Fan						0.7
Duct Frictional Heat						0.9
Supply Duct Heat Gain						0.0
Cold Deck Supply Air	62.0	58.1	79.8	69.1	25.6	
Supply Air	62.0	58.1	79.8	69.1	25.6	

[redacted]ent Outside Air 7.84 (%)
[redacted]sible Heat Ratio (SHR) 0.950
Percent Supply Air Bypassing Coil 0.00 (%)
Coil Airflow 5,989 (Cfm)

ZONE PSYCHROMETRICS - ALTERNATIVE 1

---------- P S Y C H R O M E T R I C S T A T E P O I N T S ----------

Zone 3

	Dry Bulb (F)	Wet Bulb (F)	Relat. Humid. (%)	Humid. Ratio (GR)	Enthalpy (Btu/Lb)	Temp. Diff. (F)
Space	76.0	63.8	52.1	72.8	29.6	
Main System						
Return Air Heat Pickup						0.0
Return Fan						0.0
Return Air	76.0	63.8	52.1	72.8	29.6	
Outdoor Air	92.3	74.4	44.2	105.0	38.7	
Return/Outdoor Air Mix	77.4	64.9	51.6	75.7	30.4	
Blow through Fan						0.0
Entering Coil	77.4	64.9	51.6	75.7	30.4	
Leaving Coil	61.3	58.5	85.0	71.8	25.9	
Draw Through Fan						0.7
Duct Frictional Heat						0.9
Supply Duct Heat Gain						0.0
Cold Deck Supply Air	63.0	59.1	80.2	71.8	26.3	
Supply Air	63.0	59.1	80.2	71.8	26.3	

Percent Outside Air	8.89	(%)
Sensible Heat Ratio (SHR)	0.940	
Percent Supply Air Bypassing Coil	0.00	(%)
Coil Airflow	10,560	(Cfm)

SYSTEM LOAD PROFILE - ALTERNATIVE 1

Main System 1 SZ SINGLE ZONE

Percent Design Load	Cooling Load Cap. (Ton)	Cooling Load Hours (%)	Cooling Load Hours	Heating Load Capacity (Btuh)	Heating Load Hours (%)	Heating Load Hours	Cooling Airflow Cap. (Cfm)	Cooling Airflow Hours (%)	Cooling Airflow Hours	Heating Airflow Cap. (Cfm)	Heating Airflow Hours (%)	Heating Airflow Hours
0 - 5	2.1	8	305	-10,034	10	60	1,235.7	0	0	0.0	0	0
5 - 10	4.2	16	607	-20,068	7	43	2,471.4	0	0	0.0	0	0
10 - 15	6.2	11	411	-30,103	7	42	3,707.1	0	0	0.0	0	0
15 - 20	8.3	11	430	-40,137	11	69	4,942.7	0	0	0.0	0	0
20 - 25	10.4	9	331	-50,171	5	29	6,178.4	0	0	0.0	0	0
25 - 30	12.5	3	126	-60,205	8	46	7,414.1	0	0	0.0	0	0
30 - 35	14.6	3	118	-70,240	9	53	8,649.8	0	0	0.0	0	0
35 - 40	16.6	3	120	-80,274	7	43	9,885.5	0	0	0.0	0	0
40 - 45	18.7	3	110	-90,308	9	58	11,121.2	0	0	0.0	0	0
45 - 50	20.8	3	110	-100,342	10	59	12,356.9	0	0	0.0	0	0
50 - 55	22.9	3	114	-110,376	6	36	13,592.5	0	0	0.0	0	0
55 - 60	25.0	5	169	-120,411	12	74	14,828.2	0	0	0.0	0	0
60 - 65	27.0	3	105	-130,445	0	0	16,063.9	0	0	0.0	0	0
65 - 70	29.1	4	152	-140,479	0	0	17,299.6	0	0	0.0	0	0
70 - 75	31.2	8	281	-150,513	0	0	18,535.3	0	0	0.0	0	0
75 - 80	33.3	2	60	-160,548	0	0	19,771.0	0	0	0.0	0	0
80 - 85	35.3	1	45	-170,582	0	0	21,006.6	0	0	0.0	0	0
85 - 90	37.4	3	108	-180,616	0	0	22,242.3	0	0	0.0	0	0
90 - 95	39.5	1	42	-190,650	0	0	23,478.0	0	0	0.0	0	0
95 - 100	41.6	0	0	-200,684	0	0	24,713.7	100	8,760	0.0	0	0
Hours Off	0.0	0	5,016	0	0	8,148	0.0	0	0	0.0	0	8,760

BUILDING COOL-HEAT DEMAND - ALTERNATIVE 1

January			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	33.4	30.4	-72,666	0.0	0	0.0	0	0.0	-108,574	0.0	-108,574	0.0
2	32.1	29.3	-76,985	0.0	0	0.0	0	0.0	-114,911	0.0	-114,911	0.0
3	31.7	29.3	-80,550	0.0	0	0.0	0	0.0	-117,738	0.0	-117,738	0.0
4	31.9	29.5	-82,928	0.0	0	0.0	0	0.0	-118,004	0.0	-118,004	0.0
5	32.6	30.3	-85,135	0.0	0	0.0	0	0.0	-117,036	0.0	-117,036	0.0
6	33.6	31.3	-84,570	0.0	0	0.0	-11,080	0.0	-113,776	0.0	-113,776	0.0
7	35.0	32.6	-82,419	0.0	0	0.0	-36,830	0.0	-109,300	0.0	-109,300	0.0
8	36.6	34.4	0	0.0	0	0.0	-34,246	0.0	-88,931	0.0	0	0.0
9	38.5	36.3	0	0.0	0	0.0	-34,048	0.0	-68,383	0.0	0	0.0
10	40.4	37.7	0	0.0	0	0.0	-48,617	0.0	-49,274	0.0	0	0.0
11	42.3	38.7	0	0.0	0	0.0	-39,124	0.0	-39,124	0.0	0	0.0
12	44.2	39.6	0	0.0	0	0.0	-30,952	0.0	-30,952	0.0	0	0.0
13	45.8	40.5	0	0.0	0	0.0	-18,982	0.0	-18,982	0.0	0	0.0
14	47.2	41.1	0	0.0	0	0.0	-10,359	0.0	-10,359	0.0	0	0.0
15	48.2	41.6	0	0.0	0	0.0	-3,978	0.0	-3,978	0.0	0	0.0
16	48.9	41.8	0	0.0	0	0.0	-1,478	0.0	-1,478	0.0	0	0.0
17	49.1	41.9	0	0.0	0	0.0	-26,228	0.0	-26,228	0.0	0	0.0
18	48.7	41.9	0	0.0	0	0.0	-43,598	0.0	-43,598	0.0	0	0.0
19	47.4	41.7	0	0.0	0	0.0	-53,678	0.0	-53,678	0.0	0	0.0
20	45.5	40.5	0	0.0	0	0.0	-60,294	0.0	-60,294	0.0	0	0.0
21	43.1	38.9	0	0.0	0	0.0	-69,623	0.0	-69,623	0.0	0	0.0
22	40.4	36.7	0	0.0	0	0.0	-79,297	0.0	-79,297	0.0	0	0.0
23	37.7	34.3	0	0.0	0	0.0	-90,347	0.0	-90,347	0.0	0	0.0
24	35.3	32.3	0	0.0	0	0.0	-99,675	0.0	-99,675	0.0	0	0.0

February			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	37.5	34.5	0	0.0	0	0.0	0	0.0	-93,698	0.0	-93,698	0.0
2	36.0	33.0	0	0.0	0	0.0	0	0.0	-99,022	0.0	-99,022	0.0
3	34.7	31.8	0	0.0	0	0.0	0	0.0	-105,282	0.0	-105,282	0.0
4	33.6	30.9	0	0.0	0	0.0	0	0.0	-110,118	0.0	-110,118	0.0
5	32.8	30.1	0	0.0	0	0.0	0	0.0	-113,511	0.0	-113,511	0.0
6	32.2	29.8	0	0.0	0	0.0	0	0.0	-116,855	0.0	-116,855	0.0
7	32.1	29.6	-10,920	0.0	0	0.0	-5,134	0.0	-117,086	0.0	-117,086	0.0
8	32.5	30.3	0	0.0	0	0.0	-22,222	0.0	-92,239	0.0	0	0.0
9	33.9	31.6	0	0.0	0	0.0	-29,681	0.0	-80,129	0.0	0	0.0
10	36.0	33.0	0	0.0	0	0.0	-33,377	0.0	-66,191	0.0	0	0.0
11	38.5	34.8	0	0.0	0	0.0	-54,735	0.0	-54,735	0.0	0	0.0
12	41.3	36.5	0	0.0	0	0.0	-40,874	0.0	-40,874	0.0	0	0.0
13	43.8	38.1	0	0.0	0	0.0	-26,383	0.0	-26,383	0.0	0	0.0
14	45.9	39.5	0	0.0	0	0.0	-12,976	0.0	-12,976	0.0	0	0.0
15	47.2	40.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
16	47.7	40.6	0	0.0	0	0.0	-1,176	0.0	-1,176	0.0	0	0.0
17	47.5	40.2	0	0.0	0	0.0	-8,108	0.0	-8,108	0.0	0	0.0
18	47.0	39.8	0	0.0	0	0.0	-39,782	0.0	-39,782	0.0	0	0.0
19	46.2	39.9	0	0.0	0	0.0	-57,151	0.0	-57,151	0.0	0	0.0
20	45.1	39.7	0	0.0	0	0.0	-62,710	0.0	-62,710	0.0	0	0.0
21	43.8	39.2	0	0.0	0	0.0	-68,398	0.0	-68,398	0.0	0	0.0
22	42.3	38.3	0	0.0	0	0.0	-73,722	0.0	-73,722	0.0	0	0.0
23	40.7	37.2	0	0.0	0	0.0	-80,585	0.0	-80,585	0.0	0	0.0
24	39.1	35.8	0	0.0	0	0.0	-86,521	0.0	-86,521	0.0	0	0.0

LDING COOL-HEAT DEMAND - ALTERNATIVE 1

March			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	45.4	41.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2	43.3	39.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
3	41.6	38.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
4	40.6	37.5	0	0.0	0	0.0	0	0.0	0	0.0	-23,600	0.0
5	40.2	37.3	0	0.0	0	0.0	0	0.0	0	0.0	-73,798	0.0
6	40.6	37.8	0	0.0	0	0.0	0	0.0	0	0.0	-82,280	0.0
7	41.6	39.0	0	0.0	0	0.0	0	0.0	0	0.0	-60,764	0.0
8	43.3	40.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
9	45.4	42.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
10	47.9	44.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
11	50.6	45.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
12	53.3	46.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
13	55.8	48.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
14	58.0	49.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
15	59.6	50.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
16	60.7	50.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
17	61.0	50.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
18	60.7	50.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
19	59.6	50.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
20	58.0	50.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
21	55.8	49.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
[illegible]	53.3	47.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
23	50.6	45.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
24	47.9	43.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0

April			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	57.7	53.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2	55.9	52.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
3	54.2	51.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
4	52.9	50.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
5	51.9	49.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
6	51.2	49.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
7	51.0	49.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
8	51.6	49.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
9	53.3	50.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
10	55.9	51.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
11	59.0	53.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
12	62.4	55.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
13	65.5	57.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
14	68.1	59.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
15	69.8	60.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
16	70.4	60.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
17	70.2	60.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
18	69.5	60.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
19	68.5	59.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
[illegible]	67.2	59.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
[illegible]	65.5	59.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
22	63.7	58.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
23	61.7	57.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
24	59.7	55.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0

BUILDING COOL-HEAT DEMAND - ALTERNATIVE 1

May			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	66.6	62.3	0	41.6	0	1.1	0	1.4	0	1.4	0	1.4
2	64.5	60.4	0	41.6	0	0.4	0	0.5	0	0.5	0	0.5
3	62.7	59.1	0	41.6	0	0.0	0	0.0	0	0.0	0	0.0
4	61.2	58.1	0	39.8	0	0.0	0	0.0	0	0.0	0	0.0
5	60.0	57.1	0	27.1	0	0.0	0	0.0	0	0.0	0	0.0
6	59.3	56.6	0	4.3	0	0.0	0	0.0	0	0.0	0	0.0
7	59.0	56.5	0	5.8	0	0.9	0	1.0	0	1.0	0	1.0
8	59.5	56.6	0	20.1	0	12.7	0	1.8	0	1.8	0	13.3
9	60.9	56.6	0	26.1	0	20.4	0	2.0	0	2.0	0	20.8
10	63.0	57.2	0	27.9	0	22.2	0	3.5	0	3.5	0	22.3
11	65.7	58.1	0	29.5	0	23.0	0	5.4	0	5.4	0	23.0
12	68.7	59.8	0	30.3	0	23.4	0	6.3	0	6.3	0	23.4
13	71.7	61.6	0	27.8	0	21.2	0	8.2	0	8.2	0	21.2
14	74.5	63.4	0	34.1	0	27.7	0	10.4	0	10.4	0	27.7
15	76.6	64.8	0	36.0	0	30.3	0	12.0	0	12.0	0	30.3
16	78.0	65.6	0	36.1	0	29.8	0	11.3	0	11.3	0	29.8
17	78.5	65.6	0	30.1	0	25.2	0	10.8	0	10.8	0	25.2
18	78.2	65.8	0	18.6	0	15.4	0	8.8	0	8.8	0	15.4
19	77.5	65.6	0	6.8	0	5.4	0	5.4	0	5.4	0	5.4
20	76.3	66.1	0	5.5	0	4.9	0	4.9	0	4.9	0	4.9
21	74.8	67.2	0	4.7	0	4.5	0	4.5	0	4.5	0	4.5
22	73.0	66.4	0	4.0	0	4.0	0	4.0	0	4.0	0	4.0
23	70.9	65.4	0	3.4	0	3.3	0	3.3	0	3.3	0	3.3
24	68.7	64.0	0	2.9	0	2.4	0	2.4	0	2.4	0	2.4

June			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	73.0	67.9	0	7.0	0	4.0	0	4.9	0	4.9	0	4.9
2	71.2	66.1	0	6.3	0	3.5	0	3.9	0	3.9	0	3.9
3	69.7	65.2	0	5.6	0	2.9	0	3.1	0	3.1	0	3.1
4	68.5	64.3	0	5.2	0	2.3	0	2.4	0	2.4	0	2.4
5	67.8	64.2	0	5.1	0	1.9	0	1.9	0	1.9	0	1.9
6	67.6	64.2	0	7.7	0	3.7	0	3.8	0	3.8	0	3.8
7	68.1	64.8	0	10.0	0	5.5	0	5.5	0	5.5	0	5.5
8	69.4	65.7	0	26.0	0	22.4	0	6.9	0	6.9	0	22.5
9	71.6	66.2	0	31.8	0	27.1	0	8.4	0	8.4	0	27.1
10	74.2	67.2	0	33.3	0	29.6	0	11.0	0	11.0	0	29.6
11	77.2	68.5	0	34.8	0	30.3	0	11.7	0	11.7	0	30.3
12	80.2	70.0	0	35.4	0	31.0	0	12.7	0	12.7	0	31.0
13	82.8	70.8	0	32.6	0	28.3	0	14.8	0	14.8	0	28.3
14	85.0	71.6	0	39.2	0	35.0	0	17.2	0	17.2	0	35.0
15	86.3	72.3	0	41.1	0	37.6	0	18.9	0	18.9	0	37.6
16	86.8	72.1	0	40.7	0	36.2	0	17.6	0	17.6	0	36.2
17	86.6	71.7	0	34.6	0	30.3	0	15.9	0	15.9	0	30.3
18	85.8	71.5	0	23.6	0	20.5	0	13.9	0	13.9	0	20.5
19	84.7	71.2	0	10.6	0	9.4	0	9.6	0	9.6	0	9.4
20	83.2	71.5	0	9.2	0	8.9	0	9.0	0	9.0	0	8.9
21	81.4	71.7	0	8.3	0	8.5	0	8.6	0	8.6	0	8.5
22	79.3	71.4	0	7.7	0	7.8	0	7.8	0	7.8	0	7.8
23	77.2	70.5	0	7.1	0	7.1	0	7.1	0	7.1	0	7.1
24	75.1	69.1	0	6.5	0	5.9	0	5.9	0	5.9	0	5.9

BUILDING COOL-HEAT DEMAND - ALTERNATIVE 1

July			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	72.0	69.3	0	7.2	0	3.9	0	4.8	0	4.8	0	4.8
2	70.5	68.0	0	6.4	0	3.6	0	4.0	0	4.0	0	4.0
3	69.4	67.1	0	5.9	0	3.1	0	3.3	0	3.3	0	3.3
4	68.5	66.4	0	5.5	0	2.6	0	2.7	0	2.7	0	2.7
5	67.9	66.0	0	5.4	0	2.2	0	2.3	0	2.3	0	2.3
6	67.7	65.9	0	7.4	0	3.6	0	3.6	0	3.6	0	3.6
7	68.1	66.3	0	10.2	0	5.7	0	5.7	0	5.7	0	5.7
8	69.1	67.3	0	26.7	0	23.9	0	7.3	0	7.3	0	24.0
9	70.8	68.0	0	32.1	0	27.9	0	8.9	0	8.9	0	27.9
10	72.9	69.1	0	34.0	0	30.3	0	11.3	0	11.3	0	30.3
11	75.2	70.5	0	35.0	0	30.9	0	12.0	0	12.0	0	30.9
12	77.5	71.7	0	35.7	0	31.6	0	13.0	0	13.0	0	31.6
13	79.6	72.7	0	32.8	0	28.4	0	14.9	0	14.9	0	28.4
14	81.3	73.5	0	39.4	0	35.6	0	17.2	0	17.2	0	35.6
15	82.3	73.7	0	41.3	0	37.5	0	18.6	0	18.6	0	37.5
16	82.7	73.5	0	40.8	0	36.5	0	17.6	0	17.6	0	36.5
17	82.5	73.1	0	34.5	0	30.3	0	15.7	0	15.7	0	30.3
18	82.0	72.6	0	23.2	0	20.1	0	13.5	0	13.5	0	20.1
19	81.1	73.2	0	10.1	0	8.6	0	9.0	0	9.0	0	8.6
20	79.9	73.8	0	9.2	0	8.6	0	8.7	0	8.7	0	8.6
21	78.5	73.9	0	8.5	0	8.5	0	8.5	0	8.5	0	8.5
[illegible]	76.9	73.1	0	7.9	0	7.9	0	7.9	0	7.9	0	7.9
[illegible]	75.2	71.9	0	7.4	0	6.9	0	6.9	0	6.9	0	6.9
24	73.5	70.8	0	7.0	0	5.9	0	5.9	0	5.9	0	5.9

August			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	72.7	70.2	0	8.0	0	4.4	0	5.4	0	5.4	0	5.4
2	71.2	69.0	0	6.5	0	4.1	0	4.5	0	4.5	0	4.5
3	69.9	68.0	0	5.8	0	3.4	0	3.6	0	3.6	0	3.6
4	68.8	67.1	0	5.5	0	2.8	0	2.9	0	2.9	0	2.9
5	68.0	66.6	0	5.2	0	2.3	0	2.3	0	2.3	0	2.3
6	67.5	66.2	0	6.1	0	2.8	0	2.8	0	2.8	0	2.8
7	67.3	66.1	0	9.6	0	4.9	0	4.9	0	4.9	0	4.9
8	67.8	66.5	0	26.4	0	23.5	0	6.5	0	6.5	0	23.5
9	69.1	67.0	0	32.4	0	26.7	0	7.8	0	7.8	0	26.7
10	71.2	67.8	0	34.2	0	28.9	0	10.2	0	10.2	0	28.9
11	73.8	68.7	0	35.0	0	29.7	0	10.9	0	10.9	0	29.7
12	76.5	70.0	0	35.2	0	30.3	0	11.9	0	11.9	0	30.3
13	79.1	71.2	0	32.3	0	27.9	0	14.4	0	14.4	0	27.9
14	81.1	72.6	0	39.6	0	35.4	0	17.2	0	17.2	0	35.4
15	82.5	73.6	0	41.5	0	37.4	0	18.7	0	18.7	0	37.4
16	83.0	73.7	0	40.7	0	35.3	0	16.2	0	16.2	0	35.3
17	82.8	73.5	0	34.4	0	29.9	0	15.1	0	15.1	0	29.9
18	82.3	73.5	0	21.3	0	18.7	0	12.0	0	12.0	0	18.7
19	81.5	73.1	0	10.1	0	8.6	0	9.0	0	9.0	0	8.6
[illegible]	80.4	73.7	0	9.2	0	8.7	0	8.8	0	8.8	0	8.7
[illegible]	79.1	74.9	0	8.7	0	8.6	0	8.7	0	8.7	0	8.6
22	77.6	73.9	0	8.1	0	8.2	0	8.2	0	8.2	0	8.2
23	76.0	72.7	0	7.4	0	7.5	0	7.5	0	7.5	0	7.5
24	74.3	71.3	0	7.0	0	6.4	0	6.4	0	6.4	0	6.4

BUILDING COOL-HEAT DEMAND - ALTERNATIVE 1

September			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	69.8	66.1	0	5.7	0	2.6	0	3.3	0	3.3	0	3.3
2	68.0	64.5	0	4.7	0	1.9	0	2.3	0	2.3	0	2.3
3	66.3	63.0	0	4.0	0	1.4	0	1.5	0	1.5	0	1.5
4	64.9	61.9	0	3.6	0	0.6	0	0.6	0	0.6	0	0.6
5	63.9	61.3	0	3.3	0	0.0	0	0.0	0	0.0	0	0.0
6	63.2	61.0	0	3.2	0	0.0	0	0.0	0	0.0	0	0.0
7	63.0	60.8	0	6.5	0	1.4	0	1.5	0	1.5	0	1.5
8	63.4	61.4	0	22.9	0	18.9	0	3.5	0	3.5	0	19.2
9	64.7	61.8	0	29.4	0	23.3	0	4.8	0	4.8	0	23.3
10	66.6	62.1	0	31.3	0	24.0	0	5.9	0	5.9	0	24.0
11	69.1	62.9	0	32.2	0	26.1	0	8.0	0	8.0	0	26.1
12	71.8	63.7	0	32.6	0	26.2	0	8.5	0	8.5	0	26.2
13	74.5	65.5	0	30.2	0	24.2	0	10.8	0	10.8	0	24.2
14	77.0	67.1	0	36.6	0	31.0	0	13.4	0	13.4	0	31.0
15	78.9	68.2	0	38.3	0	32.0	0	13.4	0	13.4	0	32.0
16	80.2	68.6	0	37.0	0	31.5	0	12.7	0	12.7	0	31.5
17	80.6	68.5	0	29.5	0	25.6	0	11.0	0	11.0	0	25.6
18	80.4	68.9	0	15.4	0	14.0	0	7.2	0	7.2	0	14.0
19	79.7	70.0	0	7.7	0	6.8	0	7.0	0	7.0	0	6.8
20	78.7	71.2	0	6.9	0	6.9	0	7.0	0	7.0	0	6.9
21	77.3	71.6	0	6.3	0	6.8	0	6.8	0	6.8	0	6.8
22	75.6	70.5	0	5.6	0	6.3	0	6.3	0	6.3	0	6.3
23	73.7	69.4	0	5.1	0	5.4	0	5.4	0	5.4	0	5.4
24	71.8	67.7	0	4.5	0	4.4	0	4.4	0	4.4	0	4.4

October			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	54.8	51.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2	52.9	49.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
3	51.2	48.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
4	49.8	47.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
5	48.8	46.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
6	48.2	45.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
7	47.9	45.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
8	48.5	46.2	0	2.6	0	0.0	0	0.0	0	0.0	0	0.0
9	50.3	47.3	0	21.0	0	0.0	0	0.0	0	0.0	0	0.0
10	52.9	48.7	0	22.5	0	12.3	0	0.0	0	0.0	0	6.1
11	56.2	49.9	0	23.6	0	17.2	0	0.0	0	0.0	0	17.2
12	59.6	51.5	0	24.3	0	18.7	0	0.0	0	0.0	0	18.7
13	62.9	53.5	0	22.8	0	16.5	0	0.0	0	0.0	0	16.5
14	65.5	55.2	0	28.7	0	21.7	0	0.0	0	0.0	0	21.7
15	67.3	56.3	0	29.7	0	22.9	0	0.0	0	0.0	0	22.9
16	67.9	56.6	0	28.3	0	22.4	0	0.6	0	0.6	0	22.5
17	67.7	56.4	0	19.0	0	15.5	0	0.6	0	0.6	0	15.5
18	67.0	56.6	0	9.4	0	7.0	0	0.2	0	0.2	0	7.0
19	66.0	57.6	0	2.4	0	0.7	0	0.2	0	0.2	0	0.7
20	64.6	57.9	0	1.5	0	0.0	0	0.0	0	0.0	0	0.0
21	62.9	57.3	0	0.7	0	0.0	0	0.0	0	0.0	0	0.0
22	61.0	56.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
23	59.0	54.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
24	56.9	53.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0

BUILDING COOL-HEAT DEMAND - ALTERNATIVE 1

November			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	48.7	45.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2	46.9	44.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
3	45.5	42.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
4	44.6	41.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
5	44.4	42.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
6	44.8	42.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
7	45.9	43.9	0	0.0	0	0.0	0	0.0	0	0.0	-18,531	0.0
8	47.8	46.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
9	50.2	48.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
10	52.9	49.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
11	55.8	51.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
12	58.5	52.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
13	60.9	52.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
14	62.8	53.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
15	64.0	53.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
16	64.4	53.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
17	64.1	53.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
18	63.2	53.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
19	61.8	54.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
20	60.0	53.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
21	57.9	52.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
[illegible]	55.6	51.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
[illegible]	53.2	49.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
24	50.8	47.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0

December			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	37.5	35.3	0	0.0	0	0.0	0	0.0	-31,487	0.0	-92,105	0.0
2	37.1	35.1	0	0.0	0	0.0	0	0.0	-36,944	0.0	-95,066	0.0
3	37.4	35.5	0	0.0	0	0.0	0	0.0	-56,371	0.0	-94,979	0.0
4	38.1	36.2	0	0.0	0	0.0	0	0.0	-93,754	0.0	-93,754	0.0
5	39.3	37.6	0	0.0	0	0.0	0	0.0	-89,796	0.0	-89,796	0.0
6	40.9	39.2	0	0.0	0	0.0	0	0.0	-84,823	0.0	-84,823	0.0
7	42.7	41.2	0	0.0	0	0.0	0	0.0	-79,154	0.0	-79,154	0.0
8	44.7	43.1	0	0.0	0	0.0	0	0.0	-53,853	0.0	0	0.0
9	46.8	45.3	0	0.0	0	0.0	0	0.0	-31,237	0.0	0	0.0
10	48.8	47.0	0	0.0	0	0.0	0	0.0	-16,793	0.0	0	0.0
11	50.7	48.1	0	0.0	0	0.0	0	0.0	-8,963	0.0	0	0.0
12	52.2	48.8	0	0.0	0	0.0	0	0.0	-4,141	0.0	0	0.0
13	53.4	49.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
14	54.1	49.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
15	54.4	48.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
16	54.0	48.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
17	53.0	47.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
18	51.4	46.3	0	0.0	0	0.0	0	0.0	-3,956	0.0	0	0.0
19	49.3	45.4	0	0.0	0	0.0	0	0.0	-29,097	0.0	0	0.0
[illegible]	47.0	43.5	0	0.0	0	0.0	0	0.0	-39,787	0.0	0	0.0
[illegible]	44.5	41.5	0	0.0	0	0.0	0	0.0	-60,118	0.0	0	0.0
22	42.2	39.3	0	0.0	0	0.0	0	0.0	-70,974	0.0	0	0.0
23	40.1	37.6	0	0.0	0	0.0	0	0.0	-80,312	0.0	0	0.0
24	38.5	36.2	0	0.0	0	0.0	-30,074	0.0	-87,624	0.0	0	0.0

BUILDING TEMPERATURE PROFILES - ALTERNATIVE 1

BUILDING TEMPERATURE PROFILES

Temperature Range (F)	Room Number 1	2	3
Max. Temp.	101.3	101.0	98.4
Mo./Hr.	4 18	4 18	4 18
Day Type	2	2	2
	Number of Hours		
Above 100	64	48	0
95 - 100	154	154	160
90 - 95	460	530	300
85 - 90	658	701	814
80 - 85	1,043	1,197	1,229
75 - 80	5,083	5,031	5,103
70 - 75	1,298	1,099	1,154
65 - 70	0	0	0
60 - 65	0	0	0
55 - 60	0	0	0
50 - 55	0	0	0
Below 50	0	0	0
Min. Temp.	71.9	71.9	71.9
Mo./Hr.	1 9	3 5	1 5
Day Type	3	5	4

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 1

MONTHLY ENERGY CONSUMPTION

Month	ELEC On Peak (kWh)	DEMAND On Peak (kW)	GAS On Peak (Therm)	GAS DMND On Peak (Thrm/hr)
Jan	32,680	80	202	1
Feb	29,486	80	164	1
March	33,199	80	12	1
April	30,971	80	0	0
May	42,860	127	0	0
June	47,273	140	0	0
July	46,686	135	0	0
Aug	48,459	135	0	0
Sept	42,397	130	0	0
Oct	37,099	115	0	0
Nov	30,971	80	0	0
Dec	31,933	80	96	1
Total	454,014	140	474	1

Building Energy Consumption = 69,214 (Btu/Sq Ft/Year)
Source Energy Consumption = 203,665 (Btu/Sq Ft/Year)

Floor Area = 23,072 (Sq Ft)

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1

E Q U I P M E N T   E N E R G Y   C O N S U M P T I O N

Ref Num	Equip Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
		Monthly Consumption												
0	LIGHTS													
	ELEC	8811	7970	9515	8413	9163	9117	8459	9515	8413	9163	8413	8459	105,412
	PK	38.1	38.1	38.1	38.1	38.1	38.1	38.1	38.1	38.1	38.1	38.1	38.1	38.1
1	MISC LD													
	ELEC	3685	3333	3979	3518	3832	3813	3537	3979	3518	3832	3518	3537	44,082
	PK	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9
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	EQ1122L		AIR-CLD RECIP >55 TONS											
	ELEC	0	0	0	0	6452	10273	9884	10140	7258	3077	0	0	47,084
	PK	0.0	0.0	0.0	0.0	36.5	46.0	43.7	44.1	39.7	26.1	0.0	0.0	46.0
1	EQ5200		CONDENSER FANS											
	ELEC	0	0	0	0	729	1236	1210	1228	847	262	0	0	5,511
	PK	0.0	0.0	0.0	0.0	4.4	8.0	5.1	5.1	4.7	3.5	0.0	0.0	8.0
1	EQ5001		CHILLED WATER PUMP C.V.			5 hp × .746 × .85/.539 = 3.8 kW								
	ELEC	0	0	0	0	2839	3579	3699	3699	3132	1029	0	0	17,976
	PK	0.0	0.0	0.0	0.0	5.0	5.0	5.0	5.0	5.0	5.0	0.0	0.0	5.0
1	EQ5313		CONTROLS											
	ELEC	0	0	0	0	171	216	223	223	189	62	0	0	1,085
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3
1	EQ4003		FC CENTRIF. FAN C.V.											
	ELEC	19674	17770	19674	19039	19674	19039	19674	19674	19039	19674	19039	19674	231,647
	PK	26.4	26.4	26.4	26.4	26.4	26.4	26.4	26.4	26.4	26.4	26.4	26.4	26.4

1 EQ2001 GAS FIRE TUBE HOT WATER

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1

	GAS	202	164	12	0	0	0	0	0	0	0	0	96	474
	PK	1.5	1.5	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	1.5
1	EQ5020		HEAT WATER CIRC. PUMP C.V.											
	ELEC	67	54	4	0	0	0	0	0	0	0	0	34	159
	PK	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3
1	EQ5240		BOILER FORCED DRAFT FAN											
	ELEC	342	276	20	0	0	0	0	0	0	0	0	176	814
	PK	1.7	1.7	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	1.7
1	EQ5307		BOILER CONTROLS											
	ELEC	102	83	6	0	0	0	0	0	0	0	0	53	243
	PK	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5

ITY PEAK CHECKSUMS - ALTERNATIVE 1

UTILITY PEAK CHECKSUMS

Utility ELECTRIC DEMAND

Peak Value 139.8 (kW)
Yearly Time of Peak 15 (hr) 6 (mo)

Hour 15 Month 6

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Percnt Of Tot (%)
Cooling Equipment				
1	EQ1122L	AIR-CLD RECIP >55 TONS	59.3	42.46
Sub Total			59.3	42.46
Sub Total			0.0	0.00
Air Moving Equipment				
		SUMMATION OF FAN ELECTRICAL DEMAND	26.4	18.92
Sub Total			26.4	18.92
Sub Total			0.0	0.00
Miscellaneous				
Lights			38.1	27.24
Base Utilities			0.0	0.00
Misc Equipment			15.9	11.39
Sub Total			54.0	38.62
Grand Total			139.8	100.00

CALIFORNIA TITLE 24 COMPLIANCE - ALTERNATIVE 1

---------- CALIFORNIA TITLE 24 COMPLIANCE REPORT ----------

Weather Name ..... ATLANTA.
Gross Conditioned Floor Area (sqft)..... 23,072
ACM Multiplier 1.025

---------- E N E R G Y U S E S U M M A R Y ----------

	ELEC (kWh/yr)	GAS (kBtu/yr)	PERCENT OF TOTAL ENERGY (%)	TOTAL SOURCE ENERGY (kBtu/yr)	ADJUSTED UNIT SOURCE ENERGY (kBtu/yr-sf)
Primary Heating	1,057.1	47,364.2	3.2	60,681.2	2.7
Primary Cooling					
Compressor	47,084.4	0.0	10.1	482,145.9	21.4
Tower/Cond Fans	5,511.1	0.0	1.2	56,433.5	2.5
Condenser Pump	0.0	0.0	0.0	0.0	0.0
Other Accessories	1,084.8	0.0	0.2	11,108.4	0.5
Auxiliary					
Supply Fans	231,646.6	0.0	49.5	2,372,067.0	105.4
Circulation Pumps	18,135.9	0.0	3.9	185,711.7	8.3
Base Utilities	0.0	0.0	0.0	0.0	0.0
Subtotal	249,782.5	0.0	53.4	2,557,778.8	113.6
Lighting	105,412.5	0.0	22.5	1,079,426.1	46.8
Receptacle	44,081.6	0.0	9.4	451,396.3	19.6
Domestic Hot Water	0.0	0.0	0.0	0.0	0.0
Cogeneration	0.0	0.0	0.0	0.0	0.0
Totals	454,013.9	47,364.2	100.0	4,698,970.0	207.1

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 1

MONTHLY ENERGY CONSUMPTION

Month	ELEC On Peak (kWh)	DEMAND On Peak (kW)	GAS On Peak (Therm)	GAS DMND On Peak (Thrm/hr)
Jan	32,680	80	202	1
Feb	29,486	80	164	1
March	33,199	80	12	1
April	30,971	80	0	0
May	42,113	127	0	0
June	47,273	140	0	0
July	46,686	135	0	0
Aug	48,459	135	0	0
Sept	42,397	130	0	0
Oct	35,729	115	0	0
Nov	30,971	80	0	0
Dec	31,933	80	96	1
Total	451,897	140	474	1

Building Energy Consumption = 68,901 (Btu/Sq Ft/Year)
Source Energy Consumption = 202,726 (Btu/Sq Ft/Year)

Floor Area = 23,072 (Sq Ft)

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1

EQUIPMENT ENERGY CONSUMPTION

Ref Num	Equip Code	Monthly Consumption Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	8811	7970	9515	8413	9163	9117	8459	9515	8413	9163	8413	8459	105,412
	PK	38.1	38.1	38.1	38.1	38.1	38.1	38.1	38.1	38.1	38.1	38.1	38.1	38.1
1	MISC LD													
	ELEC	3685	3333	3979	3518	3832	3813	3537	3979	3518	3832	3518	3537	44,082
	PK	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9
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	EQ1122L	AIR-CLD RECIP >55 TONS												
	ELEC	0	0	0	0	5974	10273	9884	10140	7258	2120	0	0	45,649
	PK	0.0	0.0	0.0	0.0	36.5	46.0	43.7	44.1	39.7	26.1	0.0	0.0	46.0
1	EQ5200	CONDENSER FANS												
	ELEC	0	0	0	0	692	1236	1210	1228	847	196	0	0	5,409
	PK	0.0	0.0	0.0	0.0	4.4	8.0	5.1	5.1	4.7	3.5	0.0	0.0	8.0
1	EQ5001	CHILLED WATER PUMP C.V.												
	ELEC	0	0	0	0	2620	3579	3699	3699	3132	701	0	0	17,430
	PK	0.0	0.0	0.0	0.0	5.0	5.0	5.0	5.0	5.0	5.0	0.0	0.0	5.0
1	EQ5313	CONTROLS												
	ELEC	0	0	0	0	158	216	223	223	189	42	0	0	1,052
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3
1	EQ4003	FC CENTRIF. FAN C.V.												
	ELEC	19674	17770	19674	19039	19674	19039	19674	19674	19039	19674	19039	19674	231,647
	PK	26.4	26.4	26.4	26.4	26.4	26.4	26.4	26.4	26.4	26.4	26.4	26.4	26.4

1 EQ2001 GAS FIRE TUBE HOT WATER

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1

	GAS	202	164	12	0	0	0	0	0	0	0	0	96	474
	PK	1.5	1.5	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	1.5
1	EQ5020		HEAT WATER CIRC. PUMP C.V.											
	ELEC	67	54	4	0	0	0	0	0	0	0	0	34	159
	PK	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3
1	EQ5240		BOILER FORCED DRAFT FAN											
	ELEC	342	276	20	0	0	0	0	0	0	0	0	176	814
	PK	1.7	1.7	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	1.7
1	EQ5307		BOILER CONTROLS											
	ELEC	102	83	6	0	0	0	0	0	0	0	0	53	243
	PK	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5

[redacted]TY PEAK CHECKSUMS - ALTERNATIVE 1

UTILITY PEAK CHECKSUMS

Utility ELECTRIC DEMAND

Peak Value 139.8 (kW)
Yearly Time of Peak 15 (hr) 6 (mo)

Hour 15 Month 6

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Percnt Of Tot (%)
Cooling Equipment				
1	EQ1122L	AIR-CLD RECIP >55 TONS	59.3	42.46
Sub Total			59.3	42.46
Sub Total			0.0	0.00
Air Moving Equipment				
[redacted]		SUMMATION OF FAN ELECTRICAL DEMAND	26.4	18.92
Sub Total			26.4	18.92
Sub Total			0.0	0.00
Miscellaneous				
Lights			38.1	27.24
Base Utilities			0.0	0.00
Misc Equipment			15.9	11.39
Sub Total			54.0	38.62
Grand Total			139.8	100.00

[redacted]

CALIFORNIA TITLE 24 COMPLIANCE - ALTERNATIVE 1

CALIFORNIA TITLE 24 COMPLIANCE REPORT

Weather Name ..... ATLANTA.
Gross Conditioned Floor Area (sqft)..... 23,072
ACM Multiplier 1.025

E N E R G Y U S E S U M M A R Y

	ELEC (kWh/yr)	GAS (kBtu/yr)	PERCENT OF TOTAL ENERGY (%)	TOTAL SOURCE ENERGY (kBtu/yr)	ADJUSTED UNIT SOURCE ENERGY (kBtu/yr-sf)
Primary Heating	1,057.1	47,364.2	3.2	60,681.2	2.7
Primary Cooling					
Compressor	45,649.1	0.0	9.8	467,448.3	20.8
Tower/Cond Fans	5,409.4	0.0	1.2	55,392.1	2.5
Condenser Pump	0.0	0.0	0.0	0.0	0.0
Other Accessories	1,051.8	0.0	0.2	10,770.5	0.5
Auxiliary					
Supply Fans	231,646.6	0.0	49.7	2,372,067.0	105.4
Circulation Pumps	17,589.0	0.0	3.8	180,111.9	8.0
Base Utilities	0.0	0.0	0.0	0.0	0.0
Subtotal	249,235.7	0.0	53.5	2,552,179.0	113.4
Lighting	105,412.5	0.0	22.6	1,079,426.1	46.8
Receptacle	44,081.6	0.0	9.5	451,396.3	19.6
Domestic Hot Water	0.0	0.0	0.0	0.0	0.0
Cogeneration	0.0	0.0	0.0	0.0	0.0
Totals	451,897.0	47,364.2	100.0	4,677,293.5	206.1

THLY ENERGY CONSUMPTION - ALTERNATIVE 1

---------- M O N T H L Y E N E R G Y C O N S U M P T I O N ----------

Month	ELEC On Peak (kWh)	DEMAND On Peak (kW)	GAS On Peak (Therm)	GAS DMND On Peak (Thrm/hr)
Jan	19,189	83	31	3
Feb	17,354	83	19	3
March	20,793	80	0	0
April	18,278	80	0	0
May	26,703	132	0	0
June	29,372	139	0	0
July	26,742	134	0	0
Aug	30,075	134	0	0
Sept	24,981	129	0	0
Oct	23,929	115	0	0
Nov	18,278	80	0	0
Dec	18,350	80	3	1
Total	274,045	139	53	3

Building Energy Consumption = 40,768 (Btu/Sq Ft/Year)
Source Energy Consumption = 121,871 (Btu/Sq Ft/Year)

Floor Area = 23,072 (Sq Ft)

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1

EQUIPMENT ENERGY CONSUMPTION

Ref Num	Equip Code	Monthly Consumption Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	8811	7970	9515	8413	9163	9117	8459	9515	8413	9163	8413	8459	105,412
	PK	38.1	38.1	38.1	38.1	38.1	38.1	38.1	38.1	38.1	38.1	38.1	38.1	38.1
1	MISC LD													
	ELEC	3685	3333	3979	3518	3832	3813	3537	3979	3518	3832	3518	3537	44,082
	PK	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9
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	EQ1122L	AIR-CLD RECIP >55 TONS												
	ELEC	0	0	0	0	4885	7190	6341	6973	4946	2727	0	0	33,062
	PK	0.0	0.0	0.0	0.0	41.5	45.2	43.0	43.4	39.0	25.6	0.0	0.0	45.2
1	EQ5200	CONDENSER FANS												
	ELEC	0	0	0	0	546	879	793	854	576	236	0	0	3,883
	PK	0.0	0.0	0.0	0.0	5.1	8.0	5.0	5.0	4.6	3.4	0.0	0.0	8.0
1	EQ5001	CHILLED WATER PUMP C.V.												
	ELEC	0	0	0	0	1223	1312	1193	1372	1114	935	0	0	7,149
	PK	0.0	0.0	0.0	0.0	5.0	5.0	5.0	5.0	5.0	5.0	0.0	0.0	5.0
1	EQ5313	CONTROLS												
	ELEC	0	0	0	0	74	79	72	83	67	56	0	0	431
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3
1	EQ4003	FC CENTRIF. FAN C.V.												
	ELEC	6664	6029	7298	6346	6981	6981	6346	7298	6346	6981	6346	6346	79,966
	PK	26.4	26.4	26.4	26.4	26.4	26.4	26.4	26.4	26.4	26.4	26.4	26.4	26.4

1 EQ2001 GAS FIRE TUBE HOT WATER

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1

	GAS	31	19	0	0	0	0	0	0	0	0	0	3	53
	PK	3.1	3.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	3.1
1	EQ5020		HEAT WATER CIRC. PUMP C.V.											
	ELEC	4	3	0	0	0	0	0	0	0	0	0	1	8
	PK	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3
1	EQ5240		BOILER FORCED DRAFT FAN											
	ELEC	20	15	0	0	0	0	0	0	0	0	0	5	40
	PK	1.7	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	1.7
1	EQ5307		BOILER CONTROLS											
	ELEC	6	5	0	0	0	0	0	0	0	0	0	2	12
	PK	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5

ITY PEAK CHECKSUMS - ALTERNATIVE 1

---------- 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 139.0 (kW)
Yearly Time of Peak 15 (hr) 6 (mo)

Hour 15 Month 6

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Percnt Of Tot (%)
Cooling Equipment				
1	EQ1122L	AIR-CLD RECIP >55 TONS	58.5	42.12
Sub Total			58.5	42.12
Sub Total			0.0	0.00
Air Moving Equipment				
		SUMMATION OF FAN ELECTRICAL DEMAND	26.4	19.03
Sub Total			26.4	19.03
Sub Total			0.0	0.00
Miscellaneous				
Lights			38.1	27.39
Base Utilities			0.0	0.00
Misc Equipment			15.9	11.46
Sub Total			54.0	38.85
Grand Total			139.0	100.00

CALIFORNIA TITLE 24 COMPLIANCE - ALTERNATIVE 1

---------- CALIFORNIA TITLE 24 COMPLIANCE REPORT ----------

Weather Name ..... ATLANTA.
Gross Conditioned Floor Area (sqft)..... 23,072
ACM Multiplier 1.025

---------- E N E R G Y U S E S U M M A R Y ----------

	ELEC (kWh/yr)	GAS (kBtu/yr)	PERCENT OF TOTAL ENERGY (%)	TOTAL SOURCE ENERGY (kBtu/yr)	ADJUSTED UNIT SOURCE ENERGY (kBtu/yr-sf)
Primary Heating	52.2	5,292.8	0.6	6,105.9	0.3
Primary Cooling					
Compressor	33,062.0	0.0	12.0	338,555.7	15.0
Tower/Cond Fans	3,883.1	0.0	1.4	39,763.1	1.8
Condenser Pump	0.0	0.0	0.0	0.0	0.0
Other Accessories	431.4	0.0	0.2	4,417.5	0.2
Auxiliary					
Supply Fans	79,965.6	0.0	29.0	818,849.6	36.4
Circulation Pumps	7,156.7	0.0	2.6	73,284.5	3.3
Base Utilities	0.0	0.0	0.0	0.0	0.0
Subtotal	87,122.3	0.0	31.6	892,134.1	39.6
Lighting	105,412.5	0.0	38.2	1,079,426.1	46.8
Receptacle	44,081.6	0.0	16.0	451,396.3	19.6
Domestic Hot Water	0.0	0.0	0.0	0.0	0.0
Cogeneration	0.0	0.0	0.0	0.0	0.0
Totals	274,045.0	5,292.8	100.0	2,811,798.8	123.3

[redacted]LY ENERGY CONSUMPTION - ALTERNATIVE 1
[redacted]TORAGE

---------- M O N T H L Y E N E R G Y C O N S U M P T I O N ----------

Month	ELEC On Peak (kWh)	DEMAND On Peak (kW)	GAS On Peak (Therm)	GAS DMND On Peak (Thrm/hr)
Jan	32,680	80	202	1
Feb	29,486	80	164	1
March	33,199	80	12	1
April	30,971	80	0	0
May	46,169	124	0	0
June	50,872	132	0	0
July	50,566	131	0	0
Aug	52,484	131	0	0
Sept	45,809	127	0	0
Oct	38,766	117	0	0
Nov	30,971	100	0	0
Dec	31,933	80	96	1
Total	473,906	132	474	1

Building Energy Consumption = 72,157 (Btu/Sq Ft/Year)
Source Energy Consumption = 212,494 (Btu/Sq Ft/Year)

Floor Area = 23,072 (Sq Ft)

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
ICE STORAGE

EQUIPMENT ENERGY CONSUMPTION

Ref Num	Equip Code	Monthly Consumption Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	8811	7970	9515	8413	9163	9117	8459	9515	8413	9163	8413	8459	105,412
	PK	38.1	38.1	38.1	38.1	38.1	38.1	38.1	38.1	38.1	38.1	38.1	38.1	38.1
1	MISC LD													
	ELEC	3685	3333	3979	3518	3832	3813	3537	3979	3518	3832	3518	3537	44,082
	PK	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9
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	EQ1750	AIR-CLD CTV ICE-CHILL H2O												
	ELEC	0	0	0	0	9318	13327	13211	13595	10212	4606	0	0	64,267
	PK	0.0	0.0	0.0	0.0	67.3	69.8	69.5	69.3	67.3	67.3	67.3	0.0	69.8
1	EQ5205	CONDENSER FANS												
	ELEC	0	0	0	0	719	1276	1242	1278	864	255	0	0	5,635
	PK	0.0	0.0	0.0	0.0	5.3	7.6	7.6	7.6	7.4	4.2	3.9	0.0	7.6
1	EQ5001	CHILLED WATER PUMP C.V.												
	ELEC	0	0	0	0	2883	3579	3699	3699	3132	1029	0	0	18,021
	PK	0.0	0.0	0.0	0.0	5.0	5.0	5.0	5.0	5.0	5.0	0.0	0.0	5.0
1	EQ5309	CONTROLS												
	ELEC	0	0	0	0	580	720	744	744	630	207	0	0	3,625
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0
1	EQ4003	FC CENTRIF. FAN C.V.												
	ELEC	19674	17770	19674	19039	19674	19039	19674	19674	19039	19674	19039	19674	231,647
	PK	26.4	26.4	26.4	26.4	26.4	26.4	26.4	26.4	26.4	26.4	26.4	26.4	26.4

1 EQ2001 GAS FIRE TUBE HOT WATER

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
ICE STORAGE

	GAS	202	164	12	0	0	0	0	0	0	0	0	96	474
	PK	1.5	1.5	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	1.5
1	EQ5020		HEAT WATER CIRC. PUMP C.V.											
	ELEC	67	54	4	0	0	0	0	0	0	0	0	34	159
	PK	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3
1	EQ5240		BOILER FORCED DRAFT FAN											
	ELEC	342	276	20	0	0	0	0	0	0	0	0	176	814
	PK	1.7	1.7	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	1.7
1	EQ5307		BOILER CONTROLS											
	ELEC	102	83	6	0	0	0	0	0	0	0	0	53	243
	PK	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5

ITY PEAK CHECKSUMS - ALTERNATIVE 1
STORAGE

---------- 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 131.9 (kW)
Yearly Time of Peak 12 (hr) 6 (mo)

Hour 12 Month 6

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Percnt Of Tot (%)
Cooling Equipment				
1	EQ1750	AIR-CLD CTV ICE-CHILL H2O	51.5	39.04
Sub Total			51.5	39.04
Sub Total			0.0	0.00
Air Moving Equipment				
		SUMMATION OF FAN ELECTRICAL DEMAND	26.4	20.04
Sub Total			26.4	20.04
Sub Total			0.0	0.00
Miscellaneous				
Lights			38.1	28.85
Base Utilities			0.0	0.00
Misc Equipment			15.9	12.07
Sub Total			54.0	40.92
Grand Total			131.9	100.00

CALIFORNIA TITLE 24 COMPLIANCE - ALTERNATIVE 1
ICE STORAGE

---------- CALIFORNIA TITLE 24 COMPLIANCE REPORT ----------

Weather Name ..... ATLANTA.
Gross Conditioned Floor Area (sqft)..... 23,072
ACM Multiplier 1.025

---------- E N E R G Y U S E S U M M A R Y ----------

	ELEC (kWh/yr)	GAS (kBtu/yr)	PERCENT OF TOTAL ENERGY (%)	TOTAL SOURCE ENERGY (kBtu/yr)	ADJUSTED UNIT SOURCE ENERGY (kBtu/yr-sf)
Primary Heating	1,057.1	47,364.2	3.1	60,681.2	2.7
Primary Cooling					
Compressor	64,267.3	0.0	13.2	658,098.9	29.2
Tower/Cond Fans	5,635.4	0.0	1.2	57,706.5	2.6
Condenser Pump	0.0	0.0	0.0	0.0	0.0
Other Accessories	3,625.0	0.0	0.7	37,120.1	1.6
Auxiliary					
Supply Fans	231,646.6	0.0	47.5	2,372,067.0	105.4
Circulation Pumps	18,180.6	0.0	3.7	186,169.8	8.3
Base Utilities	0.0	0.0	0.0	0.0	0.0
Subtotal	249,827.3	0.0	51.2	2,558,237.0	113.7
Lighting	105,412.5	0.0	21.6	1,079,426.1	46.8
Receptacle	44,081.6	0.0	9.0	451,396.3	19.6
Domestic Hot Water	0.0	0.0	0.0	0.0	0.0
Cogeneration	0.0	0.0	0.0	0.0	0.0
Totals	473,906.0	47,364.2	100.0	4,902,666.0	216.1

[redacted]Y ENERGY CONSUMPTION - ALTERNATIVE 1
[redacted]- LIGHTS

---------- M O N T H L Y E N E R G Y C O N S U M P T I O N ----------

Month	ELEC On Peak (kWh)	DEMAND On Peak (kW)	GAS On Peak (Therm)	GAS DMND On Peak (Thrm/hr)
Jan	30,670	74	222	2
Feb	27,690	74	183	1
March	31,081	74	20	1
April	29,023	74	0	0
May	40,125	118	0	0
June	44,695	131	0	0
July	44,209	126	0	0
Aug	45,779	126	0	0
Sept	39,820	121	0	0
Oct	34,529	107	0	0
Nov	29,033	74	3	1
Dec	30,011	74	117	1
Total	426,664	131	545	2

Building Energy Consumption = 65,477 (Btu/Sq Ft/Year) Floor Area = 23,072 (Sq Ft)
Source Energy Consumption = 191,852 (Btu/Sq Ft/Year)

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
M246 - LIGHTS

EQUIPMENT ENERGY CONSUMPTION

Ref Num	Equip Code	Monthly Consumption Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	7476	6762	8074	7138	7775	7736	7177	8074	7138	7775	7138	7177	89,441
	PK	32.3	32.3	32.3	32.3	32.3	32.3	32.3	32.3	32.3	32.3	32.3	32.3	32.3
1	MISC LD													
	ELEC	3685	3333	3979	3518	3832	3813	3537	3979	3518	3832	3518	3537	44,082
	PK	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9
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	EQ1122L	AIR-CLD RECIP >55 TONS												
	ELEC	0	0	0	0	6016	9810	9442	9661	6838	2696	0	0	44,462
	PK	0.0	0.0	0.0	0.0	34.8	44.2	41.9	42.3	38.0	24.8	0.0	0.0	44.2
1	EQ5200	CONDENSER FANS												
	ELEC	0	0	0	0	678	1175	1152	1166	796	231	0	0	5,198
	PK	0.0	0.0	0.0	0.0	4.2	8.0	4.9	4.9	4.5	3.3	0.0	0.0	8.0
1	EQ5001	CHILLED WATER PUMP C.V.												
	ELEC	0	0	0	0	2685	3579	3699	3699	2983	959	0	0	17,604
	PK	0.0	0.0	0.0	0.0	5.0	5.0	5.0	5.0	5.0	5.0	0.0	0.0	5.0
1	EQ5313	CONTROLS												
	ELEC	0	0	0	0	162	216	223	223	180	58	0	0	1,062
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3
1	EQ4003	FC CENTRIF. FAN C.V.												
	ELEC	18978	17142	18978	18366	18978	18366	18978	18978	18366	18978	18366	18978	223,453
	PK	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5

1 EQ2001 GAS FIRE TUBE HOT WATER

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
M246 - LIGHTS

	GAS	222	183	20	0	0	0	0	0	0	0	3	117	545
	PK	1.5	1.5	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	1.2	1.5
1	EQ5020		HEAT WATER CIRC. PUMP C.V.											
	ELEC	70	59	7	0	0	0	0	0	0	0	1	42	178
	PK	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.3
1	EQ5240		BOILER FORCED DRAFT FAN											
	ELEC	355	303	33	0	0	0	0	0	0	0	7	213	911
	PK	1.7	1.7	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	1.7	1.7
1	EQ5307		BOILER CONTROLS											
	ELEC	106	91	10	0	0	0	0	0	0	0	2	63	272
	PK	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5	0.5

UTILITY PEAK CHECKSUMS - ALTERNATIVE 1
- LIGHTS

---------- 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 131.2 (kW)
Yearly Time of Peak 15 (hr) 6 (mo)

Hour 15 Month 6

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Percnt Of Tot (%)
Cooling Equipment				
1	EQ1122L	AIR-CLD RECIP >55 TONS	57.5	43.80
Sub Total			57.5	43.80
Sub Total			0.0	0.00
Air Moving Equipment				
		SUMMATION OF FAN ELECTRICAL DEMAND	25.5	19.44
Sub Total			25.5	19.44
Sub Total			0.0	0.00
Miscellaneous				
Lights			32.3	24.62
Base Utilities			0.0	0.00
Misc Equipment			15.9	12.13
Sub Total			48.2	36.75
Grand Total			131.2	100.00

CALIFORNIA TITLE 24 COMPLIANCE - ALTERNATIVE 1
M246 - LIGHTS

---------- CALIFORNIA TITLE 24 COMPLIANCE REPORT ----------

Weather Name ..... ATLANTA.
Gross Conditioned Floor Area (sqft)..... 23,072
ACM Multiplier 1.025

---------- E N E R G Y U S E S U M M A R Y ----------

	ELEC (kWh/yr)	GAS (kBtu/yr)	PERCENT OF TOTAL ENERGY (%)	TOTAL SOURCE ENERGY (kBtu/yr)	ADJUSTED UNIT SOURCE ENERGY (kBtu/yr-sf)
Primary Heating	1,183.2	54,490.9	3.9	69,474.9	3.1
Primary Cooling					
Compressor	44,462.4	0.0	10.0	455,296.2	20.2
Tower/Cond Fans	5,198.4	0.0	1.2	53,232.1	2.4
Condenser Pump	0.0	0.0	0.0	0.0	0.0
Other Accessories	1,062.3	0.0	0.2	10,878.0	0.5
Auxiliary					
Supply Fans	223,453.1	0.0	50.5	2,288,165.3	101.7
Circulation Pumps	17,782.0	0.0	4.0	182,088.6	8.1
Base Utilities	0.0	0.0	0.0	0.0	0.0
Subtotal	241,235.2	0.0	54.5	2,470,253.8	109.7
Lighting	89,440.9	0.0	20.2	915,876.5	39.7
Receptacle	44,081.6	0.0	10.0	451,396.3	19.6
Domestic Hot Water	0.0	0.0	0.0	0.0	0.0
Cogeneration	0.0	0.0	0.0	0.0	0.0
Totals	426,663.9	54,490.9	100.0	4,426,408.0	195.2

BUILDING 358

E M C ENGINEERS, INC.

PROJECT: FORT McPHERSON & FORT GILLEM ESOS STUDY
LOCATION: FORT McPHERSON
ECO: Computer Simulation Summary

CLIENT CONTRACT NO: DACA21-91-C-0097
CLIENT PROJECT ENG: TERRY SEABROOK

EMC PROJECT: #3105.000
DATE: 13-APR-92
FILE: M358ECO.WK3
PREPARED BY: R. GERRANS
CHECKED BY:

Bldg: M358 **Area: 16,110 ft^2**

Run Description	Heating Gas Use (kBtu/yr)	Heating Electric Use (kWh/yr)	Cooling Electric Use (kWh/yr)	Fan Electric Use (kWh/yr)	Pump Electric Use (kWh/yr)	Lighting Electric Use (kWh/yr)	Recept. Electric Use (kWh/yr)	Total Electric Use (kWh/yr)	Peak Electric Demand (kW)	Total Gas Use (MBtu/yr)	Total Energy Use (Mbtu/yr)
Baseline	9,738	285	41,175	23,857	17,060	89,217	42,448	214,043	111	10	740
ECO#2	41,052	541	40,715	23,857	17,060	89,217	42,448	213,838	111	41	771
Savings/(Loss)	(31,313)	(255)	460	0	0	0	0	205	0	(31)	(31)
ECO#3	9,741	285	41,179	23,857	17,060	89,217	42,448	214,046	111	10	740
Savings/(Loss)	(2)	0	(4)	0	0	0	0	(4)	0	(0)	(0)
ECO#12	2,938	24	18,998	20,022	2,987	89,217	42,448	173,695	96	3	596
Savings/(Loss)	6,800	262	22,178	3,835	14,073	0	0	40,348	15	7	144

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB 3105.000
SHEET NO. 1 OF
CALCULATED BY RMM DATE 2/28/92
CHECKED BY DATE
SCALE

Computer Simulation - Bldg 358, Baseline
Bldg Type: Frame Admin Area: 16,650 ft²
ECO: 3, 12 Take off: 2
Take off Bldg: Gilson 735

Assumptions:
- Heating db = 74°F
- Cooling db = 75°F
- Walls, contain R-11 Insulation
- Lighting: 2 W/ft²
- Misc Recep Load: 3 Btuh/ft²
- Infiltration: ¾ ACH

JOB 3105.000

SHEET NO. 2 OF

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

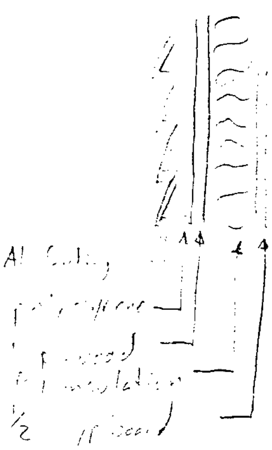
CALCULATED BY [illegible] DATE 2/28/82

CHECKED BY DATE

SCALE

Comp [illegible] [illegible] 308

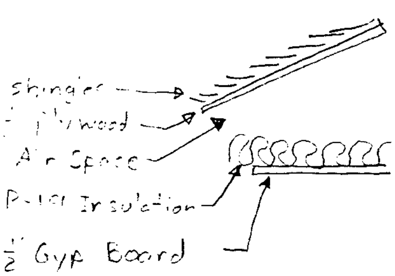
Wall U-Value - ASHRAE [illegible]



Material	R-Value
Outside Surface (15 mph wind)	0.17
Al Siding	0.61
½" Polystyrene	4.17
Plywood	1.25
Insulation	11.0
½" Gypsum Board	0.45
Inside Surface (still air)	0.68
	18.33

$U = \frac{1}{R} = \frac{1}{18.33} = \boxed{0.054}$

Roof U-Value - ASHRAE Table F 22.4



Material	R-Value
Outside Surface (15 mph)	0.17
Shingles	0.44
½" Plywood	0.62
Air Space	1.24
R-19 Insulation	19.0
½" Gyp Board	0.45
Inside Surface (still air)	0.68
	22.60

$U = \frac{1}{22.60} = \boxed{0.044}$

Slab Perimeter Coefficient - ASHRAE Table F.25.5

$F_2 = \boxed{0.80}$ Btu/h °F ft

Window U-Value - ASHRAE Table F.27.13

- Single pane wood w/ storm window
  - use double glass w/ ½" air space, type R

$\boxed{U = 0.43}$

JOB 3105.000

SHEET NO. 3 OF

CALCULATED BY [illegible] DATE 2/28/92

CHECKED BY DATE

SCALE

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

Comp [illegible] - [illegible]

Shading Coefficient - ASHRAE Table 27 26

- Light Venetian Blinds

- 0.[illegible]

Lighting - Assume 2 W/ft²

Misc Loads - Assume 3 Btuh/ft² in Rm 7 (comp room) 10 Btuh/ft²

People

Rm	#
1	16
2	12
3	17
4	[illegible]
[illegible]	7
6	8
7	4

[illegible]

Assume 3/4 [illegible]

OA Ventilation

- If no duct sizes assume 10% [illegible] ratio between duct sizes

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • Germany

JOB _____
SHEET NO. _____ OF _____
CALCULATED BY _____ DATE _____
CHECKED BY _____ DATE _____
SCALE _____

Computer Simulation — Bldg 315, McPherson

Energy

Pumps

CHW Pump = $\frac{(3\ \text{HP})(0.745\ \text{kW/HP})(1.00\ \text{kW})}{(0.812\ \text{eff})}$ = 2.7 kW × 4,330 hr/yr = 10,261 kWh/yr

HW Pump = $\frac{(2\ \text{HP})(0.745\ \text{kW/HP})(1.00\ \text{kW})}{0.810}$ = 1.5 kW × 2,580 hr/yr = 6,794 kWh/yr

17,060 kWh/yr

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • Germany

JOB ______

SHEET NO. ______ OF ______

CALCULATED BY ______ DATE ______

CHECKED BY ______ DATE ______

SCALE ______

Computer Simulation   Bldg 358, McPherson

ECO #2 - Insulated glass

- use single pane wood frame - 1 in, for [illegible]

Window U-Value - ASHRAE Table F 27.13

U = 0.90

Window Shading ASHRAE Table F 27.25

0.57

Window Area = 595 ft^2

note: Since k[illegible] negative losses were incurred in [illegible], energy losses [illegible]

Electric Savings

Total Electric Savings = -205 kWh/yr

Electric Savings = -0.13 kWh/ft^2

Gas Savings

Total Gas Savings = 31.3 MBtu/yr

Gas Savings = 0.020 MBtu/ft^2

Demand Savings

Peak Demand Savings = 0 kW

Computer simulation — Bldg 255, McPherson

ECO # 3

$Q = L (A\Delta t + B v^2)^{1/2}$

A - stack coefficient: 0.015 — one story ASHRAE Table F 23.7

B - wind coefficient: 0.024 — heavy shielding, ASHRAE Table F 23.8

v - one wind velocity = 12.65 mph

Δt: 72°F - 55°F = 17°F

L - Effective Area = Area (in²) - ASHRAE Table F 23.3

Exist

windows: w/c double slider, wood wall — 44"×36" = 11 ft²

window: 0.026 in²/ft²

frame: 0.004 in²/ft²

Door: not w/c, single wood wall — 34"×80" = 18.9 ft²

door: 0.157

frame: 0.024

Improvement - no improvement to windows

Door: w/c, single, wood wall

door: 0.114

frame: 0.004

Room 1

Exist

door: (0.157)(5)(18.9) = 14.8

frame: (0.024)(5)(18.9) = 2.3

17.1

$Q = 17.1 (0.951) = 16$ cfm

Improv

door: (0.114)(5)(18.9) = 10.8

frame: (0.004)(5)(18.9) = 0.4

11.2

$Q = 11.2 (0.951) = 11$ cfm

$\Delta Q = 16 - 11 = \boxed{5}$ cfm

Computer Simulation Bldg 358, McPherson

ECO #3 (cont'd)

From 2 - outside air ∴ no infiltration

Room 1a

Exist door: (0.157)(2)(18.9) = 5.9
frame: (0.024)(2)(18.9) = 0.9
6.8

Q = 6.8(0.95) = 7 cfm

Impr door: (0.114)(2)(18.9) = 4.3
frame: (0.004)(2)(18.9) = 0.2
4.5

Q = 4.5(0.95) = 4 cfm
ΔQ = 7 - 4 = 3 cfm

Room 1b

Exist door: (0.157)(1)(18.9) = 3.0
frame: (0.024)(1)(18.9) = 0.5
3.5

Q = 3.5(0.95) = 3 cfm

Impr door: (0.114)(1)(18.9) = 2.2
frame: (0.004)(1)(18.9) = 0.1
2.3

Q = 2.3(0.95) = 1 cfm
ΔQ = 3 - 1 = 2 cfm

Room 8

2 doors ⇒ see Rm 5 ⇒ ΔQ = 3 cfm

Room 6 - OA ∴ no infil

Room 7 - interior zone ∴ no infil

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • Germany

JOB _____
SHEET NO. _____ OF _____
CALCULATED BY _____ DATE _____
CHECKED BY _____ DATE _____
SCALE _____

Computer Simulation Bldg 358, McPherson

Run #3 (cont)

Room	Exist cfm	ΔQ	Impv cfm
1	1,055	10	1,055
3	128	3	125
—		ΔQ = 13	cfm

Demand Savings

Peak Demand Savings = 0 kW

Electric Savings

Total Electric Savings = -4 kWh/yr

Electric Savings = -0.31 kWh/cfm

Gas Savings

Total Gas Savings = 0.002 MBtu/yr

Gas Savings = -1.5×10^{-4} MBtu/cfm

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • Germany

JOB _____

SHEET NO. _____ OF _____

CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____

SCALE _____

Computer Simulation Bldg 358, McPherson

ECO #12

- varied [illegible] setpoints: night cooling 70°F heating
- Night time setback of [illegible] + fans
- Pump shutoff
- [illegible] control of AHUs

Electric Savings:

Total Electric Savings = 40,348 kwh/yr

Demand Savings:

Peak Demand Savings = 5 kW

Gas Savings:

Total Gas Savings = 5.5 MBtu/yr

01 Card - Job Information

Project: FT MCPHERSON & FT GILLEM EEAP
Location: FT MCPHERSON, BLDG 358
Program User: R. GERRANS

-----CARD 08-- Climatic Information ----------

Weather Code	Summer Clearness Number	Winter Clearness Number	Summer Design Dry Bulb	Summer Design Wet Bulb	Winter Design Dry Bulb	Building Orientation	Summer Ground Reflect	Winter Ground Reflect
ATLANTA								

-----CARD 09-- Load Simulation Periods----------

1st Month Cooling Simulation	Last Month Cooling Simulation	Peak Cooling Load Hr	1st Month Summer Period	Last Month Summer Period	1st Month Daylight Savings	Last Month Daylight Savings
MAY	OCT					

---------- Load Section Alternative #1 ----------

---- Load Alternative ----

Number	Description
1	BLDG M358, BASELINE

-----CARD 20-- General Room Parameters ----------

Room Number	Zone Reference Number	Room Descrip	Floor Length	Floor Width	Const Type	Plenum Height	Acoustic Ceiling Resistance	Floor to Floor Height	Duplicate Floors Multiplier	Duplicate Rooms per Zone	Perimeter Depth
M1	1	AHU-1 -CHW	10654	1		2		10			
2	2	AHU-2 -CHW	3610	1							
3	3	AHU-3 -DX	44	29							
4	4	COMPUTER AC	30	19							

-----CARD 21-- Thermostat Parameters ----------

Room Number	Cooling Room Design DB	Room Design RH	Cooling T'stat Driftpoint	Cooling T'stat Schedule	Heating Room Design DB	Heating T'stat Driftpoint	Heating T'stat Schedule	T'stat Location Flag	Mass / No. Hrs Average	Carpet On Floor
M1	76			CLG	74		HTG			

-----CARD 22-- Roof Parameters ----------

Room Number	Roof Number	Roof Equal to Floor?	Roof Length	Roof Width	Roof U-Value	Const Type	Roof Direction	Roof Tilt	Roof Alpha
M1	1	YES			.044	38			
2	1								
3	1								
4	1								

-----CARD 24-- Wall Parameters ----------

Room Number	Wall Number	Wall Length	Wall Height	Wall U-Value	Wall Constuc Type	Wall Direction	Wall Tilt	Wall Alpha	Ground Reflectance Multiplier
M	1		10	.054	79				
1	1	208				0			
1	2	176				90			
1	3	264				180			
1	4	104				270			
2	1	74				0			
2	2	18				180			
2	3	72				270			
3	1	44				0			
3	2	29				90			
3	3	44				180			
3	4	29				270			

-----CARD 25-- Wall/Glass Parameters ----------

Room Number	Wall Number	Glass Length	Glass Width	Pct Glass or No. of Windows	Glass U-Value	Shading Coefficient	External Shading Type	Internal Shading Type	Percent Solar to Ret. Air	Visible Transmittance	Inside Visible Reflectance
M	1	4.4	2.5		.43	.58					
1	1			31			3				
1	2			31			3				
1	3			45			3				
1	4			8							
2	1			11			4				
2	2			3			5				
2	3			8			3				
3	1			3			4				
3	2			2			5				
3	3			3			5				

-----CARD 26-- Schedules

Room Number	People	Lights	Ventilation	Infiltration	Reheat Minimum	Cooling Fans	Heating Fan	Auxiliary Fan	Room Exhaust	Daylighting Controls
M	ADMPPL	ADMLGTEQ				AVAIL				
1			OFF	AVAIL						
2			AVAIL	OFF						
3			OFF	AVAIL						
4			OFF	OFF						

-----CARD 27-- People and Lights

Room Number	People Value	People Units	People Sensible	People Latent	Lighting Value	Lighting Units	Lighting Fixture Type	Ballast Factor	Percent Lights to Ret. Air	--- Daylighting ---- Reference Point 1	Reference Point 2
M			250	200	2	WATT-SF					
1	42	PEOPLE									
2	22	PEOPLE									
3	7	PEOPLE									
4	4	PEOPLE									

-----CARD 28--- Miscellaneous Equipment

Room Number	Misc Equipment Number	Equipment Descrip	Energy Consump Value	Energy Consump Units	Schedule Code	Energy Meter Code	Percent of Load Sensible	Percent Misc. Load to Room	Percent Misc. Sens to Ret. Air	Radiant Fraction	Optional Air Path
M	1	MISC EQUIPMENT	3	BTUH-SF	ADMLGTEQ	ELEC					
1	1										
2	1										
3	1										
4	1	COMPUTERS	10	BTUH-SF							

-----CARD 29--- Room Airflows

Room	Ventilation: Cooling Value	Cooling Units	Heating Value	Heating Units	Infiltration: Cooling Value	Cooling Units	Heating Value	Heating Units	--Reheat Minimum-- Value	Units
Number										
1					.75	ACH-HR	.75	ACH-HR		
2	10	PCT-MCLG	10	PCT-MCLG						
3					.75	ACH-HR	.75	ACH-HR		

-----CARD 32-- Exposed Floor Parameters

Room Number	Exposed Floor Number	-----Slab------ Perimeter Length	Loss Coefficient	Exposed Floor: Floor Area	Floor U-Value	Const Type	Temp Flag	Cooling Temp	Heating Temp	Adjacent Room No
M	1		.8							
1	1	750								
2	1	164								
3	1	147								

-----CARD 33-- External Shading ----------

	--------OVERHANG---------			-------------------VERTICAL FINS-------------------					
Shading Type	Glass Height	Height Above Glass	Projection Out	Glass Width	Projection Left	Left Projection Out	Projection Right	Right Projection Out	Adjacent Building Flag
3	4.4	0	1.5						
4	4.4	2	22						YES
5	4.4	2	10						YES

---------- System Section Alternative #1 ----------

-----CARD 39-- System Alternative -----

Number	Description
1	BLDG M358, BASELINE

-----CARD 40--- System Type ----------

		------------OPTIONAL VENTILATION SYSTEM------------					
System Set Number	System Type	Ventil Deck Location	Cooling SADBVh	Heating SADBVh	Cooling Schedule	Heating Schedule	Fan Static Pressure
1	SZ						
2	SZ						
3	SZ						
4	SZ						

-----CARD 41-- Zone Assignment ----------

System Set	Ref #1		Ref #2		Ref #3		Ref #4		Ref #5		Ref #6	
Number	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End
1	1	1										
2	2	2										
3	3	3										
4	4	4										

-----CARD 42--- Fan SP and Duct Parameters----------

System Set Number	Cool Fan SP	Heat Fan SP	Return Fan SP	Mn Exh Fan SP	Aux Fan SP	Rm Exh Fan SP	Cool Fan Mtr Loc	Return Fan Mtr Loc	Supply Duct Ht Gn	Supply Duct Loc	Return Air Path
1	2.5						SUPPLY			OTHER	ROOMDK
2	2.5						SUPPLY			OTHER	ROOMDK
3	2.5						SUPPLY			OTHER	ROOMDK
4	.5						SUPPLY			OTHER	ROOMDK

-----CARD 44-- System Options ----------

System Set Number	Econ Type Flag	Econ On Point	Max Pct Outside Air	Direct Evap Cooling	Indirect Evap Cooling	1st Stage Evap Cooling	Fan Cycling	Exhaust Air Heat Recovery --- Effectiveness --- System	Room	--- Control Method --- System	Room
1	NONE						FAN-TS				
2	NONE						FAN-TS				
3	NONE						FAN-TS				
4	NONE										

-----CARD 45--- Equipment Schedules ----------

System Set Number	Main Cooling Coil	Economizer	Direct Evap Coil	Indirect Evap Coil	Auxiliary Cooling Coil	Main Heating Coil	Main Preheat Coil	Reheat Coil	Mech. Humidity	Auxiliary Heating Coil
1	CLGC					HTGC				
2	CLGC					HTGC				
3	CLGC					HTGC				
4	AVAIL					OFF				

---------- Equipment Section Alternative #1 ----------

-----CARD 59-- Equipment Description / TOD Schedules ----------

Alternative Number	Elec Consump Time of Day Schedule	Elec Demand Time of Day Schedule	Demand Limit Max KW	Alternative Description
1				BLDG M358, BASELINE

-----CARD 60--- Cooling Load Assignment----------

Load Asgn Ref	All Coil Loads To Cool Ref	Cooling Equipment Sizing	-Group 1- Begin	End	-Group 2- Begin	End	-Group 3- Begin	End	-Group 4- Begin	End	-Group 5- Begin	End	-Group 6- Begin	End	-Group 7- Begin	End	-Group 8- Begin	End	-Group 9- Begin	End
1	1	BLKPLANT	1	2																
2	2	BLKPLANT	3	3																
3	3	BLKPLANT	4	4																

-----CARD 62-- Cooling Equipment Parameters ----------

Cool Ref Num	Equip Code Name	Num Of Units	----------COOLING---------- --Capacity-- Value	Units	----Energy---- Value	Units	---------HEAT RECOVERY---------- --Capacity-- Value	Units	----Energy---- Value	Units	Seq Order Num	Seq Type	Demand Limit Number
1	EQ1121S	1	332.7	MBH									
2	EQ1161	1											
3	EQ1161	1											

-----CARD 63-- Cooling Pumps and References ----------

Cool Ref Num	---CHILLED WATER---- Full Load Value	Full Load Units	-----CONDENSER------ Full Load Value	Full Load Units	---HT REC or AUX---- Full Load Value	Full Load Units	Switch-over Control	Cold Storage	Cooling Tower	Misc. Access.
1	2.3	KW								

-----CARD 65-- Heating Load Assignment ----------

Load Assignment Reference	All Coil Loads To Heating Ref	-Group 1- Begin	End	-Group 2- Begin End	-Group 3- Begin End	-Group 4- Begin End	-Group 5- Begin End	-Group 6- Begin End	-Group 7- Begin End	-Group 8- Begin End	-Group 9- Begin End
1	1	1	4								

-----CARD 67-- Heating Equipment Parameters ----------

Heat Ref Number	Equip Code Name	Number Of Units	HW Pmp Full Ld Value	Units	Cap'y Value	Units	Energy Rate Value	Units	Seq Order Number	Switch over Control	Hot Strg	Misc. Acc.	Cogen	Demand Limit Number
1	EQ2001	1	1.6	KW										

-----CARD 69-- Fan Equipment Parameters ----------

System Set Number	Cooling Fan	Heating Fan	Return Fan	Exhaust Fan	Auxiliary Supply	Room Exhaust	Optional Ventilation
1	EQ4003						
2	EQ4003						
3	EQ4003						
4	HIEFF-FC						

Utility Description Reference Table

Schedules:
ADMLGTEQ ADMIN LIGHTING AND EQUIPMENT
ADMPPL ADMIN PEOPLE SCHEDULE
AVAIL AVAILABLE (100%)
CLG COOLING TSTAT SCHEDULE
CLGC COOLING COIL SCHEDULE
HTG HEATING TSTAT SCHEDULE
HTGC HEATING COIL SCHEDULE
OFF ALWAYS OFF
System:
SZ SINGLE ZONE
Equipment:
Cooling:
EQ1121S AIR-CLD RECIP 20-35 TONS
EQ1161 AIR-CLD COND COMP <15 TONS
Heating:
EQ2001 GAS FIRE TUBE HOT WATER
Fan:
EQ4003 FC CENTRIF. FAN C.V.
HIEFF-FC HIGH EFFICIENCY FAN COIL

Schedule Name: ADMLGTEQ
Project: ADMIN LIGHTING AND EQUIPMENT SC
Location:
Client:
Program User:
Comments: OFFICE LIGHTING

Starting Month: JAN Ending Month: DEC
Starting Day Type: DSGN Ending Day Type: WKDY

Hour	Util Percent
0	5
7	80
8	100
12	80
13	100
16	80
17	40
18	5
24	

Starting Month: JAN Ending Month: DEC
Starting Day Type: SAT Ending Day Type: SUN

Hour	Util Percent
0	5
24	

Schedule Name: ADMPPL
Project: ADMIN PEOPLE SCHEDULE
Location:
Client:
Program User: D JONES
Comments: OFFICE PEOPLE SCHEDULE

Starting Month: JAN Ending Month: DEC
Starting Day Type: DSGN Ending Day Type: WKDY

Hour	Util Percent
0	0
7	50
8	100
11	80
12	40
13	80
14	100
16	70
17	30
18	0
24	

Starting Month: JAN Ending Month: DEC
Starting Day Type: SAT Ending Day Type: SUN

Hour	Util Percent
0	0
24	

Schedule Name: AVAIL
Project: AVAILABLE (100)
Location:
Client:
Program User:
Comments:

Starting Month: JAN Ending Month: HTG
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	100
24	

Schedule Name: CLG
Project: COOLING TSTAT SCHEDULE
Location:
Client:
Program User:
Comments:

Starting Month: JAN Ending Month: DEC
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Temperature
0	76
24	

Schedule Name: CLGC
Project: COOLING COIL SCHEDULE
Location:
Client:
Program User: R. GERRANS
Comments:

Starting Month: JAN Ending Month: APR
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	0
24	

Starting Month: MAY Ending Month: OCT
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	100
24	

Starting Month: NOV Ending Month: HTG
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	0
24	

Schedule Name: HTG
Project: HEATING TSTAT SCHEDULE
Location:
Client:
Program User:
Comments:

Starting Month: JAN Ending Month: DEC
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Temperature
0	72
24	

Schedule Name: HTGC
Project: HEATING COIL SCHEDULE
Location:
Client:
Program User: R. GERRANS
Comments:

Starting Month: JAN Ending Month: APR
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	100
24	

Starting Month: MAY Ending Month: OCT
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	0
24	

Starting Month: NOV Ending Month: HTG
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	100
24	

Schedule Name: OFF
Project: ALWAYS OFF
Location:
Client:
Program User:
Comments:

Starting Month: JAN Ending Month: HTG
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	0
24	

```
**************************************************************************
**************************************************************************
**                                                                      **
**                 T R A C E   6 0 0   A N A L Y S I S                  **
**                                                                      **
**                 by            **
**                                                                      **
**************************************************************************
**************************************************************************
```

FT MCPHERSON & FT GILLEM EEAP
FT MCPHERSON, BLDG 358

R. GERRANS

Weather File Code:	ATLANTA.	
Location:	ATLANTA, GEORGIA	
Latitude:	33.0	(deg)
Longitude:	84.0	(deg)
Time Zone:	6	
Elevation:	1,005	(ft)
Barometric Pressure:	28.8	(in. Hg)
Summer Clearness Number:	0.90	
Winter Clearness Number:	0.90	
Summer Design Dry Bulb:	92	(F)
Summer Design Wet Bulb:	74	(F)
Winter Design Dry Bulb:	22	(F)
Summer Ground Relectance:	0.20	
Winter Ground Relectance:	0.20	
Air Density:	0.0731	(Lbm/cuft)
Air Specific Heat:	0.2444	(Btu/lbm/F)
Density-Specific Heat Prod:	1.0727	(Btu-min./hr/cuft/F)
Latent Heat Factor:	4,721.8	(Btu-min./hr/cuft)
Enthalpy Factor:	4.3883	(Lb-min./hr/cuft)

Design Simulation Period: May To October
System Simulation Period: January To December
Cooling Load Methodology: TETD/Time Averaging

Time/Date Program was Run: 9:14: 0 4/11/92
Dataset Name: M358-B .TM

AIRFLOW - ALTERNATIVE 1
BLDG M358, BASELINE

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

System Number	System Type	Main Outside Airflow (Cfm)	Main Cooling Airflow (Cfm)	Main Heating Airflow (Cfm)	Main Return Airflow (Cfm)	Main Exhaust Airflow (Cfm)	Auxil. Supply Airflow (Cfm)	Room Exhaust Airflow (Cfm)
1	SZ	0	12,863	12,863	13,929	1,065	0	0
2	SZ	449	4,493	4,493	4,493	449	0	0
3	SZ	0	1,782	1,782	1,909	128	0	0
4	SZ	0	842	842	842	0	0	0
Totals		449	19,980	19,980	21,173	1,642	0	0

CAPACITY - ALTERNATIVE 1
BLDG M358, BASELINE

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

System Number	System Type	Cooling Main Sys. Capacity (Tons)	Cooling Aux. Sys. Capacity (Tons)	Cooling Opt. Vent Capacity (Tons)	Cooling Totals (Tons)	Heating Main Sys. Capacity (Btuh)	Heating Aux. Sys. Capacity (Btuh)	Heating Preheat Capacity (Btuh)	Heating Reheat Capacity (Btuh)	Heating Humidif. Capacity (Btuh)	Heating Opt. Vent Capacity (Btuh)	Heating Totals (Btuh)
1	SZ	20.4	0.0	0.0	20.4	-114,543	0	0	0	0	0	-114,543
2	SZ	7.9	0.0	0.0	7.9	-40,463	0	0	0	0	0	-40,463
3	SZ	2.7	0.0	0.0	2.7	-18,312	0	0	0	0	0	-18,312
4	SZ	1.1	0.0	0.0	1.1	-846	0	0	0	0	0	-846
Totals		32.2	0.0	0.0	32.2	-174,164	0	0	0	0	0	-174,164

The building peaked at hour 15 month 8 with a capacity of 32.1 tons

ENGINEERING CHECKS - ALTERNATIVE 1
BLDG M358, BASELINE

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 Cfm/ Sq Ft	Cooling Cfm/ Ton	Cooling Sq Ft /Ton	Cooling Btuh/ Sq Ft	Heating Cfm/ Sq Ft	Heating Btuh/ Sq Ft	Floor Area Sq Ft
1	Main	SZ	0.00	1.21	630.5	522.3	22.98	1.21	-10.75	10,654
2	Main	SZ	10.00	1.24	566.2	454.9	26.38	1.24	-11.21	3,610
3	Main	SZ	0.00	1.40	659.2	472.1	25.42	1.40	-14.35	1,276
4	Main	SZ	0.00	1.48	746.6	505.3	23.75	1.48	-1.48	570

System 1 Peak SZ - SINGLE ZONE

	COOLING COIL PEAK					CLG SPACE PEAK		HEATING COIL PEAK		
Peaked at Time ==>		Mo/Hr: 8/15				Mo/Hr: 6/15			Mo/Hr: 13/ 1	
Outside Air ==>		OADB/WB/HR: 92/ 74/105.0				OADB: 96			OADB: 22	
Envelope Loads	Space Sens.+Lat. (Btuh)	Ret. Air Sensible (Btuh)	Ret. Air Latent (Btuh)	Net Total (Btuh)	Percnt Of Tot (%)	Space Sensible (Btuh)	Percnt Of Tot (%)	Space Peak Space Sens (Btuh)	Coil Peak Tot Sens (Btuh)	Percnt Of Tot (%)
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	35,420	0		35,420	14.47	32,890	17.11	0	0	0.00
Glass Cond	8,866	0		8,866	3.62	10,988	5.72	-29,319	-29,319	25.60
Wall Cond	7,748	2,395		10,143	4.14	7,697	4.00	-13,341	-17,465	15.25
Partition	0			0	0.00	0	0.00	0	0	0.00
Exposed Floor	0			0	0.00	0	0.00	-31,200	-31,200	27.24
Infiltration	43,919			43,919	17.94	23,085	12.01	-59,427	-59,427	51.88
Sub Total==>	95,953	2,395		98,348	40.17	74,660	38.84	-133,287	-137,411	119.96
Internal Loads										
Lights	72,724	0		72,724	29.71	72,724	37.83	0	0	0.00
People	18,900			18,900	7.72	10,500	5.46	0	0	0.00
Misc	31,962	0	0	31,962	13.06	31,962	16.63	0	0	0.00
Sub Total==>	123,586	0	0	123,586	50.48	115,186	59.92	0	0	0.00
Ceiling Load	2,395	-2,395		0	0.00	2,379	1.24	-4,124	0	0.00
Outside Air	0	0	0	0	0.00	0	0.00	0	0	0.00
Sup. Fan Heat				22,868	9.34		0.00		22,868	-19.96
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==>	221,934	0	0	244,802	100.00	192,225	100.00	-137,411	-114,543	10

COOLING COIL SELECTION

	Total Capacity (Tons)	Capacity (Mbh)	Sens Cap. (Mbh)	Coil Airfl (cfm)	Entering DB/WB/HR Deg F	Deg F	Grains	Leaving DB/WB/HR Deg F	Deg F	Grains
Main Clg	20.4	244.8	211.1	12,863	76.0	63.2	69.8	60.4	56.9	66.4
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
0										
Totals	20.4	244.8								

AREAS

	Gross Total	Glass (sf)	(%)
Floor	10,654		
Part	0		
ExFlr	750		
Roof	0	0	
Wall	7,520	1,265	17

HEATING COIL SELECTION

	Capacity (Mbh)	Coil Airfl (cfm)	Ent Deg F	Lvg Deg F
Main Htg	-114.5	12,863	74.0	82.3
Aux Htg	0.0	0	0.0	0.0
Preheat	-0.0	12,863	74.0	60.4
Reheat	0.0	0	0.0	0.0
Humidif	0.0	0	0.0	0.0
Opt Vent	0.0	0	0.0	0.0
Total	-114.5			

AIRFLOWS (cfm)

Type	Cooling	Heating
Vent	0	0
Infil	1,065	1,065
Supply	12,863	12,863
Mincfm	0	0
Return	12,863	12,863
Exhaust	0	0
Rm Exh	0	0
Auxil	0	0

ENGINEERING CHECKS

Clg % OA	0.0
Clg Cfm/Sqft	1.21
Clg Cfm/Ton	630.55
Clg Sqft/Ton	522.25
Clg Btuh/Sqft	22.98
No. People	42
Htg % OA	0.0
Htg Cfm/SqFt	1.21
Htg Btuh/SqFt	-10.75

TEMPERATURES (F)

Type	Clg	Htg
SADB	62.1	84.0
Plenum	76.7	72.8
Return	76.0	74.0
Ret/OA	76.0	74.0
Runarnd	76.0	74.0
Fn MtrTD	0.4	0.0
Fn BldTD	0.3	0.0
Fn Fricт	0.9	0.0

System 2 Peak SZ - SINGLE ZONE

	COOLING COIL PEAK					CLG SPACE PEAK			HEATING COIL PEAK	
Peaked at Time ==>	Mo/Hr: 8/15					Mo/Hr: 6/16			Mo/Hr: 13/ 1	
Outside Air ==>	OADB/WB/HR: 92/ 74/105.0					OADB: 96			OADB: 22	
	Space Sens.+Lat. (Btuh)	Ret. Air Sensible (Btuh)	Ret. Air Latent (Btuh)	Net Total (Btuh)	Percnt Of Tot (%)	Space Sensible (Btuh)	Percnt Of Tot (%)	Space Peak Space Sens (Btuh)	Coil Peak Tot Sens (Btuh)	Percnt 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	10,310		10,310	10.83	0	0.00	0	-7,155	17.68
Glass Solar	9,922	0		9,922	10.42	10,890	16.13	0	0	0.00
Glass Cond	1,696	0		1,696	1.78	2,040	3.02	-5,609	-5,609	13.86
Wall Cond	1,208	207		1,415	1.49	1,653	2.45	-3,005	-3,802	9.40
Partition	0			0	0.00	0	0.00	0	0	0.00
Exposed Floor	0			0	0.00	0	0.00	-6,822	-6,822	16.86
Infiltration	0			0	0.00	0	0.00	0	0	0.00
Sub Total==>	12,826	10,517		23,343	24.51	14,582	21.60	-15,436	-23,389	57.80
Internal Loads										
Lights	24,642	0		24,642	25.88	24,642	36.49	0	0	0.00
People	9,900			9,900	10.40	5,500	8.15	0	0	0.00
Misc	10,830	0	0	10,830	11.37	10,830	16.04	0	0	0.00
Sub Total==>	45,372	0	0	45,372	47.65	40,972	60.68	0	0	0.00
Ceiling Load	10,517	-10,517		0	0.00	11,970	17.73	-7,953	0	0.00
Outside Air	0	0	0	18,521	19.45	0	0.00	0	-25,061	61.94
Sup. Fan Heat				7,987	8.39		0.00		7,987	-19.74
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==>	68,715	0	0	95,223	100.00	67,524	100.00	-23,389	-40,463	100.00

COOLING COIL SELECTION

	Total Capacity (Tons)	Capacity (Mbh)	Sens Cap. (Mbh)	Coil Airfl (cfm)	Entering DB/WB/HR Deg F	Deg F	Grains	Leaving DB/WB/HR Deg F	Deg F	Grains
Main Clg	7.9	95.2	80.2	4,493	77.6	64.5	73.3	60.3	57.6	69.5
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
0										
Totals	7.9	95.2								

AREAS

	Gross Total	Glass (sf)	(%)
Floor	3,610		
Part	0		
ExFlr	164		
Roof	3,610	0	
Wall	1,640	242	15

HEATING COIL SELECTION

	Capacity (Mbh)	Coil Airfl (cfm)	Ent Deg F	Lvg Deg F
Main Htg	-40.5	4,493	68.8	77.2
Aux Htg	0.0	0	0.0	0.0
Preheat	-0.0	4,493	68.8	60.3
Reheat	0.0	0	0.0	0.0
Humidif	0.0	0	0.0	0.0
Opt Vent	0.0	0	0.0	0.0
Total	-40.5			

AIRFLOWS (cfm)

Type	Cooling	Heating
Vent	449	449
Infil	0	0
Supply	4,493	4,493
Mincfm	0	0
Return	4,493	4,493
Exhaust	449	449
Rm Exh	0	0
Auxil	0	0

ENGINEERING CHECKS

Clg % OA	10.0
Clg Cfm/Sqft	1.24
Clg Cfm/Ton	566.20
Clg Sqft/Ton	454.93
Clg Btuh/Sqft	26.38
No. People	22
Htg % OA	10.0
Htg Cfm/SqFt	1.24
Htg Btuh/SqFt	-11.21

TEMPERATURES (F)

Type	Clg	Htg
SADB	62.0	78.9
Plenum	85.2	67.0
Return	76.0	74.0
Ret/OA	77.6	68.8
Runarnd	76.0	74.0
Fn MtrTD	0.4	0.0
Fn BldTD	0.3	0.0
Fn Frict	0.9	0.0

System 3 Peak SZ - SINGLE ZONE

********** COOLING COIL PEAK **********						* CLG SPACE PEAK **********			HEATING COIL PEAK ********		
Peaked at Time ==>	Mo/Hr: 8/15					* Mo/Hr: 6/16		*	Mo/Hr: 13/ 1		
Outside Air ==>	OADB/WB/HR: 92/ 74/105.0					* OADB: 96		*	OADB: 22		
	Space Sens.+Lat.	Ret. Air Sensible	Ret. Air Latent	Net Total	Percnt Of Tot	* Space Sensible	Percnt Of Tot	*	Space Peak Space Sens	Coil Peak Tot Sens	Percnt Of Tot
Envelope Loads	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)	* (Btuh)	(%)	*	(Btuh)	(Btuh)	(%)
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	3,616		3,616	11.15	* 0	0.00	*	0	-2,479	13.54
Glass Solar	2,112	0		2,112	6.51	* 1,584	6.19	*	0	0	0.00
Glass Cond	617	0		617	1.90	* 742	2.90	*	-2,040	-2,040	11.14
Wall Cond	1,674	300		1,974	6.08	* 1,866	7.29	*	-3,033	-3,729	20.36
Partition	0			0	0.00	* 0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	* 0	0.00	*	-6,115	-6,115	33.39
Infiltration	5,260			5,260	16.22	* 2,683	10.49	*	-7,117	-7,117	38.87
Sub Total==>	9,663	3,916		13,579	41.87	* 6,875	26.87	*	-18,305	-21,480	117.30
Internal Loads						*		*			
Lights	8,710	0		8,710	26.85	* 8,710	34.04	*	0	0	0.00
People	3,150			3,150	9.71	* 1,750	6.84	*	0	0	0.00
Misc	3,828	0	0	3,828	11.80	* 3,828	14.96	*	0	0	0.00
Sub Total==>	15,688	0	0	15,688	48.37	* 14,288	55.84	*	0	0	0.00
Ceiling Load	3,916	-3,916		0	0.00	* 4,423	17.29	*	-3,175	0	0.00
Outside Air	0	0	0	0	0.00	* 0	0.00	*	0	0	0.00
Sup. Fan Heat				3,167	9.77	*	0.00	*		3,167	-17.30
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==>	29,267	0	0	32,434	100.00	* 25,585	100.00	*	-21,480	-18,312	100

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

	Total Capacity (Tons)	(Mbh)	Sens Cap. (Mbh)	Coil Airfl (cfm)	Entering DB/WB/HR Deg F	Deg F	Grains	Leaving DB/WB/HR Deg F	Deg F	Grains
Main Clg	2.7	32.4	28.0	1,782	76.0	63.2	69.8	61.0	57.2	66.8
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
0										
Totals	2.7	32.4								
6										

----------AREAS----------

	Gross Total	Glass (sf)	(%)
Floor	1,276		
Part	0		
ExFlr	147		
Roof	1,276		0
Wall	1,460		88

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

	Capacity (Mbh)	Coil Airfl (cfm)	Ent Deg F	Lvg Deg F
Main Htg	-18.3	1,782	74.0	83.6
Aux Htg	0.0	0	0.0	0.0
Preheat	-0.0	1,782	74.0	61.0
Reheat	0.0	0	0.0	0.0
Humidif	0.0	0	0.0	0.0
Opt Vent	0.0	0	0.0	0.0
Total	-18.3			

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

Type	Cooling	Heating
Vent	0	0
Infil	128	128
Supply	1,782	1,782
Mincfm	0	0
Return	1,782	1,782
Exhaust	0	0
Rm Exh	0	0
Auxil	0	0

--ENGINEERING CHECKS--

Clg % OA	0.0
Clg Cfm/Sqft	1.40
Clg Cfm/Ton	659.20
Clg Sqft/Ton	472.09
Clg Btuh/Sqft	25.42
No. People	7
Htg % OA	0.0
Htg Cfm/SqFt	1.40
Htg Btuh/SqFt	-14.35

--TEMPERATURES (F)---

Type	Clg	Htg
SADB	62.6	85.2
Plenum	85.7	66.1
Return	76.0	74.0
Ret/OA	76.0	74.0
Runarnd	76.0	74.0
Fn MtrTD	0.4	0.0
Fn BldTD	0.3	0.0
Fn Frict	0.9	0.0

System 4 Peak SZ - SINGLE ZONE

	COOLING COIL PEAK					CLG SPACE PEAK			HEATING COIL PEAK		
Peaked at Time ==>	Mo/Hr: 6/16					Mo/Hr: 6/16			Mo/Hr: 13/ 1		
Outside Air ==>	OADB/WB/HR: 96/ 72/ 84.0					OADB: 96			OADB: 22		
	Space Sens.+Lat.	Ret. Air Sensible	Ret. Air Latent	Net Total	Percnt Of Tot	Space Sensible	Percnt Of Tot		Space Peak Space Sens	Coil Peak Tot Sens	Percnt Of Tot
Envelope Loads	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)	(Btuh)	(%)		(Btuh)	(Btuh)	(%)
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	1,845		1,845	13.63	0	0.00		0	-1,145	135.40
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	0.01
Sub Total==>	0	1,845		1,845	13.63	0	0.00		0	-1,145	135.40
Internal Loads											
Lights	3,891	0		3,891	28.74	3,891	31.29		0	0	0.00
People	1,800			1,800	13.30	1,000	8.04		0	0	0.00
Misc	5,700	0	0	5,700	42.11	5,700	45.83		0	0	0.00
Sub Total==>	11,391	0	0	11,391	84.15	10,591	85.16		0	0	0.00
Ceiling Load	1,845	-1,845		0	0.00	1,845	14.84		-1,145	0	0.00
Outside Air	0	0	0	0	0.00	0	0.00		0	0	0.00
Sup. Fan Heat				299	2.21		0.00			299	-35.40
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==>	13,236	0	0	13,536	100.00	12,436	100.00		-1,145	-846	100.00

COOLING COIL SELECTION

	Total Capacity (Tons)	Capacity (Mbh)	Sens Cap. (Mbh)	Coil Airfl (cfm)	Entering DB/WB/HR Deg F	Deg F	Grains	Leaving DB/WB/HR Deg F	Deg F	Grains
Main Clg	1.1	13.5	12.7	842	76.0	63.2	69.8	61.9	57.9	68.4
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
0										
Totals	1.1	13.5								
0										

AREAS

	Gross Total	Glass (sf)	(%)
Floor	570		
Part	0		
ExFlr	0		
Roof	570		0
Wall	0		0

HEATING COIL SELECTION

	Capacity (Mbh)	Coil Airfl (cfm)	Ent Deg F	Lvg Deg F
Main Htg	-0.8	842	74.0	74.9
Aux Htg	0.0	0	0.0	0.0
Preheat	-0.0	842	74.0	61.9
Reheat	0.0	0	0.0	0.0
Humidif	0.0	0	0.0	0.0
Opt Vent	0.0	0	0.0	0.0
Total	-0.8			

AIRFLOWS (cfm)

Type	Cooling	Heating
Vent	0	0
Infil	0	0
Supply	842	842
Mincfm	0	0
Return	842	842
Exhaust	0	0
Rm Exh	0	0
Auxil	0	0

ENGINEERING CHECKS

Clg % OA	0.0
Clg Cfm/Sqft	1.48
Clg Cfm/Ton	746.59
Clg Sqft/Ton	505.33
Clg Btuh/Sqft	23.75
No. People	4
Htg % OA	0.0
Htg Cfm/SqFt	1.48
Htg Btuh/SqFt	-1.48

TEMPERATURES (F)

Type	Clg	Htg
SADB	62.2	75.3
Plenum	86.2	67.7
Return	76.0	74.0
Ret/OA	76.0	74.0
Runarnd	76.0	74.0
Fn MtrTD	0.1	0.0
Fn BldTD	0.1	0.0
Fn Frict	0.2	0.0

MAIN SYSTEM COOLING - ALTERNATIVE 1
BLDG M358, BASELINE

PEAK COOLING LOADS
(Main System)

Room Number	Description	Peak Time Mo/Hr	Space: OA Cond. DB/WB (F)	Space: Rm Dry Blb (F)	Space: Supp. Dry Bulb (F)	Space: Space Air Flow (Cfm)	Space: Space Sens. Load (Btuh)	Space: Space Lat. Load (Btuh)	Coil: Peak Time Mo/Hr	Coil: OA Cond. DB/WB (F)	Coil: Rm Dry Blb (F)	Coil: Supp. Dry Bulb (F)	Coil: Coil Air Flow (Cfm)	Coil: Coil Sens. Load (Btuh)	Coil: Coil Lat. Load (Btuh)
1	AHU-1 -CHW	6/15	96 73	76	62.1	12,863	192,225	23,629	8/15	92 74	76	62.4	12,863	211,112	33,690
Zone 1	Total/Ave.		96 73	76	62.1	12,863	192,225	23,629		92 74	76	62.4	12,863	211,112	33,690
Zone 1	Block	6/15	96 73	76	62.1	12,863	192,225	23,629	8/15	92 74	76	62.4	12,863	211,112	33,690
System 1	Total/Ave.		96 73	76	62.1	12,863	192,225	23,629		92 74	76	62.4	12,863	211,112	33,690
System 1	Block	6/15	96 73	76	62.1	12,863	192,225	23,629	8/15	92 74	76	62.4	12,863	211,112	33,690
2	AHU-2 -CHW	6/16	96 72	76	62.0	4,493	67,524	4,400	8/15	92 74	76	62.7	4,493	80,158	15,065
Zone 2	Total/Ave.		96 72	76	62.0	4,493	67,524	4,400		92 74	76	62.7	4,493	80,158	15,065
Zone 2	Block	6/16	96 72	76	62.0	4,493	67,524	4,400	8/15	92 74	76	62.7	4,493	80,158	15,065
System 2	Total/Ave.		96 72	76	62.0	4,493	67,524	4,400		92 74	76	62.7	4,493	80,158	15,065
System 2	Block	6/16	96 72	76	62.0	4,493	67,524	4,400	8/15	92 74	76	62.7	4,493	80,158	15,065
3	AHU-3 -DX	6/16	96 72	76	62.6	1,782	25,585	2,621	8/15	92 74	76	63.0	1,782	28,005	4,429
Zone 3	Total/Ave.		96 72	76	62.6	1,782	25,585	2,621		92 74	76	63.0	1,782	28,005	4,429
Zone 3	Block	6/16	96 72	76	62.6	1,782	25,585	2,621	8/15	92 74	76	63.0	1,782	28,005	4,429
System 3	Total/Ave.		96 72	76	62.6	1,782	25,585	2,621		92 74	76	63.0	1,782	28,005	4,429
System 3	Block	6/16	96 72	76	62.6	1,782	25,585	2,621	8/15	92 74	76	63.0	1,782	28,005	4,429
4	COMPUTER AC	6/16	96 72	76	62.2	842	12,436	800	6/16	96 72	76	62.2	842	12,736	800
Zone 4	Total/Ave.		96 72	76	62.2	842	12,436	800		96 72	76	62.2	842	12,736	800
Zone 4	Block	6/16	96 72	76	62.2	842	12,436	800	6/16	96 72	76	62.2	842	12,736	800
System 4	Total/Ave.		96 72	76	62.2	842	12,436	800		96 72	76	62.2	842	12,736	800
System 4	Block	6/16	96 72	76	62.2	842	12,436	800	6/16	96 72	76	62.2	842	12,736	800

COOLING LOADS AT COIL PEAK - ALTERNATIVE 1
BLDG M358, BASELINE

AIRFLOW COOLING LOADS
(At time of Coil Peak)

Room Number	Description	Ventilation Airflow (Cfm)	Ventilation Sensible (Btuh)	Ventilation Latent (Btuh)	Optional Ventilation Airflow (Cfm)	Optional Ventilation Sensible (Btuh)	Optional Ventilation Latent (Btuh)	Bypass Airflow (Cfm)	Bypass Sensible (Btuh)	Bypass Latent (Btuh)	Ov/Undr Sizing (Btuh)
1	AHU-1 -CHW	0	0	0	0	0	0	0	0	0	0
Zone 1	Total/Ave.	0	0	0	0	0	0	0	0	0	0
Zone 1	Block	0	0	0	0	0	0	0	0	0	0
System 1	Total/Ave.	0	0	0	0	0	0	0	0	0	0
System 1	Block	0	0	0	0	0	0	0	0	0	0
2	AHU-2 -CHW	449	7,856	10,665	0	0	0	0	0	0	0
Zone 2	Total/Ave.	449	7,856	10,665	0	0	0	0	0	0	0
Zone 2	Block	449	7,856	10,665	0	0	0	0	0	0	0
System 2	Total/Ave.	449	7,856	10,665	0	0	0	0	0	0	0
System 2	Block	449	7,856	10,665	0	0	0	0	0	0	0
3	AHU-3 -DX	0	0	0	0	0	0	0	0	0	0
Zone 3	Total/Ave.	0	0	0	0	0	0	0	0	0	0
Zone 3	Block	0	0	0	0	0	0	0	0	0	0
System 3	Total/Ave.	0	0	0	0	0	0	0	0	0	0
System 3	Block	0	0	0	0	0	0	0	0	0	0
4	COMPUTER AC	0	0	0	0	0	0	0	0	0	0
Zone 4	Total/Ave.	0	0	0	0	0	0	0	0	0	0
Zone 4	Block	0	0	0	0	0	0	0	0	0	0
System 4	Total/Ave.	0	0	0	0	0	0	0	0	0	0
System 4	Block	0	0	0	0	0	0	0	0	0	0

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

HEATING LOADS AT COIL PEAK - ALTERNATIVE 1
BLDG M358, BASELINE

AIRFLOW HEATING LOADS
(At time of Coil Peak)

Room Number	Description	--- Ventilation -- Airflow (Cfm)	Sensible (Btuh)	---- Op. Vent.---- Airflow (Cfm)	Sensible (Btuh)	----- Reheat ----- Airflow (Cfm)	Sensible (Btuh)	---- Humidif. ---- Airflow (Cfm)	Latent (Btuh)	Total (Btuh)
1	AHU-1 -CHW	0	0	0	0	0	0	0	0	0
Zone 1	Total/Ave.	0	0	0	0	0	0	0	0	0
Zone 1	Block	0	0	0	0	0	0	0	0	0
System 1	Total/Ave.	0	0	0	0	0	0	0	0	0
System 1	Block	0	0	0	0	0	0	0	0	0
2	AHU-2 -CHW	449	-25,061	0	0	0	0	0	0	-25,061
Zone 2	Total/Ave.	449	-25,061	0	0	0	0	0	0	-25,061
Zone 2	Block	449	-25,061	0	0	0	0	0	0	-25,061
System 2	Total/Ave.	449	-25,061	0	0	0	0	0	0	-25,061
System 2	Block	449	-25,061	0	0	0	0	0	0	-25,061
3	AHU-3 -DX	0	0	0	0	0	0	0	0	0
Zone 3	Total/Ave.	0	0	0	0	0	0	0	0	0
Zone 3	Block	0	0	0	0	0	0	0	0	0
System 3	Total/Ave.	0	0	0	0	0	0	0	0	0
System 3	Block	0	0	0	0	0	0	0	0	0
4	COMPUTER AC	0	0	0	0	0	0	0	0	0
Zone 4	Total/Ave.	0	0	0	0	0	0	0	0	0
Zone 4	Block	0	0	0	0	0	0	0	0	0
System 4	Total/Ave.	0	0	0	0	0	0	0	0	0
System 4	Block	0	0	0	0	0	0	0	0	0

MAIN SYSTEM HEATING - ALTERNATIVE 1
BLDG M358, BASELINE

PEAK HEATING LOADS
(Main System)

Room Number	Description	Floor Area (Sq Ft)	Space: Peak Time Mo/Hr	Space: OA Cond. DB/WB (F)	Space: Rm Dry Blb (F)	Space: Supp. Dry Bulb (F)	Space: Air Flow (Cfm)	Space: Sens. Load (Btuh)	Coil: Peak Time Mo/Hr	Coil: OA Cond. DB/WB (F)	Coil: Rm Dry Blb (F)	Coil: Supp. Dry Bulb (F)	Coil: Air Flow (Cfm)	Coil: Sens. Load (Btuh)
1	AHU-1 -CHW	10,654	13/ 1	22	18	74	84.0	12,863	-137,411	13/ 1	22	18	74	84.0	12,863	-114,543
Zone 1	Total/Ave.	10,654		22	18	74	84.0	12,863	-137,411		22	18	74	84.0	12,863	-114,543
Zone 1	Block	10,654	13/ 1	22	18	74	84.0	12,863	-137,411	13/ 1	22	18	74	84.0	12,863	-114,543
System 1	Total/Ave.	10,654		22	18	74	84.0	12,863	-137,411		22	18	74	84.0	12,863	-114,543
System 1	Block	10,654	13/ 1	22	18	74	84.0	12,863	-137,411	13/ 1	22	18	74	84.0	12,863	-114,543
2	AHU-2 -CHW	3,610	13/ 1	22	18	74	78.9	4,493	-23,389	13/ 1	22	18	74	78.9	4,493	-40,463
Zone 2	Total/Ave.	3,610		22	18	74	78.9	4,493	-23,389		22	18	74	78.9	4,493	-40,463
Zone 2	Block	3,610	13/ 1	22	18	74	78.9	4,493	-23,389	13/ 1	22	18	74	78.9	4,493	-40,463
System 2	Total/Ave.	3,610		22	18	74	78.9	4,493	-23,389		22	18	74	78.9	4,493	-40,463
System 2	Block	3,610	13/ 1	22	18	74	78.9	4,493	-23,389	13/ 1	22	18	74	78.9	4,493	-40,463
3	AHU-3 -DX	1,276	13/ 1	22	18	74	85.2	1,782	-21,480	13/ 1	22	18	74	85.2	1,782	-18,312
Zone 3	Total/Ave.	1,276		22	18	74	85.2	1,782	-21,480		22	18	74	85.2	1,782	-18,312
Zone 3	Block	1,276	13/ 1	22	18	74	85.2	1,782	-21,480	13/ 1	22	18	74	85.2	1,782	-18,312
System 3	Total/Ave.	1,276		22	18	74	85.2	1,782	-21,480		22	18	74	85.2	1,782	-18,312
System 3	Block	1,276	13/ 1	22	18	74	85.2	1,782	-21,480	13/ 1	22	18	74	85.2	1,782	-18,312
4	COMPUTER AC	570	13/ 1	22	18	74	75.3	842	-1,145	13/ 1	22	18	74	75.3	842	-846
Zone 4	Total/Ave.	570		22	18	74	75.3	842	-1,145		22	18	74	75.3	842	-846
Zone 4	Block	570	13/ 1	22	18	74	75.3	842	-1,145	13/ 1	22	18	74	75.3	842	-846
System 4	Total/Ave.	570		22	18	74	75.3	842	-1,145		22	18	74	75.3	842	-846
System 4	Block	570	13/ 1	22	18	74	75.3	842	-1,145	13/ 1	22	18	74	75.3	842	-846

COOLING AIRFLOW HEAT GAIN/LOSS - ALTERNATIVE 1
BLDG M358, BASELINE

AIRFLOW HEAT GAIN AND LOSS
(At time of Coil Peak)

Room Number	Description	Cooling: Duct Heat Pickup (Btuh)	Supply Fan Heat (Btuh)	Return Fan Heat (Btuh)	System Exhaust Heat Loss (Btuh)	Total (Btuh)	System Exhaust Airflow (Cfm)	Room Exhaust Airflow (Cfm)	Ducted Airflow (Cfm)	Plenum Airflow (Cfm)	Run Around Airflow (Cfm)	Corridr Airflow (Cfm)	System Return Airflow (Cfm)
1	AHU-1 -CHW	0	22,868	0	0	22,868	0	0	0	0	0	0	12,863
Zone 1	Total/Ave.	0	22,868	0	0	22,868	0	0	0	0	0	0	12,863
Zone 1	Block	0	22,868	0	0	22,868	0	0	0	0	0	0	12,863
System 1	Total/Ave.	0	22,868	0	0	22,868	0	0	0	0	0	0	12,863
System 1	Block	0	22,868	0	0	22,868	0	0	0	0	0	0	12,863
2	AHU-2 -CHW	0	7,987	0	0	7,987	449	0	0	0	0	0	4,493
Zone 2	Total/Ave.	0	7,987	0	0	7,987	449	0	0	0	0	0	4,493
Zone 2	Block	0	7,987	0	0	7,987	449	0	0	0	0	0	4,493
System 2	Total/Ave.	0	7,987	0	0	7,987	449	0	0	0	0	0	4,493
System 2	Block	0	7,987	0	0	7,987	449	0	0	0	0	0	4,493
3	AHU-3 -DX	0	3,167	0	0	3,167	0	0	0	0	0	0	1,782
Zone 3	Total/Ave.	0	3,167	0	0	3,167	0	0	0	0	0	0	1,782
Zone 3	Block	0	3,167	0	0	3,167	0	0	0	0	0	0	1,782
System 3	Total/Ave.	0	3,167	0	0	3,167	0	0	0	0	0	0	1,782
System 3	Block	0	3,167	0	0	3,167	0	0	0	0	0	0	1,782
4	COMPUTER AC	0	299	0	0	299	0	0	0	0	0	0	842
Zone 4	Total/Ave.	0	299	0	0	299	0	0	0	0	0	0	842
Zone 4	Block	0	299	0	0	299	0	0	0	0	0	0	842
System 4	Total/Ave.	0	299	0	0	299	0	0	0	0	0	0	842
System 4	Block	0	299	0	0	299	0	0	0	0	0	0	842

HEATING AIRFLOW HEAT GAIN/LOSS - ALTERNATIVE 1
BLDG M358, BASELINE

A I R F L O W H E A T G A I N A N D L O S S
(At time of Coil Peak)

Room Number	Description	Heating: Supply Fan Heat (Btuh)	Return Fan Heat (Btuh)	System Exhaust Heat Loss (Btuh)	Total (Btuh)	System Exhaust Airflow (Cfm)	Room Exhaust Airflow (Cfm)	Ducted Airflow (Cfm)	Plenum Airflow (Cfm)	Run Around Airflow (Cfm)	Corridr Airflow (Cfm)	System Return Airflow (Cfm)
1	AHU-1 -CHW	22,868	0	0	22,868	0	0	0	0	0	0	12,863
Zone 1	Total/Ave.	22,868	0	0	22,868	0	0	0	0	0	0	12,863
Zone 1	Block	22,868	0	0	22,868	0	0	0	0	0	0	12,863
System 1	Total/Ave.	22,868	0	0	22,868	0	0	0	0	0	0	12,863
System 1	Block	22,868	0	0	22,868	0	0	0	0	0	0	12,863
2	AHU-2 -CHW	7,987	0	0	7,987	449	0	0	0	0	0	4,493
Zone 2	Total/Ave.	7,987	0	0	7,987	449	0	0	0	0	0	4,493
Zone 2	Block	7,987	0	0	7,987	449	0	0	0	0	0	4,493
System 2	Total/Ave.	7,987	0	0	7,987	449	0	0	0	0	0	4,493
System 2	Block	7,987	0	0	7,987	449	0	0	0	0	0	4,493
3	AHU-3 -DX	3,167	0	0	3,167	0	0	0	0	0	0	1,782
Zone 3	Total/Ave.	3,167	0	0	3,167	0	0	0	0	0	0	1,782
Zone 3	Block	3,167	0	0	3,167	0	0	0	0	0	0	1,782
System 3	Total/Ave.	3,167	0	0	3,167	0	0	0	0	0	0	1,782
System 3	Block	3,167	0	0	3,167	0	0	0	0	0	0	1,782
4	COMPUTER AC	299	0	0	299	0	0	0	0	0	0	842
Zone 4	Total/Ave.	299	0	0	299	0	0	0	0	0	0	842
Zone 4	Block	299	0	0	299	0	0	0	0	0	0	842
System 4	Total/Ave.	299	0	0	299	0	0	0	0	0	0	842
System 4	Block	299	0	0	299	0	0	0	0	0	0	842

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

ZONE PSYCHROMETRICS - ALTERNATIVE 1
BLDG M358, BASELINE

---------- P S Y C H R O M E T R I C S T A T E P O I N T S ----------

Zone 1

	Dry Bulb (F)	Wet Bulb (F)	Relat. Humid. (%)	Humid. Ratio (GR)	Enthalpy (Btu/Lb)	Temp. Diff. (F)
Space	76.0	63.2	50.0	69.8	29.2	
Main System						
Return Air Heat Pickup						0.0
Return Fan						0.0
Return Air	76.0	63.2	50.0	69.8	29.2	
Outdoor Air	92.3	74.4	44.2	105.0	38.7	
Return/Outdoor Air Mix	76.0	63.2	50.0	69.8	29.2	
Blow through Fan						0.0
Entering Coil	76.0	63.2	50.0	69.8	29.2	
Leaving Coil	60.4	57.2	82.7	67.5	25.0	
Draw Through Fan						0.7
Duct Frictional Heat						0.9
Supply Duct Heat Gain						0.0
Cold Deck Supply Air	62.1	57.8	78.0	67.5	25.4	
Supply Air	62.1	57.8	78.0	67.5	25.4	

Percent Outside Air	0.00	(%)
Sensible Heat Ratio (SHR)	0.891	
Percent Supply Air Bypassing Coil	0.00	(%)
Coil Airflow	12,863	(Cfm)

ZONE PSYCHROMETRICS - ALTERNATIVE 1
BLDG M358, BASELINE

---------- P S Y C H R O M E T R I C S T A T E P O I N T S ----------

Zone 2

	Dry Bulb (F)	Wet Bulb (F)	Relat. Humid. (%)	Humid. Ratio (GR)	Enthalpy (Btu/Lb)	Temp. Diff. (F)
Space	76.0	63.2	50.0	69.8	29.2	
Main System						
Return Air Heat Pickup						0.0
Return Fan						0.0
Return Air	76.0	63.2	50.0	69.8	29.2	
Outdoor Air	92.3	74.4	44.2	105.0	38.7	
Return/Outdoor Air Mix	77.6	64.5	49.7	73.3	30.1	
Blow through Fan						0.0
Entering Coil	77.6	64.5	49.7	73.3	30.1	
Leaving Coil	60.3	57.6	85.2	69.4	25.3	
Draw Through Fan						0.7
Duct Frictional Heat						0.9
Supply Duct Heat Gain						0.0
Cold Deck Supply Air	62.0	58.2	80.3	69.4	25.7	
Supply Air	62.0	58.2	80.3	69.4	25.7	

Percent Outside Air	10.00	(%)
Sensible Heat Ratio (SHR)	0.939	
Percent Supply Air Bypassing Coil	0.00	(%)
Coil Airflow	4,493	(Cfm)

ZONE PSYCHROMETRICS - ALTERNATIVE 1
BLDG M358, BASELINE

---------- P S Y C H R O M E T R I C S T A T E P O I N T S ----------

Zone 3

	Dry Bulb (F)	Wet Bulb (F)	Relat. Humid. (%)	Humid. Ratio (GR)	Enthalpy (Btu/Lb)	Temp. Diff. (F)
Space	76.0	63.2	50.0	69.8	29.2	
Main System						
Return Air Heat Pickup						0.0
Return Fan						0.0
Return Air	76.0	63.2	50.0	69.8	29.2	
Outdoor Air	92.3	74.4	44.2	105.0	38.7	
Return/Outdoor Air Mix	76.0	63.2	50.0	69.8	29.2	
Blow through Fan						0.0
Entering Coil	76.0	63.2	50.0	69.8	29.2	
Leaving Coil	61.0	57.5	81.7	68.0	25.2	
Draw Through Fan						0.7
Duct Frictional Heat						0.9
Supply Duct Heat Gain						0.0
Cold Deck Supply Air	62.6	58.1	77.1	68.0	25.6	
Supply Air	62.6	58.1	77.1	68.0	25.6	

Percent Outside Air	0.00	(%)
Sensible Heat Ratio (SHR)	0.907	
Percent Supply Air Bypassing Coil	0.00	(%)
Coil Airflow	1,782	(Cfm)

ZONE PSYCHROMETRICS - ALTERNATIVE 1
BLDG M358, BASELINE

---------- P S Y C H R O M E T R I C S T A T E P O I N T S ----------

Zone 4

	Dry Bulb (F)	Wet Bulb (F)	Relat. Humid. (%)	Humid. Ratio (GR)	Enthalpy (Btu/Lb)	Temp. Diff. (F)
Space	76.0	63.2	50.0	69.8	29.2	
Main System						
Return Air Heat Pickup						0.0
Return Fan						0.0
Return Air	76.0	63.2	50.0	69.8	29.2	
Outdoor Air	95.6	71.8	32.1	84.0	36.2	
Return/Outdoor Air Mix	76.0	63.2	50.0	69.8	29.2	
Blow through Fan						0.0
Entering Coil	76.0	63.2	50.0	69.8	29.2	
Leaving Coil	61.9	58.0	79.9	68.8	25.6	
Draw Through Fan						0.1
Duct Frictional Heat						0.2
Supply Duct Heat Gain						0.0
Cold Deck Supply Air	62.2	58.1	79.0	68.8	25.6	
Supply Air	62.2	58.1	79.0	68.8	25.6	

Percent Outside Air	0.00	(%)
Sensible Heat Ratio (SHR)	0.940	
Percent Supply Air Bypassing Coil	0.00	(%)
Coil Airflow	842	(Cfm)

BUILDING U-VALUES - ALTERNATIVE 1
BLDG M358, BASELINE

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) Part.	ExFlr	Summr Skylt	Wintr Skylt	Roof	Summr Windo	Wintr Windo	Wall	Ceil.	Room Mass (lb/ sqft)	Room Capac. (Btu/ sqft/F)
1	AHU-1 -CHW	0.000	0.800	0.000	0.000	0.000	0.430	0.446	0.054	0.317	30.7	6.14
Zone 1	Total/Ave.	0.000	0.800	0.000	0.000	0.000	0.430	0.446	0.054	0.317	30.7	6.14
System 1	Total/Ave.	0.000	0.800	0.000	0.000	0.000	0.430	0.446	0.054	0.317	30.7	6.14
2	AHU-2 -CHW	0.000	0.800	0.000	0.000	0.044	0.430	0.446	0.054	0.317	33.4	8.80
Zone 2	Total/Ave.	0.000	0.800	0.000	0.000	0.044	0.430	0.446	0.054	0.317	33.4	8.80
System 2	Total/Ave.	0.000	0.800	0.000	0.000	0.044	0.430	0.446	0.054	0.317	33.4	8.80
3	AHU-3 -DX	0.000	0.800	0.000	0.000	0.044	0.430	0.446	0.054	0.317	53.7	12.87
Zone 3	Total/Ave.	0.000	0.800	0.000	0.000	0.044	0.430	0.446	0.054	0.317	53.7	12.87
System 3	Total/Ave.	0.000	0.800	0.000	0.000	0.044	0.430	0.446	0.054	0.317	53.7	12.87
4	COMPUTER AC	0.000	0.000	0.000	0.000	0.044	0.000	0.000	0.000	0.317	21.9	6.51
Zone 4	Total/Ave.	0.000	0.000	0.000	0.000	0.044	0.000	0.000	0.000	0.317	21.9	6.51
System 4	Total/Ave.	0.000	0.000	0.000	0.000	0.044	0.000	0.000	0.000	0.317	21.9	6.51
Building		0.000	0.800	0.000	0.000	0.044	0.430	0.446	0.054	0.317	32.8	7.28

BUILDING AREAS - ALTERNATIVE 1
BLDG M358, BASELINE

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	AHU-1 -CHW	1	1	10,654	10,654	0	750	0	0	0	1,265	17	6,255
Zone 1	Total/Ave.				10,654	0	750	0	0	0	1,265	17	6,255
System 1	Total/Ave.				10,654	0	750	0	0	0	1,265	17	6,255
2	AHU-2 -CHW	1	1	3,610	3,610	0	164	0	0	3,610	242	15	1,398
Zone 2	Total/Ave.				3,610	0	164	0	0	3,610	242	15	1,398
System 2	Total/Ave.				3,610	0	164	0	0	3,610	242	15	1,398
3	AHU-3 -DX	1	1	1,276	1,276	0	147	0	0	1,276	88	6	1,372
Zone 3	Total/Ave.				1,276	0	147	0	0	1,276	88	6	1,372
System 3	Total/Ave.				1,276	0	147	0	0	1,276	88	6	1,372
4	COMPUTER AC	1	1	570	570	0	0	0	0	570	0	0	0
Zone 4	Total/Ave.				570	0	0	0	0	570	0	0	0
System 4	Total/Ave.				570	0	0	0	0	570	0	0	0
Building					16,110	0	1,061	0	0	5,456	1,595	15	9,025

ASHRAE 90 ANALYSIS - ALTERNATIVE 1
BLDG M358, BASELINE

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

Overall Roof U-Value = 0.044 (Btu/Hr/Sq Ft/F)
Overall Wall U-Value = 0.110 (Btu/Hr/Sq Ft/F)
Overall Building U-Value = 0.088 (Btu/Hr/Sq Ft/F)

Roof Overall Thermal Transfer Value (OTTVr) = 2.25 (Btu/Hr/Sq Ft)
Wall Overall Thermal Transfer Value (OTTVw) = 13.50 (Btu/Hr/Sq Ft)

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

V
PAG

SYSTEM LOAD PROFILE - ALTERNATIVE 1
BLDG M358, BASELINE

Main System 1 SZ SINGLE ZONE

Percent Design Load	Cooling Load Cap. (Ton)	Cooling Load Hours (%)	Cooling Load Hours	Heating Load Capacity (Btuh)	Heating Load Hours (%)	Heating Load Hours	Cooling Airflow Cap. (Cfm)	Cooling Airflow Hours (%)	Cooling Airflow Hours	Heating Airflow Cap. (Cfm)	Heating Airflow Hours (%)	Heating Airflow Hours
0 - 5	1.0	14	425	-5,727	6	15	643.2	19	634	0.0	0	0
5 - 10	2.0	14	418	-11,454	10	25	1,286.3	14	474	0.0	0	0
10 - 15	3.1	13	384	-17,181	11	27	1,929.5	10	324	0.0	0	0
15 - 20	4.1	7	222	-22,909	14	36	2,572.6	7	247	0.0	0	0
20 - 25	5.1	6	171	-28,636	15	38	3,215.8	6	210	0.0	0	0
25 - 30	6.1	2	75	-34,363	20	49	3,859.0	3	108	0.0	0	0
30 - 35	7.1	3	94	-40,090	24	60	4,502.1	2	65	0.0	0	0
35 - 40	8.2	1	23	-45,817	0	0	5,145.3	1	20	0.0	0	0
40 - 45	9.2	2	64	-51,544	0	0	5,788.5	1	22	0.0	0	0
45 - 50	10.2	1	44	-57,272	0	0	6,431.6	1	22	0.0	0	0
50 - 55	11.2	1	22	-62,999	0	0	7,074.8	1	22	0.0	0	0
55 - 60	12.2	6	196	-68,726	0	0	7,717.9	5	151	0.0	0	0
60 - 65	13.3	3	106	-74,453	0	0	8,361.1	5	173	0.0	0	0
65 - 70	14.3	10	302	-80,180	0	0	9,004.3	6	215	0.0	0	0
70 - 75	15.3	4	128	-85,907	0	0	9,647.4	7	237	0.0	0	0
75 - 80	16.3	6	189	-91,634	0	0	10,290.6	7	232	0.0	0	0
80 - 85	17.3	4	127	-97,362	0	0	10,933.8	4	130	0.0	0	0
85 - 90	18.4	2	68	-103,089	0	0	11,576.9	1	22	0.0	0	0
90 - 95	19.4	0	0	-108,816	0	0	12,220.1	0	0	0.0	0	0
95 - 100	20.4	0	0	-114,543	0	0	12,863.2	0	0	0.0	0	0
Hours Off	0.0	0	5,702	0	0	8,510	0.0	0	5,452	0.0	0	8,760

Main System 2 SZ SINGLE ZONE

Percent Design Load	Cooling Load Cap. (Ton)	Cooling Load Hours (%)	Cooling Load Hours	Heating Load Capacity (Btuh)	Heating Load Hours (%)	Heating Load Hours	Cooling Airflow Cap. (Cfm)	Cooling Airflow Hours (%)	Cooling Airflow Hours	Heating Airflow Cap. (Cfm)	Heating Airflow Hours (%)	Heating Airflow Hours
0 - 5	0.4	17	543	-2,023	100	5	224.6	24	808	0.0	0	0
5 - 10	0.8	9	282	-4,046	0	0	449.3	14	465	0.0	0	0
10 - 15	1.2	8	258	-6,069	0	0	673.9	10	348	0.0	0	0
15 - 20	1.6	7	221	-8,093	0	0	898.6	4	122	0.0	0	0
20 - 25	2.0	9	306	-10,116	0	0	1,123.2	4	141	0.0	0	0
25 - 30	2.4	4	140	-12,139	0	0	1,347.9	2	77	0.0	0	0
30 - 35	2.8	3	107	-14,162	0	0	1,572.5	2	75	0.0	0	0
35 - 40	3.2	5	158	-16,185	0	0	1,797.2	1	22	0.0	0	0
40 - 45	3.6	3	104	-18,208	0	0	2,021.8	2	66	0.0	0	0
45 - 50	4.0	4	114	-20,231	0	0	2,246.5	2	64	0.0	0	0
50 - 55	4.4	5	170	-22,255	0	0	2,471.1	1	44	0.0	0	0
55 - 60	4.8	2	65	-24,278	0	0	2,695.8	3	108	0.0	0	0
60 - 65	5.2	5	172	-26,301	0	0	2,920.4	7	234	0.0	0	0
65 - 70	5.6	3	107	-28,324	0	0	3,145.1	6	196	0.0	0	0
70 - 75	6.0	5	152	-30,347	0	0	3,369.7	7	236	0.0	0	0
75 - 80	6.3	3	102	-32,370	0	0	3,594.4	3	104	0.0	0	0
80 - 85	6.7	2	65	-34,394	0	0	3,819.0	3	110	0.0	0	0
85 - 90	7.1	3	110	-36,417	0	0	4,043.7	3	107	0.0	0	0
90 - 95	7.5	1	20	-38,440	0	0	4,268.3	0	0	0.0	0	0
95 - 100	7.9	2	54	-40,463	0	0	4,493.0	2	54	0.0	0	0
Hours Off	0.0	0	5,510	0	0	8,755	0.0	0	5,379	0.0	0	8,760

SYSTEM LOAD PROFILE - ALTERNATIVE 1
BLDG M358, BASELINE

Main System 3 SZ SINGLE ZONE

Percent Design Load	Cooling Load Cap. (Ton)	Cooling Load Hours (%)	Cooling Load Hours	Heating Load Capacity (Btuh)	Heating Load Hours (%)	Heating Load Hours	Cooling Airflow Cap. (Cfm)	Cooling Airflow Hours (%)	Cooling Airflow Hours	Heating Airflow Cap. (Cfm)	Heating Airflow Hours (%)	Heating Airflow Hours
0 - 5	0.1	12	340	-916	3	16	89.1	14	484	0.0	0	0
5 - 10	0.3	8	237	-1,831	11	59	178.2	12	421	0.0	0	0
10 - 15	0.4	11	323	-2,747	22	120	267.3	11	371	0.0	0	0
15 - 20	0.5	9	249	-3,662	13	73	356.3	12	395	0.0	0	0
20 - 25	0.7	9	255	-4,578	12	66	445.4	8	262	0.0	0	0
25 - 30	0.8	3	84	-5,494	18	95	534.5	6	204	0.0	0	0
30 - 35	0.9	3	92	-6,409	18	95	623.6	1	23	0.0	0	0
35 - 40	1.1	1	25	-7,325	3	18	712.7	2	67	0.0	0	0
40 - 45	1.2	4	107	-8,240	0	0	801.8	3	109	0.0	0	0
45 - 50	1.4	4	123	-9,156	0	0	890.9	1	39	0.0	0	0
50 - 55	1.5	4	100	-10,072	0	0	979.9	1	39	0.0	0	0
55 - 60	1.6	3	91	-10,987	0	0	1,069.0	6	210	0.0	0	0
60 - 65	1.8	6	163	-11,903	0	0	1,158.1	5	172	0.0	0	0
65 - 70	1.9	8	241	-12,818	0	0	1,247.2	6	192	0.0	0	0
70 - 75	2.0	7	212	-13,734	0	0	1,336.3	6	213	0.0	0	0
75 - 80	2.2	0	0	-14,650	0	0	1,425.4	4	149	0.0	0	0
80 - 85	2.3	7	195	-15,565	0	0	1,514.5	2	66	0.0	0	0
85 - 90	2.4	0	0	-16,481	0	0	1,603.5	0	0	0.0	0	0
90 - 95	2.6	0	0	-17,397	0	0	1,692.6	0	0	0.0	0	0
95 - 100	2.7	0	0	-18,312	0	0	1,781.7	0	0	0.0	0	0
Hours Off	0.0	0	5,923	0	0	8,218	0.0	0	5,344	0.0	0	8,760

Main System 4 SZ SINGLE ZONE

Percent Design Load	Cooling Load Cap. (Ton)	Cooling Load Hours (%)	Cooling Load Hours	Heating Load Capacity (Btuh)	Heating Load Hours (%)	Heating Load Hours	Cooling Airflow Cap. (Cfm)	Cooling Airflow Hours (%)	Cooling Airflow Hours	Heating Airflow Cap. (Cfm)	Heating Airflow Hours (%)	Heating Airflow Hours
0 - 5	0.1	34	2,575	-42	0	0	42.1	0	0	0.0	0	0
5 - 10	0.1	21	1,582	-85	0	0	84.2	0	0	0.0	0	0
10 - 15	0.2	7	558	-127	0	0	126.3	0	0	0.0	0	0
15 - 20	0.2	0	27	-169	0	0	168.4	0	0	0.0	0	0
20 - 25	0.3	0	0	-211	0	0	210.5	0	0	0.0	0	0
25 - 30	0.3	0	0	-254	0	0	252.6	0	0	0.0	0	0
30 - 35	0.4	1	60	-296	0	0	294.7	0	0	0.0	0	0
35 - 40	0.5	1	85	-338	0	0	336.9	0	0	0.0	0	0
40 - 45	0.5	1	107	-381	0	0	379.0	0	0	0.0	0	0
45 - 50	0.6	1	40	-423	0	0	421.1	0	0	0.0	0	0
50 - 55	0.6	0	20	-465	0	0	463.2	0	0	0.0	0	0
55 - 60	0.7	1	52	-507	0	0	505.3	0	0	0.0	0	0
60 - 65	0.7	3	220	-550	0	0	547.4	0	0	0.0	0	0
65 - 70	0.8	2	165	-592	0	0	589.5	0	0	0.0	0	0
70 - 75	0.8	2	172	-634	0	0	631.6	0	0	0.0	0	0
75 - 80	0.9	3	235	-677	0	0	673.7	0	0	0.0	0	0
80 - 85	1.0	9	664	-719	0	0	715.8	0	0	0.0	0	0
85 - 90	1.0	8	611	-761	0	0	757.9	0	0	0.0	0	0
90 - 95	1.1	4	299	-804	0	0	800.0	0	0	0.0	0	0
95 - 100	1.1	1	42	-846	0	0	842.1	100	8,760	0.0	0	0
Hours Off	0.0	0	1,246	0	0	8,760	0.0	0	0	0.0	0	8,760

SYSTEM TOTALS LOAD PROFILE - ALTERNATIVE 1
BLDG M358, BASELINE

S Y S T E M L O A D P R O F I L E

System Totals

Percent Design Load	Cooling Load Cap. (Ton)	Cooling Load Hours (%)	Cooling Load Hours	Heating Load Capacity (Btuh)	Heating Load Hours (%)	Heating Load Hours	Cooling Airflow Cap. (Cfm)	Cooling Airflow Hours (%)	Cooling Airflow Hours	Heating Airflow Cap. (Cfm)	Heating Airflow Hours (%)	Heating Airflow Hours
0 - 5	1.6	64	4,796	-8,708	57	312	999.0	60	5,219	0.0	0	0
5 - 10	3.2	5	374	-17,416	7	41	1,998.0	9	818	0.0	0	0
10 - 15	4.8	5	401	-26,125	8	44	2,997.0	7	626	0.0	0	0
15 - 20	6.4	4	311	-34,833	8	46	3,996.0	3	291	0.0	0	0
20 - 25	8.0	2	148	-43,541	16	86	4,995.0	3	256	0.0	0	0
25 - 30	9.6	1	102	-52,249	3	18	5,994.0	2	151	0.0	0	0
30 - 35	11.3	2	113	-60,957	0	0	6,993.0	1	72	0.0	0	0
35 - 40	12.9	0	0	-69,666	0	0	7,992.0	1	45	0.0	0	0
40 - 45	14.5	1	65	-78,374	0	0	8,991.0	0	38	0.0	0	0
45 - 50	16.1	1	93	-87,082	0	0	9,990.0	1	44	0.0	0	0
50 - 55	17.7	1	66	-95,790	0	0	10,989.0	1	83	0.0	0	0
55 - 60	19.3	3	214	-104,498	0	0	11,988.0	1	93	0.0	0	0
60 - 65	20.9	1	80	-113,207	0	0	12,987.0	1	106	0.0	0	0
65 - 70	22.5	3	235	-121,915	0	0	13,986.1	4	318	0.0	0	0
70 - 75	24.1	3	219	-130,623	0	0	14,985.1	3	257	0.0	0	0
75 - 80	25.7	1	102	-139,331	0	0	15,984.1	2	151	0.0	0	0
80 - 85	27.3	1	108	-148,039	0	0	16,983.1	2	147	0.0	0	0
85 - 90	28.9	1	87	-156,748	0	0	17,982.1	1	45	0.0	0	0
90 - 95	30.6	0	0	-165,456	0	0	18,981.1	0	0	0.0	0	0
95 - 100	32.2	0	0	-174,164	0	0	19,980.1	0	0	0.0	0	0
Hours Off	0.0	0	1,246	0	0	8,213	0.0	0	0	0.0	0	8,760

BUILDING COOL-HEAT DEMAND - ALTERNATIVE 1
BLDG M358, BASELINE

January			Design		Weekday		Saturday		Sunday		Monday	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	33.4	30.4	0	0.0	0	0.0	0	0.0	-5,082	0.0	-36,775	0.0
2	32.1	29.3	0	0.0	0	0.0	0	0.0	-5,393	0.0	-38,465	0.0
3	31.7	29.3	-27,828	0.0	0	0.0	0	0.0	-5,744	0.0	-40,334	0.0
4	31.9	29.5	-48,794	0.0	0	0.0	0	0.0	-5,835	0.0	-39,739	0.0
5	32.6	30.3	-56,058	0.0	0	0.0	0	0.0	-33,655	0.0	-42,536	0.0
6	33.6	31.3	-56,302	0.0	0	0.0	0	0.0	-43,588	0.0	-43,598	0.0
7	35.0	32.6	-55,625	0.0	0	0.0	0	0.0	-41,072	0.0	-41,077	0.0
8	36.6	34.4	0	0.0	0	0.5	0	0.0	-22,900	0.0	0	0.5
9	38.5	36.3	0	0.9	0	0.9	0	0.0	-9,972	0.0	0	0.9
10	40.4	37.7	0	0.9	0	0.9	0	0.0	-3,598	0.0	0	0.9
11	42.3	38.7	0	0.9	0	0.9	0	0.0	-2,464	0.0	0	0.9
12	44.2	39.6	0	0.9	0	0.9	0	0.0	-1,860	0.0	0	0.9
13	45.8	40.5	0	0.7	0	0.7	0	0.0	-1,235	0.0	0	0.7
14	47.2	41.1	0	0.9	0	0.9	-1,003	0.0	-1,246	0.0	0	0.9
15	48.2	41.6	0	1.0	0	1.0	-1,653	0.0	-1,653	0.0	0	1.0
16	48.9	41.8	0	1.0	0	1.0	-1,896	0.0	-1,896	0.0	0	1.0
17	49.1	41.9	0	0.8	0	0.8	-2,184	0.1	-2,184	0.1	0	0.8
18	48.7	41.9	0	0.4	0	0.4	-2,190	0.0	-14,412	0.0	0	0.4
19	47.4	41.7	0	0.1	0	0.0	-2,387	0.0	-20,018	0.0	0	0.0
20	45.5	40.5	0	0.0	0	0.0	-2,692	0.0	-20,759	0.0	0	0.0
21	43.1	38.9	0	0.0	0	0.0	-3,399	0.0	-25,730	0.0	0	0.0
22	40.4	36.7	0	0.0	0	0.0	-3,843	0.0	-28,703	0.0	0	0.0
23	37.7	34.3	0	0.0	0	0.0	-4,272	0.0	-32,231	0.0	0	0.0
24	35.3	32.3	0	0.0	0	0.0	-4,832	0.0	-35,590	0.0	0	0.0

February			Design		Weekday		Saturday		Sunday		Monday	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	37.5	34.5	0	0.0	0	0.0	0	0.0	-4,996	0.0	-36,173	0.0
2	36.0	33.0	0	0.0	0	0.0	0	0.0	-23,716	0.0	-39,138	0.0
3	34.7	31.8	0	0.0	0	0.0	0	0.0	-39,718	0.0	-39,717	0.0
4	33.6	30.9	0	0.0	0	0.0	0	0.0	-41,227	0.0	-41,236	0.0
5	32.8	30.1	0	0.0	0	0.0	0	0.0	-42,557	0.0	-42,557	0.0
6	32.2	29.8	0	0.0	0	0.0	0	0.0	-44,279	0.0	-44,279	0.0
7	32.1	29.6	0	0.0	0	0.0	0	0.0	-43,495	0.0	-43,495	0.0
8	32.5	30.3	0	0.6	0	0.6	0	0.0	-19,638	0.0	0	0.6
9	33.9	31.6	0	0.9	0	0.9	0	0.0	-14,979	0.0	0	0.9
10	36.0	33.0	0	0.9	0	0.9	0	0.0	-13,435	0.0	0	0.9
11	38.5	34.8	0	0.9	0	0.9	-285	0.0	-15,623	0.0	0	0.9
12	41.3	36.5	0	0.9	0	0.9	-2,764	0.0	-10,676	0.0	0	0.9
13	43.8	38.1	0	0.7	0	0.7	-2,252	0.0	-8,172	0.0	0	0.7
14	45.9	39.5	0	1.0	0	0.9	-2,064	0.0	-8,080	0.0	0	0.9
15	47.2	40.4	0	1.0	0	1.0	-1,506	0.0	-1,506	0.0	0	1.0
16	47.7	40.6	0	1.0	0	1.0	-2,298	0.1	-6,783	0.1	0	1.0
17	47.5	40.2	0	0.8	0	0.8	-2,501	0.1	-14,772	0.1	0	0.8
18	47.0	39.8	0	0.4	0	0.4	-2,901	0.1	-27,588	0.1	0	0.4
19	46.2	39.9	0	0.1	0	0.0	-2,802	0.0	-24,926	0.0	0	0.0
20	45.1	39.7	0	0.1	0	0.0	-3,128	0.0	-26,054	0.0	0	0.0
21	43.8	39.2	0	0.0	0	0.0	-3,387	0.0	-26,189	0.0	0	0.0
22	42.3	38.3	0	0.0	0	0.0	-3,736	0.0	-27,851	0.0	0	0.0
23	40.7	37.2	0	0.0	0	0.0	-4,362	0.0	-31,756	0.0	0	0.0
24	39.1	35.8	0	0.0	0	0.0	-4,627	0.0	-33,516	0.0	0	0.0

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

BUILDING COOL-HEAT DEMAND - ALTERNATIVE 1
BLDG M358, BASELINE

March			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	45.4	41.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2	43.3	39.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
3	41.6	38.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
4	40.6	37.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
5	40.2	37.3	0	0.0	0	0.0	0	0.0	0	0.0	-2,120	0.0
6	40.6	37.8	0	0.0	0	0.0	0	0.0	0	0.0	-4,675	0.0
7	41.6	39.0	0	0.0	0	0.0	0	0.0	0	0.0	-9,805	0.0
8	43.3	40.7	0	0.7	0	0.7	0	0.0	0	0.0	0	0.6
9	45.4	42.5	0	0.9	0	0.9	0	0.0	0	0.0	0	0.9
10	47.9	44.3	0	0.9	0	0.9	0	0.0	0	0.0	0	0.9
11	50.6	45.5	0	1.0	0	0.9	0	0.0	0	0.0	0	0.9
12	53.3	46.8	0	1.0	0	0.9	0	0.1	0	0.0	0	0.9
13	55.8	48.5	0	0.8	0	0.7	0	0.1	0	0.1	0	0.7
14	58.0	49.6	0	1.0	0	1.0	0	0.1	0	0.1	0	1.0
15	59.6	50.3	0	1.0	0	1.0	0	0.1	0	0.1	0	1.0
16	60.7	50.9	0	1.1	0	1.0	0	0.1	0	0.1	0	1.0
17	61.0	50.9	0	0.9	0	0.8	0	0.1	0	0.1	0	0.8
18	60.7	50.7	0	0.5	0	0.4	0	0.1	0	0.1	0	0.4
19	59.6	50.7	0	0.1	0	0.1	0	0.1	0	0.1	0	0.1
20	58.0	50.5	0	0.1	0	0.1	0	0.1	0	0.1	0	0.1
21	55.8	49.4	0	0.1	0	0.0	0	0.0	0	0.0	0	0.0
22	53.3	47.8	0	0.1	0	0.0	0	0.0	0	0.0	0	0.0
23	50.6	45.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
24	47.9	43.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0

April			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg T
1	57.7	53.9	0	0.0	0	0.0	0	0.0	0	0.0	0	
2	55.9	52.7	0	0.0	0	0.0	0	0.0	0	0.0	0	
3	54.2	51.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
4	52.9	50.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
5	51.9	49.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
6	51.2	49.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
7	51.0	49.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
8	51.6	49.9	0	0.7	0	0.7	0	0.0	0	0.0	0	0.7
9	53.3	50.6	0	0.9	0	0.9	0	0.0	0	0.0	0	0.9
10	55.9	51.8	0	1.0	0	1.0	0	0.0	0	0.0	0	0.9
11	59.0	53.4	0	1.0	0	1.0	0	0.1	0	0.1	0	1.0
12	62.4	55.6	0	1.0	0	1.0	0	0.1	0	0.1	0	1.0
13	65.5	57.7	0	0.8	0	0.8	0	0.1	0	0.1	0	0.8
14	68.1	59.4	0	1.0	0	1.0	0	0.1	0	0.1	0	1.0
15	69.8	60.7	0	1.1	0	1.0	0	0.1	0	0.1	0	1.0
16	70.4	60.9	0	1.1	0	1.0	0	0.1	0	0.1	0	1.0
17	70.2	60.2	0	0.9	0	0.8	0	0.1	0	0.1	0	0.8
18	69.5	60.1	0	0.5	0	0.4	0	0.1	0	0.1	0	0.4
19	68.5	59.4	0	0.1	0	0.1	0	0.1	0	0.1	0	0.1
20	67.2	59.7	0	0.1	0	0.1	0	0.1	0	0.1	0	0.1
21	65.5	59.3	0	0.1	0	0.1	0	0.1	0	0.1	0	0.1
22	63.7	58.8	0	0.1	0	0.1	0	0.1	0	0.1	0	0.1
23	61.7	57.3	0	0.1	0	0.1	0	0.1	0	0.1	0	0.1
24	59.7	55.6	0	0.1	0	0.0	0	0.0	0	0.0	0	0.0

BUILDING COOL-HEAT DEMAND - ALTERNATIVE 1
BLDG M358, BASELINE

May			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	66.6	62.3	0	31.1	0	8.0	0	0.1	0	0.1	0	0.1
2	64.5	60.4	0	31.1	0	8.0	0	0.0	0	0.0	0	0.0
3	62.7	59.1	0	31.1	0	8.0	0	0.0	0	0.0	0	0.0
4	61.2	58.1	0	31.1	0	0.3	0	0.0	0	0.0	0	0.0
5	60.0	57.1	0	31.1	0	0.0	0	0.0	0	0.0	0	0.0
6	59.3	56.6	0	15.0	0	0.0	0	0.0	0	0.0	0	0.0
7	59.0	56.5	0	13.4	0	0.0	0	0.0	0	0.0	0	0.0
8	59.5	56.6	0	21.9	0	6.9	0	0.0	0	0.0	0	6.4
9	60.9	56.6	0	25.5	0	16.5	0	0.0	0	0.0	0	16.6
10	63.0	57.2	0	25.8	0	18.1	0	0.1	0	0.1	0	18.1
11	65.7	58.1	0	26.0	0	18.4	0	0.1	0	0.1	0	18.4
12	68.7	59.8	0	26.6	0	18.8	0	1.3	0	1.3	0	18.8
13	71.7	61.6	0	24.2	0	15.9	0	3.1	0	3.1	0	15.9
14	74.5	63.4	0	27.9	0	21.2	0	4.3	0	4.3	0	21.2
15	76.6	64.8	0	28.4	0	22.8	0	5.5	0	5.5	0	22.8
16	78.0	65.6	0	28.1	0	22.6	0	5.1	0	5.1	0	22.6
17	78.5	65.6	0	24.5	0	18.7	0	5.2	0	5.2	0	18.7
18	78.2	65.8	0	17.7	0	10.7	0	4.4	0	4.4	0	10.7
19	77.5	65.6	0	10.8	0	2.6	0	2.6	0	2.6	0	2.6
20	76.3	66.1	0	10.3	0	2.3	0	2.3	0	2.3	0	2.3
21	74.8	67.2	0	9.7	0	1.8	0	1.8	0	1.8	0	1.8
22	73.0	66.4	0	9.1	0	1.3	0	1.3	0	1.3	0	1.3
23	70.9	65.4	0	8.7	0	0.6	0	0.6	0	0.6	0	0.6
24	68.7	64.0	0	8.3	0	0.2	0	0.2	0	0.2	0	0.2

June			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	73.0	67.9	0	2.8	0	1.2	0	1.3	0	1.3	0	1.3
2	71.2	66.1	0	2.4	0	0.6	0	0.7	0	0.7	0	0.7
3	69.7	65.2	0	1.9	0	0.2	0	0.2	0	0.2	0	0.2
4	68.5	64.3	0	1.6	0	0.1	0	0.1	0	0.1	0	0.1
5	67.8	64.2	0	1.5	0	0.0	0	0.0	0	0.0	0	0.0
6	67.6	64.2	0	5.1	0	0.9	0	1.0	0	1.0	0	1.0
7	68.1	64.8	0	7.5	0	3.2	0	3.3	0	3.3	0	3.3
8	69.4	65.7	0	21.6	0	17.6	0	3.4	0	3.4	0	17.7
9	71.6	66.2	0	26.1	0	21.4	0	3.9	0	3.9	0	21.3
10	74.2	67.2	0	26.8	0	23.5	0	6.0	0	6.0	0	23.5
11	77.2	68.5	0	27.6	0	23.8	0	6.3	0	6.3	0	23.8
12	80.2	70.0	0	28.6	0	24.7	0	7.6	0	7.6	0	24.7
13	82.8	70.8	0	25.3	0	21.5	0	8.7	0	8.7	0	21.5
14	85.0	71.6	0	30.4	0	26.8	0	9.8	0	9.8	0	26.8
15	86.3	72.3	0	31.3	0	28.0	0	10.5	0	10.5	0	28.0
16	86.8	72.1	0	31.0	0	27.5	0	9.9	0	9.9	0	27.5
17	86.6	71.7	0	26.2	0	22.8	0	9.1	0	9.1	0	22.8
18	85.8	71.5	0	17.3	0	14.7	0	8.4	0	8.4	0	14.7
19	84.7	71.2	0	7.4	0	5.9	0	6.0	0	6.0	0	5.9
20	83.2	71.5	0	6.5	0	5.7	0	5.8	0	5.8	0	5.7
21	81.4	71.7	0	5.6	0	4.8	0	4.8	0	4.8	0	4.8
22	79.3	71.4	0	4.7	0	4.0	0	4.0	0	4.0	0	4.0
23	77.2	70.5	0	3.9	0	3.1	0	3.1	0	3.1	0	3.1
24	75.1	69.1	0	3.3	0	2.1	0	2.1	0	2.1	0	2.1

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

BUILDING COOL-HEAT DEMAND - ALTERNATIVE 1
BLDG M358, BASELINE

July			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	72.0	69.3	0	3.0	0	0.9	0	1.0	0	1.0	0	1.0
2	70.5	68.0	0	2.4	0	0.4	0	0.4	0	0.4	0	0.4
3	69.4	67.1	0	2.0	0	0.1	0	0.1	0	0.1	0	0.1
4	68.5	66.4	0	1.7	0	0.0	0	0.0	0	0.0	0	0.0
5	67.9	66.0	0	1.5	0	0.0	0	0.0	0	0.0	0	0.0
6	67.7	65.9	0	4.4	0	0.0	0	0.0	0	0.0	0	0.0
7	68.1	66.3	0	7.4	0	3.3	0	3.4	0	3.4	0	3.4
8	69.1	67.3	0	22.1	0	18.5	0	3.7	0	3.7	0	18.6
9	70.8	68.0	0	26.3	0	21.7	0	4.2	0	4.2	0	21.7
10	72.9	69.1	0	27.4	0	23.7	0	6.1	0	6.1	0	23.7
11	75.2	70.5	0	27.8	0	23.9	0	6.2	0	6.2	0	23.9
12	77.5	71.7	0	28.6	0	24.3	0	7.2	0	7.2	0	24.3
13	79.6	72.7	0	25.4	0	21.1	0	8.2	0	8.2	0	21.1
14	81.3	73.5	0	30.5	0	26.6	0	9.5	0	9.5	0	26.6
15	82.3	73.7	0	31.5	0	27.7	0	10.1	0	10.1	0	27.7
16	82.7	73.5	0	31.0	0	27.3	0	9.5	0	9.5	0	27.3
17	82.5	73.1	0	26.0	0	22.3	0	8.5	0	8.5	0	22.3
18	82.0	72.6	0	17.0	0	14.1	0	7.8	0	7.8	0	14.1
19	81.1	73.2	0	7.0	0	5.4	0	5.6	0	5.6	0	5.4
20	79.9	73.8	0	6.4	0	5.2	0	5.3	0	5.3	0	5.2
21	78.5	73.9	0	5.6	0	4.7	0	4.7	0	4.7	0	4.7
22	76.9	73.1	0	4.8	0	3.6	0	3.6	0	3.6	0	3.6
23	75.2	71.9	0	4.1	0	2.7	0	2.7	0	2.7	0	2.7
24	73.5	70.8	0	3.5	0	1.8	0	1.8	0	1.8	0	1.8

August			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	72.7	70.2	0	3.3	0	1.0	0	1.2	0	1.2	0	1.
2	71.2	69.0	0	2.5	0	0.4	0	0.5	0	0.5	0	0.
3	69.9	68.0	0	1.8	0	0.1	0	0.1	0	0.1	0	0.1
4	68.8	67.1	0	1.6	0	0.1	0	0.1	0	0.1	0	0.1
5	68.0	66.6	0	1.4	0	0.0	0	0.0	0	0.0	0	0.0
6	67.5	66.2	0	2.4	0	0.0	0	0.0	0	0.0	0	0.0
7	67.3	66.1	0	6.8	0	1.5	0	1.5	0	1.5	0	1.5
8	67.8	66.5	0	22.0	0	18.6	0	3.5	0	3.5	0	18.8
9	69.1	67.0	0	26.9	0	21.2	0	3.7	0	3.7	0	21.2
10	71.2	67.8	0	28.0	0	23.2	0	5.7	0	5.7	0	23.3
11	73.8	68.7	0	28.3	0	23.5	0	5.9	0	5.9	0	23.5
12	76.5	70.0	0	28.3	0	24.0	0	6.7	0	6.7	0	24.0
13	79.1	71.2	0	25.2	0	21.5	0	8.6	0	8.6	0	21.5
14	81.1	72.6	0	30.8	0	27.2	0	10.1	0	10.1	0	27.2
15	82.5	73.6	0	31.8	0	28.3	0	10.6	0	10.6	0	28.3
16	83.0	73.7	0	31.0	0	26.7	0	8.8	0	8.8	0	26.7
17	82.8	73.5	0	25.8	0	22.2	0	8.3	0	8.3	0	22.2
18	82.3	73.5	0	15.8	0	13.2	0	6.8	0	6.8	0	13.2
19	81.5	73.1	0	7.1	0	5.2	0	5.5	0	5.5	0	5.2
20	80.4	73.7	0	6.3	0	5.1	0	5.2	0	5.2	0	5.1
21	79.1	74.9	0	5.7	0	4.5	0	4.5	0	4.5	0	4.5
22	77.6	73.9	0	4.8	0	3.8	0	3.8	0	3.8	0	3.8
23	76.0	72.7	0	3.9	0	2.8	0	2.8	0	2.8	0	2.8
24	74.3	71.3	0	3.3	0	2.0	0	2.0	0	2.0	0	2.0

BUILDING COOL-HEAT DEMAND - ALTERNATIVE 1
BLDG M358, BASELINE

September			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	69.8	66.1	0	1.3	0	0.2	0	0.2	0	0.2	0	0.2
2	68.0	64.5	0	0.8	0	0.1	0	0.1	0	0.1	0	0.1
3	66.3	63.0	0	0.3	0	0.0	0	0.0	0	0.0	0	0.0
4	64.9	61.9	0	0.1	0	0.0	0	0.0	0	0.0	0	0.0
5	63.9	61.3	0	0.1	0	0.0	0	0.0	0	0.0	0	0.0
6	63.2	61.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
7	63.0	60.8	0	3.8	0	0.0	0	0.0	0	0.0	0	0.0
8	63.4	61.4	0	19.8	0	9.9	0	0.0	0	0.0	0	10.0
9	64.7	61.8	0	25.6	0	20.4	0	0.0	0	0.0	0	20.4
10	66.6	62.1	0	26.8	0	20.2	0	2.7	0	2.7	0	20.2
11	69.1	62.9	0	27.1	0	22.2	0	4.5	0	4.5	0	22.2
12	71.8	63.7	0	27.4	0	22.2	0	5.1	0	5.1	0	22.2
13	74.5	65.5	0	24.4	0	19.5	0	6.8	0	6.8	0	19.5
14	77.0	67.1	0	29.5	0	24.9	0	8.1	0	8.1	0	24.9
15	78.9	68.2	0	30.1	0	25.0	0	7.5	0	7.5	0	25.0
16	80.2	68.6	0	28.7	0	24.6	0	6.8	0	6.8	0	24.6
17	80.6	68.5	0	22.6	0	19.6	0	5.8	0	5.8	0	19.6
18	80.4	68.9	0	12.1	0	10.5	0	4.0	0	4.0	0	10.5
19	79.7	70.0	0	5.1	0	3.9	0	4.0	0	4.0	0	3.9
20	78.7	71.2	0	4.4	0	3.6	0	3.6	0	3.6	0	3.6
21	77.3	71.6	0	3.6	0	3.0	0	3.0	0	3.0	0	3.0
22	75.6	70.5	0	2.7	0	2.2	0	2.2	0	2.2	0	2.2
23	73.7	69.4	0	2.1	0	1.5	0	1.5	0	1.5	0	1.5
24	71.8	67.7	0	1.5	0	0.7	0	0.7	0	0.7	0	0.7

October			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	54.8	51.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2	52.9	49.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
3	51.2	48.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
4	49.8	47.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
5	48.8	46.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
6	48.2	45.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
7	47.9	45.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
8	48.5	46.2	-38	0.7	0	0.7	0	0.0	0	0.0	0	0.7
9	50.3	47.3	0	15.4	0	4.7	0	0.0	0	0.0	-1,642	4.7
10	52.9	48.7	0	20.3	0	15.1	0	0.0	0	0.0	0	15.1
11	56.2	49.9	0	21.3	0	16.6	0	0.0	0	0.0	0	15.3
12	59.6	51.5	0	21.9	0	18.0	0	0.1	0	0.1	0	16.5
13	62.9	53.5	0	19.4	0	14.7	0	0.1	0	0.1	0	14.5
14	65.5	55.2	0	24.0	0	18.6	0	0.1	0	0.1	0	18.6
15	67.3	56.3	0	24.0	0	19.1	0	0.1	0	0.1	0	19.2
16	67.9	56.6	0	22.5	0	18.7	0	0.7	0	0.6	0	18.8
17	67.7	56.4	0	15.5	0	13.2	0	0.2	0	0.2	0	13.2
18	67.0	56.6	0	7.4	0	5.6	0	0.1	0	0.1	0	5.6
19	66.0	57.6	0	0.8	0	0.1	0	0.1	0	0.1	0	0.1
20	64.6	57.9	0	0.3	0	0.1	0	0.1	0	0.1	0	0.1
21	62.9	57.3	0	0.1	0	0.1	0	0.1	0	0.1	0	0.1
22	61.0	56.0	0	0.1	0	0.0	0	0.0	0	0.0	0	0.0
23	59.0	54.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
24	56.9	53.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

BUILDING COOL-HEAT DEMAND - ALTERNATIVE 1
BLDG M358, BASELINE

November			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	48.7	45.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2	46.9	44.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
3	45.5	42.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
4	44.6	41.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
5	44.4	42.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
6	44.8	42.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
7	45.9	43.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
8	47.8	46.0	0	0.7	0	0.7	0	0.0	0	0.0	0	0.7
9	50.2	48.0	0	0.9	0	0.9	0	0.0	0	0.0	0	0.9
10	52.9	49.9	0	0.9	0	0.9	0	0.0	0	0.0	0	0.9
11	55.8	51.1	0	1.0	0	0.9	0	0.0	0	0.0	0	0.9
12	58.5	52.0	0	1.0	0	0.9	0	0.0	0	0.0	0	0.9
13	60.9	52.5	0	0.8	0	0.7	0	0.1	0	0.1	0	0.7
14	62.8	53.4	0	1.0	0	0.9	0	0.1	0	0.1	0	0.9
15	64.0	53.8	0	1.0	0	1.0	0	0.1	0	0.1	0	1.0
16	64.4	53.9	0	1.0	0	1.0	0	0.1	0	0.1	0	1.0
17	64.1	53.7	0	0.8	0	0.8	0	0.1	0	0.1	0	0.8
18	63.2	53.7	0	0.4	0	0.4	0	0.1	0	0.1	0	0.4
19	61.8	54.2	0	0.1	0	0.1	0	0.1	0	0.1	0	0.1
20	60.0	53.6	0	0.1	0	0.0	0	0.0	0	0.0	0	0.0
21	57.9	52.7	0	0.1	0	0.0	0	0.0	0	0.0	0	0.0
22	55.6	51.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
23	53.2	49.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
24	50.8	47.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0

December			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	37.5	35.3	0	0.0	0	0.0	0	0.0	0	0.0	-5,027	0
2	37.1	35.1	0	0.0	0	0.0	0	0.0	0	0.0	-5,351	0
3	37.4	35.5	0	0.0	0	0.0	0	0.0	0	0.0	-28,336	0.0
4	38.1	36.2	0	0.0	0	0.0	0	0.0	0	0.0	-38,360	0.0
5	39.3	37.6	0	0.0	0	0.0	0	0.0	0	0.0	-37,694	0.0
6	40.9	39.2	0	0.0	0	0.0	0	0.0	-2,146	0.0	-36,613	0.0
7	42.7	41.2	0	0.0	0	0.0	0	0.0	-5,461	0.0	-36,297	0.0
8	44.7	43.1	0	0.7	0	0.6	0	0.0	-5,147	0.0	0	0.6
9	46.8	45.3	0	0.9	0	0.9	0	0.0	-3,933	0.0	0	0.9
10	48.8	47.0	0	0.9	0	0.9	0	0.0	-2,409	0.0	0	0.9
11	50.7	48.1	0	0.9	0	0.9	0	0.0	-1,133	0.0	0	0.9
12	52.2	48.8	0	0.9	0	0.9	0	0.0	-384	0.0	0	0.9
13	53.4	49.2	0	0.7	0	0.7	0	0.0	0	0.0	0	0.7
14	54.1	49.2	0	1.0	0	0.9	0	0.1	0	0.1	0	0.9
15	54.4	48.9	0	1.0	0	1.0	0	0.1	0	0.1	0	1.0
16	54.0	48.2	0	1.0	0	1.0	0	0.1	-718	0.1	0	1.0
17	53.0	47.3	0	0.8	0	0.8	0	0.1	-1,133	0.1	0	0.8
18	51.4	46.3	0	0.4	0	0.4	0	0.1	-1,355	0.1	0	0.4
19	49.3	45.4	0	0.1	0	0.0	0	0.0	-1,738	0.0	0	0.0
20	47.0	43.5	0	0.0	0	0.0	0	0.0	-2,262	0.0	0	0.0
21	44.5	41.5	0	0.0	0	0.0	0	0.0	-3,020	0.0	0	0.0
22	42.2	39.3	0	0.0	0	0.0	0	0.0	-3,634	0.0	0	0.0
23	40.1	37.6	0	0.0	0	0.0	0	0.0	-4,114	0.0	0	0.0
24	38.5	36.2	0	0.0	0	0.0	0	0.0	-4,457	0.0	0	0.0

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M358, BASELINE

---------- M O N T H L Y E N E R G Y C O N S U M P T I O N ----------

Month	ELEC On Peak (kWh)	DEMAND On Peak (kW)	GAS On Peak (Therm)	GAS DMND On Peak (Thrm/hr)
Jan	12,176	49	41	1
Feb	11,109	49	45	1
March	12,471	49	1	0
April	11,097	50	0	0
May	21,829	104	0	0
June	25,614	112	0	0
July	23,633	110	0	0
Aug	25,633	111	0	0
Sept	20,978	108	0	0
Oct	17,746	94	0	0
Nov	11,027	49	0	0
Dec	11,271	49	10	0
Total	204,585	112	97	1

Building Energy Consumption = 43,947 (Btu/Sq Ft/Year)
Source Energy Consumption = 130,677 (Btu/Sq Ft/Year)

Floor Area = 16,110 (Sq Ft)

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M358, BASELINE

EQUIPMENT ENERGY CONSUMPTION

Ref Num	Equip Code	Monthly Consumption Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	7457	6745	8053	7121	7755	7717	7159	8053	7121	7755	7121	7159	89,217
	PK	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2
1	MISC LD													
	ELEC	3548	3209	3832	3388	3690	3671	3406	3832	3388	3690	3388	3406	42,448
	PK	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3
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.
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	EQ1121S	AIR-CLD RECIP 20-35 TONS												
	ELEC	0	0	0	0	3809	5798	5366	5659	4041	2220	0	0	26,893
	PK	0.0	0.0	0.0	0.0	25.7	31.4	30.4	30.5	28.0	18.0	0.0	0.0	31.4
1	EQ5200	CONDENSER FANS												
	ELEC	0	0	0	0	449	733	686	715	499	204	0	0	3,285
	PK	0.0	0.0	0.0	0.0	3.1	3.5	3.5	3.5	3.3	2.5	0.0	0.0	3.5
1	EQ5001	CHILLED WATER PUMP C.V.												
	ELEC	0	0	0	0	1182	1449	1355	1355	1058	527	0	0	6,925
	PK	0.0	0.0	0.0	0.0	2.3	2.3	2.3	2.3	2.3	2.3	0.0	0.0	2.3
1	EQ5313	CONTROLS												
	ELEC	0	0	0	0	154	189	177	177	138	69	0	0	903
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3
2	EQ1161	AIR-CLD COND COMP <15 TONS												
	ELEC	0	0	0	0	446	756	692	726	516	242	0	0	3,378
	PK	0.0	0.0	0.0	0.0	3.6	3.9	3.8	3.8	3.7	3.3	0.0	0.0	3.9

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M358, BASELINE

2	EQ5200	CONDENSER FANS											
	ELEC	0	0	0	0	42	75	70	72	50	17	0	0	326
	PK	0.0	0.0	0.0	0.0	0.3	0.4	0.3	0.4	0.3	0.2	0.0	0.0	0.4
2	EQ5303	CONTROLS											
	ELEC	0	0	0	0	123	171	164	163	141	55	0	0	817
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3
3	EQ1161	AIR-CLD COND COMP <15 TONS											
	ELEC	222	204	269	258	301	332	303	329	277	267	234	219	3,215
	PK	1.3	1.3	1.3	1.4	1.5	1.6	1.6	1.6	1.5	1.4	1.3	1.3	1.6
3	EQ5200	CONDENSER FANS											
	ELEC	10	8	14	18	26	33	30	32	26	17	14	11	240
	PK	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2
3	EQ5303	CONTROLS											
	ELEC	103	96	160	198	223	216	223	223	216	193	156	110	2,118
	PK	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
1	EQ4003	FC CENTRIF. FAN C.V.											
	ELEC	253	291	2	0	2120	2955	2604	2829	2318	1644	0	44	15,060
	PK	4.7	3.7	0.5	0.0	13.8	13.7	13.3	13.5	13.7	12.3	0.1	3.2	13.8
2	EQ4003	FC CENTRIF. FAN C.V.											
	ELEC	0	0	0	0	1115	1000	920	969	784	569	0	0	5,357
	PK	0.0	0.0	0.0	0.0	4.8	4.8	4.7	4.7	4.5	4.1	0.0	0.0	4.8
3	EQ4003	FC CENTRIF. FAN C.V.											
	ELEC	72	66	4	0	275	404	361	380	291	159	0	32	2,044
	PK	0.6	0.6	0.4	0.0	1.9	1.9	1.8	1.8	1.8	1.5	0.0	0.5	1.9
4	HIEFF-FC	HIGH EFFICIENCY FAN COIL											
	ELEC	119	107	119	115	119	115	119	119	115	119	115	119	1,397
	PK	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
1	EQ2001	GAS FIRE TUBE HOT WATER											
	GAS	41	45	1	0	0	0	0	0	0	0	0	10	97
	PK	0.7	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.7
1	EQ5020	HEAT WATER CIRC. PUMP C.V.											
	ELEC	275	269	13	0	0	0	0	0	0	0	0	120	677
	PK	1.6	1.6	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	1.6
1	EQ5240	BOILER FORCED DRAFT FAN											
	ELEC	30	29	1	0	0	0	0	0	0	0	0	13	74
	PK	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2
1	EQ5307	BOILER CONTROLS											
	ELEC	86	84	4	0	0	0	0	0	0	0	0	38	212
	PK	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5

UTILITY PEAK CHECKSUMS - ALTERNATIVE 1
BLDG M358, BASELINE

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 112.1 (kW)
Yearly Time of Peak 15 (hr) 6 (mo)

Hour 15 Month 6

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Percnt Of Tot (%)
Cooling Equipment				
1	EQ1121S	AIR-CLD RECIP 20-35 TONS	37.5	33.40
2	EQ1161	AIR-CLD COND COMP <15 TONS	4.6	4.09
3	EQ1161	AIR-CLD COND COMP <15 TONS	2.1	1.86
Sub Total			44.1	39.35
Sub Total			0.0	0.00
Air Moving Equipment				
1		SUMMATION OF FAN ELECTRICAL DEMAND	13.7	12.26
2		SUMMATION OF FAN ELECTRICAL DEMAND	4.6	4.14
3		SUMMATION OF FAN ELECTRICAL DEMAND	1.9	1.69
4		SUMMATION OF FAN ELECTRICAL DEMAND	0.2	0.14
Sub Total			20.5	18.24
Sub Total			0.0	0.00
Miscellaneous				
Lights			32.2	28.74
Base Utilities			0.0	0.00
Misc Equipment			15.3	13.67
Sub Total			47.5	42.41
Grand Total			112.1	100.00

CALIFORNIA TITLE 24 COMPLIANCE - ALTERNATIVE 1
BLDG M358, BASELINE

---------- CALIFORNIA TITLE 24 COMPLIANCE REPORT ----------

Weather Name ..... ATLANTA.
Gross Conditioned Floor Area (sqft)..... 16,110
ACM Multiplier 1.025

---------- E N E R G Y U S E S U M M A R Y ----------

	ELEC (kWh/yr)	GAS (kBtu/yr)	PERCENT OF TOTAL ENERGY (%)	TOTAL SOURCE ENERGY (kBtu/yr)	ADJUSTED UNIT SOURCE ENERGY (kBtu/yr-sf)
Primary Heating	285.2	9,738.3	1.5	13,171.0	0.8
Primary Cooling					
Compressor	33,486.5	0.0	16.1	342,902.2	21.8
Tower/Cond Fans	3,850.6	0.0	1.9	39,430.2	2.5
Condenser Pump	0.0	0.0	0.0	0.0	0.0
Other Accessories	3,838.2	0.0	1.9	39,303.2	2.5
Auxiliary					
Supply Fans	23,857.4	0.0	11.5	244,300.4	15.5
Circulation Pumps	7,602.1	0.0	3.7	77,845.6	5.0
Base Utilities	0.0	0.0	0.0	0.0	0.0
Subtotal	31,459.5	0.0	15.2	322,146.1	20.5
Lighting	89,217.2	0.0	43.0	913,585.9	56.7
Receptacle	42,447.8	0.0	20.5	434,666.1	27.0
Domestic Hot Water	0.0	0.0	0.0	0.0	0.0
Cogeneration	0.0	0.0	0.0	0.0	0.0
Totals	204,584.9	9,738.3	100.0	2,105,204.5	131.9

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M358, ECO#2

M O N T H L Y E N E R G Y C O N S U M P T I O N

Month	ELEC On Peak (kWh)	DEMAND On Peak (kW)	GAS On Peak (Therm)	GAS DMND On Peak (Thrm/hr)
Jan	12,984	49	152	1
Feb	11,773	49	138	1
March	12,870	49	35	1
April	11,097	50	0	0
May	20,494	107	0	0
June	25,929	113	0	0
July	23,779	111	0	0
Aug	25,723	111	0	0
Sept	20,932	110	0	0
Oct	18,131	96	0	0
Nov	11,151	49	10	1
Dec	11,836	49	75	1
Total	206,699	113	411	1

Building Energy Consumption = 46,339 (Btu/Sq Ft/Year)
Source Energy Consumption = 134,067 (Btu/Sq Ft/Year)

Floor Area = 16,110 (Sq Ft)

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M358, ECO#2

EQUIPMENT ENERGY CONSUMPTION

Ref Num	Equip Code	Monthly Consumption Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	7457	6745	8053	7121	7755	7717	7159	8053	7121	7755	7121	7159	89,217
	PK	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2
1	MISC LD													
	ELEC	3548	3209	3832	3388	3690	3671	3406	3832	3388	3690	3388	3406	42,448
	PK	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3
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	EQ1121S	AIR-CLD RECIP 20-35 TONS												
	ELEC	0	0	0	0	3267	6041	5470	5783	4047	1970	0	0	26,577
	PK	0.0	0.0	0.0	0.0	27.0	31.6	30.4	30.5	29.6	19.0	0.0	0.0	31.6
1	EQ5200	CONDENSER FANS												
	ELEC	0	0	0	0	404	763	701	732	502	184	0	0	3,285
	PK	0.0	0.0	0.0	0.0	3.2	3.5	3.5	3.5	3.4	2.6	0.0	0.0	3.5
1	EQ5001	CHILLED WATER PUMP C.V.												
	ELEC	0	0	0	0	895	1311	1283	1212	1035	455	0	0	6,192
	PK	0.0	0.0	0.0	0.0	2.3	2.3	2.3	2.3	2.3	2.3	0.0	0.0	2.3
1	EQ5313	CONTROLS												
	ELEC	0	0	0	0	117	171	167	158	135	59	0	0	808
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3
2	EQ1161	AIR-CLD COND COMP <15 TONS												
	ELEC	0	0	0	0	433	774	699	733	512	218	0	0	3,368
	PK	0.0	0.0	0.0	0.0	3.7	4.0	3.9	3.9	3.8	3.3	0.0	0.0	4.0

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M358, ECO#2

2	EQ5200		CONDENSER FANS										
	ELEC	0	0	0	0	41	77	71	73	50	16	0	0	327
	PK	0.0	0.0	0.0	0.0	0.3	0.4	0.4	0.4	0.3	0.2	0.0	0.0	0.4
2	EQ5303		CONTROLS										
	ELEC	0	0	0	0	114	163	164	163	123	50	0	0	777
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3
3	EQ1161		AIR-CLD COND COMP <15 TONS										
	ELEC	222	204	269	258	301	332	303	329	277	267	234	219	3,215
	PK	1.3	1.3	1.3	1.4	1.5	1.6	1.6	1.6	1.5	1.4	1.3	1.3	1.6
3	EQ5200		CONDENSER FANS										
	ELEC	10	8	14	18	26	33	30	32	26	17	14	11	240
	PK	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2
3	EQ5303		CONTROLS										
	ELEC	103	96	160	198	223	216	223	223	216	193	156	110	2,118
	PK	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
1	EQ4003		FC CENTRIF. FAN C.V.										
	ELEC	651	683	208	0	2058	3147	2722	2956	2352	2444	62	406	17,690
	PK	5.3	5.2	3.5	0.0	13.8	13.8	13.8	13.8	13.8	13.8	3.0	4.2	13.8
2	EQ4003		FC CENTRIF. FAN C.V.										
	ELEC	159	81	0	0	795	999	909	954	754	496	0	10	5,158
	PK	1.9	1.9	0.0	0.0	4.8	4.8	4.8	4.8	4.6	4.1	0.0	1.5	4.8
3	EQ4003		FC CENTRIF. FAN C.V.										
	ELEC	100	90	20	0	257	400	352	371	280	198	6	64	2,138
	PK	0.7	0.7	0.5	0.0	1.9	1.9	1.8	1.9	1.8	1.9	0.4	0.5	1.9
4	HIEFF-FC		HIGH EFFICIENCY FAN COIL										
	ELEC	119	107	119	115	119	115	119	119	115	119	115	119	1,397
	PK	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
1	EQ2001		GAS FIRE TUBE HOT WATER										
	GAS	152	138	35	0	0	0	0	0	0	0	10	75	411
	PK	1.2	1.2	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1.0	1.2
1	EQ5020		HEAT WATER CIRC. PUMP C.V.										
	ELEC	424	379	134	0	0	0	0	0	0	0	38	229	1,205
	PK	1.6	1.6	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	1.6	1.6
1	EQ5240		BOILER FORCED DRAFT FAN										
	ELEC	58	52	18	0	0	0	0	0	0	0	5	31	164
	PK	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2
1	EQ5307		BOILER CONTROLS										
	ELEC	133	118	42	0	0	0	0	0	0	0	12	72	376
	PK	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5	0.5

UTILITY PEAK CHECKSUMS - ALTERNATIVE 1
BLDG M358, ECO#2

---------- 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 112.6 (kW)
Yearly Time of Peak 15 (hr) 6 (mo)

Hour 15 Month 6

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Percnt Of Tot (%)
Cooling Equipment				
1	EQ1121S	AIR-CLD RECIP 20-35 TONS	37.7	33.47
2	EQ1161	AIR-CLD COND COMP <15 TONS	4.7	4.17
3	EQ1161	AIR-CLD COND COMP <15 TONS	2.1	1.85
Sub Total			44.5	39.49
Sub Total			0.0	0.00
Air Moving Equipment				
1		SUMMATION OF FAN ELECTRICAL DEMAND	13.8	12.22
2		SUMMATION OF FAN ELECTRICAL DEMAND	4.8	4.23
3		SUMMATION OF FAN ELECTRICAL DEMAND	1.9	1.69
4		SUMMATION OF FAN ELECTRICAL DEMAND	0.2	0.14
Sub Total			20.6	18.28
Sub Total			0.0	0.00
Miscellaneous				
Lights			32.2	28.61
Base Utilities			0.0	0.00
Misc Equipment			15.3	13.61
Sub Total			47.5	42.23
Grand Total			112.6	100.00

CALIFORNIA TITLE 24 COMPLIANCE - ALTERNATIVE 1
BLDG M358, ECO#2

CALIFORNIA TITLE 24 COMPLIANCE REPORT

Weather Name ..... ATLANTA.
Gross Conditioned Floor Area (sqft)..... 16,110
ACM Multiplier 1.025

E N E R G Y U S E S U M M A R Y

	ELEC (kWh/yr)	GAS (kBtu/yr)	PERCENT OF TOTAL ENERGY (%)	TOTAL SOURCE ENERGY (kBtu/yr)	ADJUSTED UNIT SOURCE ENERGY (kBtu/yr-sf)
Primary Heating	540.6	41,051.7	5.7	48,747.6	3.1
Primary Cooling					
Compressor	33,160.9	0.0	15.2	339,568.5	21.6
Tower/Cond Fans	3,851.9	0.0	1.8	39,444.0	2.5
Condenser Pump	0.0	0.0	0.0	0.0	0.0
Other Accessories	3,702.3	0.0	1.7	37,911.6	2.4
Auxiliary					
Supply Fans	26,382.5	0.0	12.1	270,157.1	17.2
Circulation Pumps	7,396.4	0.0	3.4	75,739.3	4.8
Base Utilities	0.0	0.0	0.0	0.0	0.0
Subtotal	33,778.9	0.0	15.4	345,896.4	22.0
Lighting	89,217.2	0.0	40.8	913,585.9	56.7
Receptacle	42,447.8	0.0	19.4	434,666.1	27.0
Domestic Hot Water	0.0	0.0	0.0	0.0	0.0
Cogeneration	0.0	0.0	0.0	0.0	0.0
Totals	206,699.5	41,051.7	100.0	2,159,820.0	135.3

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M358, ECO#3

M O N T H L Y E N E R G Y C O N S U M P T I O N

Month	ELEC On Peak (kWh)	DEMAND On Peak (kW)	GAS On Peak (Therm)	GAS DMND On Peak (Thrm/hr)
Jan	12,176	49	41	1
Feb	11,109	49	45	1
March	12,471	49	1	0
April	11,097	50	0	0
May	21,836	104	0	0
June	25,614	112	0	0
July	23,633	110	0	0
Aug	25,633	111	0	0
Sept	20,978	108	0	0
Oct	17,746	94	0	0
Nov	11,027	49	0	0
Dec	11,271	49	10	0
Total	204,591	112	97	1

Building Energy Consumption = 43,949 (Btu/Sq Ft/Year)
Source Energy Consumption = 130,681 (Btu/Sq Ft/Year)

Floor Area = 16,110 (Sq Ft)

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M358, ECO#3

EQUIPMENT ENERGY CONSUMPTION

Ref Num	Equip Code	Monthly Consumption Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	7457	6745	8053	7121	7755	7717	7159	8053	7121	7755	7121	7159	89,217
	PK	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2
1	MISC LD													
	ELEC	3548	3209	3832	3388	3690	3671	3406	3832	3388	3690	3388	3406	42,448
	PK	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3
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
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	EQ1121S	AIR-CLD RECIP 20-35 TONS												
	ELEC	0	0	0	0	3812	5798	5365	5659	4041	2221	0	0	26,896
	PK	0.0	0.0	0.0	0.0	25.7	31.4	30.4	30.5	28.0	18.0	0.0	0.0	31.4
1	EQ5200	CONDENSER FANS												
	ELEC	0	0	0	0	449	733	686	715	499	204	0	0	3,285
	PK	0.0	0.0	0.0	0.0	3.0	3.5	3.5	3.5	3.3	2.5	0.0	0.0	3.5
1	EQ5001	CHILLED WATER PUMP C.V.												
	ELEC	0	0	0	0	1182	1449	1355	1355	1058	527	0	0	6,925
	PK	0.0	0.0	0.0	0.0	2.3	2.3	2.3	2.3	2.3	2.3	0.0	0.0	2.3
1	EQ5313	CONTROLS												
	ELEC	0	0	0	0	154	189	177	177	138	69	0	0	903
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3
2	EQ1161	AIR-CLD COND COMP <15 TONS												
	ELEC	0	0	0	0	446	756	692	726	516	242	0	0	3,379
	PK	0.0	0.0	0.0	0.0	3.6	3.9	3.8	3.8	3.7	3.3	0.0	0.0	3.9

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M358, ECO#3

2	EQ5200	CONDENSER FANS											
	ELEC	0	0	0	0	42	75	70	72	50	17	0	0	326
	PK	0.0	0.0	0.0	0.0	0.3	0.4	0.3	0.4	0.3	0.2	0.0	0.0	0.4
2	EQ5303	CONTROLS											
	ELEC	0	0	0	0	123	171	164	163	141	55	0	0	817
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3
3	EQ1161	AIR-CLD COND COMP <15 TONS											
	ELEC	222	204	269	258	301	332	303	329	277	267	234	219	3,215
	PK	1.3	1.3	1.3	1.4	1.5	1.6	1.6	1.6	1.5	1.4	1.3	1.3	1.6
3	EQ5200	CONDENSER FANS											
	ELEC	10	8	14	18	26	33	30	32	26	17	14	11	240
	PK	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2
3	EQ5303	CONTROLS											
	ELEC	103	96	160	198	223	216	223	223	216	193	156	110	2,118
	PK	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
1	EQ4003	FC CENTRIF. FAN C.V.											
	ELEC	253	291	2	0	2120	2955	2604	2829	2318	1644	0	43	15,060
	PK	4.7	3.7	0.5	0.0	13.8	13.7	13.3	13.5	13.7	12.3	0.0	3.2	13.8
2	EQ4003	FC CENTRIF. FAN C.V.											
	ELEC	0	0	0	0	1118	1000	920	969	784	569	0	0	5,360
	PK	0.0	0.0	0.0	0.0	4.8	4.8	4.7	4.7	4.5	4.1	0.0	0.0	4.8
3	EQ4003	FC CENTRIF. FAN C.V.											
	ELEC	72	66	4	0	274	404	361	380	291	159	0	32	2,044
	PK	0.6	0.6	0.4	0.0	1.9	1.9	1.8	1.8	1.8	1.5	0.0	0.5	1.9
4	HIEFF-FC	HIGH EFFICIENCY FAN COIL											
	ELEC	119	107	119	115	119	115	119	119	115	119	115	119	1,397
	PK	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
1	EQ2001	GAS FIRE TUBE HOT WATER											
	GAS	41	45	1	0	0	0	0	0	0	0	0	10	97
	PK	0.7	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.7
1	EQ5020	HEAT WATER CIRC. PUMP C.V.											
	ELEC	275	269	13	0	0	0	0	0	0	0	0	120	677
	PK	1.6	1.6	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	1.6
1	EQ5240	BOILER FORCED DRAFT FAN											
	ELEC	30	29	1	0	0	0	0	0	0	0	0	13	74
	PK	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2
1	EQ5307	BOILER CONTROLS											
	ELEC	86	84	4	0	0	0	0	0	0	0	0	38	212
	PK	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5

UTILITY PEAK CHECKSUMS - ALTERNATIVE 1
BLDG M358, ECO#3

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 112.1 (kW)
Yearly Time of Peak 15 (hr) 6 (mo)

Hour 15 Month 6

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Percnt Of Tot (%)
Cooling Equipment				
1	EQ1121S	AIR-CLD RECIP 20-35 TONS	37.5	33.40
2	EQ1161	AIR-CLD COND COMP <15 TONS	4.6	4.08
3	EQ1161	AIR-CLD COND COMP <15 TONS	2.1	1.86
Sub Total			44.1	39.35
Sub Total			0.0	0.00
Air Moving Equipment				
1		SUMMATION OF FAN ELECTRICAL DEMAND	13.7	12.26
2		SUMMATION OF FAN ELECTRICAL DEMAND	4.6	4.14
3		SUMMATION OF FAN ELECTRICAL DEMAND	1.9	1.69
4		SUMMATION OF FAN ELECTRICAL DEMAND	0.2	0.14
Sub Total			20.5	18.24
Sub Total			0.0	0.00
Miscellaneous				
Lights			32.2	28.74
Base Utilities			0.0	0.00
Misc Equipment			15.3	13.67
Sub Total			47.5	42.41
Grand Total			112.1	100.00

CALIFORNIA TITLE 24 COMPLIANCE - ALTERNATIVE 1
BLDG M358, ECO#3

CALIFORNIA TITLE 24 COMPLIANCE REPORT

Weather Name ..... ATLANTA.
Gross Conditioned Floor Area (sqft)..... 16,110
ACM Multiplier 1.025

E N E R G Y U S E S U M M A R Y

	ELEC (kWh/yr)	GAS (kBtu/yr)	PERCENT OF TOTAL ENERGY (%)	TOTAL SOURCE ENERGY (kBtu/yr)	ADJUSTED UNIT SOURCE ENERGY (kBtu/yr-sf)
Primary Heating	285.2	9,740.7	1.5	13,173.5	0.8
Primary Cooling					
Compressor	33,489.8	0.0	16.1	342,936.1	21.8
Tower/Cond Fans	3,850.8	0.0	1.9	39,432.0	2.5
Condenser Pump	0.0	0.0	0.0	0.0	0.0
Other Accessories	3,838.2	0.0	1.9	39,303.2	2.5
Auxiliary					
Supply Fans	23,860.4	0.0	11.5	244,331.1	15.5
Circulation Pumps	7,602.1	0.0	3.7	77,845.6	5.0
Base Utilities	0.0	0.0	0.0	0.0	0.0
Subtotal	31,462.5	0.0	15.2	322,176.7	20.5
Lighting	89,217.2	0.0	43.0	913,585.9	56.7
Receptacle	42,447.8	0.0	20.5	434,666.1	27.0
Domestic Hot Water	0.0	0.0	0.0	0.0	0.0
Cogeneration	0.0	0.0	0.0	0.0	0.0
Totals	204,591.3	9,740.7	100.0	2,105,273.5	131.9

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M358, ECO#12

M O N T H L Y E N E R G Y C O N S U M P T I O N

Month	ELEC On Peak (kWh)	DEMAND On Peak (kW)	GAS On Peak (Therm)	GAS DMND On Peak (Thrm/hr)
Jan	11,506	56	16	2
Feb	10,386	56	12	2
March	12,279	49	0	0
April	10,875	50	0	0
May	18,537	91	0	0
June	19,544	98	0	0
July	17,676	96	0	0
Aug	19,792	96	0	0
Sept	16,182	95	0	0
Oct	15,214	89	0	0
Nov	10,817	49	0	0
Dec	10,887	49	2	1
Total	173,695	98	29	2

Building Energy Consumption = 36,981 (Btu/Sq Ft/Year)
Source Energy Consumption = 110,598 (Btu/Sq Ft/Year)

Floor Area = 16,110 (Sq Ft)

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M358, ECO#12

EQUIPMENT ENERGY CONSUMPTION

Ref Num	Equip Code	Monthly Consumption Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	7457	6745	8053	7121	7755	7717	7159	8053	7121	7755	7121	7159	89,217
	PK	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2
1	MISC LD													
	ELEC	3548	3209	3832	3388	3690	3671	3406	3832	3388	3690	3388	3406	42,448
	PK	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3
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	EQ1121S	AIR-CLD RECIP 20-35 TONS												
	ELEC	0	0	0	0	2451	2507	2076	2303	1547	875	0	0	11,759
	PK	0.0	0.0	0.0	0.0	19.4	20.4	18.8	19.2	18.6	13.5	0.0	0.0	20.4
1	EQ5200	CONDENSER FANS												
	ELEC	0	0	0	0	291	338	285	313	208	87	0	0	1,522
	PK	0.0	0.0	0.0	0.0	2.5	3.5	2.4	2.4	2.4	1.9	0.0	0.0	3.5
1	EQ5001	CHILLED WATER PUMP C.V.												
	ELEC	0	0	0	0	607	566	483	538	442	297	0	0	2,933
	PK	0.0	0.0	0.0	0.0	2.3	2.3	2.3	2.3	2.3	2.3	0.0	0.0	2.3
1	EQ5313	CONTROLS												
	ELEC	0	0	0	0	79	74	63	70	58	39	0	0	382
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3
2	EQ1161	AIR-CLD COND COMP <15 TONS												
	ELEC	0	0	0	0	110	307	267	261	134	34	0	0	1,113
	PK	0.0	0.0	0.0	0.0	2.4	2.8	2.7	2.7	2.6	2.3	0.0	0.0	2.8

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M358, ECO#12

2	EQ5200		CONDENSER FANS										
	ELEC	0	0	0	0	12	31	27	27	14	3	0	0	113
	PK	0.0	0.0	0.0	0.0	0.2	0.3	0.2	0.2	0.2	0.2	0.0	0.0	0.3
2	EQ5303		CONTROLS										
	ELEC	0	0	0	0	27	56	48	50	29	15	0	0	225
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3
3	EQ1161		AIR-CLD COND COMP <15 TONS										
	ELEC	209	192	254	239	257	286	254	284	233	224	195	185	2,813
	PK	1.3	1.3	1.3	1.4	1.5	1.6	1.6	1.6	1.5	1.4	1.3	1.3	1.6
3	EQ5200		CONDENSER FANS										
	ELEC	9	8	14	17	22	28	25	28	21	15	12	9	207
	PK	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2
3	EQ5303		CONTROLS										
	ELEC	68	62	83	72	79	79	72	83	72	71	64	58	863
	PK	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
1	EQ4003		FC CENTRIF. FAN C.V.										
	ELEC	110	83	0	0	1695	2402	2171	2462	1826	1322	0	9	12,080
	PK	13.8	13.8	0.0	0.0	12.7	13.2	13.5	13.1	12.6	13.0	0.0	3.0	13.8
2	EQ4003		FC CENTRIF. FAN C.V.										
	ELEC	0	0	0	0	1258	1105	1011	1142	880	653	0	0	6,049
	PK	4.8	0.0	0.0	0.0	4.8	4.7	4.6	4.8	4.6	4.6	0.0	0.0	4.8
3	EQ4003		FC CENTRIF. FAN C.V.										
	ELEC	28	23	0	0	161	335	289	302	172	92	0	9	1,
	PK	1.9	1.9	0.0	0.0	1.8	1.9	1.9	1.8	1.8	1.9	0.0	1.9	1.9
4	HIEFF-FC		HIGH EFFICIENCY FAN COIL										
	ELEC	40	36	44	38	42	42	38	44	38	42	38	38	482
	PK	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
1	EQ2001		GAS FIRE TUBE HOT WATER										
	GAS	16	12	0	0	0	0	0	0	0	0	0	2	29
	PK	2.3	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	2.3
1	EQ5020		HEAT WATER CIRC. PUMP C.V.										
	ELEC	26	19	0	0	0	0	0	0	0	0	0	10	54
	PK	1.6	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	1.6
1	EQ5240		BOILER FORCED DRAFT FAN										
	ELEC	3	2	0	0	0	0	0	0	0	0	0	1	7
	PK	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2
1	EQ5307		BOILER CONTROLS										
	ELEC	8	6	0	0	0	0	0	0	0	0	0	3	17
	PK	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5

UTILITY PEAK CHECKSUMS - ALTERNATIVE 1
BLDG M358, ECO#12

---------- 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 98.5 (kW)
Yearly Time of Peak 15 (hr) 6 (mo)

Hour 15 Month 6

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Percnt Of Tot (%)
Cooling Equipment				
1	EQ1121S	AIR-CLD RECIP 20-35 TONS	26.4	26.84
2	EQ1161	AIR-CLD COND COMP <15 TONS	3.3	3.40
3	EQ1161	AIR-CLD COND COMP <15 TONS	2.1	2.11
Sub Total			31.9	32.35
Sub Total			0.0	0.00
Air Moving Equipment				
1		SUMMATION OF FAN ELECTRICAL DEMAND	12.6	12.76
2		SUMMATION OF FAN ELECTRICAL DEMAND	4.5	4.61
3		SUMMATION OF FAN ELECTRICAL DEMAND	1.8	1.84
4		SUMMATION OF FAN ELECTRICAL DEMAND	0.2	0.16
Sub Total			19.1	19.38
Sub Total			0.0	0.00
Miscellaneous				
Lights			32.2	32.71
Base Utilities			0.0	0.00
Misc Equipment			15.3	15.56
Sub Total			47.5	48.27
Grand Total			98.5	100.00

CALIFORNIA TITLE 24 COMPLIANCE - ALTERNATIVE 1
BLDG M358, ECO#12

CALIFORNIA TITLE 24 COMPLIANCE REPORT

Weather Name ..... ATLANTA.
Gross Conditioned Floor Area (sqft)..... 16,110
ACM Multiplier 1.025

E N E R G Y U S E S U M M A R Y

	ELEC (kWh/yr)	GAS (kBtu/yr)	PERCENT OF TOTAL ENERGY (%)	TOTAL SOURCE ENERGY (kBtu/yr)	ADJUSTED UNIT SOURCE ENERGY (kBtu/yr-sf)
Primary Heating	23.5	2,938.0	0.5	3,333.7	0.2
Primary Cooling					
Compressor	15,685.0	0.0	9.0	160,614.4	10.2
Tower/Cond Fans	1,841.9	0.0	1.1	18,860.9	1.2
Condenser Pump	0.0	0.0	0.0	0.0	0.0
Other Accessories	1,470.6	0.0	0.8	15,059.0	1.0
Auxiliary					
Supply Fans	20,022.1	0.0	11.5	205,026.4	13.0
Circulation Pumps	2,986.9	0.0	1.7	30,585.9	1.9
Base Utilities	0.0	0.0	0.0	0.0	0.0
Subtotal	23,009.0	0.0	13.2	235,612.4	15.0
Lighting	89,217.2	0.0	51.1	913,585.9	56.7
Receptacle	42,447.8	0.0	24.3	434,666.1	27.0
Domestic Hot Water	0.0	0.0	0.0	0.0	0.0
Cogeneration	0.0	0.0	0.0	0.0	0.0
Totals	173,694.9	2,938.0	100.0	1,781,732.2	111.3

BUILDING 500

E M C ENGINEERS, INC.

PROJECT: FORT McPHERSON & FORT GILLEM ESOS STUDY
LOCATION: FORT McPHERSON
ECO: Computer Simulation Summary

CLIENT CONTRACT NO: DACA21-91-C-0097
CLIENT PROJECT ENG: TERRY SEABROOK

EMC PROJECT: #3105.000
DATE: 10-APR-92
FILE: M500ECO.WK3
PREPARED BY: R. GERRANS
CHECKED BY:

Bldg: M500 **Area: 27,466 ft^2**

Run Description	Heating Gas Use (kBtu/yr)	Heating Electric Use (kWh/yr)	Cooling Electric Use (kWh/yr)	Fan Electric Use (kWh/yr)	Pump Electric Use (kWh/yr)	Lighting Electric Use (kWh/yr)	Recept. Electric Use (kWh/yr)	Total Electric Use (kWh/yr)	Peak Electric Demand (kW)	Total Gas Use (MBtu/yr)	Total Energy Use (Mbtu/yr)
Baseline	522,953	2,949	72,756	244,089	33,103	60,842	142,768	556,507	159	523	2,422
ECO#2	542,100	3,015	72,788	244,089	33,103	60,842	142,768	556,606	161	542	2,441
Savings/(Loss)	(19,148)	(66)	(33)	0	0	0	0	(99)	(2)	(19)	(19)
ECO#3	523,838	2,952	72,771	244,089	33,103	60,842	142,768	556,526	161	524	2,423
Savings/(Loss)	(886)	(3)	(16)	0	0	0	0	(19)	(2)	(1)	(1)
ECO#7	144,716	1,073	63,409	244,089	10,647	60,842	142,768	522,828	159	145	1,929
Savings/(Loss)	378,236	1,876	9,347	0	22,456	0	0	33,679	0	378	493
ECO#12	109,736	1,030	52,295	115,273	10,302	60,842	142,768	382,510	155	110	1,415
Savings/(Loss)	413,217	1,919	20,460	128,816	22,801	0	0	173,997	4	413	1,007
ECO#13	522,953	2,949	85,878	244,089	33,103	60,842	142,768	569,629	113	523	2,467
Savings/(Loss)	0	0	(13,122)	0	0	0	0	(13,122)	46	0	(45)

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB 3105 000
SHEET NO. 1 OF
CALCULATED BY RMK DATE 3/2/92
CHECKED BY DATE
SCALE

Computer Simulation Bldg 500 - Baseline
Bldg Type: Frame/Brick Club Area: 22,917 ft²
ECO: 12, 13 For Take off: 2,3
Take off Bldg: 155

Assumptions

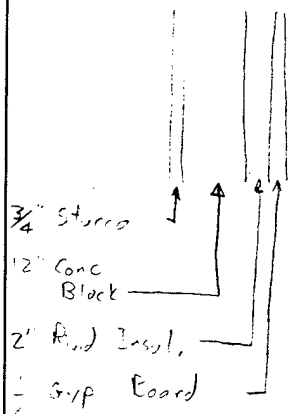
- Heating db = 72°F
- Cooling db = 76 °F
- Occupancy: 100 people - max normal
- Equipment: 1st floor: 7.5 Btuh/ft²
  2nd floor: 2.5 Btuh/ft²
- Lights: 100 % on during occupancy
- Did not include gas for boiler to heat water for domestic hot water loads

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB 3105.000
SHEET NO. 2 OF
CALCULATED BY RMM DATE 3/2/92
CHECKED BY DATE
SCALE

Comp Sim Bldg - 500

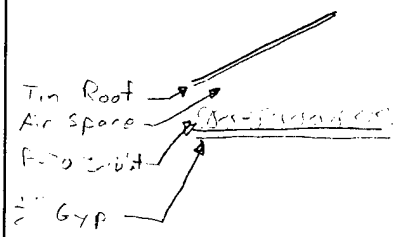
Wall U-Value ASHRAE Table F 22.4



Material	R-Value
Outside Surface (15 mph wind)	0.17
3/4" Stucco	0.15
12" Conc Block	1.23
2" Rigid Insul.	6.0
1/2" Gyp Board	0.45
Inside Surface (still Air)	0.68
	8.68

$U = \frac{1}{R} = \frac{1}{8.68} = \boxed{0.12}$

Roof U-Value - ASHRAE Table F 22.4



Material	R-Value
Outside Air (15 mph wind)	0.17
Tin Roof	0.1
Air Space	1.24
R-30 Insulation	30.0
1/2" Gyp. Board	0.45
Inside Surface (still Air)	0.68
	32.64

$U = \frac{1}{32.64} = \boxed{0.03}$

Slab Perimeter Coefficient - ASHRAE Table F 25.5

$F_2 = \boxed{0.62}$ Btuh / F-ft

Window U-Value ASHRAE Table F 27.13

- Single Pane, fixed, Al	1.10
- Double, sliding, Al	0.70
- Double, fixed Al	0.65
- Double, fixed, wood	0.55
- Single, sliding, wood	0.90
- Single, fixed, wood	0.90

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB 3105000
SHEET NO. 3 OF
CALCULATED BY [signature] DATE 3/2/92
CHECKED BY DATE
SCALE

Comp Sim Bldg 500

Window Internal shading coefficient - ASHRAE Table 27.25, 26

- Double, clear, fixed 0.53
- Double, opaque 0.35
- Double, clear, shutters 0.62
- Single, opaque 0.39
- Single shutters 0.74

Lights - field survey

- Room 1 : 12,205 W
- Room 2 : 7,664 W
- Assume 100% on during occupancy

People

- Assume 100 people
  - Rm 1: 60
  - Rm 2: 40

Misc Equip

Rm 1: Assume 7.5 Btu/ft² - kitchen + serving areas
Rm 2: Assume 2.7 Btu/ft² - minimum office + ballroom

Airflows - from mech schedule

Rm 1

OA : 4,175 cfm

Rm 2

OA : 1975 cfm

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • Germany

JOB _____
SHEET NO. _____ OF _____
CALCULATED BY _____ DATE _____
CHECKED BY _____ DATE _____
SCALE _____

Computer Simulation — Bldg 500, McPherson

Baseline Conditions

Pumps

$$\text{DHW Pump} = \frac{(5\ \text{HP}) * (0.746\ \text{kW/HP}) / .80\ (\text{eff})}{0.933\ \text{eff}} = 3.8\ \text{kW} * 8{,}760\ \text{hr/yr} = \boxed{33{,}103}\ \text{kWh}$$

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB 3105.000

SHEET NO. 4 OF

CALCULATED BY RMM DATE 3/2/92

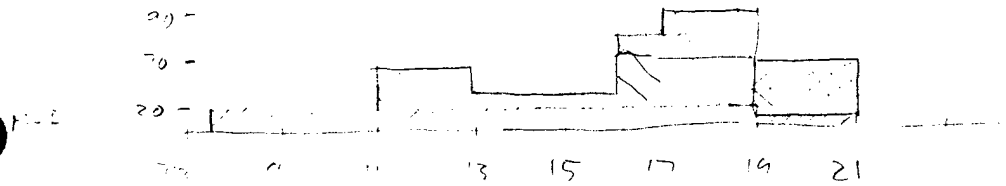
CHECKED BY DATE

SCALE

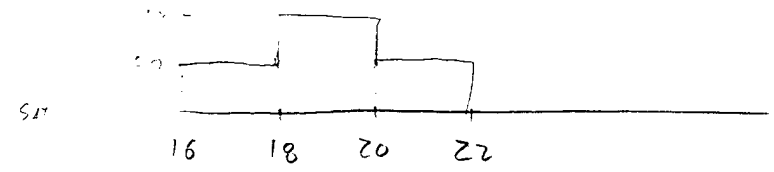
Comp Sim Bldg 500

People

Employees	M-F	07:30 - 18:00	20 people
Employees	M-TH	06:00 - 20:00	10
	F	06:00 - 23:00	
Service	M-F	11:00 - 19:00	50
	SUN	16:00 - 20:00	
Bar	M-TH	16:00 - 20:00	20
	F	16:00 - 23:00	
Pool	SAT	16:00 - 22:00	50-75 Avg. Max: 200



7:30 - 11:00	20
11:00 - 13:00	70
13:00 - 16:00	20
16:00 - 17:00	50
17:00 - 18:00	100
18:00 - 19:00	80
19:00 - 21:00	20



16:00 - 18:00	50
18:00 - 20:00	100
20:00 - 22:00	50

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB _____

SHEET NO. _____ OF _____

CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____

SCALE _____

Month	[illegible]	[illegible] Meter kW	[illegible]
[illegible]	36,600	38,040	42,033
[illegible]	43,320	41,080	38,148
MAR	35,760	34,560	41,532
APR	31,080	[illegible]	37,192
MAY	45,600	35,340	48,198
[illegible]	58,320	[illegible]	58,510
[illegible]	49,320	[illegible]	57,735
[illegible]	61,560	76,840	59,607
[illegible]	74,700	58,440	44,761
OCT	51,600	44,160	40,746
NOV	41,160	27,080	37,800
DEC	40,800	31,260	40,855
[illegible]	539,460	[illegible]	552,117

[illegible]	[illegible] Thermal kW	
JAN	3,591	1,451
FEB	4,682	1,325
MAR	2,460	529
APR	1,602	59
MAY	330	0
JUN	[illegible]	0
JUL	265	0
AUG	1,707	0
SEP	1,434	0
OCT	1,868	0
NOV	[illegible]	383
DEC	3,410	1,002
	28,786	4,749

- did not include DHW loads

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____
SHEET NO. _____ OF _____
CALCULATED BY _____ DATE _____
CHECKED BY _____ DATE _____
SCALE _____

Computer Simulation - Bldg 500, McPherson

ECO #2 - Insulated Glass

Window U-Values - ASHRAE F 27.13

- add 0.36 to all window U-Values
  - equivalent of changing from double to single pane wood

Window shading coefficient

- add 0.2 to all shading coefficient
  - equivalent to changing from double to single pane

Window Area = 640 ft²

- note: ΔU was negative ∴ losses were incurred. Converting losses to savings for take-off.

Electric Savings

Total Electric Savings = −99 kWh/yr

Electric Savings/ft² = 0.15 kWh/ft²

Demand Savings

Peak Demand Savings = 2 kW

Demand Savings/ft² = 3.1×10^{-3} kW/ft²

Gas Savings

Total Gas Savings = 19.0 MBtu/yr

Gas Savings/ft² = 0.030 MBtu/ft²

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____
SHEET NO. _____ OF _____
CALCULATED BY _____ DATE _____
CHECKED BY _____ DATE _____
SCALE _____

Computer Simulation - Bldg 500 McPherson

ECO #3 - Weatherstripping + Caulking

assume $\Delta Q = 10$ cfm / Rm

Rm 1+2

- present, infiltration = 0 cfm
- change, infiltration = 10 cfm

Rm 1

total infiltration increase = 20 cfm

- note: since ΔQ is an increase in cfm, losses were incured, losses will be treated as savings for takeoff

Electric Savings

Total Electric Savings = 19 kWh/yr
Electric Savings / cfm = 0.95 kWh/cfm

Demand Savings

Peak Demand Savings = 2 kW
Demand Savings / cfm = 0.10 kW/cfm

Gas Savings

Total Gas Savings = 0.89 MBtu/yr
Gas Savings / cfm = 0.044 MBtu/cfm

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • Germany

JOB

SHEET NO. OF

CALCULATED BY DATE

CHECKED BY DATE

SCALE

Computer Simulation — Bldg 500, McPherson

ECO # 7 – Control Pumps

- Circulation Pumps – CTW ⇒ yr round savings
  - Cycle with load
  - Install time clock
    - on: 06:00 - 21:00 M-F, 15:00 - 22:00 Sat; off otherwise
  - Usage: 11,257.0 kWh/yr – from Trace 600
- DHW Pump
  - 1/6 HP
  - Time clock; on 06:00 - 21:00 M-F, 15:00 - 22:00 Sat, off otherwise
    - ⇒ hrs off = 4,434 hrs
  - Savings = $\frac{(1/6\ HP)(0.746\ kW/HP)(0.80)(4434\ hrs)}{(0.764\ eff)}$ = [620] kWh/yr
- Combined Usage = 11,257.0 − 620 = 10,637 kWh/yr

Electrical Savings

Total Electrical Savings = [33,579] kWh/yr

Demand Savings

Peak Demand Savings = [0] kW

Gas Savings

Total Gas Savings = [378] MBtu/yr

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____

SHEET NO. _____ OF _____

CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____

SCALE _____

Computer Simulation Ridge 500, McPherson

ECO #12 - HVAC Control

- Setback thermostats, reset setpoints: 70°F - Heating 78°F cooling
- Turn off fans + Pumps: on: 06:00-21:00 M-F + 15:00-22:00 S.+, otherwise off
- Reset dock temperatures
- Circle pumps w/ load
- DHW pumps

Electric Savings

Total Electric Savings = [173,997] kWh/yr

Demand Savings

Peak Demand Savings = [4] kW

Gas Savings

Total Gas Savings = [413] MBtu/yr

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____
SHEET NO. _____ OF _____
CALCULATED BY _____ DATE _____
CHECKED BY _____ DATE _____
SCALE _____

Computer Simulation Bldg. 500, McPherson

ECO #13 - Thermal Storage

Discharge Tank : 12:00 - 18:00
Charge Tank : 00:00 - 06:00
Tank Capacity : 204 Ton Hrs - From TRACE 600 August Design Cooling
[illegible] 34 Tons for Use 35 Tons

Demand Savings

Chiller kw/ton = 1.064 kw/ton
Peak ton (Aug) = 43.5 ton
Demand Savings = 43.5 * 1.064 = 46.3 = **46** kw

Electrical Addition

Electrical Addition = **13,122** kwh/yr

01 Card - Job Information

Project: FT MCPHERSON & FT GILLEM EEAP
Location: FT MCPHERSON, BLDG 500
Program User: R. GERRANS

-----CARD 08-- Climatic Information

Weather Code	Summer Clearness Number	Winter Clearness Number	Summer Design Dry Bulb	Summer Design Wet Bulb	Winter Design Dry Bulb	Building Orientation	Summer Ground Reflect	Winter Ground Reflect
ATLANTA								

-----CARD 09-- Load Simulation Periods

1st Month Cooling Simulation	Last Month Cooling Simulation	Peak Cooling Load Hr	1st Month Summer Period	Last Month Summer Period	1st Month Daylight Savings	Last Month Daylight Savings
MAY	OCT					

---------- Load Section Alternative #1 ----------

---- Load Alternative ----

Number	Description
1	BLDG M500, BASELINE

-----CARD 20-- General Room Parameters

Room Number	Zone Reference Number	Room Descrip	Floor Length	Floor Width	Const Type	Plenum Height	Acoustic Ceiling Resistance	Floor to Floor Height	Duplicate Floors Multiplier	Duplicate Rooms per Zone	Perimeter Depth
1	1	1ST FLOOR	113	182		2		10			
2	2	2ND FLOOR	100	69		5		13			

-----CARD 21-- Thermostat Parameters

Room Number	Cooling Room Design DB	Room Design RH	Cooling T'stat Driftpoint	Cooling T'stat Schedule	Heating Room Design DB	Heating T'stat Driftpoint	Heating T'stat Schedule	T'stat Location Flag	Mass / No. Hrs Average	Carpet On Floor
1	76			CLG	72		HTG			
2	76			CLG	72		HTG			

-----CARD 22-- Roof Parameters ----------

Room Number	Roof Number	Roof Equal to Floor?	Roof Length	Roof Width	Roof U-Value	Const Type	Roof Direction	Roof Tilt	Roof Alpha
1	1	NO	113	113	.03	39			
2	1	YES			.03	39			

-----CARD 24-- Wall Parameters ----------

Room Number	Wall Number	Wall Length	Wall Height	Wall U-Value	Wall Constuc Type	Wall Direction	Wall Tilt	Wall Alpha	Ground Reflectance Multiplier
M1	1		10	.12	75				
1	1	93				0			
1	2	131	3			0			
1	3	100				270			
1	4	151				180			
1	5	53				90			
1	6	19				90			
1	7	63				180			
1	8	39				90			
M2	1		14						
2	1	11				0			
2	2	11				0			
2	3	23				0			
2	4	11				0			
2	5	11				0			
2	6	40				270			
2	7	19				0			
2	8	59				270			
2	9	82				180			
2	10	99				90			

-----CARD 25-- Wall/Glass Parameters ----------

Room Number	Wall Number	Glass Length	Glass Width	Pct Glass or No. of Windows	Glass U-Value	Shading Coefficient	External Shading Type	Internal Shading Type	Percent Solar to Ret. Air	Visible Transmittance	Inside Visible Reflectance
M1	1					1.0					
1	1	5.4	4.6	5	.55						
1	2										
1	3	9.8	4.3	2	.98						
1	4										
1	5	25.7	4.8	1	1.1						
1	6	2.75	1.8	2	.7	.46					
1	7	5.4	4.6	4	.55	.62	5				
1	8										
2	1	1.5	3.7	1	.7	.35					
2	2	2.3	5.6	2	.9	1					

-----CARD 25-- Wall/Glass Parameters ----------

Room Number	Wall Number	Glass Length	Glass Width	Pct Glass or No. of Windows	Glass U-Value	Shading Coefficient	External Shading Type	Internal Shading Type	Percent Solar to Ret. Air	Visible Transmittance	Inside Visible Reflectance
2	3	1.7	3.8	2	.9	1	3				
2	4	5.2	5.8	1	.7	.58					
2	5	1.7	4.2	1	.7	.58					
2	6	1.7	5.8	1	.9	.39					
2	7	7.9	3.3	1	.98	.74	4				
2	8	7.9	3.3	2	1.1	.74	4				
2	9	7.9	3.3	1	1.1	.74	4				
2	10	1	3.7	1	.7	.35					

-----CARD 26-- Schedules ----------

Room Number	People	Lights	Ventilation	Infiltration	Reheat Minimum	Cooling Fans	Heating Fan	Auxiliary Fan	Room Exhaust	Daylighting Controls
1	CLUBO	CLUBL	AVAIL	OFF		AVAIL				
2	CLUBO	CLUBL	AVAIL	OFF		AVAIL				

-----CARD 27-- People and Lights ----------

Room Number	People Value	People Units	People Sensible	People Latent	Lighting Value	Lighting Units	Lighting Fixture Type	Ballast Factor	Percent Lights to Ret. Air	--- Daylighting ---- Reference Point 1	Reference Point 2
1	60	PEOPLE	250	200	12205	WATTS					
2	40	PEOPLE	250	200	3664	WATTS					

-----CARD 28--- Miscellaneous Equipment ----------

Room Number	Misc Equipment Number	Equipment Descrip	Energy Consump Value	Energy Consump Units	Schedule Code	Energy Meter Code	Percent of Load Sensible	Percent Misc. Load to Room	Percent Misc. Sens to Ret. Air	Radiant Fraction	Optional Air Path
1	1	MISC EQUIP	7.5	BTUH-SF	CLUBE	ELEC					
2	1	MISC EQUIP	2.5	BTUH-SF	CLUBE	ELEC					

-----CARD 29--- Room Airflows ----------

Room	Ventilation -----Cooling-----		Ventilation -----Heating-----		Infiltration -----Cooling-----		Infiltration -----Heating-----		--Reheat Minimum--	
Number	Value	Units	Value	Units	Value	Units	Value	Units	Value	Units
1	4175	CFM	4175	CFM						
2	1975	CFM	1975	CFM						

-----CARD 32-- Exposed Floor Parameters----------

Room Number	Exposed Floor Number	-----Slab------ Perimeter Length	Loss Coefficient	Exposed Floor Floor Area	Floor U-Value	Const Type	Temp Flag	Cooling Temp	Heating Temp	Adjacent Room No
1	1	590	.62							

-----CARD 33-- External Shading ----------

Shading Type	---------OVERHANG--------- Glass Height	Height Above Glass	Projection Out	----------VERTICAL FINS---------- Glass Width	Projection Left	Left Projection Out	Projection Right	Right Projection Out	Adjacent Building Flag
3	3.75	2	21						
4	3.3	0	2.5						
5	4.6	1	3						

---------- System Section Alternative #1 ----------

-----CARD 39-- System Alternative -----

Number	Description
1	BLDG M500, BASELINE

-----CARD 40--- System Type ----------

System Set Number	System Type	----------OPTIONAL VENTILATION SYSTEM---------- Ventil Deck Location	Cooling SADBVh	Heating SADBVh	Cooling Schedule	Heating Schedule	Fan Static Pressure
1	SZ						
2	SZ						

-----CARD 41-- Zone Assignment ----------

System Set Number	Ref #1 Begin	Ref #1 End	Ref #2 Begin	Ref #2 End	Ref #3 Begin	Ref #3 End	Ref #4 Begin	Ref #4 End	Ref #5 Begin	Ref #5 End	Ref #6 Begin	Ref #6 End
1	1	1										
2	2	2										

-----CARD 42--- Fan SP and Duct Parameters----------

System Set Number	Cool Fan SP	Heat Fan SP	Return Fan SP	Mn Exh Fan SP	Aux Fan SP	Rm Exh Fan SP	Cool Fan Mtr Loc	Return Fan Mtr Loc	Supply Duct Ht Gn	Supply Duct Loc	Return Air Path
1	2.5	2.5					SUPPLY			OTHER	DUCTED
2	2.5	2.5					SUPPLY			OTHER	DUCTED

-----CARD 44-- System Options ----------

System Set Number	Econ Type	Econ On Point	Max Pct Outside Air	Direct Evap Cooling	Indirect Evap Cooling	1st Stage Evap Cooling	Fan Cycling	Exhaust Air Heat Recovery --- Effectiveness --- System	Exhaust Air Heat Recovery --- Effectiveness --- Room	Exhaust Air Heat Recovery --- Control Method --- System	Exhaust Air Heat Recovery --- Control Method --- Room
1	DRY-BULB	65									
2	DRY-BULB	65									

-----CARD 45--- Equipment Schedules ----------

System Set Number	Main Cooling Coil	Economizer	Direct Evap Coil	Indirect Evap Coil	Auxiliary Cooling Coil	Main Heating Coil	Main Preheat Coil	Reheat Coil	Mech. Humidity	Auxiliary Heating Coil
1	CLGC					HTGC				
2	CLGC					HTGC				

---------- Equipment Section Alternative #1 ----------

-----CARD 59-- Equipment Description / TOD Schedules ----------

Alternative Number	Elec Consump Time of Day Schedule	Elec Demand Time of Day Schedule	Demand Limit Max KW	Alternative Description
1				BLDG M500, BASELINE

-----CARD 60--- Cooling Load Assignment----------

Load Asgn Ref	All Coil Loads To Cool Ref	Cooling Equipment Sizing	-Group 1- Begin	-Group 1- End	-Group 2- Begin	-Group 2- End	-Group 3- Begin	-Group 3- End	-Group 4- Begin	-Group 4- End	-Group 5- Begin	-Group 5- End	-Group 6- Begin	-Group 6- End	-Group 7- Begin	-Group 7- End	-Group 8- Begin	-Group 8- End	-Group 9- Begin	-Group 9- End
1	1	BLKPLANT	1	2																

-----CARD 62-- Cooling Equipment Parameters ----------

Cool Ref Num	Equip Code Name	Num Of Units	COOLING --Capacity-- Value	COOLING --Capacity-- Units	COOLING ----Energy---- Value	COOLING ----Energy---- Units	HEAT RECOVERY --Capacity-- Value	HEAT RECOVERY --Capacity-- Units	HEAT RECOVERY ----Energy---- Value	HEAT RECOVERY ----Energy---- Units	Seq Order Num	Seq Type	Demand Limit Number
1	EQ1122L	1	90.6	TONS									

-----CARD 63-- Cooling Pumps and References ----------

Cool Ref Num	CHILLED WATER Full Load Value	CHILLED WATER Full Load Units	CONDENSER Full Load Value	CONDENSER Full Load Units	HT REC or AUX Full Load Value	HT REC or AUX Full Load Units	Switch-over Control	Cold Storage	Cooling Tower	Misc. Access.
1	3.8	KW								

-----CARD 65-- Heating Load Assignment ----------

Load Assignment Reference	All Coil Loads To Heating Ref	-Group 1- Begin	End	-Group 2- Begin	End	-Group 3- Begin	End	-Group 4- Begin	End	-Group 5- Begin	End	-Group 6- Begin	End	-Group 7- Begin	End	-Group 8- Begin	End	-Group 9- Begin	End
1	1	1	2																

-----CARD 67-- Heating Equipment Parameters ----------

Heat Ref Number	Equip Code Name	Number Of Units	HW Pmp Full Ld Value	Units	Cap'y Value	Units	Energy Rate Value	Units	Seq Order Number	Switch over Control	Hot Strg	Misc. Acc.	Cogen	Demand Limit Number
1	EQ2001	1	3.8	KW										

-----CARD 69-- Fan Equipment Parameters ----------

System Set Number	Cooling Fan	Heating Fan	Return Fan	Exhaust Fan	Auxiliary Supply	Room Exhaust	Optional Ventilation
1	EQ4003						
2	EQ4003						

Utility Description Reference Table

Schedules:
AVAIL AVAILABLE (100%)
CLG COOLING TSTAT SCHEDULE
CLGC COOLING COIL SCHEDULE
CLUBE O CLUB EQUIPMENT SCHEDULE
CLUBL O CLUB LIGHTING SCHEDULE
CLUBO O CLUB OCCUPANCY SCHEDULE
HTG HEATING TSTAT SCHEDULE
HTGC HEATING COIL SCHEDULE
OFF ALWAYS OFF
System:
SZ SINGLE ZONE
Equipment:
Cooling:
EQ1122L AIR-CLD RECIP >55 TONS
Heating:
EQ2001 GAS FIRE TUBE HOT WATER
Fan:
EQ4003 FC CENTRIF. FAN C.V.

Schedule Name: AVAIL
Project: AVAILABLE (100)
Location:
Client:
Program User:
Comments:

Starting Month: JAN Ending Month: HTG
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	100
24	

Schedule Name: CLG
Project: COOLING TSTAT SCHEDULE
Location:
Client:
Program User:
Comments:

Starting Month: JAN Ending Month: DEC
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Temperature
0	76
24	

Schedule Name: CLGC
Project: COOLING COIL SCHEDULE
Location:
Client:
Program User: R. GERRANS
Comments:

Starting Month: JAN Ending Month: APR
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	0
24	

Starting Month: MAY Ending Month: OCT
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	100
24	

Starting Month: NOV Ending Month: HTG
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	0
24	

Schedule Name: CLUBE
Project: O CLUB EQUIPMENT SCHEDULE
Location: FT MCPHERSON & FT GILLEM
Client:
Program User: R. GERRANS
Comments:

Starting Month: JAN Ending Month: DEC
Starting Day Type: DSGN Ending Day Type: WKDY

Hour	Util Percent
0	10
7	25
9	50
10	90
13	50
16	80
17	100
19	50
21	10
24	

Starting Month: JAN Ending Month: DEC
Starting Day Type: SAT Ending Day Type: SAT

Hour	Util Percent
0	10
16	75
22	10
24	

Starting Month: JAN Ending Month: DEC
Starting Day Type: SUN Ending Day Type: SUN

Hour	Util Percent
0	0
24	

Schedule Name: CLUBL
Project: O CLUB LIGHTING SCHEDULE
Location: FT MCPHERSON & FT GILLEM
Client:
Program User: R. GERRANS
Comments:

Starting Month: JAN Ending Month: DEC
Starting Day Type: DSGN Ending Day Type: WKDY

Hour	Util Percent
0	0
7	100
21	0
24	

Starting Month: JAN Ending Month: DEC
Starting Day Type: SAT Ending Day Type: SAT

Hour	Util Percent
0	0
16	100
22	0
24	

Starting Month: JAN Ending Month: DEC
Starting Day Type: SUN Ending Day Type: SUN

Hour	Util Percent
0	0
24	

Schedule Name: CLUBO
Project: O CLUB OCCUPANCY SCHEDULE
Location: FT MCPHERSON & FT GILLEM
Client:
Program User: R. GERRANS
Comments:

Starting Month: JAN Ending Month: DEC
Starting Day Type: DSGN Ending Day Type: WKDY

Hour	Util Percent
0	0
7	20
11	70
13	30
16	70
17	90
18	75
19	30
21	0
24	

Starting Month: JAN Ending Month: DEC
Starting Day Type: SAT Ending Day Type: SAT

Hour	Util Percent
0	0
16	50
18	100
20	50
22	0
24	

Starting Month: JAN Ending Month: DEC
Starting Day Type: SUN Ending Day Type: SUN

Hour	Util Percent
0	0
24	

Schedule Name: HTG
Project: HEATING TSTAT SCHEDULE
Location:
Client:
Program User:
Comments:

Starting Month: JAN Ending Month: DEC
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Temperature
0	72
24	

Schedule Name: HTGC
Project: HEATING COIL SCHEDULE
Location:
Client:
Program User: R. GERRANS
Comments:

Starting Month: JAN Ending Month: APR
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	100
24	

Starting Month: MAY Ending Month: OCT
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	0
24	

Starting Month: NOV Ending Month: HTG
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	100
24	

Schedule Name: OFF
Project: ALWAYS OFF
Location:
Client:
Program User:
Comments:

Starting Month: JAN Ending Month: HTG
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	0
24	

****
****
**
** TRACE 600 ANALYSIS **
**
** by **
**
****
****

FT MCPHERSON & FT GILLEM EEAP
FT MCPHERSON, BLDG 500

R. GERRANS

Weather File Code:	ATLANTA.	
Location:	ATLANTA, GEORGIA	
Latitude:	33.0	(deg)
Longitude:	84.0	(deg)
Time Zone:	6	
Elevation:	1,005	(ft)
Barometric Pressure:	28.8	(in. Hg)
Summer Clearness Number:	0.90	
Winter Clearness Number:	0.90	
Summer Design Dry Bulb:	92	(F)
Summer Design Wet Bulb:	74	(F)
Winter Design Dry Bulb:	22	(F)
Summer Ground Relectance:	0.20	
Winter Ground Relectance:	0.20	
Air Density:	0.0731	(Lbm/cuft)
Air Specific Heat:	0.2444	(Btu/lbm/F)
Density-Specific Heat Prod:	1.0727	(Btu-min./hr/cuft/F)
Latent Heat Factor:	4,721.8	(Btu-min./hr/cuft)
Enthalpy Factor:	4.3883	(Lb-min./hr/cuft)

Design Simulation Period: May To October
System Simulation Period: January To December
Cooling Load Methodology: TETD/Time Averaging

Time/Date Program was Run: 10:11:35 4/ 8/92
Dataset Name: M500-B .TM

AIRFLOW - ALTERNATIVE 1
BLDG M500, BASELINE

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

System Number	System Type	Main: Outside Airflow (Cfm)	Main: Cooling Airflow (Cfm)	Main: Heating Airflow (Cfm)	Main: Return Airflow (Cfm)	Main: Exhaust Airflow (Cfm)	Auxil. Supply Airflow (Cfm)	Room Exhaust Airflow (Cfm)
1	SZ	4,175	17,226	17,226	17,226	17,226	0	0
2	SZ	1,975	8,815	8,815	8,815	8,815	0	0
Totals		6,150	26,041	26,041	26,041	26,041	0	0

CAPACITY - ALTERNATIVE 1
BLDG M500, BASELINE

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

System Number	System Type	Cooling: Main Sys. Capacity (Tons)	Cooling: Aux. Sys. Capacity (Tons)	Cooling: Opt. Vent Capacity (Tons)	Cooling Totals (Tons)	Heating: Main Sys. Capacity (Btuh)	Heating: Aux. Sys. Capacity (Btuh)	Heating: Preheat Capacity (Btuh)	Heating: Reheat Capacity (Btuh)	Heating: Humidif. Capacity (Btuh)	Heating: Opt. Vent Capacity (Btuh)	Heating Totals (Btuh)
1	SZ	37.5	0.0	0.0	37.5	-278,400	0	0	0	0	0	-278,400
2	SZ	18.5	0.0	0.0	18.5	-201,015	0	0	0	0	0	-201,015
Totals		56.1	0.0	0.0	56.1	-479,415	0	0	0	0	0	-479,415

The building peaked at hour 13 month 7 with a capacity of 55.2 tons

ENGINEERING CHECKS - ALTERNATIVE 1
BLDG M500, BASELINE

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: Cfm/ Sq Ft	Cooling: Cfm/ Ton	Cooling: Sq Ft /Ton	Cooling: Btuh/ Sq Ft	Heating: Cfm/ Sq Ft	Heating: Btuh/ Sq Ft	Floor Area Sq Ft
1	Main	SZ	24.24	0.84	458.8	547.8	21.91	0.84	-13.54	20,566
2	Main	SZ	22.41	1.28	475.8	372.4	32.22	1.28	-29.13	6,900

System 1 Peak SZ - SINGLE ZONE

	********** COOLING COIL PEAK **********					*	********** CLG SPACE PEAK **********		*	********** HEATING COIL PEAK **********		
Peaked at Time ==>		Mo/Hr: 7/13				*	Mo/Hr: 6/18		*		Mo/Hr: 13/ 1	
Outside Air ==>		OADB/WB/HR: 90/ 74/105.0				*	OADB: 92		*		OADB: 22	
						*			*			
	Space Sens.+Lat.	Ret. Air Sensible	Ret. Air Latent	Net Total	Percnt Of Tot	*	Space Sensible	Percnt Of Tot	*	Space Peak Space Sens	Coil Peak Tot Sens	Percnt Of Tot
Envelope Loads	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)	*	(Btuh)	(%)	*	(Btuh)	(Btuh)	(%)
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	19,084		19,084	4.24	*	0	0.00	*	0	-17,746	6.37
Glass Solar	18,085	0		18,085	4.01	*	18,967	6.65	*	0	0	0.00
Glass Cond	4,979	0		4,979	1.11	*	5,606	1.97	*	-18,767	-18,767	6.74
Wall Cond	12,293	2,958		15,251	3.39	*	18,753	6.58	*	-24,104	-30,300	10.88
Partition	0			0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	*	0	0.00	*	-18,290	-18,290	6.57
Infiltration	0			0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	35,357	22,042		57,399	12.74	*	43,326	15.19	*	-61,161	-85,103	30.57
						*			*			
Internal Loads												
Lights	41,656	0		41,656	9.25	*	41,656	14.61	*	0	0	0.00
People	18,900			18,900	4.19	*	13,500	4.73	*	0	0	0.00
Misc	138,820	0	0	138,820	30.81	*	154,245	54.08	*	0	0	0.00
Sub Total==>	199,376	0	0	199,376	44.25	*	209,401	73.42	*	0	0	0.00
Ceiling Load	22,042	-22,042		0	0.00	*	32,469	11.38	*	-23,942	0	0.00
Outside Air	0	0	0	163,147	36.21	*	0	0.00	*	0	-223,922	80.43
Sup. Fan Heat				30,625	6.80	*		0.00	*		30,625	-11.00
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==>	256,775	0	0	450,547	100.00	*	285,195	100.00	*	-85,103	-278,400	1

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

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR			Leaving DB/WB/HR		
	(Tons)	(Mbh)	(cfm)	Deg F	Deg F	Grains	Deg F	Deg F	Grains
Main Clg	37.5	450.5	343.0	17,226	79.5	66.0	78.3	58.9	57.7	72.4
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
0										
Totals	37.5	450.5								
8										

----------AREAS----------

	Gross Total	Glass (sf)	(%)
Floor	20,566		
Part	0		
ExFlr	590		
Roof	12,769		0
Wall	5,573		441

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

	Capacity (Mbh)	Coil Airfl (cfm)	Ent Deg F	Lvg Deg F
Main Htg	-278.4	17,226	59.9	74.9
Aux Htg	0.0	0	0.0	0.0
Preheat	-0.0	17,226	59.9	58.9
Reheat	0.0	0	0.0	0.0
Humidif	0.0	0	0.0	0.0
Opt Vent	0.0	0	0.0	0.0
Total	-278.4			

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

Type	Cooling	Heating
Vent	4,175	4,175
Infil	0	0
Supply	17,226	17,226
Mincfm	0	0
Return	17,226	17,226
Exhaust	4,175	4,175
Rm Exh	0	0
Auxil	0	0

--ENGINEERING CHECKS--

Clg % OA	24.2
Clg Cfm/Sqft	0.84
Clg Cfm/Ton	458.82
Clg Sqft/Ton	547.76
Clg Btuh/Sqft	21.91
No. People	60
Htg % OA	24.2
Htg Cfm/SqFt	0.84
Htg Btuh/SqFt	-13.54

--TEMPERATURES (F)--

Type	Clg	Htg
SADB	60.6	76.6
Plenum	79.4	68.3
Return	76.0	72.0
Ret/OA	79.5	59.9
Runarnd	76.0	72.0
Fn MtrTD	0.4	0.4
Fn BldTD	0.3	0.3
Fn Frict	0.9	0.9

System 2 Peak SZ - SINGLE ZONE

	********** COOLING COIL PEAK **********						********** CLG SPACE PEAK **********			********** HEATING COIL PEAK **********		
Peaked at Time ==>		Mo/Hr: 8/15					Mo/Hr: 6/17			Mo/Hr: 13/ 1		
Outside Air ==>		OADB/WB/HR: 92/ 74/105.0					OADB: 94			OADB: 22		
	Space Sens.+Lat.	Ret. Air Sensible	Ret. Air Latent	Net Total	Percnt Of Tot		Space Sensible	Percnt Of Tot		Space Peak Space Sens	Coil Peak Tot Sens	Percnt Of Tot
Envelope Loads	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
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	11,191		11,191	5.03		0	0.00		0	-6,950	3.46
Glass Solar	6,779	0		6,779	3.05		9,570	6.63		0	0	0.00
Glass Cond	3,062	0		3,062	1.38		3,438	2.38		-10,219	-10,219	5.08
Wall Cond	54,679	22,995		77,674	34.94		59,849	41.45		-64,632	-93,589	46.56
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	0			0	0.00		0	0.00		0	0	0.00
Sub Total==>	64,519	34,186		98,706	44.40		72,857	50.46		-74,851	-110,758	55.10
Internal Loads												
Lights	12,505	0		12,505	5.62		12,505	8.66		0	0	0.00
People	5,400			5,400	2.43		7,000	4.85		0	0	0.00
Misc	8,625	0	0	8,625	3.88		13,800	9.56		0	0	0.00
Sub Total==>	26,530	0	0	26,530	11.93		33,305	23.07		0	0	0.00
Ceiling Load	34,186	-34,186		0	0.00		38,213	26.47		-35,907	0	0.00
Outside Air	0	0	0	81,415	36.62		0	0.00		0	-105,927	52.70
Sup. Fan Heat				15,671	7.05			0.00			15,671	-7.80
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==>	125,236	0	0	222,321	100.00		144,375	100.00		-110,758	-201,015	100.00

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

	Total Capacity (Tons)	Capacity (Mbh)	Sens Cap. (Mbh)	Coil Airfl (cfm)	Entering DB Deg F	Entering WB Deg F	Entering Grains	Leaving DB Deg F	Leaving WB Deg F	Leaving Grains
Main Clg	18.5	222.3	173.0	8,815	79.7	66.0	77.7	59.1	58.0	73.1
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
0										
Totals	18.5	222.3								
4										

----------AREAS----------

	Gross Total	Glass (sf)	(%)
Floor	6,900		
Part	0		
ExFlr	0		
Roof	6,900		0
Wall	5,124		199

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

	Capacity (Mbh)	Coil Airfl (cfm)	Ent Deg F	Lvg Deg F
Main Htg	-201.0	8,815	60.8	82.1
Aux Htg	0.0	0	0.0	0.0
Preheat	-0.0	8,815	60.8	59.1
Reheat	0.0	0	0.0	0.0
Humidif	0.0	0	0.0	0.0
Opt Vent	0.0	0	0.0	0.0
Total	-201.0			

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

Type	Cooling	Heating
Vent	1,975	1,975
Infil	0	0
Supply	8,815	8,815
Mincfm	0	0
Return	8,815	8,815
Exhaust	1,975	1,975
Rm Exh	0	0
Auxil	0	0

--ENGINEERING CHECKS--

Clg % OA	22.4
Clg Cfm/Sqft	1.28
Clg Cfm/Ton	475.78
Clg Sqft/Ton	372.43
Clg Btuh/Sqft	32.22
No. People	40
Htg % OA	22.4
Htg Cfm/SqFt	1.28
Htg Btuh/SqFt	-29.13

--TEMPERATURES (F)--

Type	Clg	Htg
SADB	60.7	83.7
Plenum	91.6	55.6
Return	76.0	72.0
Ret/OA	79.7	60.8
Runarnd	76.0	72.0
Fn MtrTD	0.4	0.4
Fn BldTD	0.3	0.3
Fn Frict	0.9	0.9

COOLING LOADS AT COIL PEAK - ALTERNATIVE 1
BLDG M500, BASELINE

AIRFLOW COOLING LOADS
(At time of Coil Peak)

Room Number	Description	Ventilation Airflow (Cfm)	Ventilation Sensible (Btuh)	Ventilation Latent (Btuh)	Optional Ventilation Airflow (Cfm)	Optional Ventilation Sensible (Btuh)	Optional Ventilation Latent (Btuh)	Bypass Airflow (Cfm)	Bypass Sensible (Btuh)	Bypass Latent (Btuh)	Ov/Undr Sizing (Btuh)
1	1ST FLOOR	4,175	64,042	99,106	0	0	0	0	0	0	0
Zone	1 Total/Ave.	4,175	64,042	99,106	0	0	0	0	0	0	0
Zone	1 Block	4,175	64,042	99,106	0	0	0	0	0	0	0
System	1 Total/Ave.	4,175	64,042	99,106	0	0	0	0	0	0	0
System	1 Block	4,175	64,042	99,106	0	0	0	0	0	0	0
2	2ND FLOOR	1,975	34,532	46,882	0	0	0	0	0	0	0
Zone	2 Total/Ave.	1,975	34,532	46,882	0	0	0	0	0	0	0
Zone	2 Block	1,975	34,532	46,882	0	0	0	0	0	0	0
System	2 Total/Ave.	1,975	34,532	46,882	0	0	0	0	0	0	0
System	2 Block	1,975	34,532	46,882	0	0	0	0	0	0	0

HEATING LOADS AT COIL PEAK - ALTERNATIVE 1
BLDG M500, BASELINE

AIRFLOW HEATING LOADS
(At time of Coil Peak)

Room Number	Description	Ventilation Airflow (Cfm)	Ventilation Sensible (Btuh)	Op. Vent. Airflow (Cfm)	Op. Vent. Sensible (Btuh)	Reheat Airflow (Cfm)	Reheat Sensible (Btuh)	Humidif. Airflow (Cfm)	Humidif. Latent (Btuh)	Total (Btuh)
1	1ST FLOOR	4,175	-223,922	0	0	0	0	0	0	-223,922
Zone	1 Total/Ave.	4,175	-223,922	0	0	0	0	0	0	-223,922
Zone	1 Block	4,175	-223,922	0	0	0	0	0	0	-223,922
System	1 Total/Ave.	4,175	-223,922	0	0	0	0	0	0	-223,922
System	1 Block	4,175	-223,922	0	0	0	0	0	0	-223,922
2	2ND FLOOR	1,975	-105,927	0	0	0	0	0	0	-105,927
Zone	2 Total/Ave.	1,975	-105,927	0	0	0	0	0	0	-105,927
Zone	2 Block	1,975	-105,927	0	0	0	0	0	0	-105,927
System	2 Total/Ave.	1,975	-105,927	0	0	0	0	0	0	-105,927
System	2 Block	1,975	-105,927	0	0	0	0	0	0	-105,927

COOLING AIRFLOW HEAT GAIN/LOSS - ALTERNATIVE 1
BLDG M500, BASELINE

AIRFLOW HEAT GAIN AND LOSS
(At time of Coil Peak)

Room Number	Description	Cooling: Duct Heat Pickup (Btuh)	Supply Fan Heat (Btuh)	Return Fan Heat (Btuh)	System Exhaust Heat Loss (Btuh)	Total (Btuh)	System Exhaust Airflow (Cfm)	Room Exhaust Airflow (Cfm)	Ducted Airflow (Cfm)	Plenum Airflow (Cfm)	Run Around Airflow (Cfm)	Corridr Airflow (Cfm)	System Return Airflow (Cfm)
1	1ST FLOOR	0	30,625	0	0	30,625	4,175	0	17,226	0	0	0	17,226
Zone 1	Total/Ave.	0	30,625	0	0	30,625	4,175	0	17,226	0	0	0	17,226
Zone 1	Block	0	30,625	0	0	30,625	4,175	0	17,226	0	0	0	17,226
System 1	Total/Ave.	0	30,625	0	0	30,625	4,175	0	17,226	0	0	0	17,226
System 1	Block	0	30,625	0	0	30,625	4,175	0	17,226	0	0	0	17,226
2	2ND FLOOR	0	15,671	0	0	15,671	1,975	0	8,815	0	0	0	8,815
Zone 2	Total/Ave.	0	15,671	0	0	15,671	1,975	0	8,815	0	0	0	8,815
Zone 2	Block	0	15,671	0	0	15,671	1,975	0	8,815	0	0	0	8,815
System 2	Total/Ave.	0	15,671	0	0	15,671	1,975	0	8,815	0	0	0	8,815
System 2	Block	0	15,671	0	0	15,671	1,975	0	8,815	0	0	0	8,815

HEATING AIRFLOW HEAT GAIN/LOSS - ALTERNATIVE 1
BLDG M500, BASELINE

AIRFLOW HEAT GAIN AND LOSS
(At time of Coil Peak)

Room Number	Description	Heating: Supply Fan Heat (Btuh)	Return Fan Heat (Btuh)	System Exhaust Heat Loss (Btuh)	Total (Btuh)	System Exhaust Airflow (Cfm)	Room Exhaust Airflow (Cfm)	Ducted Airflow (Cfm)	Plenum Airflow (Cfm)	Run Around Airflow (Cfm)	Corridr Airflow (Cfm)	System Return Airflow (Cfm)
1	1ST FLOOR	30,625	0	0	30,625	4,175	0	17,226	0	0	0	17,226
Zone 1	Total/Ave.	30,625	0	0	30,625	4,175	0	17,226	0	0	0	17,226
Zone 1	Block	30,625	0	0	30,625	4,175	0	17,226	0	0	0	17,226
System 1	Total/Ave.	30,625	0	0	30,625	4,175	0	17,226	0	0	0	17,226
System 1	Block	30,625	0	0	30,625	4,175	0	17,226	0	0	0	17,226
2	2ND FLOOR	15,671	0	0	15,671	1,975	0	8,815	0	0	0	8,815
Zone 2	Total/Ave.	15,671	0	0	15,671	1,975	0	8,815	0	0	0	8,815
Zone 2	Block	15,671	0	0	15,671	1,975	0	8,815	0	0	0	8,815
System 2	Total/Ave.	15,671	0	0	15,671	1,975	0	8,815	0	0	0	8,815
System 2	Block	15,671	0	0	15,671	1,975	0	8,815	0	0	0	8,815

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

ZONE PSYCHROMETRICS - ALTERNATIVE 1
BLDG M500, BASELINE

---------- P S Y C H R O M E T R I C S T A T E P O I N T S ----------

Zone 1

	Dry Bulb (F)	Wet Bulb (F)	Relat. Humid. (%)	Humid. Ratio (GR)	Enthalpy (Btu/Lb)	Temp. Diff. (F)
Space	76.0	63.2	50.0	69.8	29.2	
Main System						
Return Air Heat Pickup						0.0
Return Fan						0.0
Return Air	76.0	63.2	50.0	69.8	29.2	
Outdoor Air	90.3	73.9	47.0	105.0	38.2	
Return/Outdoor Air Mix	79.5	66.0	49.9	78.3	31.3	
Blow through Fan						0.0
Entering Coil	79.5	66.0	49.9	78.3	31.3	
Leaving Coil	58.9	57.0	89.5	69.3	24.9	
Draw Through Fan						0.7
Duct Frictional Heat						0.9
Supply Duct Heat Gain						0.0
Cold Deck Supply Air	60.6	57.6	84.4	69.3	25.3	
Supply Air	60.6	57.6	84.4	69.3	25.3	

Percent Outside Air	24.24	(%)
Sensible Heat Ratio (SHR)	0.964	
Percent Supply Air Bypassing Coil	0.00	(%)
Coil Airflow	17,226	(Cfm)

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

ZONE PSYCHROMETRICS - ALTERNATIVE 1
BLDG M500, BASELINE

---------- P S Y C H R O M E T R I C S T A T E P O I N T S ----------

Zone 2

	Dry Bulb (F)	Wet Bulb (F)	Relat. Humid. (%)	Humid. Ratio (GR)	Enthalpy (Btu/Lb)	Temp. Diff. (F)
Space	76.0	63.2	50.0	69.8	29.2	
Main System						0.0
Return Air Heat Pickup						0.0
Return Fan						
Return Air	76.0	63.2	50.0	69.8	29.2	
Outdoor Air	92.3	74.4	44.2	105.0	38.7	
Return/Outdoor Air Mix	79.7	66.0	49.2	77.7	31.3	
Blow through Fan						0.0
Entering Coil	79.7	66.0	49.2	77.7	31.3	
Leaving Coil	59.1	57.1	89.0	69.3	24.9	
Draw Through Fan						0.7
Duct Frictional Heat						0.9
Supply Duct Heat Gain						0.0
Cold Deck Supply Air	60.7	57.7	83.9	69.3	25.4	
Supply Air	60.7	57.7	83.9	69.3	25.4	

Percent Outside Air	22.41	(%)
Sensible Heat Ratio (SHR)	0.963	
Percent Supply Air Bypassing Coil	0.00	(%)
Coil Airflow	8,815	(Cfm)

BUILDING U-VALUES - ALTERNATIVE 1
BLDG M500, BASELINE

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) Part.	ExFlr	Summr Skylt	Wintr Skylt	Roof	Summr Windo	Wintr Windo	Wall	Ceil.	Room Mass (lb/ sqft)	Room Capac. (Btu/ sqft/F)
1	1ST FLOOR	0.000	0.620	0.000	0.000	0.030	0.789	0.851	0.120	0.317	26.1	6.54
Zone 1	Total/Ave.	0.000	0.620	0.000	0.000	0.030	0.789	0.851	0.120	0.317	26.1	6.54
System 1	Total/Ave.	0.000	0.620	0.000	0.000	0.030	0.789	0.851	0.120	0.317	26.1	6.54
2	2ND FLOOR	0.000	0.000	0.000	0.000	0.030	0.942	1.025	0.438	0.317	33.6	8.85
Zone 2	Total/Ave.	0.000	0.000	0.000	0.000	0.030	0.942	1.025	0.438	0.317	33.6	8.85
System 2	Total/Ave.	0.000	0.000	0.000	0.000	0.030	0.942	1.025	0.438	0.317	33.6	8.85
Building		0.000	0.620	0.000	0.000	0.030	0.837	0.905	0.276	0.317	28.0	7.12

BUILDING AREAS - ALTERNATIVE 1
BLDG M500, BASELINE

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	1ST FLOOR	1	1	20,566	20,566	0	590	0	0	12,769	441	8	5,[illegible]
Zone 1	Total/Ave.				20,566	0	590	0	0	12,769	441	8	5,[illegible]
System 1	Total/Ave.				20,566	0	590	0	0	12,769	441	8	5,[illegible]
2	2ND FLOOR	1	1	6,900	6,900	0	0	0	0	6,900	199	4	4,925
Zone 2	Total/Ave.				6,900	0	0	0	0	6,900	199	4	4,925
System 2	Total/Ave.				6,900	0	0	0	0	6,900	199	4	4,925
Building					27,466	0	590	0	0	19,669	640	6	10,057

ASHRAE 90 ANALYSIS - ALTERNATIVE 1
BLDG M500, BASELINE

---------- 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 = 0.309 (Btu/Hr/Sq Ft/F)
Overall Building U-Value = 0.128 (Btu/Hr/Sq Ft/F)

Roof Overall Thermal Transfer Value (OTTVr) = 1.15 (Btu/Hr/Sq Ft)
Wall Overall Thermal Transfer Value (OTTVw) = 17.91 (Btu/Hr/Sq Ft)

SYSTEM LOAD PROFILE - ALTERNATIVE 1
BLDG M500, BASELINE

Main System 1 SZ SINGLE ZONE

Percent Design Load	Cooling Load Cap. (Ton)	Cooling Load Hours (%)	Cooling Load Hours	Heating Load Capacity (Btuh)	Heating Load Hours (%)	Heating Load Hours	Cooling Airflow Cap. (Cfm)	Cooling Airflow Hours (%)	Cooling Airflow Hours	Heating Airflow Cap. (Cfm)	Heating Airflow Hours (%)	Heating Airflow Hours
0 - 5	1.9	11	337	-13,920	8	136	861.3	0	0	0.0	0	0
5 - 10	3.8	12	373	-27,840	6	110	1,722.7	0	0	0.0	0	0
10 - 15	5.6	7	215	-41,760	8	148	2,584.0	0	0	0.0	0	0
15 - 20	7.5	6	182	-55,680	3	51	3,445.3	0	0	0.0	0	0
20 - 25	9.4	4	130	-69,600	6	100	4,306.6	0	0	0.0	0	0
25 - 30	11.3	5	171	-83,520	6	111	5,168.0	0	0	0.0	0	0
30 - 35	13.1	6	188	-97,440	7	118	6,029.3	0	0	0.0	0	0
35 - 40	15.0	3	92	-111,360	8	147	6,890.6	0	0	0.0	0	0
40 - 45	16.9	4	122	-125,280	6	103	7,751.9	0	0	0.0	0	0
45 - 50	18.8	4	141	-139,200	10	181	8,613.3	0	0	0.0	0	0
50 - 55	20.7	4	129	-153,120	8	139	9,474.6	0	0	0.0	0	0
55 - 60	22.5	4	120	-167,040	6	105	10,335.9	0	0	0.0	0	0
60 - 65	24.4	2	68	-180,960	8	141	11,197.2	0	0	0.0	0	0
65 - 70	26.3	4	140	-194,880	9	160	12,058.6	0	0	0.0	0	0
70 - 75	28.2	6	198	-208,800	2	28	12,919.9	0	0	0.0	0	0
75 - 80	30.0	7	226	-222,720	0	0	13,781.2	0	0	0.0	0	0
80 - 85	31.9	4	133	-236,640	0	0	14,642.5	0	0	0.0	0	0
85 - 90	33.8	2	68	-250,560	0	0	15,503.9	0	0	0.0	0	0
90 - 95	35.7	4	117	-264,480	0	0	16,365.2	0	0	0.0	0	0
95 - 100	37.5	1	43	-278,400	0	0	17,226.5	100	8,760	0.0	0	0
Hours Off	0.0	0	5,567	0	0	6,982	0.0	0	0	0.0	0	8,760

Main System 2 SZ SINGLE ZONE

Percent Design Load	Cooling Load Cap. (Ton)	Cooling Load Hours (%)	Cooling Load Hours	Heating Load Capacity (Btuh)	Heating Load Hours (%)	Heating Load Hours	Cooling Airflow Cap. (Cfm)	Cooling Airflow Hours (%)	Cooling Airflow Hours	Heating Airflow Cap. (Cfm)	Heating Airflow Hours (%)	Heating Airflow Hours
0 - 5	0.9	7	154	-10,051	3	81	440.7	0	0	0.0	0	0
5 - 10	1.9	7	167	-20,101	6	173	881.5	0	0	0.0	0	0
10 - 15	2.8	4	104	-30,152	8	230	1,322.2	0	0	0.0	0	0
15 - 20	3.7	4	96	-40,203	7	224	1,762.9	0	0	0.0	0	0
20 - 25	4.6	5	111	-50,254	7	217	2,203.7	0	0	0.0	0	0
25 - 30	5.6	4	98	-60,304	4	132	2,644.4	0	0	0.0	0	0
30 - 35	6.5	3	80	-70,355	8	254	3,085.1	0	0	0.0	0	0
35 - 40	7.4	5	118	-80,406	5	163	3,525.9	0	0	0.0	0	0
40 - 45	8.3	7	171	-90,457	4	134	3,966.6	0	0	0.0	0	0
45 - 50	9.3	10	235	-100,507	6	176	4,407.3	0	0	0.0	0	0
50 - 55	10.2	9	206	-110,558	6	195	4,848.1	0	0	0.0	0	0
55 - 60	11.1	6	129	-120,609	9	268	5,288.8	0	0	0.0	0	0
60 - 65	12.0	6	147	-130,660	8	247	5,729.5	0	0	0.0	0	0
65 - 70	13.0	6	151	-140,710	5	162	6,170.3	0	0	0.0	0	0
70 - 75	13.9	5	118	-150,761	5	152	6,611.0	0	0	0.0	0	0
75 - 80	14.8	6	139	-160,812	7	214	7,051.7	0	0	0.0	0	0
80 - 85	15.7	5	120	-170,863	0	0	7,492.5	0	0	0.0	0	0
85 - 90	16.7	0	0	-180,913	0	0	7,933.2	0	0	0.0	0	0
90 - 95	17.6	0	0	-190,964	0	0	8,373.9	0	0	0.0	0	0
95 - 100	18.5	0	0	-201,015	0	0	8,814.7	100	8,760	0.0	0	0
Hours Off	0.0	0	6,416	0	0	5,738	0.0	0	0	0.0	0	8,760

SYSTEM TOTALS LOAD PROFILE - ALTERNATIVE 1
BLDG M500, BASELINE

S Y S T E M L O A D P R O F I L E

System Totals

Percent Design Load	Cooling Load Cap. (Ton)	Cooling Load Hours (%)	Cooling Load Hours	Heating Load Capacity (Btuh)	Heating Load Hours (%)	Heating Load Hours	Cooling Airflow Cap. (Cfm)	Cooling Airflow Hours (%)	Cooling Airflow Hours	Heating Airflow Cap. (Cfm)	Heating Airflow Hours (%)	Heating Airflow Hours
0 - 5	2.8	16	513	-23,971	11	349	1,302.1	0	0	0.0	0	0
5 - 10	5.6	9	303	-47,941	16	483	2,604.1	0	0	0.0	0	0
10 - 15	8.4	4	137	-71,912	7	225	3,906.2	0	0	0.0	0	0
15 - 20	11.2	6	177	-95,883	9	295	5,208.2	0	0	0.0	0	0
20 - 25	14.0	6	186	-119,854	9	269	6,510.3	0	0	0.0	0	0
25 - 30	16.8	7	240	-143,824	9	278	7,812.3	0	0	0.0	0	0
30 - 35	19.6	3	107	-167,795	4	121	9,114.4	0	0	0.0	0	0
35 - 40	22.4	4	130	-191,766	3	94	10,416.5	0	0	0.0	0	0
40 - 45	25.2	3	91	-215,737	5	167	11,718.5	0	0	0.0	0	0
45 - 50	28.0	5	148	-239,707	3	108	13,020.6	0	0	0.0	0	0
50 - 55	30.8	5	154	-263,678	6	177	14,322.6	0	0	0.0	0	0
55 - 60	33.6	2	75	-287,649	5	144	15,624.7	0	0	0.0	0	0
60 - 65	36.4	8	241	-311,620	3	80	16,926.8	0	0	0.0	0	0
65 - 70	39.3	3	82	-335,590	5	145	18,228.8	0	0	0.0	0	0
70 - 75	42.1	5	157	-359,561	6	177	19,530.9	0	0	0.0	0	0
75 - 80	44.9	7	225	-383,532	0	0	20,832.9	0	0	0.0	0	0
80 - 85	47.7	2	74	-407,503	0	0	22,135.0	0	0	0.0	0	0
85 - 90	50.5	3	98	-431,473	0	0	23,437.1	0	0	0.0	0	0
90 - 95	53.3	2	65	-455,444	0	0	24,739.1	0	0	0.0	0	0
95 - 100	56.1	0	0	-479,415	0	0	26,041.2	100	8,760	0.0	0	0
Hours Off	0.0	0	5,557	0	0	5,648	0.0	0	0	0.0	0	8,760

BUILDING COOL-HEAT DEMAND - ALTERNATIVE 1
BLDG M500, BASELINE

January			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	33.4	30.4	-225,264	0.0	-143,531	0.0	-271,935	0.0	-329,390	0.0	-312,241	0.0
2	32.1	29.3	-237,216	0.0	-316,492	0.0	-328,273	0.0	-345,384	0.0	-328,311	0.0
3	31.7	29.3	-246,651	0.0	-335,695	0.0	-335,747	0.0	-352,916	0.0	-335,767	0.0
4	31.9	29.5	-251,976	0.0	-338,428	0.0	-338,434	0.0	-355,583	0.0	-338,434	0.0
5	32.6	30.3	-256,564	0.0	-336,321	0.0	-336,321	0.0	-353,472	0.0	-336,321	0.0
6	33.6	31.3	-255,123	0.0	-330,204	0.0	-330,204	0.0	-347,354	0.0	-330,204	0.0
7	35.0	32.6	-249,846	0.0	-319,249	0.0	-319,249	0.0	-336,397	0.0	-319,249	0.0
8	36.6	34.4	-124,367	0.0	-203,673	0.0	-288,558	0.0	-305,708	0.0	-203,673	0.0
9	38.5	36.3	-70,248	0.0	-164,088	0.0	-248,972	0.0	-266,121	0.0	-164,088	0.0
10	40.4	37.7	-22,402	0.0	-83,342	0.0	-211,102	0.0	-228,251	0.0	-83,342	0.0
11	42.3	38.7	0	0.0	-44,218	0.0	-184,201	0.0	-201,351	0.0	-44,218	0.0
12	44.2	39.6	0	0.0	-30,756	0.0	-163,469	0.0	-180,619	0.0	-30,756	0.0
13	45.8	40.5	0	0.0	-25,639	0.0	-144,203	0.0	-161,352	0.0	-25,639	0.0
14	47.2	41.1	0	0.0	-28,265	0.0	-123,248	0.0	-140,397	0.0	-28,265	0.0
15	48.2	41.6	-2,370	0.0	-20,378	0.0	-105,384	0.0	-122,533	0.0	-20,378	0.0
16	48.9	41.8	0	0.0	-15,965	0.0	-94,366	0.0	-111,515	0.0	-15,965	0.0
17	49.1	41.9	0	0.0	-15,980	0.0	-18,842	0.0	-129,803	0.0	-15,980	0.0
18	48.7	41.9	0	0.0	-27,960	0.0	-36,273	0.0	-152,795	0.0	-27,960	0.0
19	47.4	41.7	0	0.0	-43,926	0.0	-45,738	0.0	-177,967	0.0	-43,926	0.0
20	45.5	40.5	0	0.0	-67,671	0.0	-56,359	0.0	-201,152	0.0	-67,671	0.0
21	43.1	38.9	0	0.0	-79,353	0.0	-73,039	0.0	-228,818	0.0	-79,353	0.0
22	40.4	36.7	-64,385	0.0	-112,592	0.0	-83,875	0.0	-256,150	0.0	-112,592	0.0
23	37.7	34.3	-97,098	0.0	-122,710	0.0	-122,710	0.0	-282,287	0.0	-122,710	0.0
24	35.3	32.3	-103,611	0.0	-134,390	0.0	-134,390	0.0	-308,644	0.0	-134,390	0.0

February			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	37.5	34.5	-184,299	0.0	-128,249	0.0	-217,028	0.0	-267,384	0.0	-275,979	0.0
2	36.0	33.0	-235,379	0.0	-259,039	0.0	-292,639	0.0	-309,758	0.0	-292,650	0.0
3	34.7	31.8	-242,692	0.0	-305,891	0.0	-305,902	0.0	-323,069	0.0	-305,931	0.0
4	33.6	30.9	-248,619	0.0	-319,707	0.0	-319,724	0.0	-336,875	0.0	-319,724	0.0
5	32.8	30.1	-251,136	0.0	-328,988	0.0	-328,988	0.0	-346,138	0.0	-328,988	0.0
6	32.2	29.8	-250,466	0.0	-336,455	0.0	-336,455	0.0	-353,604	0.0	-336,455	0.0
7	32.1	29.6	-244,014	0.0	-337,249	0.0	-337,249	0.0	-354,397	0.0	-337,249	0.0
8	32.5	30.3	-110,894	0.0	-227,464	0.0	-312,349	0.0	-329,500	0.0	-227,464	0.0
9	33.9	31.6	-61,057	0.0	-198,421	0.0	-283,305	0.0	-300,454	0.0	-198,421	0.0
10	36.0	33.0	-18,973	0.0	-123,099	0.0	-250,859	0.0	-268,009	0.0	-123,099	0.0
11	38.5	34.8	0	0.0	-61,704	0.0	-223,788	0.0	-240,938	0.0	-61,704	0.0
12	41.3	36.5	0	0.0	-46,699	0.0	-196,575	0.0	-213,726	0.0	-46,699	0.0
13	43.8	38.1	0	0.0	-39,751	0.0	-170,696	0.0	-187,844	0.0	-39,751	0.0
14	45.9	39.5	0	0.0	-40,900	0.0	-145,349	0.0	-162,498	0.0	-40,900	0.0
15	47.2	40.4	-2,045	0.0	-29,925	0.0	-120,155	0.0	-137,304	0.0	-29,925	0.0
16	47.7	40.6	0	0.0	-23,270	0.0	-108,453	0.0	-125,604	0.0	-23,270	0.0
17	47.5	40.2	0	0.0	-18,004	0.0	-20,867	0.0	-134,702	0.0	-18,004	0.0
18	47.0	39.8	0	0.0	-28,645	0.0	-36,957	0.0	-163,935	0.0	-28,645	0.0
19	46.2	39.9	0	0.0	-45,749	0.0	-47,562	0.0	-185,869	0.0	-45,749	0.0
20	45.1	39.7	0	0.0	-69,999	0.0	-58,687	0.0	-205,974	0.0	-69,999	0.0
21	43.8	39.2	0	0.0	-77,869	0.0	-71,557	0.0	-223,721	0.0	-77,869	0.0
22	42.3	38.3	-58,480	0.0	-106,369	0.0	-77,651	0.0	-240,938	0.0	-106,369	0.0
23	40.7	37.2	-97,311	0.0	-114,156	0.0	-114,156	0.0	-258,989	0.0	-114,156	0.0
24	39.1	35.8	-103,610	0.0	-121,943	0.0	-121,943	0.0	-277,039	0.0	-121,943	0.0

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

BUILDING COOL-HEAT DEMAND - ALTERNATIVE 1
BLDG M500, BASELINE

March			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	45.4	41.6	-70,146	0.0	-44,400	0.0	-91,003	0.0	-92,729	0.0	-189,308	0.0
2	43.3	39.7	-142,388	0.0	-102,056	0.0	-102,052	0.0	-103,776	0.0	-212,855	0.0
3	41.6	38.6	-152,352	0.0	-110,044	0.0	-176,026	0.0	-162,260	0.0	-232,394	0.0
4	40.6	37.5	-162,534	0.0	-152,302	0.0	-244,174	0.0	-261,348	0.0	-244,174	0.0
5	40.2	37.3	-167,122	0.0	-253,140	0.0	-253,082	0.0	-270,217	0.0	-253,111	0.0
6	40.6	37.8	-165,680	0.0	-252,933	0.0	-252,979	0.0	-270,128	0.0	-252,979	0.0
7	41.6	39.0	-132,454	0.0	-229,258	0.0	-229,258	0.0	-246,409	0.0	-229,258	0.0
8	43.3	40.7	-29,479	0.0	-113,056	0.0	-197,942	0.0	-215,091	0.0	-113,056	0.0
9	45.4	42.5	0	0.0	-77,255	0.0	-162,139	0.0	-179,288	0.0	-77,255	0.0
10	47.9	44.3	0	0.0	-31,209	0.0	-131,384	0.0	-148,533	0.0	-31,209	0.0
11	50.6	45.5	0	0.0	-12,653	0.0	-100,607	0.0	-117,756	0.0	-12,653	0.0
12	53.3	46.8	0	0.0	0	0.0	-75,313	0.0	-92,463	0.0	0	0.0
13	55.8	48.5	0	0.0	0	0.0	-45,563	0.0	-62,713	0.0	0	0.0
14	58.0	49.6	0	0.0	0	0.0	-13,744	0.0	-30,894	0.0	0	0.0
15	59.6	50.3	0	0.0	0	0.0	0	0.0	-9,886	0.0	0	0.0
16	60.7	50.9	0	0.0	0	0.0	0	0.0	-4,932	0.0	0	0.0
17	61.0	50.9	0	0.0	0	0.0	0	0.0	-4,936	0.0	0	0.0
18	60.7	50.7	0	0.0	0	0.0	0	0.0	-15,577	0.0	0	0.0
19	59.6	50.7	0	0.0	0	0.0	0	0.0	-35,906	0.0	0	0.0
20	58.0	50.5	0	0.0	0	0.0	0	0.0	-71,641	0.0	0	0.0
21	55.8	49.4	0	0.0	0	0.0	0	0.0	-97,631	0.0	0	0.0
22	53.3	47.8	0	0.0	0	0.0	0	0.0	-125,606	0.0	0	0.0
23	50.6	45.9	0	0.0	-40,825	0.0	-49,140	0.0	-152,939	0.0	-40,825	0.0
24	47.9	43.8	0	0.0	-80,594	0.0	-80,596	0.0	-180,922	0.0	-80,594	0.0

April			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	57.7	53.9	-21,585	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2	55.9	52.7	-25,905	0.0	0	0.0	0	0.0	0	0.0	-18,109	0.0
3	54.2	51.3	-30,305	0.0	0	0.0	0	0.0	-5,314	0.0	-55,496	0.0
4	52.9	50.2	-32,294	0.0	0	0.0	-48,469	0.0	-64,376	0.0	-95,341	0.0
5	51.9	49.6	-34,199	0.0	-21,475	0.0	-66,957	0.0	-68,679	0.0	-132,354	0.0
6	51.2	49.2	-31,046	0.0	-69,904	0.0	-69,898	0.0	-71,625	0.0	-134,470	0.0
7	51.0	49.3	-16,477	0.0	-61,486	0.0	-61,493	0.0	-80,311	0.0	-118,141	0.0
8	51.6	49.9	0	0.0	-29,295	0.0	-46,388	0.0	-114,025	0.0	-29,295	0.0
9	53.3	50.6	0	0.0	-12,442	0.0	-29,535	0.0	-90,520	0.0	-12,442	0.0
10	55.9	51.8	0	0.0	0	0.0	-22,993	0.0	-56,174	0.0	0	0.0
11	59.0	53.4	0	0.0	0	0.0	-10,755	0.0	-27,910	0.0	0	0.0
12	62.4	55.6	0	0.0	-1,971	0.0	0	0.0	-4,921	0.0	0	0.0
13	65.5	57.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
14	68.1	59.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
15	69.8	60.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
16	70.4	60.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
17	70.2	60.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
18	69.5	60.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
19	68.5	59.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
20	67.2	59.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
21	65.5	59.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
22	63.7	58.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
23	61.7	57.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
24	59.7	55.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0

BUILDING COOL-HEAT DEMAND - ALTERNATIVE 1
BLDG M500, BASELINE

May			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	66.6	62.3	0	17.8	0	0.0	0	0.0	0	0.0	0	0.0
2	64.5	60.4	0	1.2	0	0.0	0	0.0	0	0.0	0	0.0
3	62.7	59.1	0	0.9	0	0.0	0	0.0	0	0.0	0	0.0
4	61.2	58.1	0	0.4	0	0.0	0	0.0	0	0.0	0	0.0
5	60.0	57.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
6	59.3	56.6	0	1.8	0	0.0	0	0.0	0	0.0	0	0.0
7	59.0	56.5	0	3.2	0	0.0	0	0.0	0	0.0	0	0.0
8	59.5	56.6	0	10.2	0	0.0	0	0.0	0	0.0	0	0.0
9	60.9	56.6	0	16.1	0	0.0	0	0.0	0	0.0	0	0.0
10	63.0	57.2	0	24.1	0	1.5	0	0.0	0	0.0	0	1.4
11	65.7	58.1	0	33.3	0	15.7	0	0.0	0	0.0	0	15.7
12	68.7	59.8	0	37.5	0	17.5	0	0.0	0	0.0	0	17.5
13	71.7	61.6	0	40.3	0	23.0	0	0.0	0	0.0	0	22.6
14	74.5	63.4	0	35.9	0	22.4	0	0.0	0	0.0	0	22.4
15	76.6	64.8	0	37.5	0	26.1	0	9.3	0	0.0	0	26.1
16	78.0	65.6	0	38.0	0	27.8	0	15.8	0	5.7	0	27.8
17	78.5	65.6	0	41.5	0	34.4	0	33.5	0	14.5	0	34.4
18	78.2	65.8	0	41.7	0	37.0	0	31.8	0	13.7	0	37.0
19	77.5	65.6	0	34.9	0	33.8	0	30.5	0	10.8	0	33.8
20	76.3	66.1	0	22.6	0	23.1	0	29.5	0	8.6	0	23.1
21	74.8	67.2	0	19.6	0	22.4	0	27.4	0	6.7	0	22.4
22	73.0	66.4	0	6.5	0	6.0	0	25.5	0	4.3	0	6.0
23	70.9	65.4	0	4.6	0	3.6	0	3.3	0	1.5	0	3.6
24	68.7	64.0	0	3.0	0	1.6	0	1.5	0	0.0	0	1.6

June			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	73.0	67.9	0	11.5	0	5.8	0	6.8	0	4.3	0	6
2	71.2	66.1	0	10.3	0	3.7	0	3.9	0	1.6	0	3
3	69.7	65.2	0	8.8	0	2.3	0	2.3	0	0.0	0	2.3
4	68.5	64.3	0	8.0	0	1.1	0	1.1	0	0.0	0	1.1
5	67.8	64.2	0	7.6	0	0.4	0	0.4	0	0.0	0	0.4
6	67.6	64.2	0	10.6	0	1.7	0	1.7	0	0.0	0	1.7
7	68.1	64.8	0	14.9	0	2.9	0	2.9	0	0.0	0	2.9
8	69.4	65.7	0	27.3	0	14.1	0	4.1	0	0.0	0	14.1
9	71.6	66.2	0	29.7	0	20.1	0	9.8	0	6.6	0	20.1
10	74.2	67.2	0	36.5	0	27.8	0	14.7	0	13.0	0	27.8
11	77.2	68.5	0	46.8	0	36.3	0	16.7	0	15.0	0	36.3
12	80.2	70.0	0	50.8	0	41.1	0	20.2	0	18.4	0	41.1
13	82.8	70.8	0	53.5	0	44.4	0	23.6	0	21.8	0	44.4
14	85.0	71.6	0	48.4	0	39.0	0	26.6	0	24.9	0	39.0
15	86.3	72.3	0	50.4	0	43.1	0	30.0	0	28.2	0	43.1
16	86.8	72.1	0	49.3	0	42.5	0	29.8	0	28.1	0	42.5
17	86.6	71.7	0	52.5	0	48.3	0	47.8	0	27.5	0	48.3
18	85.8	71.5	0	53.4	0	50.9	0	45.3	0	26.3	0	50.9
19	84.7	71.2	0	47.3	0	46.6	0	43.3	0	22.1	0	46.6
20	83.2	71.5	0	33.9	0	35.1	0	42.2	0	19.9	0	35.1
21	81.4	71.7	0	30.6	0	33.3	0	38.2	0	17.2	0	33.3
22	79.3	71.4	0	15.8	0	15.3	0	35.4	0	14.1	0	15.3
23	77.2	70.5	0	13.7	0	13.3	0	12.3	0	11.2	0	13.3
24	75.1	69.1	0	12.2	0	9.9	0	9.8	0	7.7	0	9.9

BUILDING COOL-HEAT DEMAND - ALTERNATIVE 1
BLDG M500, BASELINE

July			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	72.0	69.3	0	12.9	0	4.7	0	5.6	0	2.7	0	5.8
2	70.5	68.0	0	10.6	0	3.3	0	3.4	0	0.8	0	3.4
3	69.4	67.1	0	9.4	0	2.2	0	2.2	0	0.0	0	2.2
4	68.5	66.4	0	8.5	0	1.0	0	1.0	0	0.0	0	1.0
5	67.9	66.0	0	8.3	0	0.3	0	0.3	0	0.0	0	0.3
6	67.7	65.9	0	10.5	0	1.4	0	1.4	0	0.0	0	1.4
7	68.1	66.3	0	15.2	0	3.1	0	3.1	0	0.0	0	3.1
8	69.1	67.3	0	28.3	0	13.9	0	4.2	0	0.0	0	13.9
9	70.8	68.0	0	30.4	0	22.2	0	8.8	0	2.7	0	22.2
10	72.9	69.1	0	38.5	0	30.6	0	16.1	0	14.4	0	30.6
11	75.2	70.5	0	47.6	0	38.9	0	17.7	0	15.6	0	38.9
12	77.5	71.7	0	52.2	0	43.5	0	21.0	0	18.9	0	43.5
13	79.6	72.7	0	54.9	0	46.4	0	24.1	0	22.1	0	46.4
14	81.3	73.5	0	49.0	0	41.6	0	28.0	0	26.0	0	41.6
15	82.3	73.7	0	51.2	0	44.7	0	30.6	0	28.6	0	44.7
16	82.7	73.5	0	49.9	0	43.3	0	29.9	0	28.1	0	43.3
17	82.5	73.1	0	53.2	0	49.4	0	49.5	0	27.1	0	49.4
18	82.0	72.6	0	54.2	0	52.0	0	45.8	0	25.7	0	52.0
19	81.1	73.2	0	48.5	0	47.8	0	44.6	0	21.6	0	47.8
20	79.9	73.8	0	34.9	0	35.3	0	43.0	0	18.7	0	35.3
21	78.5	73.9	0	32.2	0	35.5	0	40.9	0	16.9	0	35.5
22	76.9	73.1	0	16.2	0	14.4	0	37.2	0	13.4	0	14.4
23	75.2	71.9	0	14.8	0	12.4	0	10.9	0	9.9	0	12.4
24	73.5	70.8	0	13.3	0	8.9	0	8.8	0	6.2	0	8.9

August			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	72.7	70.2	0	14.4	0	6.0	0	7.0	0	4.1	0	7.3
2	71.2	69.0	0	11.6	0	4.1	0	4.3	0	1.6	0	4.3
3	69.9	68.0	0	9.5	0	2.7	0	2.7	0	0.0	0	2.7
4	68.8	67.1	0	8.4	0	1.5	0	1.5	0	0.0	0	1.5
5	68.0	66.6	0	7.8	0	0.5	0	0.5	0	0.0	0	0.5
6	67.5	66.2	0	9.2	0	0.5	0	0.5	0	0.0	0	0.5
7	67.3	66.1	0	13.8	0	2.0	0	2.0	0	0.0	0	2.0
8	67.8	66.5	0	27.1	0	13.1	0	3.1	0	0.0	0	13.1
9	69.1	67.0	0	31.0	0	16.4	0	4.4	0	0.0	0	16.4
10	71.2	67.8	0	38.9	0	27.3	0	11.6	0	6.0	0	27.3
11	73.8	68.7	0	47.6	0	35.4	0	15.0	0	13.4	0	35.4
12	76.5	70.0	0	50.5	0	40.1	0	18.0	0	16.0	0	40.1
13	79.1	71.2	0	53.1	0	43.5	0	21.9	0	19.9	0	43.5
14	81.1	72.6	0	49.3	0	39.4	0	26.1	0	24.2	0	39.4
15	82.5	73.6	0	51.8	0	42.8	0	29.2	0	27.3	0	42.8
16	83.0	73.7	0	50.4	0	42.5	0	28.9	0	26.9	0	42.5
17	82.8	73.5	0	54.9	0	49.1	0	49.2	0	26.7	0	49.1
18	82.3	73.5	0	53.3	0	50.8	0	44.6	0	24.4	0	50.8
19	81.5	73.1	0	47.6	0	47.1	0	43.9	0	20.9	0	47.1
20	80.4	73.7	0	34.2	0	35.1	0	42.8	0	18.4	0	35.1
21	79.1	74.9	0	33.0	0	35.7	0	41.0	0	17.1	0	35.7
22	77.6	73.9	0	16.0	0	15.4	0	39.0	0	14.3	0	15.4
23	76.0	72.7	0	14.5	0	13.5	0	11.8	0	11.0	0	13.5
24	74.3	71.3	0	12.9	0	10.1	0	9.9	0	7.4	0	10.1

BUILDING COOL-HEAT DEMAND - ALTERNATIVE 1
BLDG M500, BASELINE

September			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	69.8	66.1	0	7.5	0	2.0	0	2.5	0	0.2	0	2.6
2	68.0	64.5	0	5.1	0	0.8	0	0.8	0	0.0	0	0.9
3	66.3	63.0	0	3.8	0	0.0	0	0.0	0	0.0	0	0.0
4	64.9	61.9	0	3.0	0	0.0	0	0.0	0	0.0	0	0.0
5	63.9	61.3	0	2.5	0	0.0	0	0.0	0	0.0	0	0.0
6	63.2	61.0	0	2.5	0	0.0	0	0.0	0	0.0	0	0.0
7	63.0	60.8	0	6.3	0	0.0	0	0.0	0	0.0	0	0.0
8	63.4	61.4	0	19.4	0	0.0	0	0.0	0	0.0	0	0.0
9	64.7	61.8	0	24.0	0	4.1	0	0.0	0	0.0	0	4.1
10	66.6	62.1	0	31.9	0	12.9	0	0.0	0	0.0	0	12.9
11	69.1	62.9	0	40.5	0	21.0	0	0.0	0	0.0	0	21.0
12	71.8	63.7	0	43.8	0	29.0	0	3.3	0	0.0	0	29.0
13	74.5	65.5	0	46.8	0	32.8	0	10.7	0	1.3	0	32.8
14	77.0	67.1	0	42.1	0	28.8	0	16.7	0	10.1	0	28.8
15	78.9	68.2	0	44.0	0	32.3	0	19.4	0	18.1	0	32.3
16	80.2	68.6	0	42.5	0	33.8	0	20.9	0	19.2	0	33.8
17	80.6	68.5	0	45.6	0	39.5	0	39.1	0	18.6	0	39.5
18	80.4	68.9	0	42.7	0	40.6	0	35.0	0	15.7	0	40.6
19	79.7	70.0	0	38.0	0	39.5	0	36.1	0	14.1	0	39.5
20	78.7	71.2	0	27.1	0	29.1	0	36.4	0	13.0	0	29.1
21	77.3	71.6	0	24.8	0	29.6	0	34.8	0	11.6	0	29.6
22	75.6	70.5	0	10.2	0	10.1	0	31.5	0	8.7	0	10.1
23	73.7	69.4	0	8.5	0	7.9	0	7.1	0	5.6	0	7.9
24	71.8	67.7	0	6.7	0	4.8	0	4.7	0	2.3	0	4.8

October			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	54.8	51.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2	52.9	49.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
3	51.2	48.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
4	49.8	47.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
5	48.8	46.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
6	48.2	45.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
7	47.9	45.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
8	48.5	46.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
9	50.3	47.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
10	52.9	48.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
11	56.2	49.9	0	11.4	0	0.0	0	0.0	0	0.0	0	0.0
12	59.6	51.5	0	18.8	0	0.0	0	0.0	0	0.0	0	0.0
13	62.9	53.5	0	25.0	0	0.0	0	0.0	0	0.0	0	0.0
14	65.5	55.2	0	25.2	0	3.7	0	0.0	0	0.0	0	0.0
15	67.3	56.3	0	26.8	0	11.1	0	0.0	0	0.0	0	0.0
16	67.9	56.6	0	26.3	0	11.4	0	0.0	0	0.0	0	0.0
17	67.7	56.4	0	27.7	0	14.9	0	0.0	0	0.0	0	9.7
18	67.0	56.6	0	26.7	0	17.1	0	0.0	0	0.0	0	17.1
19	66.0	57.6	0	22.8	0	16.3	0	0.0	0	0.0	0	16.3
20	64.6	57.9	0	11.6	0	3.7	0	1.9	0	0.0	0	3.7
21	62.9	57.3	0	9.2	0	2.5	0	3.6	0	0.0	0	2.5
22	61.0	56.0	0	0.0	0	0.0	0	1.9	0	0.0	0	0.0
23	59.0	54.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
24	56.9	53.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0

BUILDING COOL-HEAT DEMAND - ALTERNATIVE 1
BLDG M500, BASELINE

November			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	48.7	45.7	-88,569	0.0	0	0.0	-77,424	0.0	-79,139	0.0	-157,973	0.0
2	46.9	44.1	-53,781	0.0	-37,184	0.0	-86,342	0.0	-88,072	0.0	-178,059	0.0
3	45.5	42.8	-58,415	0.0	-93,714	0.0	-93,711	0.0	-95,437	0.0	-194,310	0.0
4	44.6	41.9	-61,879	0.0	-97,810	0.0	-183,029	0.0	-193,889	0.0	-205,544	0.0
5	44.4	42.0	-63,783	0.0	-112,014	0.0	-210,822	0.0	-227,970	0.0	-210,849	0.0
6	44.8	42.7	-63,654	0.0	-211,762	0.0	-211,708	0.0	-228,854	0.0	-211,719	0.0
7	45.9	43.9	-82,078	0.0	-201,162	0.0	-201,211	0.0	-218,360	0.0	-201,211	0.0
8	47.8	46.0	-25,104	0.0	-79,762	0.0	-164,647	0.0	-181,797	0.0	-79,761	0.0
9	50.2	48.0	0	0.0	-37,602	0.0	-119,941	0.0	-137,090	0.0	-37,602	0.0
10	52.9	49.9	0	0.0	-9,639	0.0	-82,101	0.0	-99,252	0.0	-9,639	0.0
11	55.8	51.1	0	0.0	0	0.0	-50,164	0.0	-67,312	0.0	0	0.0
12	58.5	52.0	0	0.0	0	0.0	-23,431	0.0	-40,581	0.0	0	0.0
13	60.9	52.5	0	0.0	0	0.0	0	0.0	-12,804	0.0	0	0.0
14	62.8	53.4	0	0.0	-1,610	0.0	0	0.0	0	0.0	-1,610	0.0
15	64.0	53.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
16	64.4	53.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
17	64.1	53.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
18	63.2	53.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
19	61.8	54.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
20	60.0	53.6	0	0.0	0	0.0	-2,454	0.0	-25,582	0.0	0	0.0
21	57.9	52.7	0	0.0	0	0.0	0	0.0	-81,077	0.0	0	0.0
22	55.6	51.2	0	0.0	0	0.0	0	0.0	-104,561	0.0	0	0.0
23	53.2	49.5	0	0.0	0	0.0	0	0.0	-128,615	0.0	0	0.0
24	50.8	47.6	0	0.0	-20,988	0.0	-58,405	0.0	-154,253	0.0	-20,988	0.0

December			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	37.5	35.3	-83,599	0.0	-128,240	0.0	-178,981	0.0	-198,014	0.0	-275,149	0.0
2	37.1	35.1	-87,693	0.0	-169,511	0.0	-282,629	0.0	-299,777	0.0	-282,603	0.0
3	37.4	35.5	-91,381	0.0	-284,650	0.0	-284,564	0.0	-301,715	0.0	-284,613	0.0
4	38.1	36.2	-178,299	0.0	-280,896	0.0	-280,951	0.0	-298,101	0.0	-280,951	0.0
5	39.3	37.6	-199,922	0.0	-272,864	0.0	-272,864	0.0	-290,013	0.0	-272,864	0.0
6	40.9	39.2	-198,614	0.0	-259,279	0.0	-259,279	0.0	-276,428	0.0	-259,279	0.0
7	42.7	41.2	-193,825	0.0	-245,206	0.0	-245,206	0.0	-262,356	0.0	-245,206	0.0
8	44.7	43.1	-66,932	0.0	-124,694	0.0	-209,580	0.0	-226,730	0.0	-124,694	0.0
9	46.8	45.3	-32,495	0.0	-82,303	0.0	-167,188	0.0	-184,337	0.0	-82,303	0.0
10	48.8	47.0	0	0.0	-31,583	0.0	-129,123	0.0	-146,272	0.0	-31,583	0.0
11	50.7	48.1	0	0.0	-9,518	0.0	-102,962	0.0	-120,112	0.0	-9,518	0.0
12	52.2	48.8	0	0.0	0	0.0	-85,447	0.0	-102,596	0.0	0	0.0
13	53.4	49.2	0	0.0	0	0.0	-65,662	0.0	-82,810	0.0	0	0.0
14	54.1	49.2	0	0.0	0	0.0	-47,391	0.0	-64,540	0.0	0	0.0
15	54.4	48.9	0	0.0	0	0.0	-36,166	0.0	-53,316	0.0	0	0.0
16	54.0	48.2	0	0.0	0	0.0	-42,721	0.0	-59,870	0.0	0	0.0
17	53.0	47.3	0	0.0	0	0.0	-5,104	0.0	-93,876	0.0	0	0.0
18	51.4	46.3	0	0.0	0	0.0	-26,155	0.0	-125,350	0.0	0	0.0
19	49.3	45.4	0	0.0	-30,742	0.0	-37,315	0.0	-155,800	0.0	-30,742	0.0
20	47.0	43.5	0	0.0	-60,095	0.0	-48,784	0.0	-183,763	0.0	-60,095	0.0
21	44.5	41.5	0	0.0	-71,988	0.0	-65,676	0.0	-211,257	0.0	-71,988	0.0
22	42.2	39.3	0	0.0	-104,382	0.0	-75,664	0.0	-236,781	0.0	-104,382	0.0
23	40.1	37.6	-11,158	0.0	-115,427	0.0	-115,427	0.0	-261,638	0.0	-115,427	0.0
24	38.5	36.2	-79,709	0.0	-123,214	0.0	-123,214	0.0	-279,687	0.0	-123,214	0.0

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M500, BASELINE

M O N T H L Y E N E R G Y C O N S U M P T I O N

Month	ELEC On Peak (kWh)	DEMAND On Peak (kW)	GAS On Peak (Therm)	GAS DMND On Peak (Thrm/hr)
Jan	41,151	99	1,485	4
Feb	37,352	99	1,353	4
March	41,219	94	684	3
April	37,531	94	122	2
May	47,780	144	0	0
June	57,692	162	0	0
July	56,957	160	0	0
Aug	58,819	159	0	0
Sept	49,215	147	0	0
Oct	40,716	125	0	0
Nov	37,554	94	484	3
Dec	40,050	99	1,101	4
Total	546,037	162	5,230	4

Building Energy Consumption = 86,892 (Btu/Sq Ft/Year) Floor Area = 27,466 (Sq Ft)
Source Energy Consumption = 223,619 (Btu/Sq Ft/Year)

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M500, BASELINE

EQUIPMENT ENERGY CONSUMPTION

Ref Num	Equip Code	Monthly Consumption Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	5046	4602	5491	4919	5269	5269	4919	5491	4919	5269	4729	4919	60,842
	PK	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9
1	MISC LD													
	ELEC	11818	10813	12823	11632	12321	12321	11632	12823	11632	12321	10999	11632	142,768
	PK	50.2	50.2	50.2	50.2	50.2	50.2	50.2	50.2	50.2	50.2	50.2	50.2	50.2
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	EQ1122L	AIR-CLD RECIP >55 TONS												
	ELEC	0	0	0	0	7121	15523	15101	15182	9514	1547	0	0	63,988
	PK	0.0	0.0	0.0	0.0	41.8	58.6	57.1	57.5	47.9	25.1	0.0	0.0	58.6
1	EQ5200	CONDENSER FANS												
	ELEC	0	0	0	0	875	1893	1900	1895	1181	140	0	0	7,884
	PK	0.0	0.0	0.0	0.0	5.1	11.2	6.8	6.8	5.7	3.3	0.0	0.0	11.2
1	EQ5001	CHILLED WATER PUMP C.V.												
	ELEC	0	0	0	0	1357	2432	2478	2500	1767	657	0	0	11,191
	PK	0.0	0.0	0.0	0.0	3.8	3.8	3.8	3.8	3.8	3.8	0.0	0.0	3.8
1	EQ5313	CONTROLS												
	ELEC	0	0	0	0	107	192	196	197	139	52	0	0	883
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3
1	EQ4003	FC CENTRIF. FAN C.V.												
	ELEC	13714	12387	13714	13271	13714	13271	13714	13714	13271	13714	13271	13714	161,467
	PK	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M500, BASELINE

2	EQ4003			FC CENTRIF. FAN C.V.									
	ELEC	7017	6338	7017	6791	7017	6791	7017	7017	6791	7017	6791	7017	82,621
	PK	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4
1	EQ2001			GAS FIRE TUBE HOT WATER										
	GAS	1485	1353	684	122	0	0	0	0	0	0	484	1101	5,230
	PK	4.3	4.3	3.2	1.6	0.0	0.0	0.0	0.0	0.0	0.0	2.7	3.6	4.3
1	EQ5020			HEAT WATER CIRC. PUMP C.V.										
	ELEC	2827	2554	1729	730	0	0	0	0	0	0	1402	2200	11,442
	PK	3.8	3.8	3.8	3.8	0.0	0.0	0.0	0.0	0.0	0.0	3.8	3.8	3.8
1	EQ5240			BOILER FORCED DRAFT FAN										
	ELEC	357	322	218	92	0	0	0	0	0	0	177	278	1,444
	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	EQ5307			BOILER CONTROLS										
	ELEC	372	336	228	96	0	0	0	0	0	0	184	290	1,505
	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

UTILITY PEAK CHECKSUMS - ALTERNATIVE 1
BLDG M500, BASELINE

---------- 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 161.7 (kW)
Yearly Time of Peak 18 (hr) 6 (mo)

Hour 18 Month 6

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Percnt Of Tot (%)
Cooling Equipment				
1	EQ1122L	AIR-CLD RECIP >55 TONS	67.7	41.88
Sub Total			67.7	41.88
Sub Total			0.0	0.00
Air Moving Equipment				
1		SUMMATION OF FAN ELECTRICAL DEMAND	18.4	11.40
2		SUMMATION OF FAN ELECTRICAL DEMAND	9.4	5.83
Sub Total			27.9	17.23
Sub Total			0.0	0.00
Miscellaneous				
Lights			15.9	9.81
Base Utilities			0.0	0.00
Misc Equipment			50.2	31.07
Sub Total			66.1	40.89
Grand Total			161.7	100.00

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M500, ECO#2

M O N T H L Y E N E R G Y C O N S U M P T I O N

Month	ELEC On Peak (kWh)	DEMAND On Peak (kW)	GAS On Peak (Therm)	GAS DMND On Peak (Thrm/hr)
Jan	42,033	100	1,530	4
Feb	38,148	100	1,397	4
March	41,758	95	716	3
April	37,789	94	131	2
May	48,198	145	0	0
June	58,510	163	0	0
July	57,735	162	0	0
Aug	59,607	161	0	0
Sept	49,761	148	0	0
Oct	40,746	126	0	0
Nov	37,991	94	506	3
Dec	40,855	100	1,140	4
Total	553,131	163	5,421	4

Building Energy Consumption = 88,471 (Btu/Sq Ft/Year)
Source Energy Consumption = 226,997 (Btu/Sq Ft/Year)

Floor Area = 27,466 (Sq Ft)

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M500, ECO#2

EQUIPMENT ENERGY CONSUMPTION

Ref Num	Equip Code	Monthly Consumption Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	5046	4602	5491	4919	5269	5269	4919	5491	4919	5269	4729	4919	60,842
	PK	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9
1	MISC LD													
	ELEC	11818	10813	12823	11632	12321	12321	11632	12823	11632	12321	10999	11632	142,768
	PK	50.2	50.2	50.2	50.2	50.2	50.2	50.2	50.2	50.2	50.2	50.2	50.2	50.2
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	EQ1122L	AIR-CLD RECIP >55 TONS												
	ELEC	0	0	0	0	7120	15583	15112	15195	9514	1489	0	0	64,014
	PK	0.0	0.0	0.0	0.0	42.2	59.3	57.4	57.6	48.2	25.5	0.0	0.0	59.3
1	EQ5200	CONDENSER FANS												
	ELEC	0	0	0	0	876	1902	1903	1898	1182	135	0	0	7,897
	PK	0.0	0.0	0.0	0.0	5.1	11.2	6.8	6.8	5.8	3.3	0.0	0.0	11.2
1	EQ5001	CHILLED WATER PUMP C.V.												
	ELEC	0	0	0	0	1775	3182	3241	3271	2312	756	0	0	14,536
	PK	0.0	0.0	0.0	0.0	5.0	5.0	5.0	5.0	5.0	5.0	0.0	0.0	5.0
1	EQ5313	CONTROLS												
	ELEC	0	0	0	0	107	192	196	197	139	46	0	0	877
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3
1	EQ4003	FC CENTRIF. FAN C.V.												
	ELEC	13713	12386	13713	13271	13713	13271	13713	13713	13271	13713	13271	13713	161,463
	PK	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M500, ECO#2

2	EQ4003			FC CENTRIF. FAN C.V.									
	ELEC	7017	6338	7017	6791	7017	6791	7017	7017	6791	7017	6791	7017	82,625
	PK	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4
1	EQ2001			GAS FIRE TUBE HOT WATER									
	GAS	1530	1397	716	131	0	0	0	0	0	0	506	1140	5,421
	PK	4.4	4.4	3.3	1.7	0.0	0.0	0.0	0.0	0.0	0.0	2.8	3.7	4.4
1	EQ5020			HEAT WATER CIRC. PUMP C.V.									
	ELEC	3699	3341	2262	979	0	0	0	0	0	0	1834	2978	15,093
	PK	5.0	5.0	5.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	5.0	5.0	5.0
1	EQ5240			BOILER FORCED DRAFT FAN									
	ELEC	367	331	224	97	0	0	0	0	0	0	182	295	1,497
	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	EQ5307			BOILER CONTROLS									
	ELEC	372	336	228	98	0	0	0	0	0	0	184	299	1,518
	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

UTILITY PEAK CHECKSUMS - ALTERNATIVE 1
BLDG M500, ECO#2

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 163.0 (kW)
Yearly Time of Peak 18 (hr) 6 (mo)

Hour 18 Month 6

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Percnt Of Tot (%)
Cooling Equipment				
1	EQ1122L	AIR-CLD RECIP >55 TONS	69.1	42.36
Sub Total			69.1	42.36
Sub Total			0.0	0.00
Air Moving Equipment				
1		SUMMATION OF FAN ELECTRICAL DEMAND	18.4	11.31
2		SUMMATION OF FAN ELECTRICAL DEMAND	9.4	5.79
Sub Total			27.9	17.09
Sub Total			0.0	0.00
Miscellaneous				
Lights			15.9	9.73
Base Utilities			0.0	0.00
Misc Equipment			50.2	30.82
Sub Total			66.1	40.55
Grand Total			163.0	100.00

CALIFORNIA TITLE 24 COMPLIANCE - ALTERNATIVE 1
BLDG M500, ECO#2

CALIFORNIA TITLE 24 COMPLIANCE REPORT

Weather Name ..... ATLANTA.
Gross Conditioned Floor Area (sqft)..... 27,466
ACM Multiplier 1.025

E N E R G Y U S E S U M M A R Y

	ELEC (kWh/yr)	GAS (kBtu/yr)	PERCENT OF TOTAL ENERGY (%)	TOTAL SOURCE ENERGY (kBtu/yr)	ADJUSTED UNIT SOURCE ENERGY (kBtu/yr-sf)
Primary Heating	3,015.4	542,100.2	22.7	601,509.4	22.4
Primary Cooling					
Compressor	64,014.1	0.0	9.0	655,505.7	24.5
Tower/Cond Fans	7,897.0	0.0	1.1	80,865.1	3.0
Condenser Pump	0.0	0.0	0.0	0.0	0.0
Other Accessories	877.2	0.0	0.1	8,982.5	0.3
Auxiliary					
Supply Fans	244,087.6	0.0	34.3	2,499,462.5	93.3
Circulation Pumps	29,629.2	0.0	4.2	303,404.1	11.3
Base Utilities	0.0	0.0	0.0	0.0	0.0
Subtotal	273,716.8	0.0	38.4	2,802,866.5	104.6
Lighting	60,841.8	0.0	8.5	623,021.1	22.7
Receptacle	142,768.4	0.0	20.1	1,461,952.1	53.2
Domestic Hot Water	0.0	0.0	0.0	0.0	0.0
Cogeneration	0.0	0.0	0.0	0.0	0.0
Totals	553,130.6	542,100.2	100.0	6,234,702.5	230.8

CALIFORNIA TITLE 24 COMPLIANCE - ALTERNATIVE 1
BLDG M500, BASELINE

CALIFORNIA TITLE 24 COMPLIANCE REPORT

Weather Name ..... ATLANTA.
Gross Conditioned Floor Area (sqft)..... 27,466
ACM Multiplier 1.025

E N E R G Y U S E S U M M A R Y

	ELEC (kWh/yr)	GAS (kBtu/yr)	PERCENT OF TOTAL ENERGY (%)	TOTAL SOURCE ENERGY (kBtu/yr)	ADJUSTED UNIT SOURCE ENERGY (kBtu/yr-sf)
Primary Heating	2,949.0	522,952.5	22.3	580,674.3	21.7
Primary Cooling					
Compressor	63,988.1	0.0	9.2	655,239.4	24.5
Tower/Cond Fans	7,884.2	0.0	1.1	80,734.8	3.0
Condenser Pump	0.0	0.0	0.0	0.0	0.0
Other Accessories	883.5	0.0	0.1	9,047.1	0.3
Auxiliary					
Supply Fans	244,088.9	0.0	34.9	2,499,476.5	93.3
Circulation Pumps	22,632.8	0.0	3.2	231,760.2	8.6
Base Utilities	0.0	0.0	0.0	0.0	0.0
Subtotal	266,721.7	0.0	38.1	2,731,236.8	101.9
Lighting	60,841.8	0.0	8.7	623,021.1	22.7
Receptacle	142,768.4	0.0	20.4	1,461,952.1	53.2
Domestic Hot Water	0.0	0.0	0.0	0.0	0.0
Cogeneration	0.0	0.0	0.0	0.0	0.0
Totals	546,036.8	522,952.5	100.0	6,141,905.5	227.3

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M500, ECO#3

M O N T H L Y E N E R G Y C O N S U M P T I O N

Month	ELEC On Peak (kWh)	DEMAND On Peak (kW)	GAS On Peak (Therm)	GAS DMND On Peak (Thrm/hr)
Jan	42,023	100	1,487	4
Feb	38,139	100	1,355	4
March	41,753	95	686	3
April	37,756	94	123	2
May	48,196	145	0	0
June	58,450	163	0	0
July	57,726	161	0	0
Aug	59,595	161	0	0
Sept	49,760	148	0	0
Oct	40,916	126	0	0
Nov	37,986	94	485	3
Dec	40,729	100	1,103	4
Total	553,031	163	5,238	4

Building Energy Consumption = 87,793 (Btu/Sq Ft/Year)
Source Energy Consumption = 226,260 (Btu/Sq Ft/Year)

Floor Area = 27,466 (Sq Ft)

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M500, ECO#3

EQUIPMENT ENERGY CONSUMPTION

Ref Num	Equip Code	Monthly Consumption Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	5046	4602	5491	4919	5269	5269	4919	5491	4919	5269	4729	4919	60,842
	PK	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9
1	MISC LD													
	ELEC	11818	10813	12823	11632	12321	12321	11632	12823	11632	12321	10999	11632	142,768
	PK	50.2	50.2	50.2	50.2	50.2	50.2	50.2	50.2	50.2	50.2	50.2	50.2	50.2
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	EQ1122L	AIR-CLD RECIP >55 TONS												
	ELEC	0	0	0	0	7119	15530	15106	15187	9514	1544	0	0	64,001
	PK	0.0	0.0	0.0	0.0	41.8	58.7	57.2	57.5	47.9	25.1	0.0	0.0	58.7
1	EQ5200	CONDENSER FANS												
	ELEC	0	0	0	0	875	1895	1901	1896	1181	140	0	0	7,887
	PK	0.0	0.0	0.0	0.0	5.1	11.2	6.8	6.8	5.7	3.3	0.0	0.0	11.2
1	EQ5001	CHILLED WATER PUMP C.V.												
	ELEC	0	0	0	0	1775	3182	3241	3271	2312	860	0	0	14,641
	PK	0.0	0.0	0.0	0.0	5.0	5.0	5.0	5.0	5.0	5.0	0.0	0.0	5.0
1	EQ5313	CONTROLS												
	ELEC	0	0	0	0	107	192	196	197	139	52	0	0	883
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3
1	EQ4003	FC CENTRIF. FAN C.V.												
	ELEC	13713	12386	13713	13271	13713	13271	13713	13713	13271	13713	13271	13713	161,463
	PK	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M500, ECO#3

2	EQ4003			FC CENTRIF. FAN C.V.									
	ELEC	7017	6338	7017	6791	7017	6791	7017	7017	6791	7017	6791	7017	82,625
	PK	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4
1	EQ2001			GAS FIRE TUBE HOT WATER									
	GAS	1487	1355	686	123	0	0	0	0	0	0	485	1103	5,238
	PK	4.3	4.3	3.2	1.6	0.0	0.0	0.0	0.0	0.0	0.0	2.7	3.6	4.3
1	EQ5020			HEAT WATER CIRC. PUMP C.V.									
	ELEC	3699	3341	2262	954	0	0	0	0	0	0	1834	2878	14,969
	PK	5.0	5.0	5.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	5.0	5.0	5.0
1	EQ5240			BOILER FORCED DRAFT FAN									
	ELEC	357	323	219	92	0	0	0	0	0	0	177	278	1,447
	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	EQ5307			BOILER CONTROLS									
	ELEC	372	336	228	96	0	0	0	0	0	0	184	290	1,505
	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

UTILITY PEAK CHECKSUMS - ALTERNATIVE 1
BLDG M500, ECO#3

UTILITY PEAK CHECKSUMS

Utility ELECTRIC DEMAND

Peak Value 162.9 (kW)
Yearly Time of Peak 18 (hr) 6 (mo)

Hour 18 Month 6

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Percnt Of Tot (%)
Cooling Equipment				
1	EQ1122L	AIR-CLD RECIP >55 TONS	68.9	42.32
Sub Total			68.9	42.32
Sub Total			0.0	0.00
Air Moving Equipment				
1		SUMMATION OF FAN ELECTRICAL DEMAND	18.4	11.31
2		SUMMATION OF FAN ELECTRICAL DEMAND	9.4	5.79
Sub Total			27.9	17.10
Sub Total			0.0	0.00
Miscellaneous				
Lights			15.9	9.74
Base Utilities			0.0	0.00
Misc Equipment			50.2	30.84
Sub Total			66.1	40.58
Grand Total			162.9	100.00

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

CALIFORNIA TITLE 24 COMPLIANCE - ALTERNATIVE 1
BLDG M500, ECO#3

CALIFORNIA TITLE 24 COMPLIANCE REPORT

Weather Name	ATLANTA.
Gross Conditioned Floor Area (sqft).....	27,466
ACM Multiplier	1.025

E N E R G Y U S E S U M M A R Y

	ELEC (kWh/yr)	GAS (kBtu/yr)	PERCENT OF TOTAL ENERGY (%)	TOTAL SOURCE ENERGY (kBtu/yr)	ADJUSTED UNIT SOURCE ENERGY (kBtu/yr-sf)
Primary Heating	2,952.2	523,838.3	22.1	581,639.9	21.7
Primary Cooling					
Compressor	64,001.2	0.0	9.1	655,373.6	24.5
Tower/Cond Fans	7,886.7	0.0	1.1	80,759.6	3.0
Condenser Pump	0.0	0.0	0.0	0.0	0.0
Other Accessories	883.5	0.0	0.1	9,047.1	0.3
Auxiliary					
Supply Fans	244,087.6	0.0	34.5	2,499,462.5	93.3
Circulation Pumps	29,609.4	0.0	4.2	303,200.5	11.3
Base Utilities	0.0	0.0	0.0	0.0	0.0
Subtotal	273,696.9	0.0	38.7	2,802,662.8	104.6
Lighting	60,841.8	0.0	8.6	623,021.1	22.7
Receptacle	142,768.4	0.0	20.2	1,461,952.1	53.2
Domestic Hot Water	0.0	0.0	0.0	0.0	0.0
Cogeneration	0.0	0.0	0.0	0.0	0.0
Totals	553,030.7	523,838.3	100.0	6,214,456.5	230.0

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M500, ECO#7

M O N T H L Y E N E R G Y C O N S U M P T I O N

Month	ELEC On Peak (kWh)	DEMAND On Peak (kW)	GAS On Peak (Therm)	GAS DMND On Peak (Thrm/hr)
Jan	28,077	99	448	6
Feb	25,647	99	438	6
March	29,320	94	176	3
April	25,944	94	12	2
May	36,404	144	0	0
June	43,878	162	0	0
July	41,144	160	0	0
Aug	44,847	159	0	0
Sept	36,813	147	0	0
Oct	30,788	125	0	0
Nov	25,010	94	102	3
Dec	26,760	99	271	5
Total	394,632	162	1,447	6

Building Energy Consumption = 54,307 (Btu/Sq Ft/Year)
Source Energy Consumption = 152,675 (Btu/Sq Ft/Year)

Floor Area = 27,466 (Sq Ft)

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M500, ECO#7

EQUIPMENT ENERGY CONSUMPTION

Ref Num	Equip Code	Monthly Consumption Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	5046	4602	5491	4919	5269	5269	4919	5491	4919	5269	4729	4919	60,842
	PK	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9
1	MISC LD													
	ELEC	11818	10813	12823	11632	12321	12321	11632	12823	11632	12321	10999	11632	142,768
	PK	50.2	50.2	50.2	50.2	50.2	50.2	50.2	50.2	50.2	50.2	50.2	50.2	50.2
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
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	EQ1122L	AIR-CLD RECIP >55 TONS												
	ELEC	0	0	0	0	6805	13229	12323	12988	8501	2107	0	0	55,953
	PK	0.0	0.0	0.0	0.0	41.8	58.6	57.1	57.4	50.3	25.9	0.0	0.0	58.6
1	EQ5200	CONDENSER FANS												
	ELEC	0	0	0	0	838	1616	1561	1623	1053	190	0	0	6,880
	PK	0.0	0.0	0.0	0.0	5.2	11.2	6.8	6.8	6.7	3.4	0.0	0.0	11.2
1	EQ5001	CHILLED WATER PUMP C.V.												
	ELEC	0	0	0	0	1110	1360	1273	1417	1273	859	0	0	7,292
	PK	0.0	0.0	0.0	0.0	3.8	3.8	3.8	3.8	3.8	3.8	0.0	0.0	3.8
1	EQ5313	CONTROLS												
	ELEC	0	0	0	0	88	107	100	112	100	68	0	0	576
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3
1	EQ4003	FC CENTRIF. FAN C.V.												
	ELEC	6322	5769	6875	6175	6599	6599	6175	6875	6175	6599	5917	6175	76,252
	PK	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M500, ECO#7

2	EQ4003			FC CENTRIF. FAN C.V.									
	ELEC	3235	2952	3518	3160	3377	3377	3160	3518	3160	3377	3028	3160	39,020
	PK	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4
1	EQ2001			GAS FIRE TUBE HOT WATER										
	GAS	448	438	176	12	0	0	0	0	0	0	102	271	1,447
	PK	5.8	6.0	3.5	1.8	0.0	0.0	0.0	0.0	0.0	0.0	2.6	5.1	6.0
1	EQ5020			HEAT WATER CIRC. PUMP C.V.										
	ELEC	1303	1189	483	46	0	0	0	0	0	0	266	688	3,975
	PK	3.8	3.8	3.8	3.8	0.0	0.0	0.0	0.0	0.0	0.0	3.8	3.8	3.8
1	EQ5240			BOILER FORCED DRAFT FAN										
	ELEC	180	165	67	6	0	0	0	0	0	0	37	95	550
	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	EQ5307			BOILER CONTROLS										
	ELEC	172	157	63	6	0	0	0	0	0	0	35	91	523
	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

UTILITY PEAK CHECKSUMS - ALTERNATIVE 1
BLDG M500, ECO#7

---------- 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 161.7 (kW)
Yearly Time of Peak 18 (hr) 6 (mo)

Hour 18 Month 6

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Percnt Of Tot (%)
Cooling Equipment				
1	EQ1122L	AIR-CLD RECIP >55 TONS	67.7	41.88
Sub Total			67.7	41.88
Sub Total			0.0	0.00
Air Moving Equipment				
1		SUMMATION OF FAN ELECTRICAL DEMAND	18.4	11.40
2		SUMMATION OF FAN ELECTRICAL DEMAND	9.4	5.83
Sub Total			27.9	17.23
Sub Total			0.0	0.00
Miscellaneous				
Lights			15.9	9.81
Base Utilities			0.0	0.00
Misc Equipment			50.2	31.07
Sub Total			66.1	40.89
Grand Total			161.7	100.00

CALIFORNIA TITLE 24 COMPLIANCE - ALTERNATIVE 1
BLDG M500, ECO#7

CALIFORNIA TITLE 24 COMPLIANCE REPORT

Weather Name ..... ATLANTA.
Gross Conditioned Floor Area (sqft)..... 27,466
ACM Multiplier 1.025

E N E R G Y U S E S U M M A R Y

	ELEC (kWh/yr)	GAS (kBtu/yr)	PERCENT OF TOTAL ENERGY (%)	TOTAL SOURCE ENERGY (kBtu/yr)	ADJUSTED UNIT SOURCE ENERGY (kBtu/yr-sf)
Primary Heating	1,072.9	144,716.2	9.9	163,319.3	6.1
Primary Cooling					
Compressor	55,952.8	0.0	12.8	572,957.7	21.4
Tower/Cond Fans	6,880.5	0.0	1.6	70,456.5	2.6
Condenser Pump	0.0	0.0	0.0	0.0	0.0
Other Accessories	575.7	0.0	0.1	5,895.2	0.2
Auxiliary					
Supply Fans	115,272.8	0.0	26.4	1,180,396.1	44.1
Circulation Pumps	11,267.0	0.0	2.6	115,374.3	4.3
Base Utilities	0.0	0.0	0.0	0.0	0.0
Subtotal	126,539.8	0.0	29.0	1,295,770.5	48.4
Lighting	60,841.8	0.0	13.9	623,021.1	22.7
Receptacle	142,768.4	0.0	32.7	1,461,952.1	53.2
Domestic Hot Water	0.0	0.0	0.0	0.0	0.0
Cogeneration	0.0	0.0	0.0	0.0	0.0
Totals	394,631.9	144,716.2	100.0	4,193,372.7	154.6

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M500, ECO#12

MONTHLY ENERGY CONSUMPTION

Month	ELEC On Peak (kWh)	DEMAND On Peak (kW)	GAS On Peak (Therm)	GAS DMND On Peak (Thrm/hr)
Jan	27,992	99	364	5
Feb	25,571	99	356	5
March	29,214	94	115	3
April	25,925	94	4	1
May	34,840	141	0	0
June	41,458	158	0	0
July	38,994	156	0	0
Aug	42,393	155	0	0
Sept	34,462	142	0	0
Oct	29,990	124	0	0
Nov	24,999	94	57	2
Dec	26,671	94	202	3
Total	382,510	158	1,097	5

Building Energy Consumption = 51,527 (Btu/Sq Ft/Year)
Source Energy Consumption = 146,815 (Btu/Sq Ft/Year)

Floor Area = 27,466 (Sq Ft)

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M500, ECO#12

EQUIPMENT ENERGY CONSUMPTION

Ref Num	Equip Code	Monthly Consumption Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	5046	4602	5491	4919	5269	5269	4919	5491	4919	5269	4729	4919	60,842
	PK	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9
1	MISC LD													
	ELEC	11818	10813	12823	11632	12321	12321	11632	12823	11632	12321	10999	11632	142,768
	PK	50.2	50.2	50.2	50.2	50.2	50.2	50.2	50.2	50.2	50.2	50.2	50.2	50.2
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	EQ1122L	AIR-CLD RECIP >55 TONS												
	ELEC	0	0	0	0	5500	11089	10427	10818	6635	1681	0	0	46,150
	PK	0.0	0.0	0.0	0.0	38.9	55.0	52.9	54.3	44.7	23.7	0.0	0.0	55.0
1	EQ5200	CONDENSER FANS												
	ELEC	0	0	0	0	669	1337	1307	1339	814	154	0	0	5,619
	PK	0.0	0.0	0.0	0.0	4.7	11.2	6.3	6.4	5.9	3.1	0.0	0.0	11.2
1	EQ5001	CHILLED WATER PUMP C.V.												
	ELEC	0	0	0	0	1026	1360	1273	1417	1045	547	0	0	6,669
	PK	0.0	0.0	0.0	0.0	3.8	3.8	3.8	3.8	3.8	3.8	0.0	0.0	3.8
1	EQ5313	CONTROLS												
	ELEC	0	0	0	0	81	107	100	112	82	43	0	0	526
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3
1	EQ4003	FC CENTRIF. FAN C.V.												
	ELEC	6322	5769	6875	6175	6599	6599	6175	6875	6175	6599	5917	6175	76,252
	PK	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M500, ECO#12

2	EQ4003	FC CENTRIF. FAN C.V.											
	ELEC	3235	2952	3518	3160	3377	3377	3160	3518	3160	3377	3028	3160	39,020
	PK	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4
1	EQ2001	GAS FIRE TUBE HOT WATER												
	GAS	364	356	115	4	0	0	0	0	0	0	57	202	1,097
	PK	5.2	5.4	2.6	0.9	0.0	0.0	0.0	0.0	0.0	0.0	2.3	2.5	5.4
1	EQ5020	HEAT WATER CIRC. PUMP C.V.												
	ELEC	1224	1117	395	30	0	0	0	0	0	0	255	612	3,633
	PK	3.8	3.8	3.8	3.8	0.0	0.0	0.0	0.0	0.0	0.0	3.8	3.8	3.8
1	EQ5240	BOILER FORCED DRAFT FAN												
	ELEC	186	170	60	5	0	0	0	0	0	0	39	93	552
	PK	0.6	0.6	0.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.6	0.6
1	EQ5307	BOILER CONTROLS												
	ELEC	161	147	52	4	0	0	0	0	0	0	33	81	478
	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

UTILITY PEAK CHECKSUMS - ALTERNATIVE 1
BLDG M500, ECO#12

UTILITY PEAK CHECKSUMS

Utility ELECTRIC DEMAND

Peak Value 158.3 (kW)
Yearly Time of Peak 18 (hr) 6 (mo)

Hour 18 Month 6

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Percnt Of Tot (%)
Cooling Equipment				
1	EQ1122L	AIR-CLD RECIP >55 TONS	64.3	40.63
Sub Total			64.3	40.63
Sub Total			0.0	0.00
Air Moving Equipment				
1		SUMMATION OF FAN ELECTRICAL DEMAND	18.4	11.64
2		SUMMATION OF FAN ELECTRICAL DEMAND	9.4	5.96
Sub Total			27.9	17.60
Sub Total			0.0	0.00
Miscellaneous				
Lights			15.9	10.02
Base Utilities			0.0	0.00
Misc Equipment			50.2	31.74
Sub Total			66.1	41.77
Grand Total			158.3	100.00

CALIFORNIA TITLE 24 COMPLIANCE - ALTERNATIVE 1
BLDG M500, ECO#12

CALIFORNIA TITLE 24 COMPLIANCE REPORT

Weather Name ..... ATLANTA.
Gross Conditioned Floor Area (sqft)..... 27,466
ACM Multiplier 1.025

E N E R G Y U S E S U M M A R Y

	ELEC (kWh/yr)	GAS (kBtu/yr)	PERCENT OF TOTAL ENERGY (%)	TOTAL SOURCE ENERGY (kBtu/yr)	ADJUSTED UNIT SOURCE ENERGY (kBtu/yr-sf)
Primary Heating	1,030.0	109,735.9	8.0	126,059.1	4.7
Primary Cooling					
Compressor	46,149.9	0.0	11.1	472,576.1	17.6
Tower/Cond Fans	5,619.0	0.0	1.4	57,538.5	2.1
Condenser Pump	0.0	0.0	0.0	0.0	0.0
Other Accessories	526.5	0.0	0.1	5,391.4	0.2
Auxiliary					
Supply Fans	115,272.8	0.0	27.8	1,180,396.1	44.1
Circulation Pumps	10,301.8	0.0	2.5	105,490.7	3.9
Base Utilities	0.0	0.0	0.0	0.0	0.0
Subtotal	125,574.6	0.0	30.3	1,285,886.7	48.0
Lighting	60,841.8	0.0	14.7	623,021.1	22.7
Receptacle	142,768.4	0.0	34.4	1,461,952.1	53.2
Domestic Hot Water	0.0	0.0	0.0	0.0	0.0
Cogeneration	0.0	0.0	0.0	0.0	0.0
Totals	382,510.2	109,735.9	100.0	4,032,425.2	148.6

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M500, ECO#13

MONTHLY ENERGY CONSUMPTION

Month	ELEC On Peak (kWh)	DEMAND On Peak (kW)	GAS On Peak (Therm)	GAS DMND On Peak (Thrm/hr)
Jan	42,393	99	1,485	4
Feb	38,494	99	1,353	4
March	42,484	94	684	3
April	38,755	94	122	2
May	49,747	144	0	0
June	58,648	162	0	0
July	57,998	160	0	0
Aug	60,097	159	0	0
Sept	50,993	146	0	0
Oct	43,384	125	0	0
Nov	38,777	94	484	3
Dec	41,314	99	1,101	4
Total	563,084	162	5,230	4

Building Energy Consumption = 89,010 (Btu/Sq Ft/Year)
Source Energy Consumption = 229,974 (Btu/Sq Ft/Year)

Floor Area = 27,466 (Sq Ft)

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M500, ECO#13

EQUIPMENT ENERGY CONSUMPTION

Ref Num	Equip Code	Monthly Consumption Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	5046	4602	5491	4919	5269	5269	4919	5491	4919	5269	4729	4919	60,842
	PK	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9
1	MISC LD													
	ELEC	11818	10813	12823	11632	12321	12321	11632	12823	11632	12321	10999	11632	142,768
	PK	50.2	50.2	50.2	50.2	50.2	50.2	50.2	50.2	50.2	50.2	50.2	50.2	50.2
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.
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	EQ1122L	AIR-CLD RECIP >55 TONS												
	ELEC	0	0	0	0	4909	10820	10530	10635	6553	1129	0	0	44,575
	PK	0.0	0.0	0.0	0.0	41.8	57.9	55.7	57.4	47.0	25.0	0.0	0.0	57.9
1	EQ5200	CONDENSER FANS												
	ELEC	0	0	0	0	604	1326	1324	1322	804	101	0	0	5,482
	PK	0.0	0.0	0.0	0.0	5.1	11.2	6.6	6.8	5.6	3.3	0.0	0.0	11.2
1	EQ5001	CHILLED WATER PUMP C.V.												
	ELEC	0	0	0	0	973	1877	1911	1927	1330	464	0	0	8,482
	PK	0.0	0.0	0.0	0.0	3.8	3.8	3.8	3.8	3.8	3.8	0.0	0.0	3.8
1	EQ5313	CONTROLS												
	ELEC	0	0	0	0	77	148	151	152	105	37	0	0	670
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3
2	EQ1750	AIR-CLD CTV ICE-CHILL H2O												
	ELEC	1108	1021	1130	1094	4523	6482	6448	6663	5266	3107	1094	1130	39,067
	PK	16.5	16.5	16.5	16.5	39.3	40.7	40.5	40.4	39.3	39.3	16.5	16.5	40.7

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M500, ECO#13

2	EQ5205			CONDENSER FANS									
	ELEC	10	9	10	10	14	17	17	17	15	13	10	10	153
	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
2	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
2	EQ5309			CONTROLS									
	ELEC	124	112	124	120	327	326	335	337	307	213	120	124	2,569
	PK	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
1	EQ4003			FC CENTRIF. FAN C.V.									
	ELEC	13713	12386	13713	13271	13713	13271	13713	13713	13271	13713	13271	13713	161,463
	PK	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4
2	EQ4003			FC CENTRIF. FAN C.V.									
	ELEC	7017	6338	7017	6791	7017	6791	7017	7017	6791	7017	6791	7017	82,625
	PK	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4
1	EQ2001			GAS FIRE TUBE HOT WATER									
	GAS	1485	1353	684	122	0	0	0	0	0	0	484	1101	5,230
	PK	4.3	4.3	3.2	1.6	0.0	0.0	0.0	0.0	0.0	0.0	2.7	3.6	4.3
1	EQ5020			HEAT WATER CIRC. PUMP C.V.									
	ELEC	2827	2554	1729	730	0	0	0	0	0	0	1402	2200	11,442
	PK	3.8	3.8	3.8	3.8	0.0	0.0	0.0	0.0	0.0	0.0	3.8	3.8	3.8
1	EQ5240			BOILER FORCED DRAFT FAN									
	ELEC	357	322	218	92	0	0	0	0	0	0	177	278	1,444
	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	EQ5307			BOILER CONTROLS									
	ELEC	372	336	228	96	0	0	0	0	0	0	184	290	1,505
	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

UTILITY PEAK CHECKSUMS - ALTERNATIVE 1
BLDG M500, ECO#13

---------- 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 161.7 (kW)
Yearly Time of Peak 18 (hr) 6 (mo)

Hour 18 Month 6

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Percnt Of Tot (%)
Cooling Equipment				
1	EQ1122L	AIR-CLD RECIP >55 TONS	67.7	41.88
Sub Total			67.7	41.88
Sub Total			0.0	0.00
Air Moving Equipment				
1		SUMMATION OF FAN ELECTRICAL DEMAND	18.4	11.40
2		SUMMATION OF FAN ELECTRICAL DEMAND	9.4	5.83
Sub Total			27.9	17.23
Sub Total			0.0	0.00
Miscellaneous				
Lights			15.9	9.81
Base Utilities			0.0	0.00
Misc Equipment			50.2	31.07
Sub Total			66.1	40.89
Grand Total			161.7	100.00

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M500, ECO#13

---- B U I L D I N G C O O L I N G D E M A N D S A N D T H E R M A L S T O R A G E ----

January

	Design		Design			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	42.7	35.4	0.0	0.0	0.0	203
2	41.8	34.7	0.0	4.1	6.7	205
3	41.1	34.4	0.0	0.0	0.0	203
4	40.6	34.0	0.0	4.1	6.7	205
5	40.4	34.0	0.0	0.0	0.0	203
6	40.8	34.4	0.0	4.1	6.7	205
7	41.6	35.0	0.0	0.0	0.0	203
8	43.2	36.5	0.0	4.1	6.7	205
9	45.5	38.5	0.0	0.0	0.0	205
10	48.1	40.4	0.0	0.0	0.0	205
11	51.0	42.2	0.0	0.0	0.0	205
12	53.8	43.8	0.0	0.0	0.0	205
13	55.9	45.0	0.0	0.0	0.0	203
14	57.3	45.5	0.0	0.0	0.0	201
15	57.8	45.6	0.0	0.0	0.0	199
16	57.3	44.8	0.0	0.0	0.0	197
17	56.1	43.9	0.0	0.0	0.0	197
18	54.2	42.7	0.0	0.0	0.0	197
19	51.9	41.6	0.0	0.0	0.0	197
20	49.6	40.2	0.0	0.0	0.0	197
21	47.7	39.1	0.0	0.0	0.0	197
22	46.0	37.9	0.0	0.0	0.0	197
23	44.6	36.8	0.0	0.0	0.0	197
24	43.6	36.1	0.0	0.0	0.0	197

	Typical		Weekday				Saturday			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	33.4	30.4	0.0	10.0	15.1	205	0.0	12.0	16.5	205
2	32.1	29.3	0.0	0.0	0.0	203	0.0	0.0	0.0	203
3	31.7	29.3	0.0	4.1	6.7	205	0.0	4.1	6.7	205
4	31.9	29.5	0.0	0.0	0.0	203	0.0	0.0	0.0	203
5	32.6	30.3	0.0	4.1	6.7	205	0.0	4.1	6.7	205
6	33.6	31.3	0.0	0.0	0.0	203	0.0	0.0	0.0	203
7	35.0	32.6	0.0	4.1	6.7	205	0.0	4.1	6.7	205
8	36.6	34.4	0.0	0.0	0.0	203	0.0	0.0	0.0	203
9	38.5	36.3	0.0	0.0	0.0	203	0.0	0.0	0.0	203
10	40.4	37.7	0.0	0.0	0.0	203	0.0	0.0	0.0	203
11	42.3	38.7	0.0	0.0	0.0	203	0.0	0.0	0.0	203
12	44.2	39.6	0.0	0.0	0.0	203	0.0	0.0	0.0	203
13	45.8	40.5	0.0	0.0	0.0	201	0.0	0.0	0.0	201
14	47.2	41.1	0.0	0.0	0.0	199	0.0	0.0	0.0	199
15	48.2	41.6	0.0	0.0	0.0	197	0.0	0.0	0.0	197

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M500, ECO#13

	Typical		Weekday				Saturday			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
16	48.9	41.8	0.0	0.0	0.0	195	0.0	0.0	0.0	195
17	49.1	41.9	0.0	0.0	0.0	195	0.0	0.0	0.0	195
18	48.7	41.9	0.0	0.0	0.0	195	0.0	0.0	0.0	195
19	47.4	41.7	0.0	0.0	0.0	195	0.0	0.0	0.0	195
20	45.5	40.5	0.0	0.0	0.0	195	0.0	0.0	0.0	195
21	43.1	38.9	0.0	0.0	0.0	195	0.0	0.0	0.0	195
22	40.4	36.7	0.0	0.0	0.0	195	0.0	0.0	0.0	195
23	37.7	34.3	0.0	0.0	0.0	195	0.0	0.0	0.0	195
24	35.3	32.3	0.0	0.0	0.0	195	0.0	0.0	0.0	195

	Typical		Sunday				Monday			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	33.4	30.4	0.0	12.0	16.5	205	0.0	12.0	16.5	205
2	32.1	29.3	0.0	0.0	0.0	203	0.0	0.0	0.0	203
3	31.7	29.3	0.0	4.1	6.7	205	0.0	4.1	6.7	205
4	31.9	29.5	0.0	0.0	0.0	203	0.0	0.0	0.0	203
5	32.6	30.3	0.0	4.1	6.7	205	0.0	4.1	6.7	205
6	33.6	31.3	0.0	0.0	0.0	203	0.0	0.0	0.0	203
7	35.0	32.6	0.0	4.1	6.7	205	0.0	4.1	6.7	205
8	36.6	34.4	0.0	0.0	0.0	203	0.0	0.0	0.0	203
9	38.5	36.3	0.0	0.0	0.0	203	0.0	0.0	0.0	203
10	40.4	37.7	0.0	0.0	0.0	203	0.0	0.0	0.0	203
11	42.3	38.7	0.0	0.0	0.0	203	0.0	0.0	0.0	203
12	44.2	39.6	0.0	0.0	0.0	203	0.0	0.0	0.0	203
13	45.8	40.5	0.0	0.0	0.0	201	0.0	0.0	0.0	201
14	47.2	41.1	0.0	0.0	0.0	199	0.0	0.0	0.0	199
15	48.2	41.6	0.0	0.0	0.0	197	0.0	0.0	0.0	197
16	48.9	41.8	0.0	0.0	0.0	195	0.0	0.0	0.0	195
17	49.1	41.9	0.0	0.0	0.0	195	0.0	0.0	0.0	195
18	48.7	41.9	0.0	0.0	0.0	195	0.0	0.0	0.0	195
19	47.4	41.7	0.0	0.0	0.0	195	0.0	0.0	0.0	195
20	45.5	40.5	0.0	0.0	0.0	195	0.0	0.0	0.0	195
21	43.1	38.9	0.0	0.0	0.0	195	0.0	0.0	0.0	195
22	40.4	36.7	0.0	0.0	0.0	195	0.0	0.0	0.0	195
23	37.7	34.3	0.0	0.0	0.0	195	0.0	0.0	0.0	195
24	35.3	32.3	0.0	0.0	0.0	195	0.0	0.0	0.0	195

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M500, ECO#13

---- B U I L D I N G C O O L I N G D E M A N D S A N D T H E R M A L S T O R A G E ----

February

	Design		Design			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	42.8	35.6	0.0	12.0	16.5	205
2	42.0	34.9	0.0	0.0	0.0	203
3	41.4	34.5	0.0	4.1	6.7	205
4	41.0	34.2	0.0	0.0	0.0	203
5	40.8	34.0	0.0	4.1	6.7	205
6	41.1	34.4	0.0	0.0	0.0	203
7	41.9	35.0	0.0	4.1	6.7	205
8	43.3	36.5	0.0	0.0	0.0	203
9	45.3	38.2	0.0	0.0	0.0	203
10	47.7	39.5	0.0	0.0	0.0	203
11	50.3	41.3	0.0	0.0	0.0	203
12	52.8	42.5	0.0	0.0	0.0	203
13	54.7	43.4	0.0	0.0	0.0	201
14	55.9	44.0	0.0	0.0	0.0	199
15	56.4	44.2	0.0	0.0	0.0	197
16	55.9	43.6	0.0	0.0	0.0	195
17	54.8	42.6	0.0	0.0	0.0	195
18	53.1	41.4	0.0	0.0	0.0	195
19	51.1	40.4	0.0	0.0	0.0	195
20	49.1	39.4	0.0	0.0	0.0	195
21	47.4	38.5	0.0	0.0	0.0	195
22	45.8	37.6	0.0	0.0	0.0	195
23	44.5	36.9	0.0	0.0	0.0	195
24	43.6	36.1	0.0	0.0	0.0	195

	Typical		Weekday				Saturday			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	37.5	34.5	0.0	12.0	16.5	205	0.0	12.0	16.5	205
2	36.0	33.0	0.0	0.0	0.0	203	0.0	0.0	0.0	203
3	34.7	31.8	0.0	4.1	6.7	205	0.0	4.1	6.7	205
4	33.6	30.9	0.0	0.0	0.0	203	0.0	0.0	0.0	203
5	32.8	30.1	0.0	4.1	6.7	205	0.0	4.1	6.7	205
6	32.2	29.8	0.0	0.0	0.0	203	0.0	0.0	0.0	203
7	32.1	29.6	0.0	4.1	6.7	205	0.0	4.1	6.7	205
8	32.5	30.3	0.0	0.0	0.0	203	0.0	0.0	0.0	203
9	33.9	31.6	0.0	0.0	0.0	203	0.0	0.0	0.0	203
10	36.0	33.0	0.0	0.0	0.0	203	0.0	0.0	0.0	203
11	38.5	34.8	0.0	0.0	0.0	203	0.0	0.0	0.0	203
12	41.3	36.5	0.0	0.0	0.0	203	0.0	0.0	0.0	203
13	43.8	38.1	0.0	0.0	0.0	201	0.0	0.0	0.0	201
14	45.9	39.5	0.0	0.0	0.0	199	0.0	0.0	0.0	199
15	47.2	40.4	0.0	0.0	0.0	197	0.0	0.0	0.0	197

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M500, ECO#13

			Weekday				Saturday			
	Typical		Cooling	Chiller	Chiller	Storage	Cooling	Chiller	Chiller	Storage
	OADB	OAWB	Load	Load	Demand	Capacity	Load	Load	Demand	Capacity
Hour	(F)	(F)	(Ton)	(Ton)	(kW)	(Ton-Hr)	(Ton)	(Ton)	(kW)	(Ton-Hr)
16	47.7	40.6	0.0	0.0	0.0	195	0.0	0.0	0.0	195
17	47.5	40.2	0.0	0.0	0.0	195	0.0	0.0	0.0	195
18	47.0	39.8	0.0	0.0	0.0	195	0.0	0.0	0.0	195
19	46.2	39.9	0.0	0.0	0.0	195	0.0	0.0	0.0	195
20	45.1	39.7	0.0	0.0	0.0	195	0.0	0.0	0.0	195
21	43.8	39.2	0.0	0.0	0.0	195	0.0	0.0	0.0	195
22	42.3	38.3	0.0	0.0	0.0	195	0.0	0.0	0.0	195
23	40.7	37.2	0.0	0.0	0.0	195	0.0	0.0	0.0	195
24	39.1	35.8	0.0	0.0	0.0	195	0.0	0.0	0.0	195

			Sunday				Monday			
	Typical		Cooling	Chiller	Chiller	Storage	Cooling	Chiller	Chiller	Storage
	OADB	OAWB	Load	Load	Demand	Capacity	Load	Load	Demand	Capacity
Hour	(F)	(F)	(Ton)	(Ton)	(kW)	(Ton-Hr)	(Ton)	(Ton)	(kW)	(Ton-Hr)
1	37.5	34.5	0.0	12.0	16.5	205	0.0	12.0	16.5	205
2	36.0	33.0	0.0	0.0	0.0	203	0.0	0.0	0.0	203
3	34.7	31.8	0.0	4.1	6.7	205	0.0	4.1	6.7	205
4	33.6	30.9	0.0	0.0	0.0	203	0.0	0.0	0.0	203
5	32.8	30.1	0.0	4.1	6.7	205	0.0	4.1	6.7	205
6	32.2	29.8	0.0	0.0	0.0	203	0.0	0.0	0.0	203
7	32.1	29.6	0.0	4.1	6.7	205	0.0	4.1	6.7	205
8	32.5	30.3	0.0	0.0	0.0	203	0.0	0.0	0.0	203
9	33.9	31.6	0.0	0.0	0.0	203	0.0	0.0	0.0	203
10	36.0	33.0	0.0	0.0	0.0	203	0.0	0.0	0.0	203
11	38.5	34.8	0.0	0.0	0.0	203	0.0	0.0	0.0	203
12	41.3	36.5	0.0	0.0	0.0	203	0.0	0.0	0.0	203
13	43.8	38.1	0.0	0.0	0.0	201	0.0	0.0	0.0	201
14	45.9	39.5	0.0	0.0	0.0	199	0.0	0.0	0.0	199
15	47.2	40.4	0.0	0.0	0.0	197	0.0	0.0	0.0	197
16	47.7	40.6	0.0	0.0	0.0	195	0.0	0.0	0.0	195
17	47.5	40.2	0.0	0.0	0.0	195	0.0	0.0	0.0	195
18	47.0	39.8	0.0	0.0	0.0	195	0.0	0.0	0.0	195
19	46.2	39.9	0.0	0.0	0.0	195	0.0	0.0	0.0	195
20	45.1	39.7	0.0	0.0	0.0	195	0.0	0.0	0.0	195
21	43.8	39.2	0.0	0.0	0.0	195	0.0	0.0	0.0	195
22	42.3	38.3	0.0	0.0	0.0	195	0.0	0.0	0.0	195
23	40.7	37.2	0.0	0.0	0.0	195	0.0	0.0	0.0	195
24	39.1	35.8	0.0	0.0	0.0	195	0.0	0.0	0.0	195

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M500, ECO#13

---- B U I L D I N G C O O L I N G D E M A N D S A N D T H E R M A L S T O R A G E ----

March

	Design		Design			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	51.8	42.9	0.0	12.0	16.5	205
2	50.8	42.1	0.0	0.0	0.0	203
3	50.0	41.8	0.0	4.1	6.7	205
4	49.3	41.1	0.0	0.0	0.0	203
5	49.1	41.1	0.0	4.1	6.7	205
6	49.5	41.6	0.0	0.0	0.0	203
7	50.6	42.7	0.0	4.1	6.7	205
8	52.5	44.3	0.0	0.0	0.0	203
9	55.2	46.4	0.0	0.0	0.0	203
10	58.3	48.5	0.0	0.0	0.0	203
11	61.8	50.3	0.0	0.0	0.0	203
12	65.1	51.9	0.0	0.0	0.0	203
13	67.6	53.4	0.0	0.0	0.0	201
14	69.3	53.9	0.0	0.0	0.0	199
15	69.9	53.8	0.0	0.0	0.0	197
16	69.3	53.1	0.0	0.0	0.0	195
17	67.8	51.8	0.0	0.0	0.0	195
18	65.6	50.2	0.0	0.0	0.0	195
19	62.9	48.9	0.0	0.0	0.0	195
20	60.2	47.7	0.0	0.0	0.0	195
21	57.9	46.5	0.0	0.0	0.0	195
22	55.8	45.3	0.0	0.0	0.0	195
23	54.1	44.4	0.0	0.0	0.0	195
24	52.9	43.7	0.0	0.0	0.0	195

	Typical		Weekday				Saturday			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	45.4	41.6	0.0	12.0	16.5	205	0.0	12.0	16.5	205
2	43.3	39.7	0.0	0.0	0.0	203	0.0	0.0	0.0	203
3	41.6	38.6	0.0	4.1	6.7	205	0.0	4.1	6.7	205
4	40.6	37.5	0.0	0.0	0.0	203	0.0	0.0	0.0	203
5	40.2	37.3	0.0	4.1	6.7	205	0.0	4.1	6.7	205
6	40.6	37.8	0.0	0.0	0.0	203	0.0	0.0	0.0	203
7	41.6	39.0	0.0	4.1	6.7	205	0.0	4.1	6.7	205
8	43.3	40.7	0.0	0.0	0.0	203	0.0	0.0	0.0	203
9	45.4	42.5	0.0	0.0	0.0	203	0.0	0.0	0.0	203
10	47.9	44.3	0.0	0.0	0.0	203	0.0	0.0	0.0	203
11	50.6	45.5	0.0	0.0	0.0	203	0.0	0.0	0.0	203
12	53.3	46.8	0.0	0.0	0.0	203	0.0	0.0	0.0	203
13	55.8	48.5	0.0	0.0	0.0	201	0.0	0.0	0.0	201
14	58.0	49.6	0.0	0.0	0.0	199	0.0	0.0	0.0	199
15	59.6	50.3	0.0	0.0	0.0	197	0.0	0.0	0.0	197

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M500, ECO#13

			Weekday				Saturday			
	Typical		Cooling	Chiller	Chiller	Storage	Cooling	Chiller	Chiller	Storage
	OADB	OAWB	Load	Load	Demand	Capacity	Load	Load	Demand	Capacity
Hour	(F)	(F)	(Ton)	(Ton)	(kW)	(Ton-Hr)	(Ton)	(Ton)	(kW)	(Ton-Hr)
16	60.7	50.9	0.0	0.0	0.0	195	0.0	0.0	0.0	195
17	61.0	50.9	0.0	0.0	0.0	195	0.0	0.0	0.0	195
18	60.7	50.7	0.0	0.0	0.0	195	0.0	0.0	0.0	195
19	59.6	50.7	0.0	0.0	0.0	195	0.0	0.0	0.0	195
20	58.0	50.5	0.0	0.0	0.0	195	0.0	0.0	0.0	195
21	55.8	49.4	0.0	0.0	0.0	195	0.0	0.0	0.0	195
22	53.3	47.8	0.0	0.0	0.0	195	0.0	0.0	0.0	195
23	50.6	45.9	0.0	0.0	0.0	195	0.0	0.0	0.0	195
24	47.9	43.8	0.0	0.0	0.0	195	0.0	0.0	0.0	195

			Sunday				Monday			
	Typical		Cooling	Chiller	Chiller	Storage	Cooling	Chiller	Chiller	Storage
	OADB	OAWB	Load	Load	Demand	Capacity	Load	Load	Demand	Capacity
Hour	(F)	(F)	(Ton)	(Ton)	(kW)	(Ton-Hr)	(Ton)	(Ton)	(kW)	(Ton-Hr)
1	45.4	41.6	0.0	12.0	16.5	205	0.0	12.0	16.5	205
2	43.3	39.7	0.0	0.0	0.0	203	0.0	0.0	0.0	203
3	41.6	38.6	0.0	4.1	6.7	205	0.0	4.1	6.7	205
4	40.6	37.5	0.0	0.0	0.0	203	0.0	0.0	0.0	203
5	40.2	37.3	0.0	4.1	6.7	205	0.0	4.1	6.7	205
6	40.6	37.8	0.0	0.0	0.0	203	0.0	0.0	0.0	203
7	41.6	39.0	0.0	4.1	6.7	205	0.0	4.1	6.7	205
8	43.3	40.7	0.0	0.0	0.0	203	0.0	0.0	0.0	203
9	45.4	42.5	0.0	0.0	0.0	203	0.0	0.0	0.0	203
10	47.9	44.3	0.0	0.0	0.0	203	0.0	0.0	0.0	203
11	50.6	45.5	0.0	0.0	0.0	203	0.0	0.0	0.0	203
12	53.3	46.8	0.0	0.0	0.0	203	0.0	0.0	0.0	203
13	55.8	48.5	0.0	0.0	0.0	201	0.0	0.0	0.0	201
14	58.0	49.6	0.0	0.0	0.0	199	0.0	0.0	0.0	199
15	59.6	50.3	0.0	0.0	0.0	197	0.0	0.0	0.0	197
16	60.7	50.9	0.0	0.0	0.0	195	0.0	0.0	0.0	195
17	61.0	50.9	0.0	0.0	0.0	195	0.0	0.0	0.0	195
18	60.7	50.7	0.0	0.0	0.0	195	0.0	0.0	0.0	195
19	59.6	50.7	0.0	0.0	0.0	195	0.0	0.0	0.0	195
20	58.0	50.5	0.0	0.0	0.0	195	0.0	0.0	0.0	195
21	55.8	49.4	0.0	0.0	0.0	195	0.0	0.0	0.0	195
22	53.3	47.8	0.0	0.0	0.0	195	0.0	0.0	0.0	195
23	50.6	45.9	0.0	0.0	0.0	195	0.0	0.0	0.0	195
24	47.9	43.8	0.0	0.0	0.0	195	0.0	0.0	0.0	195

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M500, ECO#13

---- B U I L D I N G C O O L I N G D E M A N D S A N D T H E R M A L S T O R A G E ----

April

	Design		Design			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	62.6	52.5	0.0	12.0	16.5	205
2	61.6	52.1	0.0	0.0	0.0	203
3	60.9	51.6	0.0	4.1	6.7	205
4	60.3	51.2	0.0	0.0	0.0	203
5	60.1	51.3	0.0	4.1	6.7	205
6	60.5	51.9	0.0	0.0	0.0	203
7	61.4	53.0	0.0	4.1	6.7	205
8	63.2	54.5	0.0	0.0	0.0	203
9	65.7	55.8	0.0	0.0	0.0	203
10	68.6	57.1	0.0	0.0	0.0	203
11	71.9	58.6	0.0	0.0	0.0	203
12	75.0	60.3	0.0	0.0	0.0	203
13	77.4	61.5	0.0	0.0	0.0	201
14	78.9	62.2	0.0	0.0	0.0	199
15	79.5	62.5	0.0	0.0	0.0	197
16	78.9	61.8	0.0	0.0	0.0	195
17	77.5	60.3	0.0	0.0	0.0	195
18	75.4	59.1	0.0	0.0	0.0	195
19	72.9	57.3	0.0	0.0	0.0	195
20	70.4	56.5	0.0	0.0	0.0	195
21	68.2	55.7	0.0	0.0	0.0	195
22	66.3	55.0	0.0	0.0	0.0	195
23	64.7	54.0	0.0	0.0	0.0	195
24	63.6	53.2	0.0	0.0	0.0	195

	Typical		Weekday				Saturday			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	57.7	53.9	0.0	12.0	16.5	205	0.0	12.0	16.5	205
2	55.9	52.7	0.0	0.0	0.0	203	0.0	0.0	0.0	203
3	54.2	51.3	0.0	4.1	6.7	205	0.0	4.1	6.7	205
4	52.9	50.2	0.0	0.0	0.0	203	0.0	0.0	0.0	203
5	51.9	49.6	0.0	4.1	6.7	205	0.0	4.1	6.7	205
6	51.2	49.2	0.0	0.0	0.0	203	0.0	0.0	0.0	203
7	51.0	49.3	0.0	4.1	6.7	205	0.0	4.1	6.7	205
8	51.6	49.9	0.0	0.0	0.0	203	0.0	0.0	0.0	203
9	53.3	50.6	0.0	0.0	0.0	203	0.0	0.0	0.0	203
10	55.9	51.8	0.0	0.0	0.0	203	0.0	0.0	0.0	203
11	59.0	53.4	0.0	0.0	0.0	203	0.0	0.0	0.0	203
12	62.4	55.6	0.0	0.0	0.0	203	0.0	0.0	0.0	203
13	65.5	57.7	0.0	0.0	0.0	201	0.0	0.0	0.0	201
14	68.1	59.4	0.0	0.0	0.0	199	0.0	0.0	0.0	199
15	69.8	60.7	0.0	0.0	0.0	197	0.0	0.0	0.0	197

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M500, ECO#13

			Weekday				Saturday			
	Typical		Cooling	Chiller	Chiller	Storage	Cooling	Chiller	Chiller	Storage
	OADB	OAWB	Load	Load	Demand	Capacity	Load	Load	Demand	Capacity
Hour	(F)	(F)	(Ton)	(Ton)	(kW)	(Ton-Hr)	(Ton)	(Ton)	(kW)	(Ton-Hr)
16	70.4	60.9	0.0	0.0	0.0	195	0.0	0.0	0.0	195
17	70.2	60.2	0.0	0.0	0.0	195	0.0	0.0	0.0	195
18	69.5	60.1	0.0	0.0	0.0	195	0.0	0.0	0.0	195
19	68.5	59.4	0.0	0.0	0.0	195	0.0	0.0	0.0	195
20	67.2	59.7	0.0	0.0	0.0	195	0.0	0.0	0.0	195
21	65.5	59.3	0.0	0.0	0.0	195	0.0	0.0	0.0	195
22	63.7	58.8	0.0	0.0	0.0	195	0.0	0.0	0.0	195
23	61.7	57.3	0.0	0.0	0.0	195	0.0	0.0	0.0	195
24	59.7	55.6	0.0	0.0	0.0	195	0.0	0.0	0.0	195

			Sunday				Monday			
	Typical		Cooling	Chiller	Chiller	Storage	Cooling	Chiller	Chiller	Storage
	OADB	OAWB	Load	Load	Demand	Capacity	Load	Load	Demand	Capacity
Hour	(F)	(F)	(Ton)	(Ton)	(kW)	(Ton-Hr)	(Ton)	(Ton)	(kW)	(Ton-Hr)
1	57.7	53.9	0.0	12.0	16.5	205	0.0	12.0	16.5	205
2	55.9	52.7	0.0	0.0	0.0	203	0.0	0.0	0.0	203
3	54.2	51.3	0.0	4.1	6.7	205	0.0	4.1	6.7	205
4	52.9	50.2	0.0	0.0	0.0	203	0.0	0.0	0.0	203
5	51.9	49.6	0.0	4.1	6.7	205	0.0	4.1	6.7	205
6	51.2	49.2	0.0	0.0	0.0	203	0.0	0.0	0.0	203
7	51.0	49.3	0.0	4.1	6.7	205	0.0	4.1	6.7	205
8	51.6	49.9	0.0	0.0	0.0	203	0.0	0.0	0.0	203
9	53.3	50.6	0.0	0.0	0.0	203	0.0	0.0	0.0	203
10	55.9	51.8	0.0	0.0	0.0	203	0.0	0.0	0.0	203
11	59.0	53.4	0.0	0.0	0.0	203	0.0	0.0	0.0	203
12	62.4	55.6	0.0	0.0	0.0	203	0.0	0.0	0.0	203
13	65.5	57.7	0.0	0.0	0.0	201	0.0	0.0	0.0	201
14	68.1	59.4	0.0	0.0	0.0	199	0.0	0.0	0.0	199
15	69.8	60.7	0.0	0.0	0.0	197	0.0	0.0	0.0	197
16	70.4	60.9	0.0	0.0	0.0	195	0.0	0.0	0.0	195
17	70.2	60.2	0.0	0.0	0.0	195	0.0	0.0	0.0	195
18	69.5	60.1	0.0	0.0	0.0	195	0.0	0.0	0.0	195
19	68.5	59.4	0.0	0.0	0.0	195	0.0	0.0	0.0	195
20	67.2	59.7	0.0	0.0	0.0	195	0.0	0.0	0.0	195
21	65.5	59.3	0.0	0.0	0.0	195	0.0	0.0	0.0	195
22	63.7	58.8	0.0	0.0	0.0	195	0.0	0.0	0.0	195
23	61.7	57.3	0.0	0.0	0.0	195	0.0	0.0	0.0	195
24	59.7	55.6	0.0	0.0	0.0	195	0.0	0.0	0.0	195

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M500, ECO#13

---- B U I L D I N G C O O L I N G D E M A N D S A N D T H E R M A L S T O R A G E ----

May

Hour	Design OADB (F)	Design OAWB (F)	Design Cooling Load (Ton)	Design Chiller Load (Ton)	Design Chiller Demand (kW)	Design Storage Capacity (Ton-Hr)
1	70.8	59.3	0.0	12.0	16.5	205
2	69.8	58.5	1.2	0.0	0.0	201
3	69.0	58.2	0.9	6.2	10.1	205
4	68.4	58.1	0.4	0.0	0.0	202
5	68.2	58.0	0.0	4.4	7.3	205
6	68.6	58.5	0.0	0.0	0.0	203
7	69.6	59.5	0.0	4.1	6.7	205
8	71.3	60.6	0.0	0.0	0.0	203
9	73.9	61.5	0.0	0.0	0.0	203
10	76.8	62.7	0.0	0.0	0.0	203
11	80.1	63.9	0.0	0.0	0.0	203
12	83.2	65.4	0.0	0.0	0.0	203
13	85.6	66.5	40.3	0.0	0.0	160
14	87.1	67.1	35.9	0.0	0.0	123
15	87.7	67.2	37.5	0.0	0.0	84
16	87.1	66.5	38.0	0.0	0.0	45
17	85.8	65.1	0.0	0.0	0.0	45
18	83.6	63.9	0.0	0.0	0.0	45
19	81.1	62.4	0.0	0.0	0.0	45
20	78.6	61.6	0.0	0.0	0.0	45
21	76.4	61.8	0.0	0.0	0.0	45
22	74.5	60.9	0.0	0.0	0.0	45
23	72.9	60.3	0.0	0.0	0.0	45
24	71.7	59.9	0.0	0.0	0.0	45

Hour	Typical OADB (F)	Typical OAWB (F)	Weekday Cooling Load (Ton)	Weekday Chiller Load (Ton)	Weekday Chiller Demand (kW)	Weekday Storage Capacity (Ton-Hr)	Saturday Cooling Load (Ton)	Saturday Chiller Load (Ton)	Saturday Chiller Demand (kW)	Saturday Storage Capacity (Ton-Hr)
1	66.6	62.3	0.0	35.0	39.3	80	0.0	35.0	39.3	128
2	64.5	60.4	0.0	35.0	39.3	114	0.0	35.0	39.3	162
3	62.7	59.1	0.0	35.0	39.3	148	0.0	35.0	39.3	195
4	61.2	58.1	0.0	35.0	39.3	181	0.0	11.7	16.3	205
5	60.0	57.1	0.0	25.1	27.8	205	0.0	0.0	0.0	203
6	59.3	56.6	0.0	0.0	0.0	203	0.0	4.1	6.7	205
7	59.0	56.5	0.0	4.1	6.7	205	0.0	0.0	0.0	203
8	59.5	56.6	0.0	0.0	0.0	203	0.0	4.1	6.7	205
9	60.9	56.6	0.0	0.0	0.0	203	0.0	0.0	0.0	205
10	63.0	57.2	1.5	0.0	0.0	201	0.0	0.0	0.0	205
11	65.7	58.1	0.0	0.0	0.0	201	0.0	0.0	0.0	205
12	68.7	59.8	0.0	0.0	0.0	201	0.0	0.0	0.0	205
13	71.7	61.6	23.0	0.0	0.0	176	0.0	0.0	0.0	203
14	74.5	63.4	22.4	0.0	0.0	152	0.0	0.0	0.0	201
15	76.6	64.8	26.1	0.0	0.0	124	9.3	0.0	0.0	189

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M500, ECO#13

	Typical		Weekday				Saturday			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
16	78.0	65.6	27.8	0.0	0.0	95	15.8	0.0	0.0	172
17	78.5	65.6	0.0	0.0	0.0	95	0.0	0.0	0.0	172
18	78.2	65.8	0.0	0.0	0.0	95	0.0	0.0	0.0	172
19	77.5	65.6	0.0	0.0	0.0	95	0.0	0.0	0.0	172
20	76.3	66.1	0.0	0.0	0.0	95	0.0	0.0	0.0	172
21	74.8	67.2	0.0	0.0	0.0	95	0.0	0.0	0.0	172
22	73.0	66.4	0.0	0.0	0.0	95	0.0	0.0	0.0	172
23	70.9	65.4	0.0	0.0	0.0	95	0.0	0.0	0.0	172
24	68.7	64.0	1.6	0.0	0.0	94	1.5	0.0	0.0	170

	Typical		Sunday				Monday			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	66.6	62.3	0.0	35.0	39.3	203	0.0	17.2	20.5	205
2	64.5	60.4	0.0	3.4	5.5	205	0.0	0.0	0.0	203
3	62.7	59.1	0.0	0.0	0.0	203	0.0	4.1	6.7	205
4	61.2	58.1	0.0	4.1	6.7	205	0.0	0.0	0.0	203
5	60.0	57.1	0.0	0.0	0.0	203	0.0	4.1	6.7	205
6	59.3	56.6	0.0	4.1	6.7	205	0.0	0.0	0.0	203
7	59.0	56.5	0.0	0.0	0.0	203	0.0	4.1	6.7	205
8	59.5	56.6	0.0	4.1	6.7	205	0.0	0.0	0.0	203
9	60.9	56.6	0.0	0.0	0.0	205	0.0	0.0	0.0	203
10	63.0	57.2	0.0	0.0	0.0	205	1.4	0.0	0.0	201
11	65.7	58.1	0.0	0.0	0.0	205	0.0	0.0	0.0	201
12	68.7	59.8	0.0	0.0	0.0	205	0.0	0.0	0.0	201
13	71.7	61.6	0.0	0.0	0.0	203	22.6	0.0	0.0	177
14	74.5	63.4	0.0	0.0	0.0	201	22.4	0.0	0.0	152
15	76.6	64.8	0.0	0.0	0.0	199	26.1	0.0	0.0	125
16	78.0	65.6	5.7	0.0	0.0	191	27.8	0.0	0.0	96
17	78.5	65.6	0.0	0.0	0.0	191	0.0	0.0	0.0	96
18	78.2	65.8	0.0	0.0	0.0	191	0.0	0.0	0.0	96
19	77.5	65.6	0.0	0.0	0.0	191	0.0	0.0	0.0	96
20	76.3	66.1	0.0	0.0	0.0	191	0.0	0.0	0.0	96
21	74.8	67.2	0.0	0.0	0.0	191	0.0	0.0	0.0	96
22	73.0	66.4	0.0	0.0	0.0	191	0.0	0.0	0.0	96
23	70.9	65.4	1.5	0.0	0.0	189	0.0	0.0	0.0	96
24	68.7	64.0	0.0	0.0	0.0	189	1.6	0.0	0.0	94

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M500, ECO#13

---- B U I L D I N G C O O L I N G D E M A N D S A N D T H E R M A L S T O R A G E ----

June

	Design		Design			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	79.5	66.2	0.0	35.0	40.7	128
2	78.5	65.3	0.0	35.0	40.4	162
3	77.7	65.1	0.0	35.0	40.1	195
4	77.2	64.8	0.0	11.3	16.3	205
5	77.0	65.1	0.0	0.0	0.0	203
6	77.4	65.6	0.0	4.1	6.8	205
7	78.3	66.5	0.0	0.0	0.0	203
8	80.0	67.7	0.0	4.1	6.9	205
9	82.5	68.3	0.0	0.0	0.0	205
10	85.4	69.5	0.0	0.0	0.0	205
11	88.7	70.8	0.0	0.0	0.0	205
12	91.8	72.2	0.0	0.0	0.0	205
13	94.1	72.6	53.5	0.0	0.0	149
14	95.6	72.9	48.4	0.0	0.0	99
15	96.2	72.9	50.4	0.0	0.0	48
16	95.6	72.0	49.3	0.0	0.0	0
17	94.3	70.8	0.0	0.0	0.0	0
18	92.1	69.7	0.0	0.0	0.0	0
19	89.6	68.3	0.0	0.0	0.0	0
20	87.1	67.7	0.0	0.0	0.0	0
21	85.0	67.5	0.0	0.0	0.0	0
22	83.1	67.3	0.0	0.0	0.0	0
23	81.6	66.8	0.0	0.0	0.0	0
24	80.4	66.3	0.0	0.0	0.0	0

	Typical		Weekday				Saturday			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	73.0	67.9	0.0	35.0	39.3	35	0.0	35.0	39.3	63
2	71.2	66.1	0.0	35.0	39.3	70	0.0	35.0	39.3	97
3	69.7	65.2	0.0	35.0	39.3	104	0.0	35.0	39.3	131
4	68.5	64.3	1.1	35.0	39.3	137	1.1	35.0	39.3	164
5	67.8	64.2	0.4	35.0	39.3	170	0.4	35.0	39.3	197
6	67.6	64.2	1.7	35.0	39.3	202	1.7	11.6	16.2	205
7	68.1	64.8	0.0	5.1	8.4	205	0.0	0.0	0.0	203
8	69.4	65.7	0.0	0.0	0.0	203	0.0	4.1	6.7	205
9	71.6	66.2	0.0	0.0	0.0	203	0.0	0.0	0.0	205
10	74.2	67.2	0.0	0.0	0.0	203	0.0	0.0	0.0	205
11	77.2	68.5	0.0	0.0	0.0	203	0.0	0.0	0.0	205
12	80.2	70.0	0.0	0.0	0.0	203	0.0	0.0	0.0	205
13	82.8	70.8	44.4	0.0	0.0	156	23.6	0.0	0.0	179
14	85.0	71.6	39.0	0.0	0.0	116	26.6	0.0	0.0	151
15	86.3	72.3	43.1	0.0	0.0	71	30.0	0.0	0.0	119

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M500, ECO#13

	Typical		Weekday				Saturday			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
16	86.8	72.1	42.5	0.0	0.0	28	29.8	0.0	0.0	88
17	86.6	71.7	0.0	0.0	0.0	28	0.0	0.0	0.0	88
18	85.8	71.5	0.0	0.0	0.0	28	0.0	0.0	0.0	88
19	84.7	71.2	0.0	0.0	0.0	28	0.0	0.0	0.0	88
20	83.2	71.5	0.0	0.0	0.0	28	0.0	0.0	0.0	88
21	81.4	71.7	0.0	0.0	0.0	28	0.0	0.0	0.0	88
22	79.3	71.4	0.0	0.0	0.0	28	0.0	0.0	0.0	88
23	77.2	70.5	0.0	0.0	0.0	28	0.0	0.0	0.0	88
24	75.1	69.1	0.0	0.0	0.0	28	0.0	0.0	0.0	88

	Typical		Sunday				Monday			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	73.0	67.9	0.0	35.0	39.3	122	0.0	35.0	39.3	129
2	71.2	66.1	1.6	35.0	39.3	154	0.0	35.0	39.3	163
3	69.7	65.2	0.0	35.0	39.3	188	0.0	35.0	39.3	196
4	68.5	64.3	0.0	18.7	21.7	205	1.1	11.6	16.2	205
5	67.8	64.2	0.0	0.0	0.0	203	0.4	0.0	0.0	202
6	67.6	64.2	0.0	4.1	6.7	205	1.7	6.2	10.2	205
7	68.1	64.8	0.0	0.0	0.0	203	0.0	0.0	0.0	203
8	69.4	65.7	0.0	4.1	6.7	205	0.0	4.1	6.7	205
9	71.6	66.2	0.0	0.0	0.0	205	0.0	0.0	0.0	205
10	74.2	67.2	0.0	0.0	0.0	205	0.0	0.0	0.0	205
11	77.2	68.5	0.0	0.0	0.0	205	0.0	0.0	0.0	205
12	80.2	70.0	0.0	0.0	0.0	205	0.0	0.0	0.0	205
13	82.8	70.8	21.8	0.0	0.0	181	44.4	0.0	0.0	158
14	85.0	71.6	24.9	0.0	0.0	154	39.0	0.0	0.0	118
15	86.3	72.3	28.2	0.0	0.0	124	43.1	0.0	0.0	73
16	86.8	72.1	28.1	0.0	0.0	95	42.5	0.0	0.0	30
17	86.6	71.7	0.0	0.0	0.0	95	0.0	0.0	0.0	30
18	85.8	71.5	0.0	0.0	0.0	95	0.0	0.0	0.0	30
19	84.7	71.2	0.0	0.0	0.0	95	0.0	0.0	0.0	30
20	83.2	71.5	0.0	0.0	0.0	95	0.0	0.0	0.0	30
21	81.4	71.7	0.0	0.0	0.0	95	0.0	0.0	0.0	30
22	79.3	71.4	0.0	0.0	0.0	95	0.0	0.0	0.0	30
23	77.2	70.5	0.0	0.0	0.0	95	0.0	0.0	0.0	30
24	75.1	69.1	0.0	0.0	0.0	95	0.0	0.0	0.0	30

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M500, ECO#13

---- B U I L D I N G C O O L I N G D E M A N D S A N D T H E R M A L S T O R A G E ----

July

	Design		Design			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	78.9	67.7	0.0	35.0	40.5	65
2	78.2	67.2	0.0	35.0	40.3	99
3	77.6	66.8	0.0	35.0	40.1	133
4	77.1	66.6	0.0	35.0	39.9	167
5	77.0	66.6	0.0	35.0	39.9	200
6	77.3	66.9	0.0	6.5	10.8	205
7	78.0	67.6	0.0	0.0	0.0	203
8	79.4	68.8	0.0	4.1	6.9	205
9	81.3	69.6	0.0	0.0	0.0	205
10	83.6	70.7	0.0	0.0	0.0	205
11	86.1	72.2	0.0	0.0	0.0	205
12	88.5	73.3	0.0	0.0	0.0	205
13	90.3	74.0	54.9	0.0	0.0	148
14	91.5	74.3	49.0	0.0	0.0	97
15	92.0	74.0	51.2	0.0	0.0	45
16	91.5	73.2	49.9	0.0	0.0	0
17	90.5	72.1	0.0	0.0	0.0	0
18	88.8	70.8	0.0	0.0	0.0	0
19	86.9	70.4	0.0	0.0	0.0	0
20	84.9	70.2	0.0	0.0	0.0	0
21	83.3	70.0	0.0	0.0	0.0	0
22	81.8	69.4	0.0	0.0	0.0	0
23	80.6	68.7	0.0	0.0	0.0	0
24	79.7	68.4	0.0	0.0	0.0	0

			Weekday				Saturday			
	Typical		Cooling	Chiller	Chiller	Storage	Cooling	Chiller	Chiller	Storage
Hour	OADB (F)	OAWB (F)	Load (Ton)	Load (Ton)	Demand (kW)	Capacity (Ton-Hr)	Load (Ton)	Load (Ton)	Demand (kW)	Capacity (Ton-Hr)
1	72.0	69.3	0.0	35.0	39.3	35	0.0	35.0	39.3	56
2	70.5	68.0	0.0	35.0	39.3	70	0.0	35.0	39.3	91
3	69.4	67.1	0.0	35.0	39.3	104	0.0	35.0	39.3	125
4	68.5	66.4	1.0	35.0	39.3	137	1.0	35.0	39.3	157
5	67.9	66.0	0.3	35.0	39.3	170	0.3	35.0	39.3	191
6	67.7	65.9	1.4	35.0	39.3	202	1.4	17.5	20.7	205
7	68.1	66.3	0.0	4.6	7.5	205	0.0	0.0	0.0	203
8	69.1	67.3	0.0	0.0	0.0	203	0.0	4.1	6.7	205
9	70.8	68.0	0.0	0.0	0.0	203	0.0	0.0	0.0	205
10	72.9	69.1	0.0	0.0	0.0	203	0.0	0.0	0.0	205
11	75.2	70.5	0.0	0.0	0.0	203	0.0	0.0	0.0	205
12	77.5	71.7	0.0	0.0	0.0	203	0.0	0.0	0.0	205
13	79.6	72.7	46.4	0.0	0.0	154	24.1	0.0	0.0	179
14	81.3	73.5	41.6	0.0	0.0	111	28.0	0.0	0.0	149
15	82.3	73.7	44.7	0.0	0.0	65	30.6	0.0	0.0	117

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M500, ECO#13

			Weekday				Saturday			
	Typical		Cooling	Chiller	Chiller	Storage	Cooling	Chiller	Chiller	Storage
	OADB	OAWB	Load	Load	Demand	Capacity	Load	Load	Demand	Capacity
Hour	(F)	(F)	(Ton)	(Ton)	(kW)	(Ton-Hr)	(Ton)	(Ton)	(kW)	(Ton-Hr)
16	82.7	73.5	43.3	0.0	0.0	21	29.9	0.0	0.0	86
17	82.5	73.1	0.0	0.0	0.0	21	0.0	0.0	0.0	86
18	82.0	72.6	0.0	0.0	0.0	21	0.0	0.0	0.0	86
19	81.1	73.2	0.0	0.0	0.0	21	0.0	0.0	0.0	86
20	79.9	73.8	0.0	0.0	0.0	21	0.0	0.0	0.0	86
21	78.5	73.9	0.0	0.0	0.0	21	0.0	0.0	0.0	86
22	76.9	73.1	0.0	0.0	0.0	21	0.0	0.0	0.0	86
23	75.2	71.9	0.0	0.0	0.0	21	0.0	0.0	0.0	86
24	73.5	70.8	0.0	0.0	0.0	21	0.0	0.0	0.0	86

			Sunday				Monday			
	Typical		Cooling	Chiller	Chiller	Storage	Cooling	Chiller	Chiller	Storage
	OADB	OAWB	Load	Load	Demand	Capacity	Load	Load	Demand	Capacity
Hour	(F)	(F)	(Ton)	(Ton)	(kW)	(Ton-Hr)	(Ton)	(Ton)	(kW)	(Ton-Hr)
1	72.0	69.3	0.0	35.0	39.3	120	0.0	35.0	39.3	127
2	70.5	68.0	0.8	35.0	39.3	153	0.0	35.0	39.3	161
3	69.4	67.1	0.0	35.0	39.3	186	0.0	35.0	39.3	195
4	68.5	66.4	0.0	20.4	23.3	205	1.0	13.2	17.3	205
5	67.9	66.0	0.0	0.0	0.0	203	0.3	0.0	0.0	202
6	67.7	65.9	0.0	4.1	6.7	205	1.4	5.8	9.4	205
7	68.1	66.3	0.0	0.0	0.0	203	0.0	0.0	0.0	203
8	69.1	67.3	0.0	4.1	6.7	205	0.0	4.1	6.7	205
9	70.8	68.0	0.0	0.0	0.0	205	0.0	0.0	0.0	205
10	72.9	69.1	0.0	0.0	0.0	205	0.0	0.0	0.0	205
11	75.2	70.5	0.0	0.0	0.0	205	0.0	0.0	0.0	205
12	77.5	71.7	0.0	0.0	0.0	205	0.0	0.0	0.0	205
13	79.6	72.7	22.1	0.0	0.0	181	46.4	0.0	0.0	156
14	81.3	73.5	26.0	0.0	0.0	153	41.6	0.0	0.0	113
15	82.3	73.7	28.6	0.0	0.0	123	44.7	0.0	0.0	67
16	82.7	73.5	28.1	0.0	0.0	93	43.3	0.0	0.0	23
17	82.5	73.1	0.0	0.0	0.0	93	0.0	0.0	0.0	23
18	82.0	72.6	0.0	0.0	0.0	93	0.0	0.0	0.0	23
19	81.1	73.2	0.0	0.0	0.0	93	0.0	0.0	0.0	23
20	79.9	73.8	0.0	0.0	0.0	93	0.0	0.0	0.0	23
21	78.5	73.9	0.0	0.0	0.0	93	0.0	0.0	0.0	23
22	76.9	73.1	0.0	0.0	0.0	93	0.0	0.0	0.0	23
23	75.2	71.9	0.0	0.0	0.0	93	0.0	0.0	0.0	23
24	73.5	70.8	0.0	0.0	0.0	93	0.0	0.0	0.0	23

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M500, ECO#13

---- B U I L D I N G C O O L I N G D E M A N D S A N D T H E R M A L S T O R A G E ----

August

	Design		Design			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	78.6	67.6	0.0	35.0	40.4	58
2	77.9	67.2	0.0	35.0	40.2	93
3	77.2	66.9	0.0	35.0	40.0	127
4	76.8	66.6	0.0	35.0	39.9	160
5	76.6	66.7	0.0	35.0	39.8	194
6	76.9	67.1	0.0	12.9	17.4	205
7	77.7	67.8	0.0	0.0	0.0	203
8	79.1	69.0	0.0	4.1	6.9	205
9	81.2	70.0	0.0	0.0	0.0	205
10	83.5	70.9	0.0	0.0	0.0	205
11	86.2	71.8	0.0	0.0	0.0	205
12	88.7	72.7	0.0	0.0	0.0	205
13	90.6	73.2	53.1	0.0	0.0	150
14	91.8	73.8	49.3	0.0	0.0	99
15	92.3	74.0	51.8	0.0	0.0	46
16	91.8	73.3	50.4	0.0	0.0	0
17	90.7	72.4	0.0	0.0	0.0	0
18	89.0	71.4	0.0	0.0	0.0	0
19	87.0	70.1	0.0	0.0	0.0	0
20	84.9	69.8	0.0	0.0	0.0	0
21	83.2	70.3	0.0	0.0	0.0	0
22	81.6	69.3	0.0	0.0	0.0	0
23	80.4	68.5	0.0	0.0	0.0	0
24	79.4	67.9	0.0	0.0	0.0	0

	Typical		Weekday				Saturday			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	72.7	70.2	0.0	35.0	39.3	35	0.0	35.0	39.3	64
2	71.2	69.0	0.0	35.0	39.3	70	0.0	35.0	39.3	98
3	69.9	68.0	0.0	35.0	39.3	104	0.0	35.0	39.3	132
4	68.8	67.1	1.5	35.0	39.3	136	1.5	35.0	39.3	164
5	68.0	66.6	0.5	35.0	39.3	170	0.5	35.0	39.3	197
6	67.5	66.2	0.5	35.0	39.3	202	0.5	10.1	15.2	205
7	67.3	66.1	0.0	4.3	7.1	205	0.0	0.0	0.0	203
8	67.8	66.5	0.0	0.0	0.0	203	0.0	4.1	6.7	205
9	69.1	67.0	0.0	0.0	0.0	203	0.0	0.0	0.0	205
10	71.2	67.8	0.0	0.0	0.0	203	0.0	0.0	0.0	205
11	73.8	68.7	0.0	0.0	0.0	203	0.0	0.0	0.0	205
12	76.5	70.0	0.0	0.0	0.0	203	0.0	0.0	0.0	205
13	79.1	71.2	43.5	0.0	0.0	157	21.9	0.0	0.0	181
14	81.1	72.6	39.4	0.0	0.0	116	26.1	0.0	0.0	153
15	82.5	73.6	42.8	0.0	0.0	72	29.2	0.0	0.0	122

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M500, ECO#13

			Weekday				Saturday			
	Typical		Cooling	Chiller	Chiller	Storage	Cooling	Chiller	Chiller	Storage
	OADB	OAWB	Load	Load	Demand	Capacity	Load	Load	Demand	Capacity
Hour	(F)	(F)	(Ton)	(Ton)	(kW)	(Ton-Hr)	(Ton)	(Ton)	(kW)	(Ton-Hr)
16	83.0	73.7	42.5	0.0	0.0	29	28.9	0.0	0.0	92
17	82.8	73.5	0.0	0.0	0.0	29	0.0	0.0	0.0	92
18	82.3	73.5	0.0	0.0	0.0	29	0.0	0.0	0.0	92
19	81.5	73.1	0.0	0.0	0.0	29	0.0	0.0	0.0	92
20	80.4	73.7	0.0	0.0	0.0	29	0.0	0.0	0.0	92
21	79.1	74.9	0.0	0.0	0.0	29	0.0	0.0	0.0	92
22	77.6	73.9	0.0	0.0	0.0	29	0.0	0.0	0.0	92
23	76.0	72.7	0.0	0.0	0.0	29	0.0	0.0	0.0	92
24	74.3	71.3	0.0	0.0	0.0	29	0.0	0.0	0.0	92

			Sunday				Monday			
	Typical		Cooling	Chiller	Chiller	Storage	Cooling	Chiller	Chiller	Storage
	OADB	OAWB	Load	Load	Demand	Capacity	Load	Load	Demand	Capacity
Hour	(F)	(F)	(Ton)	(Ton)	(kW)	(Ton-Hr)	(Ton)	(Ton)	(kW)	(Ton-Hr)
1	72.7	70.2	0.0	35.0	39.3	126	0.0	35.0	39.3	134
2	71.2	69.0	1.6	35.0	39.3	158	0.0	35.0	39.3	167
3	69.9	68.0	0.0	35.0	39.3	192	0.0	35.0	39.3	201
4	68.8	67.1	0.0	14.9	18.6	205	1.5	7.5	12.3	205
5	68.0	66.6	0.0	0.0	0.0	203	0.5	0.0	0.0	202
6	67.5	66.2	0.0	4.1	6.7	205	0.5	5.0	8.3	205
7	67.3	66.1	0.0	0.0	0.0	203	0.0	0.0	0.0	203
8	67.8	66.5	0.0	4.1	6.7	205	0.0	4.1	6.7	205
9	69.1	67.0	0.0	0.0	0.0	205	0.0	0.0	0.0	205
10	71.2	67.8	0.0	0.0	0.0	205	0.0	0.0	0.0	205
11	73.8	68.7	0.0	0.0	0.0	205	0.0	0.0	0.0	205
12	76.5	70.0	0.0	0.0	0.0	205	0.0	0.0	0.0	205
13	79.1	71.2	19.9	0.0	0.0	183	43.5	0.0	0.0	159
14	81.1	72.6	24.2	0.0	0.0	157	39.4	0.0	0.0	118
15	82.5	73.6	27.3	0.0	0.0	128	42.8	0.0	0.0	74
16	83.0	73.7	26.9	0.0	0.0	100	42.5	0.0	0.0	31
17	82.8	73.5	0.0	0.0	0.0	100	0.0	0.0	0.0	31
18	82.3	73.5	0.0	0.0	0.0	100	0.0	0.0	0.0	31
19	81.5	73.1	0.0	0.0	0.0	100	0.0	0.0	0.0	31
20	80.4	73.7	0.0	0.0	0.0	100	0.0	0.0	0.0	31
21	79.1	74.9	0.0	0.0	0.0	100	0.0	0.0	0.0	31
22	77.6	73.9	0.0	0.0	0.0	100	0.0	0.0	0.0	31
23	76.0	72.7	0.0	0.0	0.0	100	0.0	0.0	0.0	31
24	74.3	71.3	0.0	0.0	0.0	100	0.0	0.0	0.0	31

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M500, ECO#13

---- B U I L D I N G C O O L I N G D E M A N D S A N D T H E R M A L S T O R A G E ----

September

	Design		Design			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	74.6	63.1	0.0	35.0	39.3	66
2	73.7	62.4	0.0	35.0	39.3	100
3	73.0	61.9	0.0	35.0	39.3	134
4	72.4	61.7	0.0	35.0	39.3	168
5	72.3	61.8	0.0	35.0	39.3	201
6	72.6	62.5	0.0	5.8	9.5	205
7	73.5	63.2	0.0	0.0	0.0	203
8	75.1	64.8	0.0	4.1	6.7	205
9	77.4	65.9	0.0	0.0	0.0	205
10	80.0	66.8	0.0	0.0	0.0	205
11	83.0	67.8	0.0	0.0	0.0	205
12	85.8	68.5	0.0	0.0	0.0	205
13	87.9	69.7	46.8	0.0	0.0	156
14	89.3	70.2	42.1	0.0	0.0	112
15	89.9	70.1	44.0	0.0	0.0	67
16	89.3	69.1	42.5	0.0	0.0	24
17	88.1	67.8	0.0	0.0	0.0	24
18	86.2	66.8	0.0	0.0	0.0	24
19	83.9	66.5	0.0	0.0	0.0	24
20	81.6	66.3	0.0	0.0	0.0	24
21	79.7	66.1	0.0	0.0	0.0	24
22	77.9	65.0	0.0	0.0	0.0	24
23	76.5	64.4	0.0	0.0	0.0	24
24	75.4	63.6	0.0	0.0	0.0	24

	Typical		Weekday				Saturday			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	69.8	66.1	0.0	35.0	39.3	59	0.0	35.0	39.3	105
2	68.0	64.5	0.8	35.0	39.3	92	0.8	35.0	39.3	138
3	66.3	63.0	0.0	35.0	39.3	126	0.0	35.0	39.3	172
4	64.9	61.9	0.0	35.0	39.3	160	0.0	34.6	38.8	205
5	63.9	61.3	0.0	35.0	39.3	194	0.0	0.0	0.0	203
6	63.2	61.0	0.0	13.0	17.2	205	0.0	4.1	6.7	205
7	63.0	60.8	0.0	0.0	0.0	203	0.0	0.0	0.0	203
8	63.4	61.4	0.0	4.1	6.7	205	0.0	4.1	6.7	205
9	64.7	61.8	0.0	0.0	0.0	205	0.0	0.0	0.0	205
10	66.6	62.1	0.0	0.0	0.0	205	0.0	0.0	0.0	205
11	69.1	62.9	0.0	0.0	0.0	205	0.0	0.0	0.0	205
12	71.8	63.7	0.0	0.0	0.0	205	0.0	0.0	0.0	205
13	74.5	65.5	32.8	0.0	0.0	170	10.7	0.0	0.0	192
14	77.0	67.1	28.8	0.0	0.0	139	16.7	0.0	0.0	173
15	78.9	68.2	32.3	0.0	0.0	106	19.4	0.0	0.0	152

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M500, ECO#13

	Typical		Weekday				Saturday			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
16	80.2	68.6	33.8	0.0	0.0	71	20.9	0.0	0.0	130
17	80.6	68.5	0.0	0.0	0.0	71	0.0	0.0	0.0	130
18	80.4	68.9	0.0	0.0	0.0	71	0.0	0.0	0.0	130
19	79.7	70.0	0.0	0.0	0.0	71	0.0	0.0	0.0	130
20	78.7	71.2	0.0	0.0	0.0	71	0.0	0.0	0.0	130
21	77.3	71.6	0.0	0.0	0.0	71	0.0	0.0	0.0	130
22	75.6	70.5	0.0	0.0	0.0	71	0.0	0.0	0.0	130
23	73.7	69.4	0.0	0.0	0.0	71	0.0	0.0	0.0	130
24	71.8	67.7	0.0	0.0	0.0	71	0.0	0.0	0.0	130

	Typical		Sunday				Monday			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	69.8	66.1	0.2	35.0	39.3	163	0.0	35.0	39.3	180
2	68.0	64.5	0.0	35.0	39.3	197	0.9	27.4	30.3	205
3	66.3	63.0	0.0	10.0	15.1	205	0.0	0.0	0.0	203
4	64.9	61.9	0.0	0.0	0.0	203	0.0	4.1	6.7	205
5	63.9	61.3	0.0	4.1	6.7	205	0.0	0.0	0.0	203
6	63.2	61.0	0.0	0.0	0.0	203	0.0	4.1	6.7	205
7	63.0	60.8	0.0	4.1	6.7	205	0.0	0.0	0.0	203
8	63.4	61.4	0.0	0.0	0.0	203	0.0	4.1	6.7	205
9	64.7	61.8	0.0	0.0	0.0	203	0.0	0.0	0.0	205
10	66.6	62.1	0.0	0.0	0.0	203	0.0	0.0	0.0	205
11	69.1	62.9	0.0	0.0	0.0	203	0.0	0.0	0.0	205
12	71.8	63.7	0.0	0.0	0.0	203	0.0	0.0	0.0	205
13	74.5	65.5	1.3	0.0	0.0	199	32.8	0.0	0.0	170
14	77.0	67.1	10.1	0.0	0.0	187	28.8	0.0	0.0	139
15	78.9	68.2	18.1	0.0	0.0	167	32.3	0.0	0.0	106
16	80.2	68.6	19.2	0.0	0.0	146	33.8	0.0	0.0	71
17	80.6	68.5	0.0	0.0	0.0	146	0.0	0.0	0.0	71
18	80.4	68.9	0.0	0.0	0.0	146	0.0	0.0	0.0	71
19	79.7	70.0	0.0	0.0	0.0	146	0.0	0.0	0.0	71
20	78.7	71.2	0.0	0.0	0.0	146	0.0	0.0	0.0	71
21	77.3	71.6	0.0	0.0	0.0	146	0.0	0.0	0.0	71
22	75.6	70.5	0.0	0.0	0.0	146	0.0	0.0	0.0	71
23	73.7	69.4	0.0	0.0	0.0	146	0.0	0.0	0.0	71
24	71.8	67.7	0.0	0.0	0.0	146	0.0	0.0	0.0	71

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M500, ECO#13

---- B U I L D I N G C O O L I N G D E M A N D S A N D T H E R M A L S T O R A G E ----

October

	Design		Design			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	59.5	50.0	0.0	35.0	39.3	105
2	58.5	49.3	0.0	35.0	39.3	139
3	57.7	48.8	0.0	35.0	39.3	173
4	57.1	48.5	0.0	33.8	37.7	205
5	56.9	48.3	0.0	0.0	0.0	203
6	57.3	48.7	0.0	4.1	6.7	205
7	58.3	49.7	0.0	0.0	0.0	203
8	60.1	51.3	0.0	4.1	6.7	205
9	62.7	52.9	0.0	0.0	0.0	205
10	65.7	54.4	0.0	0.0	0.0	205
11	69.1	55.5	0.0	0.0	0.0	205
12	72.3	56.7	0.0	0.0	0.0	205
13	74.7	57.8	25.0	0.0	0.0	178
14	76.3	58.6	25.2	0.0	0.0	151
15	76.9	58.7	26.8	0.0	0.0	122
16	76.3	58.0	26.3	0.0	0.0	95
17	74.9	57.0	0.0	0.0	0.0	95
18	72.7	56.0	0.0	0.0	0.0	95
19	70.1	55.5	0.0	0.0	0.0	95
20	67.5	54.7	0.0	0.0	0.0	95
21	65.3	53.6	0.0	0.0	0.0	95
22	63.3	52.4	0.0	0.0	0.0	95
23	61.7	51.5	0.0	0.0	0.0	95
24	60.5	50.7	0.0	0.0	0.0	95

	Typical		Weekday				Saturday			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	54.8	51.3	0.0	35.0	39.3	129	0.0	35.0	39.3	204
2	52.9	49.6	0.0	35.0	39.3	163	0.0	2.8	4.6	205
3	51.2	48.2	0.0	35.0	39.3	196	0.0	0.0	0.0	203
4	49.8	47.2	0.0	10.7	15.6	205	0.0	4.1	6.7	205
5	48.8	46.2	0.0	0.0	0.0	203	0.0	0.0	0.0	203
6	48.2	45.7	0.0	4.1	6.7	205	0.0	4.1	6.7	205
7	47.9	45.6	0.0	0.0	0.0	203	0.0	0.0	0.0	203
8	48.5	46.2	0.0	4.1	6.7	205	0.0	4.1	6.7	205
9	50.3	47.3	0.0	0.0	0.0	205	0.0	0.0	0.0	205
10	52.9	48.7	0.0	0.0	0.0	205	0.0	0.0	0.0	205
11	56.2	49.9	0.0	0.0	0.0	205	0.0	0.0	0.0	205
12	59.6	51.5	0.0	0.0	0.0	205	0.0	0.0	0.0	205
13	62.9	53.5	0.0	0.0	0.0	203	0.0	0.0	0.0	203
14	65.5	55.2	3.7	0.0	0.0	197	0.0	0.0	0.0	201
15	67.3	56.3	11.1	0.0	0.0	184	0.0	0.0	0.0	199

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M500, ECO#13

	Typical		Weekday				Saturday			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
16	67.9	56.6	11.4	0.0	0.0	171	0.0	0.0	0.0	197
17	67.7	56.4	0.0	0.0	0.0	171	0.0	0.0	0.0	197
18	67.0	56.6	0.0	0.0	0.0	171	0.0	0.0	0.0	197
19	66.0	57.6	0.0	0.0	0.0	171	0.0	0.0	0.0	197
20	64.6	57.9	0.0	0.0	0.0	171	0.0	0.0	0.0	197
21	62.9	57.3	0.0	0.0	0.0	171	0.0	0.0	0.0	197
22	61.0	56.0	0.0	0.0	0.0	171	0.0	0.0	0.0	197
23	59.0	54.8	0.0	0.0	0.0	171	0.0	0.0	0.0	197
24	56.9	53.0	0.0	0.0	0.0	171	0.0	0.0	0.0	197

	Typical		Sunday				Monday			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	54.8	51.3	0.0	10.0	15.1	205	0.0	12.0	16.5	205
2	52.9	49.6	0.0	0.0	0.0	203	0.0	0.0	0.0	203
3	51.2	48.2	0.0	4.1	6.7	205	0.0	4.1	6.7	205
4	49.8	47.2	0.0	0.0	0.0	203	0.0	0.0	0.0	203
5	48.8	46.2	0.0	4.1	6.7	205	0.0	4.1	6.7	205
6	48.2	45.7	0.0	0.0	0.0	203	0.0	0.0	0.0	203
7	47.9	45.6	0.0	4.1	6.7	205	0.0	4.1	6.7	205
8	48.5	46.2	0.0	0.0	0.0	203	0.0	0.0	0.0	203
9	50.3	47.3	0.0	0.0	0.0	203	0.0	0.0	0.0	203
10	52.9	48.7	0.0	0.0	0.0	203	0.0	0.0	0.0	203
11	56.2	49.9	0.0	0.0	0.0	203	0.0	0.0	0.0	203
12	59.6	51.5	0.0	0.0	0.0	203	0.0	0.0	0.0	203
13	62.9	53.5	0.0	0.0	0.0	201	0.0	0.0	0.0	201
14	65.5	55.2	0.0	0.0	0.0	199	0.0	0.0	0.0	199
15	67.3	56.3	0.0	0.0	0.0	197	0.0	0.0	0.0	197
16	67.9	56.6	0.0	0.0	0.0	195	0.0	0.0	0.0	195
17	67.7	56.4	0.0	0.0	0.0	195	0.0	0.0	0.0	195
18	67.0	56.6	0.0	0.0	0.0	195	0.0	0.0	0.0	195
19	66.0	57.6	0.0	0.0	0.0	195	0.0	0.0	0.0	195
20	64.6	57.9	0.0	0.0	0.0	195	0.0	0.0	0.0	195
21	62.9	57.3	0.0	0.0	0.0	195	0.0	0.0	0.0	195
22	61.0	56.0	0.0	0.0	0.0	195	0.0	0.0	0.0	195
23	59.0	54.8	0.0	0.0	0.0	195	0.0	0.0	0.0	195
24	56.9	53.0	0.0	0.0	0.0	195	0.0	0.0	0.0	195

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M500, ECO#13

---- B U I L D I N G C O O L I N G D E M A N D S A N D T H E R M A L S T O R A G E ----

November

	Design		Design			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	56.0	47.2	0.0	12.0	16.5	205
2	55.0	46.4	0.0	0.0	0.0	203
3	54.2	45.8	0.0	4.1	6.7	205
4	53.6	45.2	0.0	0.0	0.0	203
5	53.4	45.3	0.0	4.1	6.7	205
6	53.8	45.9	0.0	0.0	0.0	203
7	54.8	46.9	0.0	4.1	6.7	205
8	56.6	48.7	0.0	0.0	0.0	203
9	59.2	50.6	0.0	0.0	0.0	203
10	62.2	52.6	0.0	0.0	0.0	203
11	65.6	54.1	0.0	0.0	0.0	203
12	68.8	55.3	0.0	0.0	0.0	203
13	71.2	55.7	0.0	0.0	0.0	201
14	72.8	56.3	0.0	0.0	0.0	199
15	73.4	56.2	0.0	0.0	0.0	197
16	72.8	55.6	0.0	0.0	0.0	195
17	71.4	54.6	0.0	0.0	0.0	195
18	69.2	53.6	0.0	0.0	0.0	195
19	66.6	53.0	0.0	0.0	0.0	195
20	64.0	51.7	0.0	0.0	0.0	195
21	61.8	50.7	0.0	0.0	0.0	195
22	59.8	49.6	0.0	0.0	0.0	195
23	58.2	48.7	0.0	0.0	0.0	195
24	57.0	48.0	0.0	0.0	0.0	195

			Weekday				Saturday			
Hour	Typical OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	48.7	45.7	0.0	12.0	16.5	205	0.0	12.0	16.5	205
2	46.9	44.1	0.0	0.0	0.0	203	0.0	0.0	0.0	203
3	45.5	42.8	0.0	4.1	6.7	205	0.0	4.1	6.7	205
4	44.6	41.9	0.0	0.0	0.0	203	0.0	0.0	0.0	203
5	44.4	42.0	0.0	4.1	6.7	205	0.0	4.1	6.7	205
6	44.8	42.7	0.0	0.0	0.0	203	0.0	0.0	0.0	203
7	45.9	43.9	0.0	4.1	6.7	205	0.0	4.1	6.7	205
8	47.8	46.0	0.0	0.0	0.0	203	0.0	0.0	0.0	203
9	50.2	48.0	0.0	0.0	0.0	203	0.0	0.0	0.0	203
10	52.9	49.9	0.0	0.0	0.0	203	0.0	0.0	0.0	203
11	55.8	51.1	0.0	0.0	0.0	203	0.0	0.0	0.0	203
12	58.5	52.0	0.0	0.0	0.0	203	0.0	0.0	0.0	203
13	60.9	52.5	0.0	0.0	0.0	201	0.0	0.0	0.0	201
14	62.8	53.4	0.0	0.0	0.0	199	0.0	0.0	0.0	199
15	64.0	53.8	0.0	0.0	0.0	197	0.0	0.0	0.0	197

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M500, ECO#13

	Typical		Weekday				Saturday			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
16	64.4	53.9	0.0	0.0	0.0	195	0.0	0.0	0.0	195
17	64.1	53.7	0.0	0.0	0.0	195	0.0	0.0	0.0	195
18	63.2	53.7	0.0	0.0	0.0	195	0.0	0.0	0.0	195
19	61.8	54.2	0.0	0.0	0.0	195	0.0	0.0	0.0	195
20	60.0	53.6	0.0	0.0	0.0	195	0.0	0.0	0.0	195
21	57.9	52.7	0.0	0.0	0.0	195	0.0	0.0	0.0	195
22	55.6	51.2	0.0	0.0	0.0	195	0.0	0.0	0.0	195
23	53.2	49.5	0.0	0.0	0.0	195	0.0	0.0	0.0	195
24	50.8	47.6	0.0	0.0	0.0	195	0.0	0.0	0.0	195

	Typical		Sunday				Monday			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	48.7	45.7	0.0	12.0	16.5	205	0.0	12.0	16.5	205
2	46.9	44.1	0.0	0.0	0.0	203	0.0	0.0	0.0	203
3	45.5	42.8	0.0	4.1	6.7	205	0.0	4.1	6.7	205
4	44.6	41.9	0.0	0.0	0.0	203	0.0	0.0	0.0	203
5	44.4	42.0	0.0	4.1	6.7	205	0.0	4.1	6.7	205
6	44.8	42.7	0.0	0.0	0.0	203	0.0	0.0	0.0	203
7	45.9	43.9	0.0	4.1	6.7	205	0.0	4.1	6.7	205
8	47.8	46.0	0.0	0.0	0.0	203	0.0	0.0	0.0	203
9	50.2	48.0	0.0	0.0	0.0	203	0.0	0.0	0.0	203
10	52.9	49.9	0.0	0.0	0.0	203	0.0	0.0	0.0	203
11	55.8	51.1	0.0	0.0	0.0	203	0.0	0.0	0.0	203
12	58.5	52.0	0.0	0.0	0.0	203	0.0	0.0	0.0	203
13	60.9	52.5	0.0	0.0	0.0	201	0.0	0.0	0.0	201
14	62.8	53.4	0.0	0.0	0.0	199	0.0	0.0	0.0	199
15	64.0	53.8	0.0	0.0	0.0	197	0.0	0.0	0.0	197
16	64.4	53.9	0.0	0.0	0.0	195	0.0	0.0	0.0	195
17	64.1	53.7	0.0	0.0	0.0	195	0.0	0.0	0.0	195
18	63.2	53.7	0.0	0.0	0.0	195	0.0	0.0	0.0	195
19	61.8	54.2	0.0	0.0	0.0	195	0.0	0.0	0.0	195
20	60.0	53.6	0.0	0.0	0.0	195	0.0	0.0	0.0	195
21	57.9	52.7	0.0	0.0	0.0	195	0.0	0.0	0.0	195
22	55.6	51.2	0.0	0.0	0.0	195	0.0	0.0	0.0	195
23	53.2	49.5	0.0	0.0	0.0	195	0.0	0.0	0.0	195
24	50.8	47.6	0.0	0.0	0.0	195	0.0	0.0	0.0	195

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M500, ECO#13

---- B U I L D I N G C O O L I N G D E M A N D S A N D T H E R M A L S T O R A G E ----

December

	Design		Design			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	48.2	40.8	0.0	12.0	16.5	205
2	47.3	40.2	0.0	0.0	0.0	203
3	46.6	39.7	0.0	4.1	6.7	205
4	46.1	39.3	0.0	0.0	0.0	203
5	45.9	39.4	0.0	4.1	6.7	205
6	46.3	39.7	0.0	0.0	0.0	203
7	47.1	40.6	0.0	4.1	6.7	205
8	48.7	42.0	0.0	0.0	0.0	203
9	50.9	44.0	0.0	0.0	0.0	203
10	53.5	46.1	0.0	0.0	0.0	203
11	56.5	48.0	0.0	0.0	0.0	203
12	59.2	49.7	0.0	0.0	0.0	203
13	61.3	50.8	0.0	0.0	0.0	201
14	62.7	51.4	0.0	0.0	0.0	199
15	63.2	51.4	0.0	0.0	0.0	197
16	62.7	50.7	0.0	0.0	0.0	195
17	61.5	49.7	0.0	0.0	0.0	195
18	59.6	48.5	0.0	0.0	0.0	195
19	57.3	47.6	0.0	0.0	0.0	195
20	55.1	45.9	0.0	0.0	0.0	195
21	53.2	44.6	0.0	0.0	0.0	195
22	51.5	43.1	0.0	0.0	0.0	195
23	50.1	42.2	0.0	0.0	0.0	195
24	49.0	41.5	0.0	0.0	0.0	195

	Typical		Weekday				Saturday			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	37.5	35.3	0.0	12.0	16.5	205	0.0	12.0	16.5	205
2	37.1	35.1	0.0	0.0	0.0	203	0.0	0.0	0.0	203
3	37.4	35.5	0.0	4.1	6.7	205	0.0	4.1	6.7	205
4	38.1	36.2	0.0	0.0	0.0	203	0.0	0.0	0.0	203
5	39.3	37.6	0.0	4.1	6.7	205	0.0	4.1	6.7	205
6	40.9	39.2	0.0	0.0	0.0	203	0.0	0.0	0.0	203
7	42.7	41.2	0.0	4.1	6.7	205	0.0	4.1	6.7	205
8	44.7	43.1	0.0	0.0	0.0	203	0.0	0.0	0.0	203
9	46.8	45.3	0.0	0.0	0.0	203	0.0	0.0	0.0	203
10	48.8	47.0	0.0	0.0	0.0	203	0.0	0.0	0.0	203
11	50.7	48.1	0.0	0.0	0.0	203	0.0	0.0	0.0	203
12	52.2	48.8	0.0	0.0	0.0	203	0.0	0.0	0.0	203
13	53.4	49.2	0.0	0.0	0.0	201	0.0	0.0	0.0	201
14	54.1	49.2	0.0	0.0	0.0	199	0.0	0.0	0.0	199
15	54.4	48.9	0.0	0.0	0.0	197	0.0	0.0	0.0	197

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

COLD THERMAL STORAGE - ALTERNATIVE 1
BLDG M500, ECO#13

	Typical		Weekday				Saturday			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
16	54.0	48.2	0.0	0.0	0.0	195	0.0	0.0	0.0	195
17	53.0	47.3	0.0	0.0	0.0	195	0.0	0.0	0.0	195
18	51.4	46.3	0.0	0.0	0.0	195	0.0	0.0	0.0	195
19	49.3	45.4	0.0	0.0	0.0	195	0.0	0.0	0.0	195
20	47.0	43.5	0.0	0.0	0.0	195	0.0	0.0	0.0	195
21	44.5	41.5	0.0	0.0	0.0	195	0.0	0.0	0.0	195
22	42.2	39.3	0.0	0.0	0.0	195	0.0	0.0	0.0	195
23	40.1	37.6	0.0	0.0	0.0	195	0.0	0.0	0.0	195
24	38.5	36.2	0.0	0.0	0.0	195	0.0	0.0	0.0	195

	Typical		Sunday				Monday			
Hour	OADB (F)	OAWB (F)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)	Cooling Load (Ton)	Chiller Load (Ton)	Chiller Demand (kW)	Storage Capacity (Ton-Hr)
1	37.5	35.3	0.0	12.0	16.5	205	0.0	12.0	16.5	205
2	37.1	35.1	0.0	0.0	0.0	203	0.0	0.0	0.0	203
3	37.4	35.5	0.0	4.1	6.7	205	0.0	4.1	6.7	205
4	38.1	36.2	0.0	0.0	0.0	203	0.0	0.0	0.0	203
5	39.3	37.6	0.0	4.1	6.7	205	0.0	4.1	6.7	205
6	40.9	39.2	0.0	0.0	0.0	203	0.0	0.0	0.0	203
7	42.7	41.2	0.0	4.1	6.7	205	0.0	4.1	6.7	205
8	44.7	43.1	0.0	0.0	0.0	203	0.0	0.0	0.0	203
9	46.8	45.3	0.0	0.0	0.0	203	0.0	0.0	0.0	203
10	48.8	47.0	0.0	0.0	0.0	203	0.0	0.0	0.0	203
11	50.7	48.1	0.0	0.0	0.0	203	0.0	0.0	0.0	203
12	52.2	48.8	0.0	0.0	0.0	203	0.0	0.0	0.0	203
13	53.4	49.2	0.0	0.0	0.0	201	0.0	0.0	0.0	201
14	54.1	49.2	0.0	0.0	0.0	199	0.0	0.0	0.0	199
15	54.4	48.9	0.0	0.0	0.0	197	0.0	0.0	0.0	197
16	54.0	48.2	0.0	0.0	0.0	195	0.0	0.0	0.0	195
17	53.0	47.3	0.0	0.0	0.0	195	0.0	0.0	0.0	195
18	51.4	46.3	0.0	0.0	0.0	195	0.0	0.0	0.0	195
19	49.3	45.4	0.0	0.0	0.0	195	0.0	0.0	0.0	195
20	47.0	43.5	0.0	0.0	0.0	195	0.0	0.0	0.0	195
21	44.5	41.5	0.0	0.0	0.0	195	0.0	0.0	0.0	195
22	42.2	39.3	0.0	0.0	0.0	195	0.0	0.0	0.0	195
23	40.1	37.6	0.0	0.0	0.0	195	0.0	0.0	0.0	195
24	38.5	36.2	0.0	0.0	0.0	195	0.0	0.0	0.0	195

CALIFORNIA TITLE 24 COMPLIANCE - ALTERNATIVE 1
BLDG M500, ECO#13

CALIFORNIA TITLE 24 COMPLIANCE REPORT

Weather Name ..... ATLANTA.
Gross Conditioned Floor Area (sqft)..... 27,466
ACM Multiplier 1.025

E N E R G Y U S E S U M M A R Y

	ELEC (kWh/yr)	GAS (kBtu/yr)	PERCENT OF TOTAL ENERGY (%)	TOTAL SOURCE ENERGY (kBtu/yr)	ADJUSTED UNIT SOURCE ENERGY (kBtu/yr-sf)
Primary Heating	2,949.0	522,952.4	21.8	580,674.2	21.7
Primary Cooling					
Compressor	83,641.3	0.0	11.7	856,488.9	32.0
Tower/Cond Fans	5,634.1	0.0	0.8	57,693.5	2.2
Condenser Pump	0.0	0.0	0.0	0.0	0.0
Other Accessories	3,238.6	0.0	0.5	33,163.3	1.2
Auxiliary					
Supply Fans	244,087.6	0.0	34.1	2,499,462.5	93.3
Circulation Pumps	19,923.4	0.0	2.8	204,016.0	7.6
Base Utilities	0.0	0.0	0.0	0.0	0.0
Subtotal	264,010.9	0.0	36.9	2,703,478.3	100.9
Lighting	60,841.8	0.0	8.5	623,021.1	22.7
Receptacle	142,768.4	0.0	19.9	1,461,952.1	53.2
Domestic Hot Water	0.0	0.0	0.0	0.0	0.0
Cogeneration	0.0	0.0	0.0	0.0	0.0
Totals	563,084.2	522,952.4	100.0	6,316,471.5	233.8

BUILDING 514

E M C ENGINEERS, INC.

PROJECT: FORT McPHERSON & FORT GILLEM ESOS STUDY
LOCATION: FORT McPHERSON
ECO: Computer Simulation Summary

CLIENT CONTRACT NO: DACA21-91-C-0097
CLIENT PROJECT ENG: TERRY SEABROOK

EMC PROJECT: #3105.000
DATE: 10-APR-92
FILE: M514ECO.WK3
PREPARED BY: JIM WATTERS
CHECKED BY:

Bldg: M514 **Area: 9,744 ft^2**

Run Description	Heating Gas Use (kBtu/yr)	Heating Electric Use (kWh/yr)	Cooling Electric Use (kWh/yr)	Fan Electric Use (kWh/yr)	Pump Electric Use (kWh/yr)	Lighting Electric Use (kWh/yr)	Recept. Electric Use (kWh/yr)	Total Electric Use (kWh/yr)	Peak Electric Demand (kW)	Total Gas Use (MBtu/yr)	Total Energy Use (Mbtu/yr)
Baseline	23,160	1,165	22,984	68,724	0	52,797	5,400	151,070	46	23	539
ECO#6	23,160	1,165	21,783	68,724	0	52,797	5,400	149,868	46	23	535
Savings/(Loss)	0	0	1,202	0	0	0	0	1,202	0	0	4
ECO#12	5,964	142	3,721	23,725	0	52,797	5,400	85,784	41	6	299
Savings/(Loss)	17,196	1,023	19,263	44,999	0	0	0	65,286	5	17	240

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB 3105.000
SHEET NO. _____ OF _____
CALCULATED BY JW DATE 3/3/92
CHECKED BY _____ DATE _____
SCALE _____

COMPUTER SIMULATION BLDG 514 BASE RUN

BLDG. TYPE : ~~CMU BLOCK W/ STUCCO~~ CMU Admin
AREA = ~~8704 ft²~~ 9744 ft²
ECO : 12

ASSUMPTIONS

- ~~OCCUPANCY : 25 people~~
- INFILTRATION : ½ ACH
- ~~WINDOW U VALUE : 0.8~~
- ~~LIGHTS : 2.2 WATTS/ft²~~
- HEATING db : 72°F
- COOLING db : 76°F
- ~~MISC. LOAD : 4.1kW~~
- ~~SLAB METHOD : $F_2 = 0.62$~~

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB 3105.000

SHEET NO. _____ OF _____

CALCULATED BY JW DATE 2/24/92

CHECKED BY _____ DATE _____

SCALE _____

BLDG 514

TRACE 600 ENERGY SIMULATION BASE RUN

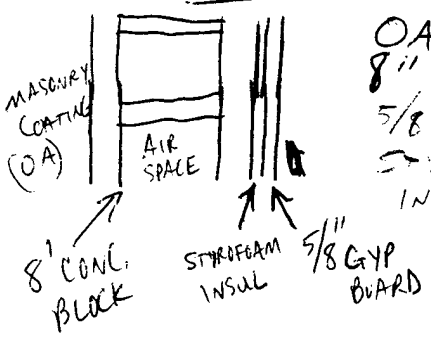
~~BUILDING ORIENTATION: 270~~

WALL TYPE ~~B~~: 8" CONC. BLOCK WALL ~~W/ TEXTURED~~ EXTERIOR ~~MASONRY~~ COATING. STYRO FOAM BETWEEN FURRING STRIPS 5/8" GYP BOARD ON ~~1~~" FURRING STRIPS

~~BLDG TYPE: CHILD CARE CENTER~~

~~SQUARE FT: 7616~~ 8704 ft²

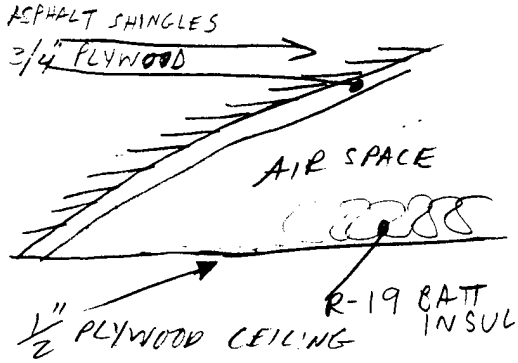
WALL U VALUE



	R-VALUE
OA ⇒ 1" STUCCO ⇒	0.17
8" CONC. BLOCK ⇒	0.20
	1.7
5/8 GYP BOARD ⇒	0.56
STYROFOAM ⇒	2.5
INSIDE AIR ⇒	+ 0.68
	5.81

$U = \frac{1}{5.161} = \boxed{0.1-}$

ROOF U-VALUE



	R-VALUE
OA ⇒	0.17
SHINGLES ⇒	0.44
3/4" PLYWOOD ⇒	0.93
AIR SPACE ⇒	1.24
PLYWOOD CEILING ⇒	0.62
INSIDE ⇒	0.62
R-19 ⇒	19.0
	23.02

$U = \frac{1}{R} = \boxed{0.043}$

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB 3105.000
SHEET NO. ____ OF ____
CALCULATED BY JW DATE 2/24/92
CHECKED BY ____ DATE ____
SCALE ____

BLDG 514

WINDOW U-VALUE - ASHRAE TABLE F 27.13
Double Pane, Aluminum Frame, Sliding

U = 0.70

Shading Coefficient - ASHRAE Table F 27.26
- Light Venetian Blinds
⇒ 0.58

PEOPLE

60 People - Accounts for 30 Adults + 60 children (½ adult)
SENSIBLE: 250 BTU/hr·Per
LATENT: 250 BTU/hr·Per
ASHRAE TABLE 26.3

LIGHTS

FROM LIGHTING PLANS:	TOTAL WATTS
ADDITION TO 514 ⇒	7597
MAIN BLDG	11 470
	19,067 Watts

MISC. LOADS	HEAT GAIN (WATTS)	For Peak
MICROWAVE	65	
FULL SIZE REFRIGERATOR	200	200
STOVE	1250	1250
DISHWASHER	700	
WASHER	375	
DRYER	750	
TV	200	200
COFFEE MAKER	260	
COKE MACHINE	300	300
		1,950 Watts

JOB

SHEET NO. OF

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • Germany

CALCULATED BY DATE

CHECKED BY DATE

SCALE

Computer Simulation Bldg 514, McPherson

ECO #12 - HVAC Controls

- Setback thermostats with new setpoints: 78°F cooling & 70°F heating
- Time clock on fans: on 06:00 - 18:00 M-F, otherwise off
- Reset AHU Deck temperature for demand

Electric Savings

Total Electric Savings = 65,286 kWh/yr

Demand Savings

Peak Demand Savings = 5 kW

Gas Savings

Total Gas Savings = 17 MBtu/yr

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB
SHEET NO. OF
CALCULATED BY DATE
CHECKED BY DATE
SCALE

COMPUTER SIMULATION BLDG 514, MCPHERSON

ECO #6

- DRY BULB ECONOMISER

ELECTRIC SAVINGS

TOTAL ELECTRIC SAVINGS = ~~305~~ 1,202 kWH/yr

DEMAND SAVINGS

PEAK DEMAND SAVINGS = 0 kW

GAS SAVINGS

TOTAL GAS SAVINGS = 0 MBTU/yr

01 Card - Job Information

Project: FT MCPHERSON & FT GILLEM EEAP
Location: FT MCPHERSON, BLDG. 514
Program User: J. WATTERS

-----CARD 08-- Climatic Information

Weather Code	Summer Clearness Number	Winter Clearness Number	Summer Design Dry Bulb	Summer Design Wet Bulb	Winter Design Dry Bulb	Building Orientation	Summer Ground Reflect	Winter Ground Reflect
ATLANTA								

-----CARD 09-- Load Simulation Periods

1st Month Cooling Simulation	Last Month Cooling Simulation	Peak Cooling Load Hr	1st Month Summer Period	Last Month Summer Period	1st Month Daylight Savings	Last Month Daylight Savings
MAY	OCT					

---------- Load Section Alternative #1 ----------

---- Load Alternative ----

Number	Description
1	BLDG M514, BASELINE

-----CARD 20-- General Room Parameters

Room Number	Zone Reference Number	Room Descrip	Floor Length	Floor Width	Const Type	Plenum Height	Acoustic Ceiling Resistance	Floor to Floor Height	Duplicate Floors Multiplier	Duplicate Rooms per Zone	Perimeter Depth
1	1	WHOLE BUILDING	174	56		1		9			

-----CARD 21-- Thermostat Parameters

Room Number	Cooling Room Design DB	Room Design RH	Cooling T'stat Driftpoint	Cooling T'stat Schedule	Heating Room Design DB	Heating T'stat Driftpoint	Heating T'stat Schedule	T'stat Location Flag	Mass / No. Hrs Average	Carpet On Floor
1	76			CLG	72		HTG			

-----CARD 22-- Roof Parameters ----------

Room Number	Roof Number	Roof Equal to Floor?	Roof Length	Roof Width	Roof U-Value	Const Type	Roof Direction	Roof Tilt	Roof Alpha
1	1	NO	174	80	.043	34	90	65	

-----CARD 24-- Wall Parameters ----------

Room Number	Wall Number	Wall Length	Wall Height	Wall U-Value	Wall Constuc Type	Wall Direction	Wall Tilt	Wall Alpha	Ground Reflectance Multiplier
1	1	174	10	.17	95	270			
1	2	56	10	.17	95	0			
1	3	174	10	.17	95	90			
1	4	56	10	.17	95	180			

-----CARD 25-- Wall/Glass Parameters ----------

Room Number	Wall Number	Glass Length	Glass Width	Pct Glass or No. of Windows	Glass U-Value	Shading Coefficient	External Shading Type	Internal Shading Type	Percent Solar to Ret. Air	Visible Transmittance	Inside Visible Reflectance
1	1	4	2.5	10	.7	.58					
1	2	4	2.5	6	.7	.58					
1	3	4	2.5	7	.7	.58					
1	4	4	2.5	6	.7	.58					

-----CARD 26-- Schedules ----------

Room Number	People	Lights	Ventilation	Infiltration	Reheat Minimum	Cooling Fans	Heating Fan	Auxiliary Fan	Room Exhaust	Daylighting Controls
1	ADMPPL	ADMLGTEQ	AVAIL	OFF		AVAIL				

-----CARD 27-- People and Lights ----------

Room Number	People Value	People Units	People Sensible	People Latent	Lighting Value	Lighting Units	Lighting Fixture Type	Ballast Factor	Percent Lights to Ret. Air	--- Daylighting --- Reference Point 1	Reference Point 2
1	60	PEOPLE	250	250	19067	WATTS					

-----CARD 28--- Miscellaneous Equipment ----------

Room Number	Misc Equipment Number	Equipment Descrip	Energy Consump Value	Energy Consump Units	Schedule Code	Energy Meter Code	Percent of Load Sensible	Percent Misc. Load to Room	Percent Misc. Sens to Ret. Air	Radiant Fraction	Optional Air Path
1	1	ENTIRE FACILITY	1.95	KW	ADMLGTEQ	ELEC					

-----CARD 29--- Room Airflows ----------

Room	Ventilation -----Cooling----- Value	Units	Ventilation -----Heating----- Value	Units	Infiltration -----Cooling----- Value	Units	Infiltration -----Heating----- Value	Units	--Reheat Minimum-- Value	Units
Number										
1	650	CFM	650	CFM						

-----CARD 30- Fan Airflows ----------

Room	Main ----Cooling---- Value	Units	Main ----Heating---- Value	Units	Auxiliary ----Cooling---- Value	Units	Auxiliary ----Heating---- Value	Units	--Room Exhaust-- Value	Units
Number										
1									340	CFM

-----CARD 32-- Exposed Floor Parameters----------

Room	Exposed Floor Number	Slab ------ Perimeter Length	Slab ------ Loss Coefficient	Exposed Floor Area	Exposed Floor U-Value	Exposed Floor Const Type	Exposed Floor Temp Flag	Cooling Temp	Heating Temp	Adjacent Room No
Number										
1	1	460	.8							

---------- System Section Alternative #1 ----------

-----CARD 39-- System Alternative -----

Number	Description
1	BLDG M514, BASELINE

-----CARD 40--- System Type ----------

System Set Number	System Type	Ventil Deck Location	OPTIONAL VENTILATION SYSTEM Cooling SADBVh	Heating SADBVh	Cooling Schedule	Heating Schedule	Fan Static Pressure
1	SZ						

-----CARD 41-- Zone Assignment ----------

System Set Number	Ref #1 Begin	Ref #1 End	Ref #2 Begin	Ref #2 End	Ref #3 Begin	Ref #3 End	Ref #4 Begin	Ref #4 End	Ref #5 Begin	Ref #5 End	Ref #6 Begin	Ref #6 End
1	1	1										

-----CARD 42--- Fan SP and Duct Parameters----------

System Set Number	Cool Fan SP	Heat Fan SP	Return Fan SP	Mn Exh Fan SP	Aux Fan SP	Rm Exh Fan SP	Cool Fan Mtr Loc	Return Fan Mtr Loc	Supply Duct Ht Gn	Supply Duct Loc	Return Air Path
1	2.5			1			SUPPLY			RETAIR	PLENUM

-----CARD 43-- Airflow Design Temperatures ----------

System Set Number	Minimum Cooling SADB	Maximum Cooling SADB	Minimum Heating SADB	Maximum Heating SADB	Minimum Cooling Lv DB	Maximum Cooling Lv DB	Minimum Preheat Lv DB	Maximum Preheat Lv DB	Minimum Room RH	Design Ht Rec Diff
1										

-----CARD 44-- System Options ----------

System Set Number	Econ Type Flag	Econ On Point	Max Pct Outside Air	Direct Evap Cooling	Indirect Evap Cooling	1st Stage Evap Cooling	Fan Cycling	--------- Exhaust Air Heat Recovery --------- --- Effectiveness --- System	Room	--- Control Method --- System	Room
1	NONE										

-----CARD 45--- Equipment Schedules ----------

System Set Number	Main Cooling Coil	Economizer	Direct Evap Coil	Indirect Evap Coil	Auxiliary Cooling Coil	Main Heating Coil	Main Preheat Coil	Reheat Coil	Mech. Humidity	Auxiliary Heating Coil
1	CLGC	OFF				HTGC				

-----CARD 47-- Fan Overrides ----------

Sys Set Num	Clg Fan Eff	Htg Fan Eff	Ret Fan Eff	Mn Exh Fan Eff	Aux Fan Eff	Rm Exh Fan Eff	Opt Vnt Sys Fan Eff	Mech Eff	----------MAIN COOLING FAN--------- Air Value	Air Units	Size Meth	Confg
1	82											

---------- Equipment Section Alternative #1 ----------

-----CARD 59-- Equipment Description / TOD Schedules ----------

Alternative Number	Elec Consump Time of Day Schedule	Elec Demand Time of Day Schedule	Demand Limit Max KW	Alternative Description
1				BLDG M514, BASELINE

-----CARD 60--- Cooling Load Assignment----------

Load Asgn Ref	All Coil Loads To Cool Ref	Cooling Equipment Sizing	-Group 1- Begin	End	-Group 2- Begin	End	-Group 3- Begin	End	-Group 4- Begin	End	-Group 5- Begin	End	-Group 6- Begin	End	-Group 7- Begin	End	-Group 8- Begin	End	-Group 9- Begin	End
1	1	BLKPLANT	1	1																

-----CARD 62-- Cooling Equipment Parameters ----------

Cool Ref Num	Equip Code Name	Num Of Units	COOLING Capacity Value	COOLING Capacity Units	COOLING Energy Value	COOLING Energy Units	HEAT RECOVERY Capacity Value	HEAT RECOVERY Capacity Units	HEAT RECOVERY Energy Value	HEAT RECOVERY Energy Units	Seq Order Num	Seq Type	Demand Limit Number
1	EQ1170S	1	28.6	TONS									

-----CARD 65-- Heating Load Assignment ----------

Load Assignment Reference	All Coil Loads To Heating Ref	Group 1- Begin	Group 1- End	Group 2- Begin End	Group 3- Begin End	Group 4- Begin End	Group 5- Begin End	Group 6- Begin End	Group 7- Begin End	Group 8- Begin End	Group 9- Begin End
1	1	1	1								

-----CARD 67-- Heating Equipment Parameters ----------

Heat Ref Number	Equip Code Name	Number Of Units	HW Pmp Full Ld Value	HW Pmp Full Ld Units	Cap'y Value	Cap'y Units	Energy Rate Value	Energy Rate Units	Seq Order Number	Switch over Control	Hot Strg	Misc. Acc.	Cogen	Demand Limit Number
1	EQ2454	1												

-----CARD 69-- Fan Equipment Parameters ----------

System Set Number	Cooling Fan	Heating Fan	Return Fan	Exhaust Fan	Auxiliary Supply	Room Exhaust	Optional Ventilation
1	EQ4003			EQ4003			

Utility Description Reference Table

Schedules:
ADMLGTEQ ADMIN LIGHTING AND EQUIPMENT
ADMPPL ADMIN PEOPLE SCHEDULE
AVAIL AVAILABLE (100%)
CLG COOLING TSTAT SCHEDULE
CLGC COOLING COIL SCHEDULE
HTG HEATING TSTAT SCHEDULE
HTGC HEATING COIL SCHEDULE
OFF ALWAYS OFF
System:
SZ SINGLE ZONE
Equipment:
Cooling:
EQ1170S AIR-CLD COND COMP <20 TONS
Heating:
EQ2454 RESIDENT GAS FURNACE W-FAN
Fan:
EQ4003 FC CENTRIF. FAN C.V.

Schedule Name: ADMLGTEQ
Project: ADMIN LIGHTING AND EQUIPMENT SC
Location:
Client:
Program User:
Comments: OFFICE LIGHTING

Starting Month: JAN Ending Month: DEC
Starting Day Type: DSGN Ending Day Type: WKDY

Hour	Util Percent
0	5
7	80
8	100
12	80
13	100
16	80
17	40
18	5
24	

Starting Month: JAN Ending Month: DEC
Starting Day Type: SAT Ending Day Type: SUN

Hour	Util Percent
0	5
24	

Schedule Name: ADMPPL
Project: ADMIN PEOPLE SCHEDULE
Location:
Client:
Program User: D JONES
Comments: OFFICE PEOPLE SCHEDULE

Starting Month: JAN Ending Month: DEC
Starting Day Type: DSGN Ending Day Type: WKDY

Hour	Util Percent
0	0
7	50
8	100
11	80
12	40
13	80
14	100
16	70
17	30
18	0
24	

Starting Month: JAN Ending Month: DEC
Starting Day Type: SAT Ending Day Type: SUN

Hour	Util Percent
0	0
24	

Schedule Name: AVAIL
Project: AVAILABLE (100)
Location:
Client:
Program User:
Comments:

Starting Month: JAN Ending Month: HTG
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	100
24	

Schedule Name: CLG
Project: COOLING TSTAT SCHEDULE
Location:
Client:
Program User:
Comments:

Starting Month: JAN Ending Month: DEC
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Temperature
0	76
24	

Schedule Name: CLGC
Project: COOLING COIL SCHEDULE
Location:
Client:
Program User: R. GERRANS
Comments:

Starting Month: JAN Ending Month: APR
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	0
24	

Starting Month: MAY Ending Month: OCT
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	100
24	

Starting Month: NOV Ending Month: HTG
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	0
24	

Schedule Name: HTG
Project: HEATING TSTAT SCHEDULE
Location:
Client:
Program User:
Comments:

Starting Month: JAN Ending Month: DEC
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Temperature
0	72
24	

Schedule Name: HTGC
Project: HEATING COIL SCHEDULE
Location:
Client:
Program User: R. GERRANS
Comments:

Starting Month: JAN Ending Month: APR
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	100
24	

Starting Month: MAY Ending Month: OCT
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	0
24	

Starting Month: NOV Ending Month: HTG
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	100
24	

Schedule Name: OFF
Project: ALWAYS OFF
Location:
Client:
Program User:
Comments:

Starting Month: JAN Ending Month: HTG
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util Percent
0	0
24	

```
**************************************************************************
**************************************************************************
**                                                                      **
**                T R A C E   6 0 0   A N A L Y S I S                   **
**                                                                      **
**                by            **                                      **
**                                                                      **
**************************************************************************
**************************************************************************
```

FT MCPHERSON & FT GILLEM EEAP
FT MCPHERSON, BLDG. 514

J. WATTERS

Weather File Code:	ATLANTA.	
Location:	ATLANTA, GEORGIA	
Latitude:	33.0	(deg)
Longitude:	84.0	(deg)
Time Zone:	6	
Elevation:	1,005	(ft)
Barometric Pressure:	28.8	(in. Hg)
Summer Clearness Number:	0.90	
Winter Clearness Number:	0.90	
Summer Design Dry Bulb:	92	(F)
Summer Design Wet Bulb:	74	(F)
Winter Design Dry Bulb:	22	(F)
Summer Ground Relectance:	0.20	
Winter Ground Relectance:	0.20	
Air Density:	0.0731	(Lbm/cuft)
Air Specific Heat:	0.2444	(Btu/lbm/F)
Density-Specific Heat Prod:	1.0727	(Btu-min./hr/cuft/F)
Latent Heat Factor:	4,721.8	(Btu-min./hr/cuft)
Enthalpy Factor:	4.3883	(Lb-min./hr/cuft)

Design Simulation Period: May To October
System Simulation Period: January To December
Cooling Load Methodology: TETD/Time Averaging

Time/Date Program was Run: 10:57:33 4/10/92
Dataset Name: M514-B .TM

AIRFLOW - ALTERNATIVE 1
BLDG M514, BASELINE

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

System Number	System Type	Main Outside Airflow (Cfm)	Main Cooling Airflow (Cfm)	Main Heating Airflow (Cfm)	Main Return Airflow (Cfm)	Main Exhaust Airflow (Cfm)	Auxil. Supply Airflow (Cfm)	Room Exhaust Airflow (Cfm)
1	SZ	650	7,881	7,881	7,881	650	0	340
Totals		650	7,881	7,881	7,881	650	0	340

CAPACITY - ALTERNATIVE 1
BLDG M514, BASELINE

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

System Number	System Type	Cooling Main Sys. Capacity (Tons)	Cooling Aux. Sys. Capacity (Tons)	Cooling Opt. Vent Capacity (Tons)	Cooling Totals (Tons)	Heating Main Sys. Capacity (Btuh)	Heating Aux. Sys. Capacity (Btuh)	Heating Preheat Capacity (Btuh)	Heating Reheat Capacity (Btuh)	Heating Humidif. Capacity (Btuh)	Heating Opt. Vent Capacity (Btuh)	Heating Totals (Btuh)
1	SZ	16.0	0.0	0.0	16.0	-113,914	0	0	0	0	0	-113,914
Totals		16.0	0.0	0.0	16.0	-113,914	0	0	0	0	0	-113,914

The building peaked at hour 15 month 6 with a capacity of 16.0 tons

ENGINEERING CHECKS - ALTERNATIVE 1
BLDG M514, BASELINE

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 Cfm/ Sq Ft	Cooling Cfm/ Ton	Cooling Sq Ft /Ton	Cooling Btuh/ Sq Ft	Heating Cfm/ Sq Ft	Heating Btuh/ Sq Ft	Floor Area Sq Ft
1	Main	SZ	8.25	0.81	493.8	610.6	19.65	0.81	-11.69	9,744

System 1 Peak SZ - SINGLE ZONE

	COOLING COIL PEAK					CLG SPACE PEAK			HEATING COIL PEAK	
Peaked at Time ==>	Mo/Hr: 7/15					Mo/Hr: 6/16			Mo/Hr: 13/ 1	
Outside Air ==>	OADB/WB/HR: 92/ 74/105.0					OADB: 96			OADB: 22	
	Space Sens.+Lat.	Ret. Air Sensible	Ret. Air Latent	Net Total	Percnt Of Tot	Space Sensible	Percnt Of Tot	Space Peak Space Sens	Coil Peak Tot Sens	Percnt Of Tot
Envelope Loads	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)	(Btuh)	(%)	(Btuh)	(Btuh)	(%)
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	15,177		15,177	7.92	0	0.00	0	-28,250	24.80
Glass Solar	13,920	0		13,920	7.27	14,790	11.38	0	0	0.00
Glass Cond	3,248	0		3,248	1.70	3,979	3.06	-10,779	-10,779	9.46
Wall Cond	16,468	2,082		18,550	9.69	18,987	14.61	-32,291	-36,391	31.95
Partition	0			0	0.00	0	0.00	0	0	0.00
Exposed Floor	0			0	0.00	0	0.00	-18,400	-18,400	16.15
Infiltration	0			0	0.00	0	0.00	0	0	0.00
Sub Total==>	33,636	17,259		50,895	26.58	37,756	29.04	-61,470	-93,821	82.36
Internal Loads										
Lights	65,076	0		65,076	33.98	65,076	50.06	0	0	0.00
People	30,000			30,000	15.66	15,000	11.54	0	0	0.00
Misc	6,655	0	0	6,655	3.48	6,655	5.12	0	0	0.00
Sub Total==>	101,731	0	0	101,731	53.12	86,731	66.72	0	0	0.00
Ceiling Load	4,767	-4,767		0	0.00	5,510	4.24	-8,655	0	0.00
Outside Air	0	0	0	26,586	13.88	0	0.00	0	-34,862	30.60
Sup. Fan Heat				12,814	6.69		0.00		12,814	-11.25
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		-513	0	-513	-0.27		0.00		1,954	-1.72
Terminal Bypass		0	0	0	0.00		0.00		0	0.00
Grand Total==>	140,134	11,978	0	191,512	100.00	129,996	100.00	-70,125	-113,914	100.00

COOLING COIL SELECTION

	Total Capacity (Tons)	Capacity (Mbh)	Sens Cap. (Mbh)	Coil Airfl (cfm)	Entering DB/WB/HR Deg F	Deg F	Grains	Leaving DB/WB/HR Deg F	Deg F	Grains
Main Clg	16.0	191.5	161.1	7,881	78.7	64.7	72.7	59.1	56.8	68.0
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
0										
Totals	16.0	191.5								
6										

AREAS

	Gross Total	Glass (sf)	(%)
Floor	9,744		
Part	0		
ExFlr	460		
Roof	13,920		0
Wall	4,600		290

HEATING COIL SELECTION

	Capacity (Mbh)	Coil Airfl (cfm)	Ent Deg F	Lvg Deg F
Main Htg	-113.9	7,881	65.3	78.8
Aux Htg	0.0	0	0.0	0.0
Preheat	-0.0	7,881	65.3	59.1
Reheat	0.0	0	0.0	0.0
Humidif	0.0	0	0.0	0.0
Opt Vent	0.0	0	0.0	0.0
Total	-113.9			

AIRFLOWS (cfm)

Type	Cooling	Heating
Vent	650	650
Infil	0	0
Supply	7,881	7,881
Mincfm	0	0
Return	7,541	7,881
Exhaust	310	650
Rm Exh	340	0
Auxil	0	0

ENGINEERING CHECKS

Clg % OA	8.2
Clg Cfm/Sqft	0.81
Clg Cfm/Ton	493.80
Clg Sqft/Ton	610.55
Clg Btuh/Sqft	19.65
No. People	60
Htg % OA	8.2
Htg Cfm/SqFt	0.81
Htg Btuh/SqFt	-11.69

TEMPERATURES (F)

Type	Clg	Htg
SADB	60.6	80.3
Plenum	77.5	69.2
Return	77.5	69.2
Ret/OA	78.7	65.3
Runarnd	76.0	72.0
Fn MtrTD	0.3	0.0
Fn BldTD	0.3	0.0
Fn Frict	0.9	0.0

COOLING LOADS AT COIL PEAK - ALTERNATIVE 1
BLDG M514, BASELINE

AIRFLOW COOLING LOADS
(At time of Coil Peak)

Room Number	Description	Ventilation Airflow (Cfm)	Ventilation Sensible (Btuh)	Ventilation Latent (Btuh)	Optional Ventilation Airflow (Cfm)	Optional Ventilation Sensible (Btuh)	Optional Ventilation Latent (Btuh)	Bypass Airflow (Cfm)	Bypass Sensible (Btuh)	Bypass Latent (Btuh)	Ov/Undr Sizing (Btuh)
1	WHOLE BUILDING	650	11,156	15,430	0	0	0	0	0	0	0
Zone 1	Total/Ave.	650	11,156	15,430	0	0	0	0	0	0	0
Zone 1	Block	650	11,156	15,430	0	0	0	0	0	0	0
System 1	Total/Ave.	650	11,156	15,430	0	0	0	0	0	0	0
System 1	Block	650	11,156	15,430	0	0	0	0	0	0	0

HEATING LOADS AT COIL PEAK - ALTERNATIVE 1
BLDG M514, BASELINE

AIRFLOW HEATING LOADS
(At time of Coil Peak)

Room Number	Description	Ventilation Airflow (Cfm)	Ventilation Sensible (Btuh)	Op. Vent. Airflow (Cfm)	Op. Vent. Sensible (Btuh)	Reheat Airflow (Cfm)	Reheat Sensible (Btuh)	Humidif. Airflow (Cfm)	Humidif. Latent (Btuh)	Total (Btuh)
1	WHOLE BUILDING	650	-34,862	0	0	0	0	0	0	-34,862
Zone 1	Total/Ave.	650	-34,862	0	0	0	0	0	0	-34,862
Zone 1	Block	650	-34,862	0	0	0	0	0	0	-34,862
System 1	Total/Ave.	650	-34,862	0	0	0	0	0	0	-34,862
System 1	Block	650	-34,862	0	0	0	0	0	0	-34,862

COOLING AIRFLOW HEAT GAIN/LOSS - ALTERNATIVE 1
BLDG M514, BASELINE

A I R F L O W H E A T G A I N A N D L O S S
(At time of Coil Peak)

		Cooling												
Room Number	Description	Duct Heat Pickup (Btuh)	Supply Fan Heat (Btuh)	Return Fan Heat (Btuh)	System Exhaust Heat Loss (Btuh)	Total (Btuh)	System Exhaust Airflow (Cfm)	Room Exhaust Airflow (Cfm)	Ducted Airflow (Cfm)	Plenum Airflow (Cfm)	Run Around Airflow (Cfm)	Corridr Airflow (Cfm)	System Return Airflow (Cfm)
1	WHOLE BUILDING	0	12,814	0	-513	12,301	310	340	0	7,541	0	0	7,541
Zone 1	Total/Ave.	0	12,814	0	-513	12,301	310	340	0	7,541	0	0	7,541
Zone 1	Block	0	12,814	0	-513	12,301	310	340	0	7,541	0	0	7,541
System 1	Total/Ave.	0	12,814	0	-513	12,301	310	340	0	7,541	0	0	7,541
System 1	Block	0	12,814	0	-513	12,301	310	340	0	7,541	0	0	7,541

HEATING AIRFLOW HEAT GAIN/LOSS - ALTERNATIVE 1
BLDG M514, BASELINE

A I R F L O W H E A T G A I N A N D L O S S
(At time of Coil Peak)

		Heating										
Room Number	Description	Supply Fan Heat (Btuh)	Return Fan Heat (Btuh)	System Exhaust Heat Loss (Btuh)	Total (Btuh)	System Exhaust Airflow (Cfm)	Room Exhaust Airflow (Cfm)	Ducted Airflow (Cfm)	Plenum Airflow (Cfm)	Run Around Airflow (Cfm)	Corridr Airflow (Cfm)	System Return Airflow (Cfm)
1	WHOLE BUILDING	12,814	0	1,954	14,769	650	0	0	7,881	0	0	7,881
Zone 1	Total/Ave.	12,814	0	1,954	14,769	650	0	0	7,881	0	0	7,881
Zone 1	Block	12,814	0	1,954	14,769	650	0	0	7,881	0	0	7,[redacted]
System 1	Total/Ave.	12,814	0	1,954	14,769	650	0	0	7,881	0	0	7,[redacted]
System 1	Block	12,814	0	1,954	14,769	650	0	0	7,881	0	0	7,881

ZONE PSYCHROMETRICS - ALTERNATIVE 1
BLDG M514, BASELINE

---------- P S Y C H R O M E T R I C S T A T E P O I N T S ----------

Zone 1

	Dry Bulb (F)	Wet Bulb (F)	Relat. Humid. (%)	Humid. Ratio (GR)	Enthalpy (Btu/Lb)	Temp. Diff. (F)
Space	76.0	63.2	50.0	69.8	29.2	
Main System						
Return Air Heat Pickup						1.8
Return Fan						0.0
Return Air	77.8	63.8	47.1	69.8	29.6	
Outdoor Air	92.0	74.4	44.6	105.0	38.6	
Return/Outdoor Air Mix	79.0	64.8	47.2	72.7	30.3	
Blow through Fan						0.0
Entering Coil	79.0	64.8	47.2	72.7	30.3	
Leaving Coil	59.1	56.7	86.6	67.5	24.7	
Draw Through Fan						0.6
Duct Frictional Heat						0.9
Supply Duct Heat Gain						0.0
Cold Deck Supply Air	60.6	57.2	82.0	67.5	25.0	
Supply Air	60.6	57.2	82.0	67.5	25.0	

Percent Outside Air	8.25	(%)
Sensible Heat Ratio (SHR)	0.897	
Percent Supply Air Bypassing Coil	0.00	(%)
Coil Airflow	7,881	(Cfm)

BUILDING U-VALUES - ALTERNATIVE 1
BLDG M514, BASELINE

---------- 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) Part.	ExFlr	Summr Skylt	Wintr Skylt	Roof	Summr Windo	Wintr Windo	Wall	Ceil.	Room Mass (lb/ sqft)	Room Capac. (Btu/ sqft/F)
1	WHOLE BUILDING	0.000	0.800	0.000	0.000	0.043	0.700	0.743	0.170	0.317	246.3	50.53
Zone 1	Total/Ave.	0.000	0.800	0.000	0.000	0.043	0.700	0.743	0.170	0.317	246.3	50.53
System 1	Total/Ave.	0.000	0.800	0.000	0.000	0.043	0.700	0.743	0.170	0.317	246.3	50.53
Building		0.000	0.800	0.000	0.000	0.043	0.700	0.743	0.170	0.317	246.3	50.53

BUILDING AREAS - ALTERNATIVE 1
BLDG M514, BASELINE

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	WHOLE BUILDING	1	1	9,744	9,744	0	460	0	0	13,920	290	6	4,310
Zone	1 Total/Ave.				9,744	0	460	0	0	13,920	290	6	4,310
System	1 Total/Ave.				9,744	0	460	0	0	13,920	290	6	4,310
Building					9,744	0	460	0	0	13,920	290	6	4,310

ASHRAE 90 ANALYSIS - ALTERNATIVE 1
BLDG M514, BASELINE

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

Overall Roof U-Value = 0.043 (Btu/Hr/Sq Ft/F)
Overall Wall U-Value = 0.203 (Btu/Hr/Sq Ft/F)
Overall Building U-Value = 0.083 (Btu/Hr/Sq Ft/F)

Roof Overall Thermal Transfer Value (OTTVr) = 0.31 (Btu/Hr/Sq Ft)
Wall Overall Thermal Transfer Value (OTTVw) = 9.95 (Btu/Hr/Sq Ft)

SYSTEM LOAD PROFILE - ALTERNATIVE 1
BLDG M514, BASELINE

Main System 1 SZ SINGLE ZONE

Percent Design Load	Cooling Load Cap. (Ton)	Cooling Load Hours (%)	Cooling Load Hours	Heating Load Capacity (Btuh)	Heating Load Hours (%)	Heating Load Hours	Cooling Airflow Cap. (Cfm)	Cooling Airflow Hours (%)	Cooling Airflow Hours	Heating Airflow Cap. (Cfm)	Heating Airflow Hours (%)	Heating Airflow Hours
0 - 5	0.8	3	129	-5,696	0	0	394.0	0	0	0.0	0	0
5 - 10	1.6	7	260	-11,391	1	4	788.1	0	0	0.0	0	0
10 - 15	2.4	6	231	-17,087	0	0	1,182.1	0	0	0.0	0	0
15 - 20	3.2	20	784	-22,783	0	0	1,576.1	0	0	0.0	0	0
20 - 25	4.0	11	413	-28,479	4	19	1,970.2	0	0	0.0	0	0
25 - 30	4.8	6	222	-34,174	27	127	2,364.2	0	0	0.0	0	0
30 - 35	5.6	12	455	-39,870	14	67	2,758.2	0	0	0.0	0	0
35 - 40	6.4	5	187	-45,566	16	75	3,152.3	0	0	0.0	0	0
40 - 45	7.2	1	34	-51,261	16	73	3,546.3	0	0	0.0	0	0
45 - 50	8.0	2	59	-56,957	22	100	3,940.4	0	0	0.0	0	0
50 - 55	8.8	3	129	-62,653	0	0	4,334.4	0	0	0.0	0	0
55 - 60	9.6	3	131	-68,349	0	0	4,728.4	0	0	0.0	0	0
60 - 65	10.4	4	167	-74,044	0	0	5,122.5	0	0	0.0	0	0
65 - 70	11.2	2	65	-79,740	0	0	5,516.5	0	0	0.0	0	0
70 - 75	12.0	6	240	-85,436	0	0	5,910.5	0	0	0.0	0	0
75 - 80	12.8	4	166	-91,132	0	0	6,304.6	0	0	0.0	0	0
80 - 85	13.6	2	65	-96,827	0	0	6,698.6	0	0	0.0	0	0
85 - 90	14.4	3	130	-102,523	0	0	7,092.6	0	0	0.0	0	0
90 - 95	15.2	0	0	-108,219	0	0	7,486.7	0	0	0.0	0	0
95 - 100	16.0	0	0	-113,914	0	0	7,880.7	100	8,760	0.0	0	0
Hours Off	0.0	0	4,893	0	0	8,295	0.0	0	0	0.0	0	8,760

SYSTEM TOTALS LOAD PROFILE - ALTERNATIVE 1
BLDG M514, BASELINE

S Y S T E M L O A D P R O F I L E

System Totals

Percent Design Load	Cooling Load Cap. (Ton)	Cooling Load Hours (%)	Cooling Load Hours	Heating Load Capacity (Btuh)	Heating Load Hours (%)	Heating Load Hours	Cooling Airflow Cap. (Cfm)	Cooling Airflow Hours (%)	Cooling Airflow Hours	Heating Airflow Cap. (Cfm)	Heating Airflow Hours (%)	Heating Airflow Hours
0 - 5	0.8	3	129	-5,696	0	0	394.0	0	0	0.0	0	0
5 - 10	1.6	7	260	-11,391	1	4	788.1	0	0	0.0	0	0
10 - 15	2.4	6	231	-17,087	0	0	1,182.1	0	0	0.0	0	0
15 - 20	3.2	20	784	-22,783	0	0	1,576.1	0	0	0.0	0	0
20 - 25	4.0	11	413	-28,479	4	19	1,970.2	0	0	0.0	0	0
25 - 30	4.8	6	222	-34,174	27	127	2,364.2	0	0	0.0	0	0
30 - 35	5.6	12	455	-39,870	14	67	2,758.2	0	0	0.0	0	0
35 - 40	6.4	5	187	-45,566	16	75	3,152.3	0	0	0.0	0	0
40 - 45	7.2	1	34	-51,261	16	73	3,546.3	0	0	0.0	0	0
45 - 50	8.0	2	59	-56,957	22	100	3,940.4	0	0	0.0	0	0
50 - 55	8.8	3	129	-62,653	0	0	4,334.4	0	0	0.0	0	0
55 - 60	9.6	3	131	-68,349	0	0	4,728.4	0	0	0.0	0	0
60 - 65	10.4	4	167	-74,044	0	0	5,122.5	0	0	0.0	0	0
65 - 70	11.2	2	65	-79,740	0	0	5,516.5	0	0	0.0	0	0
70 - 75	12.0	6	240	-85,436	0	0	5,910.5	0	0	0.0	0	0
75 - 80	12.8	4	166	-91,132	0	0	6,304.6	0	0	0.0	0	0
80 - 85	13.6	2	65	-96,827	0	0	6,698.6	0	0	0.0	0	0
85 - 90	14.4	3	130	-102,523	0	0	7,092.6	0	0	0.0	0	0
90 - 95	15.2	0	0	-108,219	0	0	7,486.7	0	0	0.0	0	0
95 - 100	16.0	0	0	-113,914	0	0	7,880.7	100	8,760	0.0	0	0
Hours Off	0.0	0	4,893	0	0	8,295	0.0	0	0	0.0	0	8,760

BUILDING COOL-HEAT DEMAND - ALTERNATIVE 1
BLDG M514, BASELINE

January			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	33.4	30.4	-27,858	0.0	0	0.0	0	0.0	-48,246	0.0	-48,246	0.0
2	32.1	29.3	-30,187	0.0	0	0.0	0	0.0	-50,851	0.0	-50,851	0.0
3	31.7	29.3	-32,991	0.0	0	0.0	0	0.0	-52,607	0.0	-52,607	0.0
4	31.9	29.5	-34,817	0.0	0	0.0	0	0.0	-54,166	0.0	-54,166	0.0
5	32.6	30.3	-37,287	0.0	0	0.0	-8,124	0.0	-55,151	0.0	-55,151	0.0
6	33.6	31.3	-37,853	0.0	0	0.0	-55,932	0.0	-55,932	0.0	-55,932	0.0
7	35.0	32.6	-38,769	0.0	0	0.0	-55,797	0.0	-55,797	0.0	-55,797	0.0
8	36.6	34.4	0	0.0	0	0.0	-51,482	0.0	-51,482	0.0	0	0.0
9	38.5	36.3	0	0.0	0	0.0	-47,685	0.0	-47,685	0.0	0	0.0
10	40.4	37.7	0	0.0	0	0.0	-44,250	0.0	-44,250	0.0	0	0.0
11	42.3	38.7	0	0.0	0	0.0	-41,862	0.0	-41,862	0.0	0	0.0
12	44.2	39.6	0	0.0	0	0.0	-39,726	0.0	-39,726	0.0	0	0.0
13	45.8	40.5	0	0.0	0	0.0	-35,728	0.0	-35,728	0.0	0	0.0
14	47.2	41.1	0	0.0	0	0.0	-32,900	0.0	-32,900	0.0	0	0.0
15	48.2	41.6	0	0.0	0	0.0	-29,339	0.0	-29,339	0.0	0	0.0
16	48.9	41.8	0	0.0	0	0.0	-26,209	0.0	-26,209	0.0	0	0.0
17	49.1	41.9	0	0.0	0	0.0	-31,072	0.0	-31,072	0.0	0	0.0
18	48.7	41.9	0	0.0	0	0.0	-30,794	0.0	-30,794	0.0	0	0.0
19	47.4	41.7	0	0.0	0	0.0	-31,068	0.0	-31,068	0.0	0	0.0
20	45.5	40.5	0	0.0	0	0.0	-33,246	0.0	-33,246	0.0	0	0.0
21	43.1	38.9	0	0.0	0	0.0	-35,760	0.0	-35,760	0.0	0	0.0
22	40.4	36.7	0	0.0	0	0.0	-38,496	0.0	-38,496	0.0	0	0.0
23	37.7	34.3	0	0.0	0	0.0	-42,080	0.0	-42,080	0.0	0	0.0
24	35.3	32.3	0	0.0	0	0.0	-45,444	0.0	-45,444	0.0	0	0.0

February			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	37.5	34.5	0	0.0	0	0.0	0	0.0	-43,285	0.0	-43,285	0.0
2	36.0	33.0	0	0.0	0	0.0	0	0.0	-46,661	0.0	-46,661	0.0
3	34.7	31.8	0	0.0	0	0.0	0	0.0	-48,409	0.0	-48,409	0.0
4	33.6	30.9	0	0.0	0	0.0	0	0.0	-51,503	0.0	-51,503	0.0
5	32.8	30.1	-12,531	0.0	0	0.0	0	0.0	-52,910	0.0	-52,910	0.0
6	32.2	29.8	-34,917	0.0	0	0.0	0	0.0	-54,805	0.0	-54,805	0.0
7	32.1	29.6	-35,296	0.0	0	0.0	-33,445	0.0	-55,812	0.0	-55,812	0.0
8	32.5	30.3	0	0.0	0	0.0	-50,754	0.0	-50,754	0.0	0	0.0
9	33.9	31.6	0	0.0	0	0.0	-49,839	0.0	-49,839	0.0	0	0.0
10	36.0	33.0	0	0.0	0	0.0	-48,116	0.0	-48,116	0.0	0	0.0
11	38.5	34.8	0	0.0	0	0.0	-45,317	0.0	-45,317	0.0	0	0.0
12	41.3	36.5	0	0.0	0	0.0	-41,476	0.0	-41,476	0.0	0	0.0
13	43.8	38.1	0	0.0	0	0.0	-37,505	0.0	-37,505	0.0	0	0.0
14	45.9	39.5	0	0.0	0	0.0	-33,346	0.0	-33,346	0.0	0	0.0
15	47.2	40.4	0	0.0	0	0.0	-29,077	0.0	-29,077	0.0	0	0.0
16	47.7	40.6	0	0.0	0	0.0	-26,917	0.0	-26,917	0.0	0	0.0
17	47.5	40.2	0	0.0	0	0.0	-28,817	0.0	-28,817	0.0	0	0.0
18	47.0	39.8	0	0.0	0	0.0	-33,045	0.0	-33,045	0.0	0	0.0
19	46.2	39.9	0	0.0	0	0.0	-32,129	0.0	-32,129	0.0	0	0.0
20	45.1	39.7	0	0.0	0	0.0	-32,267	0.0	-32,267	0.0	0	0.0
21	43.8	39.2	0	0.0	0	0.0	-34,023	0.0	-34,023	0.0	0	0.0
22	42.3	38.3	0	0.0	0	0.0	-35,918	0.0	-35,918	0.0	0	0.0
23	40.7	37.2	0	0.0	0	0.0	-39,356	0.0	-39,356	0.0	0	0.0
24	39.1	35.8	0	0.0	0	0.0	-41,321	0.0	-41,321	0.0	0	0.0

BUILDING COOL-HEAT DEMAND - ALTERNATIVE 1
BLDG M514, BASELINE

March			------ Design -----		----- Weekday -----		-----Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	45.4	41.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2	43.3	39.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
3	41.6	38.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
4	40.6	37.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
5	40.2	37.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
6	40.6	37.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
7	41.6	39.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
8	43.3	40.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
9	45.4	42.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
10	47.9	44.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
11	50.6	45.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
12	53.3	46.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
13	55.8	48.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
14	58.0	49.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
15	59.6	50.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
16	60.7	50.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
17	61.0	50.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
18	60.7	50.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
19	59.6	50.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
20	58.0	50.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
21	55.8	49.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
22	53.3	47.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
23	50.6	45.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
24	47.9	43.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0

April			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	57.7	53.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2	55.9	52.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
3	54.2	51.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
4	52.9	50.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
5	51.9	49.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
6	51.2	49.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
7	51.0	49.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
8	51.6	49.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
9	53.3	50.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
10	55.9	51.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
11	59.0	53.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
12	62.4	55.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
13	65.5	57.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
14	68.1	59.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
15	69.8	60.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
16	70.4	60.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
17	70.2	60.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
18	69.5	60.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
19	68.5	59.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
20	67.2	59.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
21	65.5	59.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
22	63.7	58.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
23	61.7	57.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
24	59.7	55.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0

BUILDING COOL-HEAT DEMAND - ALTERNATIVE 1
BLDG M514, BASELINE

May			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	66.6	62.3	0	16.0	0	1.7	0	2.0	0	2.0	0	2.0
2	64.5	60.4	0	14.6	0	1.4	0	1.5	0	1.5	0	1.5
3	62.7	59.1	0	14.0	0	1.1	0	1.2	0	1.2	0	1.2
4	61.2	58.1	0	13.6	0	0.8	0	0.8	0	0.8	0	0.8
5	60.0	57.1	0	13.3	0	0.5	0	0.5	0	0.5	0	0.5
6	59.3	56.6	0	13.2	0	0.7	0	0.7	0	0.7	0	0.7
7	59.0	56.5	0	13.1	0	0.8	0	0.8	0	0.8	0	0.8
8	59.5	56.6	0	13.2	0	6.3	0	0.8	0	0.8	0	6.3
9	60.9	56.6	0	13.7	0	8.5	0	0.9	0	0.9	0	8.5
10	63.0	57.2	0	14.3	0	9.1	0	1.2	0	1.2	0	9.1
11	65.7	58.1	0	14.6	0	9.3	0	1.4	0	1.4	0	9.3
12	68.7	59.8	0	14.7	0	9.2	0	1.6	0	1.6	0	9.2
13	71.7	61.6	0	14.5	0	7.7	0	2.1	0	2.1	0	7.7
14	74.5	63.4	0	14.6	0	10.1	0	2.7	0	2.7	0	10.1
15	76.6	64.8	0	15.0	0	11.2	0	3.2	0	3.2	0	11.2
16	78.0	65.6	0	15.1	0	11.4	0	3.2	0	3.2	0	11.4
17	78.5	65.6	0	14.7	0	9.7	0	3.4	0	3.4	0	9.7
18	78.2	65.8	0	14.2	0	6.1	0	3.3	0	3.3	0	6.1
19	77.5	65.6	0	13.6	0	3.0	0	3.0	0	3.0	0	3.0
20	76.3	66.1	0	13.1	0	3.0	0	3.0	0	3.0	0	3.0
21	74.8	67.2	0	6.1	0	3.0	0	3.0	0	3.0	0	3.0
22	73.0	66.4	0	4.1	0	2.9	0	2.9	0	2.9	0	2.9
23	70.9	65.4	0	3.7	0	2.7	0	2.7	0	2.7	0	2.7
24	68.7	64.0	0	3.4	0	2.3	0	2.3	0	2.3	0	2.3

June			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	73.0	67.9	0	5.5	0	3.6	0	3.9	0	3.9	0	3.9
2	71.2	66.1	0	4.9	0	3.4	0	3.5	0	3.5	0	3.5
3	69.7	65.2	0	4.5	0	3.1	0	3.1	0	3.1	0	3.1
4	68.5	64.3	0	4.3	0	2.7	0	2.7	0	2.7	0	2.7
5	67.8	64.2	0	4.1	0	2.4	0	2.4	0	2.4	0	2.4
6	67.6	64.2	0	4.5	0	2.7	0	2.7	0	2.7	0	2.7
7	68.1	64.8	0	4.9	0	2.8	0	2.8	0	2.8	0	2.8
8	69.4	65.7	0	10.8	0	9.1	0	2.9	0	2.9	0	9.1
9	71.6	66.2	0	13.3	0	11.3	0	3.2	0	3.2	0	11.3
10	74.2	67.2	0	13.7	0	11.9	0	3.7	0	3.7	0	11.9
11	77.2	68.5	0	14.1	0	12.2	0	4.0	0	4.0	0	12.2
12	80.2	70.0	0	14.2	0	12.2	0	4.3	0	4.3	0	12.2
13	82.8	70.8	0	12.5	0	10.5	0	4.8	0	4.8	0	10.5
14	85.0	71.6	0	14.9	0	13.0	0	5.4	0	5.4	0	13.0
15	86.3	72.3	0	15.9	0	14.1	0	5.9	0	5.9	0	14.1
16	86.8	72.1	0	16.0	0	14.0	0	5.9	0	5.9	0	14.0
17	86.6	71.7	0	14.1	0	12.1	0	5.8	0	5.8	0	12.1
18	85.8	71.5	0	10.4	0	8.5	0	5.7	0	5.7	0	8.5
19	84.7	71.2	0	6.7	0	5.3	0	5.3	0	5.3	0	5.3
20	83.2	71.5	0	6.5	0	5.3	0	5.3	0	5.3	0	5.3
21	81.4	71.7	0	6.3	0	5.2	0	5.3	0	5.3	0	5.2
22	79.3	71.4	0	6.0	0	5.1	0	5.1	0	5.1	0	5.1
23	77.2	70.5	0	5.7	0	4.7	0	4.7	0	4.7	0	4.7
24	75.1	69.1	0	5.4	0	4.3	0	4.3	0	4.3	0	4.3

BUILDING COOL-HEAT DEMAND - ALTERNATIVE 1
BLDG M514, BASELINE

July			------ Design -----		----- Weekday -----		-----Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	72.0	69.3	0	5.4	0	3.4	0	3.8	0	3.8	0	3.8
2	70.5	68.0	0	4.8	0	3.3	0	3.4	0	3.4	0	3.4
3	69.4	67.1	0	4.4	0	3.0	0	3.0	0	3.0	0	3.0
4	68.5	66.4	0	4.2	0	2.7	0	2.7	0	2.7	0	2.7
5	67.9	66.0	0	4.0	0	2.5	0	2.5	0	2.5	0	2.5
6	67.7	65.9	0	4.3	0	2.6	0	2.6	0	2.6	0	2.6
7	68.1	66.3	0	4.8	0	2.8	0	2.8	0	2.8	0	2.8
8	69.1	67.3	0	10.9	0	9.5	0	3.0	0	3.0	0	9.5
9	70.8	68.0	0	13.2	0	11.5	0	3.2	0	3.2	0	11.5
10	72.9	69.1	0	13.9	0	12.2	0	3.8	0	3.8	0	12.2
11	75.2	70.5	0	14.2	0	12.4	0	4.0	0	4.0	0	12.4
12	77.5	71.7	0	14.2	0	12.3	0	4.3	0	4.3	0	12.3
13	79.6	72.7	0	12.5	0	10.6	0	4.8	0	4.8	0	10.6
14	81.3	73.5	0	15.0	0	13.3	0	5.4	0	5.4	0	13.3
15	82.3	73.7	0	15.9	0	14.1	0	5.8	0	5.8	0	14.1
16	82.7	73.5	0	16.0	0	14.2	0	5.9	0	5.9	0	14.2
17	82.5	73.1	0	13.9	0	12.1	0	5.8	0	5.8	0	12.1
18	82.0	72.6	0	10.1	0	8.5	0	5.7	0	5.7	0	8.5
19	81.1	73.2	0	6.5	0	5.0	0	5.2	0	5.2	0	5.0
20	79.9	73.8	0	6.4	0	5.2	0	5.3	0	5.3	0	5.2
21	78.5	73.9	0	6.3	0	5.3	0	5.3	0	5.3	0	5.3
22	76.9	73.1	0	6.0	0	5.1	0	5.1	0	5.1	0	5.1
23	75.2	71.9	0	5.7	0	4.8	0	4.8	0	4.8	0	4.8
24	73.5	70.8	0	5.4	0	4.3	0	4.3	0	4.3	0	4.3

August			------ Design -----		----- Weekday -----		-----Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	72.7	70.2	0	5.4	0	3.3	0	3.7	0	3.7	0	3.7
2	71.2	69.0	0	4.7	0	3.1	0	3.3	0	3.3	0	3.3
3	69.9	68.0	0	4.3	0	3.0	0	3.1	0	3.1	0	3.1
4	68.8	67.1	0	4.0	0	2.6	0	2.7	0	2.7	0	2.7
5	68.0	66.6	0	3.9	0	2.4	0	2.4	0	2.4	0	2.4
6	67.5	66.2	0	3.9	0	2.3	0	2.3	0	2.3	0	2.3
7	67.3	66.1	0	4.6	0	2.5	0	2.5	0	2.5	0	2.5
8	67.8	66.5	0	10.8	0	9.2	0	2.6	0	2.6	0	9.2
9	69.1	67.0	0	13.3	0	11.1	0	2.8	0	2.8	0	11.1
10	71.2	67.8	0	13.8	0	11.6	0	3.3	0	3.3	0	11.6
11	73.8	68.7	0	14.0	0	11.8	0	3.5	0	3.5	0	11.8
12	76.5	70.0	0	13.8	0	11.8	0	3.9	0	3.9	0	11.8
13	79.1	71.2	0	12.2	0	10.2	0	4.5	0	4.5	0	10.2
14	81.1	72.6	0	14.9	0	13.0	0	5.2	0	5.2	0	13.0
15	82.5	73.6	0	15.8	0	13.8	0	5.6	0	5.6	0	13.8
16	83.0	73.7	0	15.9	0	13.7	0	5.3	0	5.3	0	13.7
17	82.8	73.5	0	13.9	0	11.8	0	5.4	0	5.4	0	11.8
18	82.3	73.5	0	9.8	0	8.0	0	5.1	0	5.1	0	8.0
19	81.5	73.1	0	6.3	0	4.8	0	5.0	0	5.0	0	4.8
20	80.4	73.7	0	6.3	0	5.0	0	5.1	0	5.1	0	5.0
21	79.1	74.9	0	6.1	0	5.1	0	5.1	0	5.1	0	5.1
22	77.6	73.9	0	5.8	0	5.0	0	5.0	0	5.0	0	5.0
23	76.0	72.7	0	5.5	0	4.6	0	4.6	0	4.6	0	4.6
24	74.3	71.3	0	5.2	0	4.1	0	4.1	0	4.1	0	4.1

BUILDING COOL-HEAT DEMAND - ALTERNATIVE 1
BLDG M514, BASELINE

September			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	69.8	66.1	0	4.1	0	2.0	0	2.4	0	2.4	0	2.4
2	68.0	64.5	0	3.6	0	1.9	0	2.1	0	2.1	0	2.1
3	66.3	63.0	0	3.2	0	1.6	0	1.7	0	1.7	0	1.7
4	64.9	61.9	0	2.9	0	1.3	0	1.3	0	1.3	0	1.3
5	63.9	61.3	0	2.6	0	1.1	0	1.1	0	1.1	0	1.1
6	63.2	61.0	0	2.5	0	0.9	0	0.9	0	0.9	0	0.9
7	63.0	60.8	0	3.1	0	1.1	0	1.1	0	1.1	0	1.1
8	63.4	61.4	0	9.2	0	7.5	0	1.3	0	1.3	0	7.5
9	64.7	61.8	0	12.0	0	9.6	0	1.5	0	1.5	0	9.6
10	66.6	62.1	0	12.5	0	9.8	0	1.6	0	1.6	0	9.8
11	69.1	62.9	0	12.7	0	10.3	0	2.2	0	2.2	0	10.3
12	71.8	63.7	0	12.7	0	10.1	0	2.4	0	2.4	0	10.1
13	74.5	65.5	0	11.1	0	8.7	0	3.0	0	3.0	0	8.7
14	77.0	67.1	0	13.6	0	11.2	0	3.6	0	3.6	0	11.2
15	78.9	68.2	0	14.3	0	11.9	0	3.7	0	3.7	0	11.9
16	80.2	68.6	0	14.3	0	12.2	0	3.9	0	3.9	0	12.2
17	80.6	68.5	0	12.2	0	10.2	0	3.9	0	3.9	0	10.2
18	80.4	68.9	0	7.9	0	6.3	0	3.4	0	3.4	0	6.3
19	79.7	70.0	0	5.0	0	3.6	0	3.6	0	3.6	0	3.6
20	78.7	71.2	0	4.9	0	3.7	0	3.7	0	3.7	0	3.7
21	77.3	71.6	0	4.7	0	3.7	0	3.7	0	3.7	0	3.7
22	75.6	70.5	0	4.4	0	3.5	0	3.5	0	3.5	0	3.5
23	73.7	69.4	0	4.1	0	3.2	0	3.2	0	3.2	0	3.2
24	71.8	67.7	0	3.7	0	2.8	0	2.8	0	2.8	0	2.8

October			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	54.8	51.3	0	0.4	0	0.0	0	0.0	0	0.0	0	0.0
2	52.9	49.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
3	51.2	48.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
4	49.8	47.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
5	48.8	46.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
6	48.2	45.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
7	47.9	45.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
8	48.5	46.2	0	3.6	0	0.0	0	0.0	0	0.0	0	0.0
9	50.3	47.3	0	7.6	0	0.0	0	0.0	0	0.0	0	0.0
10	52.9	48.7	0	8.1	0	2.7	0	0.0	0	0.0	0	0.0
11	56.2	49.9	0	8.6	0	6.0	0	0.0	0	0.0	0	0.0
12	59.6	51.5	0	8.7	0	6.4	0	0.0	0	0.0	0	0.0
13	62.9	53.5	0	7.4	0	5.0	0	0.0	0	0.0	0	0.0
14	65.5	55.2	0	9.6	0	7.1	0	0.0	0	0.0	0	0.0
15	67.3	56.3	0	10.4	0	7.9	0	0.0	0	0.0	0	1.2
16	67.9	56.6	0	10.5	0	8.2	0	0.0	0	0.0	0	8.7
17	67.7	56.4	0	7.9	0	5.9	0	0.0	0	0.0	0	6.0
18	67.0	56.6	0	4.5	0	2.8	0	0.0	0	0.0	0	2.8
19	66.0	57.6	0	1.9	0	0.1	0	0.0	0	0.0	0	0.1
20	64.6	57.9	0	1.7	0	0.0	0	0.0	0	0.0	0	0.0
21	62.9	57.3	0	1.4	0	0.0	0	0.0	0	0.0	0	0.0
22	61.0	56.0	0	1.0	0	0.0	0	0.0	0	0.0	0	0.0
23	59.0	54.8	0	0.8	0	0.0	0	0.0	0	0.0	0	0.0
24	56.9	53.0	0	0.5	0	0.0	0	0.0	0	0.0	0	0.0

BUILDING COOL-HEAT DEMAND - ALTERNATIVE 1
BLDG M514, BASELINE

November			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	48.7	45.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2	46.9	44.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
3	45.5	42.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
4	44.6	41.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
5	44.4	42.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
6	44.8	42.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
7	45.9	43.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
8	47.8	46.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
9	50.2	48.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
10	52.9	49.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
11	55.8	51.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
12	58.5	52.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
13	60.9	52.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
14	62.8	53.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
15	64.0	53.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
16	64.4	53.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
17	64.1	53.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
18	63.2	53.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
19	61.8	54.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
20	60.0	53.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
21	57.9	52.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
22	55.6	51.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
23	53.2	49.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
24	50.8	47.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0

December			------ Design -----		----- Weekday -----		----- Saturday----		------ Sunday -----		------ Monday -----	
Hour	OADB	OAWB	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton	Htg Btuh	Clg Ton
1	37.5	35.3	0	0.0	0	0.0	0	0.0	0	0.0	0	[redacted]
2	37.1	35.1	0	0.0	0	0.0	0	0.0	0	0.0	0	[redacted]
3	37.4	35.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
4	38.1	36.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
5	39.3	37.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
6	40.9	39.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
7	42.7	41.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
8	44.7	43.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
9	46.8	45.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
10	48.8	47.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
11	50.7	48.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
12	52.2	48.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
13	53.4	49.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
14	54.1	49.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
15	54.4	48.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
16	54.0	48.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
17	53.0	47.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
18	51.4	46.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
19	49.3	45.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
20	47.0	43.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
21	44.5	41.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
22	42.2	39.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
23	40.1	37.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
24	38.5	36.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0

BUILDING TEMPERATURE PROFILES - ALTERNATIVE 1
BLDG M514, BASELINE

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)	Room Number 1
Max. Temp.	79.3
Mo./Hr.	4 19
Day Type	5
	Number of Hours
Above 100	0
95 - 100	0
90 - 95	0
85 - 90	0
80 - 85	0
75 - 80	6,324
70 - 75	2,436
65 - 70	0
60 - 65	0
55 - 60	0
50 - 55	0
Below 50	0
Min. Temp.	71.9
Mo./Hr.	1 4
Day Type	1

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M514, BASELINE

---------- M O N T H L Y E N E R G Y C O N S U M P T I O N ----------

Month	ELEC On Peak (kWh)	DEMAND On Peak (kW)	GAS On Peak (Therm)	GAS DMND On Peak (Thrm/hr)
Jan	11,333	29	127	1
Feb	10,206	29	105	1
March	11,090	29	0	0
April	10,293	29	0	0
May	14,195	45	0	0
June	15,798	49	0	0
July	15,494	46	0	0
Aug	16,105	46	0	0
Sept	13,869	45	0	0
Oct	11,887	40	0	0
Nov	10,293	29	0	0
Dec	10,507	29	0	0
Total	151,070	49	232	1

Building Energy Consumption = 55,292 (Btu/Sq Ft/Year) Floor Area = 9,744 (Sq Ft)
Source Energy Consumption = 161,262 (Btu/Sq Ft/Year)

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M514, BASELINE

EQUIPMENT ENERGY CONSUMPTION

Ref Num	Equip Code	Monthly Consumption Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	4413	3992	4766	4214	4589	4567	4237	4766	4214	4589	4214	4237	52,797
	PK	19.1	19.1	19.1	19.1	19.1	19.1	19.1	19.1	19.1	19.1	19.1	19.1	19.1
1	MISC LD													
	ELEC	451	408	487	431	469	467	433	487	431	469	431	433	5,400
	PK	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
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	EQ1170S	AIR-CLD COND COMP <20 TONS												
	ELEC	0	0	0	0	2772	4356	4231	4261	3004	863	0	0	19,487
	PK	0.0	0.0	0.0	0.0	14.0	16.0	15.3	15.3	13.7	9.2	0.0	0.0	16.0
1	EQ5200	CONDENSER FANS												
	ELEC	0	0	0	0	313	544	533	531	356	77	0	0	2,353
	PK	0.0	0.0	0.0	0.0	1.8	3.5	1.9	1.9	1.7	1.2	0.0	0.0	3.5
1	EQ5313	CONTROLS												
	ELEC	0	0	0	0	214	216	223	223	216	52	0	0	1,144
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3
1	EQ4003	FC CENTRIF. FAN C.V.												
	ELEC	5738	5183	5738	5553	5738	5553	5738	5738	5553	5738	5553	5738	67,562
	PK	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7
1	EQ4003	FC CENTRIF. FAN C.V.												
	ELEC	99	89	99	96	99	96	99	99	96	99	96	99	1,162
	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

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M514, BASELINE

1	EQ2454		RESIDENT GAS FURNACE W-FAN											
	GAS	127	105	0	0	0	0	0	0	0	0	0	0	232
	PK	0.7	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7
1	EQ5254		RESIDENTIAL FURNACE FAN											
	ELEC	632	534	0	0	0	0	0	0	0	0	0	0	1,165
	PK	2.5	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5

UTILITY PEAK CHECKSUMS - ALTERNATIVE 1
BLDG M514, BASELINE

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 48.6 (kW)
Yearly Time of Peak 15 (hr) 6 (mo)

Hour 15 Month 6

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Percnt Of Tot (%)
Cooling Equipment				
1	EQ1170S	AIR-CLD COND COMP <20 TONS	19.8	40.65
Sub Total			19.8	40.65
Sub Total			0.0	0.00
Air Moving Equipment				
1		SUMMATION OF FAN ELECTRICAL DEMAND	7.8	16.13
Sub Total			7.8	16.13
Sub Total			0.0	0.00
Miscellaneous				
Lights			19.1	39.21
Base Utilities			0.0	0.00
Misc Equipment			2.0	4.01
Sub Total			21.0	43.22
Grand Total			48.6	100.00

CALIFORNIA TITLE 24 COMPLIANCE - ALTERNATIVE 1
BLDG M514, BASELINE

---------- CALIFORNIA TITLE 24 COMPLIANCE REPORT ----------

Weather Name ..... ATLANTA.
Gross Conditioned Floor Area (sqft)..... 9,744
ACM Multiplier 1.025

---------- E N E R G Y U S E S U M M A R Y ----------

	ELEC (kWh/yr)	GAS (kBtu/yr)	PERCENT OF TOTAL ENERGY (%)	TOTAL SOURCE ENERGY (kBtu/yr)	ADJUSTED UNIT SOURCE ENERGY (kBtu/yr-sf)
Primary Heating	1,165.3	23,159.9	5.0	36,312.0	3.8
Primary Cooling					
Compressor	19,486.8	0.0	12.3	199,545.5	21.0
Tower/Cond Fans	2,353.4	0.0	1.5	24,098.4	2.5
Condenser Pump	0.0	0.0	0.0	0.0	0.0
Other Accessories	1,144.2	0.0	0.7	11,716.6	1.2
Auxiliary					
Supply Fans	68,723.9	0.0	43.5	703,734.8	74.0
Circulation Pumps	0.0	0.0	0.0	0.0	0.0
Base Utilities	0.0	0.0	0.0	0.0	0.0
Subtotal	68,723.9	0.0	43.5	703,734.8	74.0
Lighting	52,796.6	0.0	33.4	540,638.2	55.5
Receptacle	5,399.6	0.0	3.4	55,291.5	5.7
Domestic Hot Water	0.0	0.0	0.0	0.0	0.0
Cogeneration	0.0	0.0	0.0	0.0	0.0
Totals	151,069.8	23,159.9	100.0	1,571,337.0	163.8

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M514, ECO#6

---------- M O N T H L Y E N E R G Y C O N S U M P T I O N ----------

Month	ELEC On Peak (kWh)	DEMAND On Peak (kW)	GAS On Peak (Therm)	GAS DMND On Peak (Thrm/hr)
Jan	11,333	29	127	1
Feb	10,206	29	105	1
March	11,090	29	0	0
April	10,293	29	0	0
May	14,257	45	0	0
June	15,799	49	0	0
July	15,494	46	0	0
Aug	16,105	46	0	0
Sept	13,869	45	0	0
Oct	11,799	40	0	0
Nov	10,294	29	0	0
Dec	10,507	29	0	0
Total	151,046	49	232	1

Building Energy Consumption = 55,283 (Btu/Sq Ft/Year) Floor Area = 9,744 (Sq Ft)
Source Energy Consumption = 161,237 (Btu/Sq Ft/Year)

Trane Air Conditioning Economics
By: Trane Customer Direct Service Network

V 6
PAC

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M514, ECO#6

EQUIPMENT ENERGY CONSUMPTION

Ref Num	Equip Code	Monthly Consumption Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	4413	3992	4766	4214	4589	4567	4237	4766	4214	4589	4214	4237	52,797
	PK	19.1	19.1	19.1	19.1	19.1	19.1	19.1	19.1	19.1	19.1	19.1	19.1	19.1
1	MISC LD													
	ELEC	451	408	487	431	469	467	433	487	431	469	431	433	5,400
	PK	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
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	
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	EQ1170S	AIR-CLD COND COMP <20 TONS												
	ELEC	0	0	0	0	2750	4356	4231	4261	3004	714	0	0	19,317
	PK	0.0	0.0	0.0	0.0	14.0	16.0	15.3	15.3	13.7	9.2	0.0	0.0	16.0
1	EQ5200	CONDENSER FANS												
	ELEC	0	0	0	0	311	544	533	531	356	66	0	0	2,341
	PK	0.0	0.0	0.0	0.0	1.8	3.5	1.9	1.9	1.7	1.2	0.0	0.0	3.5
1	EQ5313	CONTROLS												
	ELEC	0	0	0	0	205	216	223	223	216	42	0	0	1,125
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3
1	EQ4003	FC CENTRIF. FAN C.V.												
	ELEC	5738	5183	5738	5553	5738	5553	5738	5738	5553	5738	5553	5738	67,564
	PK	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7
1	EQ4003	FC CENTRIF. FAN C.V.												
	ELEC	99	89	99	96	194	96	99	99	96	179	96	99	1,338
	PK	0.1	0.1	0.1	0.1	3.2	0.1	0.1	0.1	0.1	3.1	0.1	0.1	3.2

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M514, ECO#6

1	EQ2454		RESIDENT GAS FURNACE W-FAN											
	GAS	127	105	0	0	0	0	0	0	0	0	0	0	232
	PK	0.7	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7
1	EQ5254		RESIDENTIAL FURNACE FAN											
	ELEC	632	534	0	0	0	0	0	0	0	0	0	0	1,165
	PK	2.5	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5

UTILITY PEAK CHECKSUMS - ALTERNATIVE 1
BLDG M514, ECO#6

---------- 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 48.6 (kW)
Yearly Time of Peak 15 (hr) 6 (mo)

Hour 15 Month 6

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Percnt Of Tot (%)
Cooling Equipment				
1	EQ1170S	AIR-CLD COND COMP <20 TONS	19.8	40.65
Sub Total			19.8	40.65
Sub Total			0.0	0.00
Air Moving Equipment				
1		SUMMATION OF FAN ELECTRICAL DEMAND	7.8	16.13
Sub Total			7.8	16.13
Sub Total			0.0	0.00
Miscellaneous				
Lights			19.1	39.21
Base Utilities			0.0	0.00
Misc Equipment			2.0	4.01
Sub Total			21.0	43.22
Grand Total			48.6	100.00

CALIFORNIA TITLE 24 COMPLIANCE - ALTERNATIVE 1
BLDG M514, ECO#6

CALIFORNIA TITLE 24 COMPLIANCE REPORT

Weather Name ..... ATLANTA.
Gross Conditioned Floor Area (sqft)..... 9,744
ACM Multiplier 1.025

E N E R G Y U S E S U M M A R Y

	ELEC (kWh/yr)	GAS (kBtu/yr)	PERCENT OF TOTAL ENERGY (%)	TOTAL SOURCE ENERGY (kBtu/yr)	ADJUSTED UNIT SOURCE ENERGY (kBtu/yr-sf)
Primary Heating	1,165.3	23,159.5	5.0	36,311.6	3.8
Primary Cooling					
Compressor	19,316.7	0.0	12.2	197,803.5	20.8
Tower/Cond Fans	2,341.4	0.0	1.5	23,975.6	2.5
Condenser Pump	0.0	0.0	0.0	0.0	0.0
Other Accessories	1,124.7	0.0	0.7	11,516.9	1.2
Auxiliary					
Supply Fans	68,902.2	0.0	43.7	705,560.2	74.2
Circulation Pumps	0.0	0.0	0.0	0.0	0.0
Base Utilities	0.0	0.0	0.0	0.0	0.0
Subtotal	68,902.2	0.0	43.7	705,560.2	74.2
Lighting	52,796.6	0.0	33.5	540,638.2	55.5
Receptacle	5,399.6	0.0	3.4	55,291.5	5.7
Domestic Hot Water	0.0	0.0	0.0	0.0	0.0
Cogeneration	0.0	0.0	0.0	0.0	0.0
Totals	151,046.4	23,159.5	100.0	1,571,097.6	163.7

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M514, ECO#12

---------- M O N T H L Y E N E R G Y C O N S U M P T I O N ----------

Month	ELEC On Peak (kWh)	DEMAND On Peak (kW)	GAS On Peak (Therm)	GAS DMND On Peak (Thrm/hr)
Jan	6,927	32	35	1
Feb	6,245	32	24	1
March	7,419	29	0	0
April	6,528	29	0	0
May	7,130	29	0	0
June	7,105	29	0	0
July	7,979	41	0	0
Aug	8,928	41	0	0
Sept	7,314	40	0	0
Oct	7,130	38	0	0
Nov	6,528	29	0	0
Dec	6,553	29	0	0
Total	85,784	41	60	1

Building Energy Consumption = 30,659 (Btu/Sq Ft/Year)
Source Energy Consumption = 90,795 (Btu/Sq Ft/Year)

Floor Area = 9,744 (Sq Ft)

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M514, ECO#12

EQUIPMENT ENERGY CONSUMPTION

Ref Num	Equip Code	Monthly Consumption Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	4413	3992	4766	4214	4589	4567	4237	4766	4214	4589	4214	4237	52,797
	PK	19.1	19.1	19.1	19.1	19.1	19.1	19.1	19.1	19.1	19.1	19.1	19.1	19.1
1	MISC LD													
	ELEC	451	408	487	431	469	467	433	487	431	469	431	433	5,400
	PK	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
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	EQ1170S	AIR-CLD COND COMP <20 TONS												
	ELEC	0	0	0	0	0	0	1209	1280	661	0	0	0	3,150
	PK	0.0	0.0	0.0	0.0	0.0	0.0	10.6	10.5	9.7	8.5	0.0	0.0	10.6
1	EQ5200	CONDENSER FANS												
	ELEC	0	0	0	0	0	0	152	158	81	0	0	0	391
	PK	0.0	0.0	0.0	0.0	0.0	0.0	1.3	1.3	1.1	0.8	0.0	0.0	1.3
1	EQ5313	CONTROLS												
	ELEC	0	0	0	0	0	0	66	71	43	0	0	0	180
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.0	0.0	0.3
1	EQ4003	FC CENTRIF. FAN C.V.												
	ELEC	1944	1759	2129	1851	2036	2036	1851	2129	1851	2036	1851	1851	23,324
	PK	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7
1	EQ4003	FC CENTRIF. FAN C.V.												
	ELEC	33	30	37	32	35	35	32	37	32	35	32	32	401
	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

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BLDG M514, ECO#12

1	EQ2454		RESIDENT GAS FURNACE W-FAN											
	GAS	35	24	0	0	0	0	0	0	0	0	0	0	60
	PK	1.3	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3
1	EQ5254		RESIDENTIAL FURNACE FAN											
	ELEC	86	56	0	0	0	0	0	0	0	0	0	0	142
	PK	2.7	2.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.7

UTILITY PEAK CHECKSUMS - ALTERNATIVE 1
BLDG M514, ECO#12

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 41.0 (kW)
Yearly Time of Peak 16 (hr) 7 (mo)

Hour 16 Month 7

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Percnt Of Tot (%)
Cooling Equipment				
1	EQ1170S	AIR-CLD COND COMP <20 TONS	12.1	29.62
Sub Total			12.1	29.62
Sub Total			0.0	0.00
Air Moving Equipment				
1		SUMMATION OF FAN ELECTRICAL DEMAND	7.8	19.13
Sub Total			7.8	19.13
Sub Total			0.0	0.00
Miscellaneous				
Lights			19.1	46.49
Base Utilities			0.0	0.00
Misc Equipment			2.0	4.75
Sub Total			21.0	51.25
Grand Total			41.0	100.00

CALIFORNIA TITLE 24 COMPLIANCE - ALTERNATIVE 1
BLDG M514, ECO#12

CALIFORNIA TITLE 24 COMPLIANCE REPORT

Weather Name ..... ATLANTA.
Gross Conditioned Floor Area (sqft)..... 9,744
ACM Multiplier 1.025

E N E R G Y U S E S U M M A R Y

	ELEC (kWh/yr)	GAS (kBtu/yr)	PERCENT OF TOTAL ENERGY (%)	TOTAL SOURCE ENERGY (kBtu/yr)	ADJUSTED UNIT SOURCE ENERGY (kBtu/yr-sf)
Primary Heating	141.9	5,964.3	2.2	7,730.9	0.8
Primary Cooling					
Compressor	3,149.9	0.0	3.6	32,254.7	3.4
Tower/Cond Fans	391.0	0.0	0.4	4,004.3	0.4
Condenser Pump	0.0	0.0	0.0	0.0	0.0
Other Accessories	180.3	0.0	0.2	1,846.3	0.2
Auxiliary					
Supply Fans	23,724.8	0.0	27.1	242,942.1	25.6
Circulation Pumps	0.0	0.0	0.0	0.0	0.0
Base Utilities	0.0	0.0	0.0	0.0	0.0
Subtotal	23,724.8	0.0	27.1	242,942.1	25.6
Lighting	52,796.6	0.0	60.3	540,638.2	55.5
Receptacle	5,399.6	0.0	6.2	55,291.5	5.7
Domestic Hot Water	0.0	0.0	0.0	0.0	0.0
Cogeneration	0.0	0.0	0.0	0.0	0.0
Totals	85,784.0	5,964.3	100.0	884,708.1	91.5

APPENDIX F

FIELD SURVEY DATA

OMEGA PROCESS CONTROLS, INC.
A Division of OMEGA ENGINEERING, Inc.

One Omega Circle
Pureland Industrial Park
P.O. Box 336
Bridgeport, NJ 08014
(609) 467-4200

C E R T I F I C A T E O F C A L I B R A T I O N

f o r

EMC ENGINEERS
1950 SPECTRUM CIRCLE
SUITE 312
MARIETTA, GA 30067

Cust PO# 62584 Model# HH-23
Omega WO# 202992981 Serial# T-54474

C A L - 3

OMEGA Process Controls Inc certifies that the above instrumentation has been calibrated to meet or exceed the published specifications. This calibration was performed using instrumentation and standards that are traceable to the United States National Institute of Standards and Technology, and is in compliance with MIL-STD-45662A.

Readings Observed in: Fahrenheit

STANDARD	AS RECEIVED	FINAL CAL
32	32.5	32.0
900	900.8	900.4
1800	1800.4	1800.0

TEST EQUIPMENT	NIST(NBS)
Fluke 8860A Digit Multimeter, S/N 3335023	245516
Analogic AN-3100 DC Standard, S/N 7904379	245516
Gen Res RDS63-A Dec Resistor, S/N 591	241457
Omega TRC-III Ice Point Cell, S/N 003	241457

TEST CONDITIONS
Temp: 23C Rel Hum: 26%

CERTIFIED BY
John L. Howard

Instrumentation Supervisor

BUILDING 022

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: _____ OF _____
CALCULATED BY: KK
CHECKED BY: _____
DATE: 12-17-91

BLDG.# 22
ECO 1

PIPE INSULATION

LOCATION	PIPE DIAMETER	PIPE LENGTH	FLUID TYPE	FLUID TEMP.	AIR TEMP.	INSULATION TYPE	INSULATION THICKNESS	INSULATION CONDITION
MECH. RM	1½	150'	HW	180°	70	RUBBER	1/2"	GOOD
↓	1½"	150'	CW	NA		↓	↓	↓

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO. _____ OF _____
CALCULATED BY: KC
CHECKED BY: _____
DATE: 12-17-91

BLDG.# 22
ECO 1

DUCT INSULATION

LOCATION	DUCT CROSSECTION	SHAPE	DUCT TEMP. (°F)	SURROUND AIR TEMP. (°F)	INSULATION TYPE	INSULATION THICKNESS	INSULATION CONDITION
FAN ROOM	24 X 24		72	60	FIBERGLASS FOIL	1"	GOOD

COMMENTS: ONLY ONE AHU. OTHERS ARE FAN COIL.

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: JW
CHECKED BY:
DATE: 12/17/91

BLDG.# 22
ECO 2

WINDOWS SURVEY

WINDOW NO.	SINGLE/DOUBLE PANE	TYPE–SLIDING FIXED, CASEMENT	FRAME MAT'L	ORIENTATION	GLASS SHADING	WINDOW COVER	DIMENSIONS (INCH)
							~~47x34~~
15	DOUBLE	CASEMENT	METAL (ALUM)	W	NO	BLINDS	34x47
24 ~~00~~	"	"	"	S	"	"	"
8	"	"	"	E	"	"	"
17	"	"	"	N	"	"	"

COMMENTS: ALL WINDOWS ARE FAIRLY NEW METAL CASEMENT W/ NO INFILTRATION.

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO. ____ OF ____
CALCULATED BY: JW
CHECKED BY: ____
DATE: 12/17/91

BLDG.# 22
ECO 3

WEATHERSTRIPING AND CAULKING

	DOOR\ WINDOW	CONDITION OF W.S./CAULK	INFILTRATION	ORIENTATION	DIMENSIONS (INCH)	#
①	D	W.S on BOTTOM LEFT MISSING	HIGH	W	60x80	1
	W	EXCEL.	NONE	W	34x47	15
	11	11	11	NSE	11	Refer to WINDOWS
	D	GOOD	LOW	N&S ENDS	35x80	2
	D	11	11	N&S BACKS	11	2
①	D	W.S. ON BOTTOM LEFT MISSING	HIGH	E	60x80	1

COMMENTS: ① FRONT DOOR HAS ½" AIR GAP ON BOTTOM W/ HIGH INFILTRATION. WEATHER STRIP ACROSS BOTTOM IS MISSING.

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY:
CHECKED BY:
DATE:

BLDG.# 92
ECO 4

DOMESTIC HOT WATER

FAUCET LOCATION	WATER TEMPERATURE
Rm. 107 sink	130°F
Room 104 sink	134°F
PROBLEMS:	

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: KL
CHECKED BY:
DATE: 12-17-91

BLDG.# 22
ECO 5

MOTORS

MOTOR # 1 HP 2 PH RPM 3450
MODEL # JMM3555T VOLTS 208 AMPS 5.7
SERIAL # PRESENT HR. TO
MFG BALDOR REQUIRED HR. TO
FRAME 145JM EFF. 79%
DESCRIPTION CWP COMMENTS OPERATE DURING SUMMER
NO PUMP INFO

MOTOR # 2 HP 1/4 PH RPM
MODEL # VOLTS 115V AMPS ?
SERIAL # PRESENT HR. TO
MFG BELL & GOSSETT REQUIRED HR. TO
FRAME EFF.
DESCRIPTION HW PUMP COMMENTS OPERATE DURING WINTER

MOTOR # 3 HP PH RPM 1725
MODEL # M74792 VOLTS 115 AMPS 7
SERIAL # PRESENT HR. TO
MFG BELL GOSSETT REQUIRED HR. TO
FRAME EFF.
DESCRIPTION DHW PUMP MOTOR COMMENTS

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: KU
CHECKED BY:
DATE: 12-17-91

BLDG.# 22
ECO 5

MOTORS

MOTOR #	4	HP	1/2	PH	1Ø	RPM	1725
MODEL #	8-10633-23	VOLTS	115	AMPS	7.2		
SERIAL #		PRESENT HR.	0	TO	2400		
MFG	GOULD	REQUIRED HR.		TO			
FRAME		EFF.					
DESCRIPTION	AHU	COMMENTS					

MOTOR #		HP		PH		RPM	
MODEL #		VOLTS		AMPS			
SERIAL #		PRESENT HR.		TO			
MFG		REQUIRED HR.		TO			
FRAME		EFF.					
DESCRIPTION		COMMENTS					

MOTOR #		HP		PH		RPM	
MODEL #		VOLTS		AMPS			
SERIAL #		PRESENT HR.		TO			
MFG		REQUIRED HR.		TO			
FRAME		EFF.					
DESCRIPTION		COMMENTS					

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB	Ft. McPherson/Ft. Gillem Energy Study
PROJ.#	EMC # 3105.000
SHEET NO.	OF
CALCULATED BY:	EMD
CHECKED BY:	
DATE:	[illegible]

BLDG.# 22
ECO 8

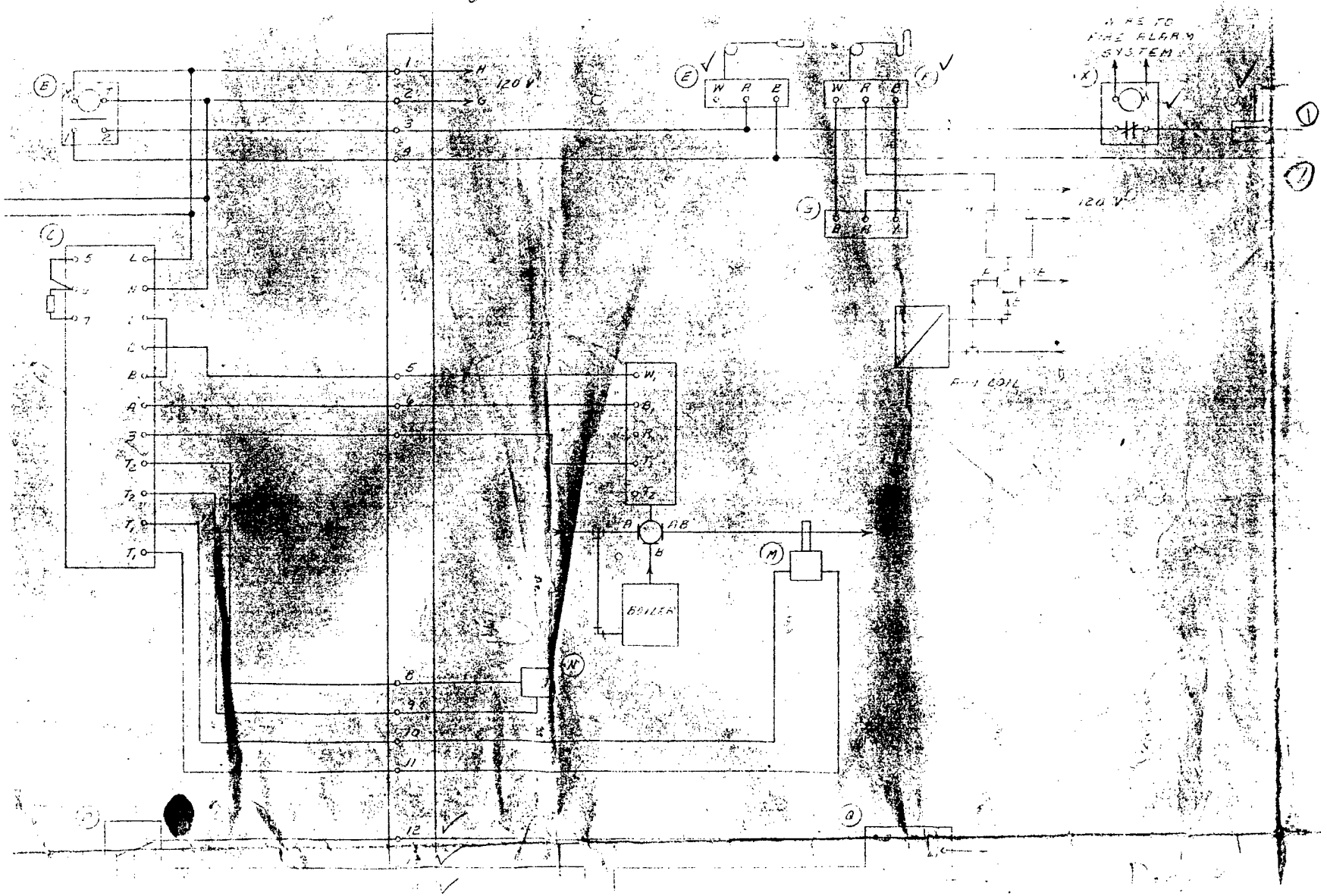
FLOW RESTRICTIONS

SHOWERHEADS	SHOWERS/DAY	NO. OF PEOPLE	PRESENT GPM (QTS/SEC)	GPM w/ LOW-FLOW (QTS/SEC)	LOCATION
			4½/45 1.5	5/45	[illegible]

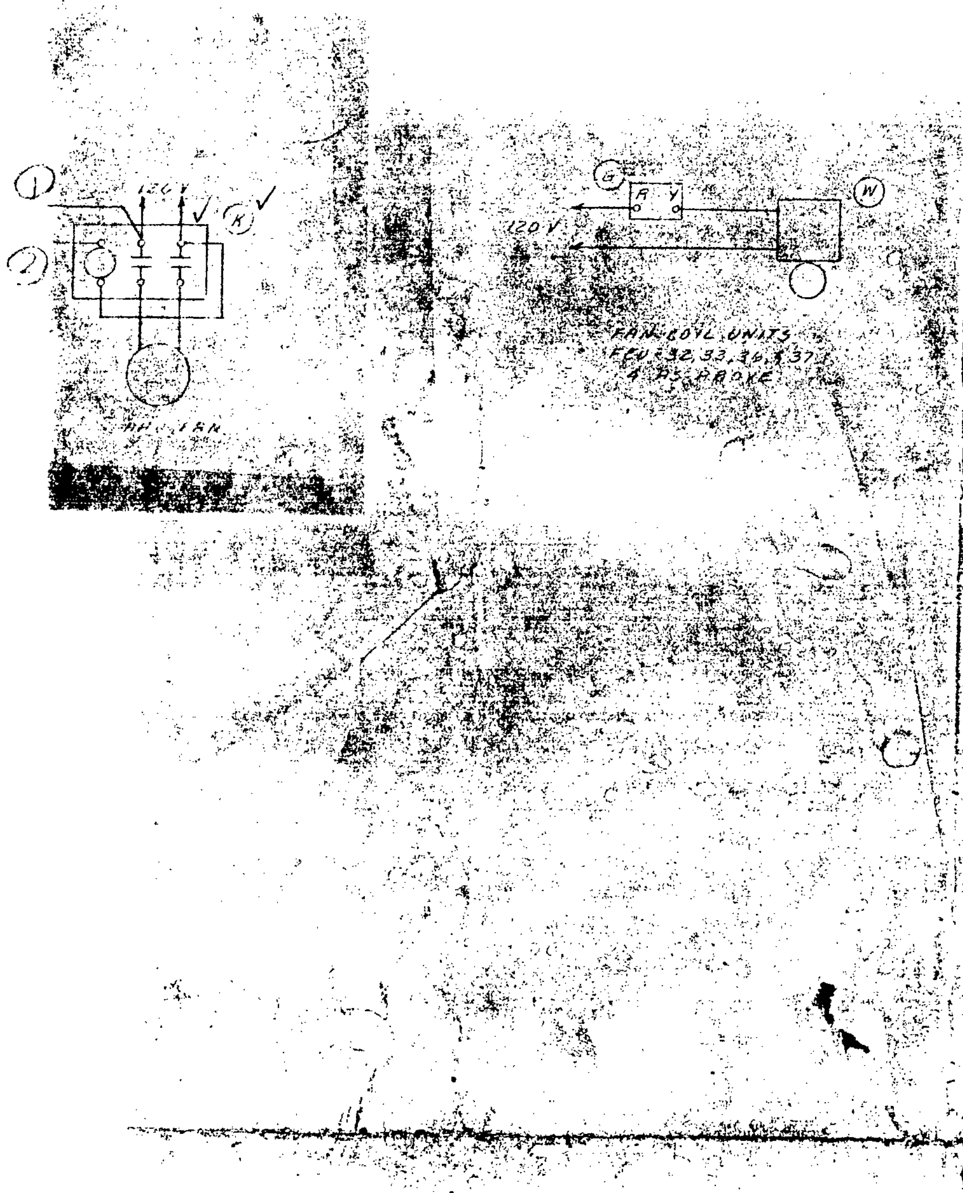
FAUCETS	NO. OF PEOPLE	PRESENT GPM OZ.\SEC.	GPM w/ LOW FLOW RESTR.	LOCATION
		40/10	40/35	107

COMMENTS: Flow The measured [illegible] low-Flow
[illegible] installed.
The Faucet RESTRICTOR is very weak & not very practical

Page 22



Page 2

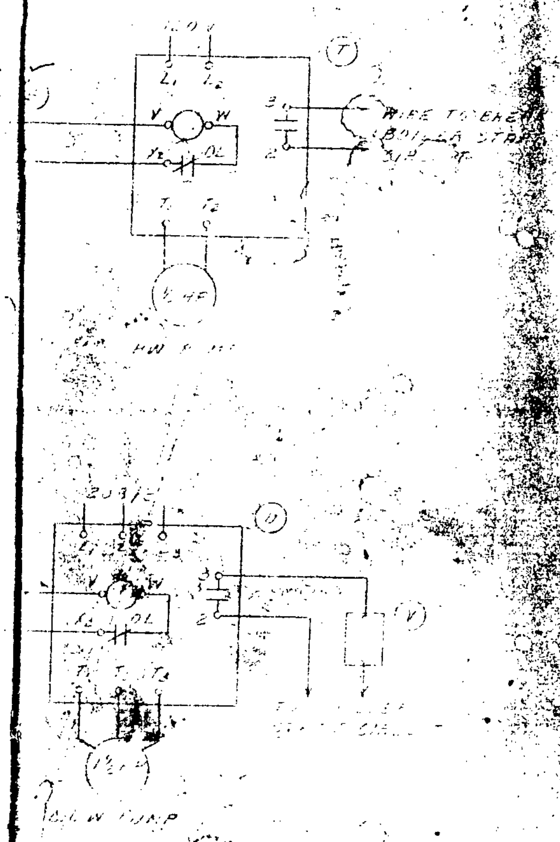


LEGEND

A. PANEL	Prewired enclosure, Nema-1, 20" x [illegible] " Surface mounted, gray finish
B. TIME CLOCK	7008-00 Paragon 7-day 120v.
C. AQUATROL	W964F, Set 1:1, Ratio, [illegible] Mode, 1 min. timing, +10° shift
D. SWITCH	Heat-Cool 4 PDT toggle [illegible] inside panel
E. [illegible]	T6031A 1029, Set [illegible]
F. [illegible]	T673A 1706, trial set 72°F, locate element in return air
G. AQUASTAT	L6?76B 1023 change over control, strap to line
H. VALVE	Air handling unit control valve consisting M445D 1007 120v., 2-pos., spring return motor, [illegible] 1032 linkage V5013A 1195 valve body 3/4" [illegible]
J. FIRESTAT	L4029E 1237, 125°F, manual reset, locate element in return air
K. CONTACTOR	R4243B 1004, 30 Amp, 2-pole with 138552B enclosure
L. VALVE	Boiler water temperature reset control valve, consisting of: M644A 1016 motor, [illegible] linkage V5013A 1211 valve body 1" 2-way
M. [illegible] SENSOR	T7043A 1023 with immersion well
N. [illegible] SENSOR	T7043B 1015
P. LIMIT	T678C 1005 DPDT high temp limit, [illegible] with 121371A well 1/2"
Q. VALVE	System diverting valve consisting of: [illegible] motor, AV-394 linkage, VB-9323 mixing valve [illegible]
R. VALVE	System mixing valve consisting of: [illegible] motor; AV-394 linkage, VB-9313 mixing valve body 2"
S. [illegible]	[illegible] 1029 set 6?°F with [illegible]
T. [illegible]	1 [illegible] Furnas [illegible] pump starter [illegible]
U. STARTER	[illegible] Furnas [illegible] Pump [illegible]

Page 4 →


15
16
18
19
20
21
3 R
2 B
X C
120V
L1
L2
AB
A
B
BOILER CIRCUIT
CHILLER
HW PUMP
3
4
3/Way Valve @ Boiler - 3
Diverting Valve - 5
Sensor - 2
Ground - 1
5
6
7
12
13
14
10
11
L1
L2



FLOW [illegible] Chiller interlock flow switch by other

W[illegible] Solenoid valve, 120v., [illegible] Asco

[illegible] 1067, 24v., N.C. contacts with 1383528 enclosure

CONTROL WIRING DIAGRAM

HVAC - BLDG (23)

FORT McPHERSON, GE.

CONTRACTOR - PENKERAKER

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: _____ OF _____
CALCULATED BY: C M D
CHECKED BY: _____
DATE: 12-11-[illegible]

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 22 BLDG NAME: _____ JOB: 3105.000
PRIMARY FUNCTION: HEALTH CLINIC GROSS SQ FT _____ NO OF FLRS 1
BUILDING MANAGER NAME: _____
PHONE: _____ OFFICE NO. _____
SPECIAL AREAS: COMPUTER FACILITY [ ] - ZONE NO'S. _____
AUDITORIUM [ ] - ZONE NO'S. _____
LABORATORIES [ ] - ZONE NO'S. _____
CAFETERIA [ ] - ZONE NO'S. _____
OTHER [ ] _____ - ZONE NO'S. _____

ZONE NO. 1 FUNCTION: _____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: Rm 105 (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F ____ TO ____, SAT ____ TO ____, SUN ____ TO ____
PRESENT TEMP: WINTER OCC 72.5 °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F
REQUIRE TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F

REMARKS: _____

ZONE NO. 2 FUNCTION: _____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: MAIN LOBBY (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F ____ TO ____, SAT ____ TO ____, SUN ____ TO ____
PRESENT TEMP: WINTER OCC 73.7 °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F
REQUIRE TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F

REMARKS: _____

ZONE NO. 3 FUNCTION: _____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: HALL (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F ____ TO ____, SAT ____ TO ____, SUN ____ TO ____
PRESENT TEMP: WINTER OCC 71.3 °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F
REQUIRE TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F

REMARKS: _____

ZONE NO. _____ FUNCTION: _____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: _____ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F ____ TO ____, SAT ____ TO ____, SUN ____ TO ____
PRESENT TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F
REQUIRE TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F

REMARKS: _____

Rooms are occupied 24 hrs/day

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

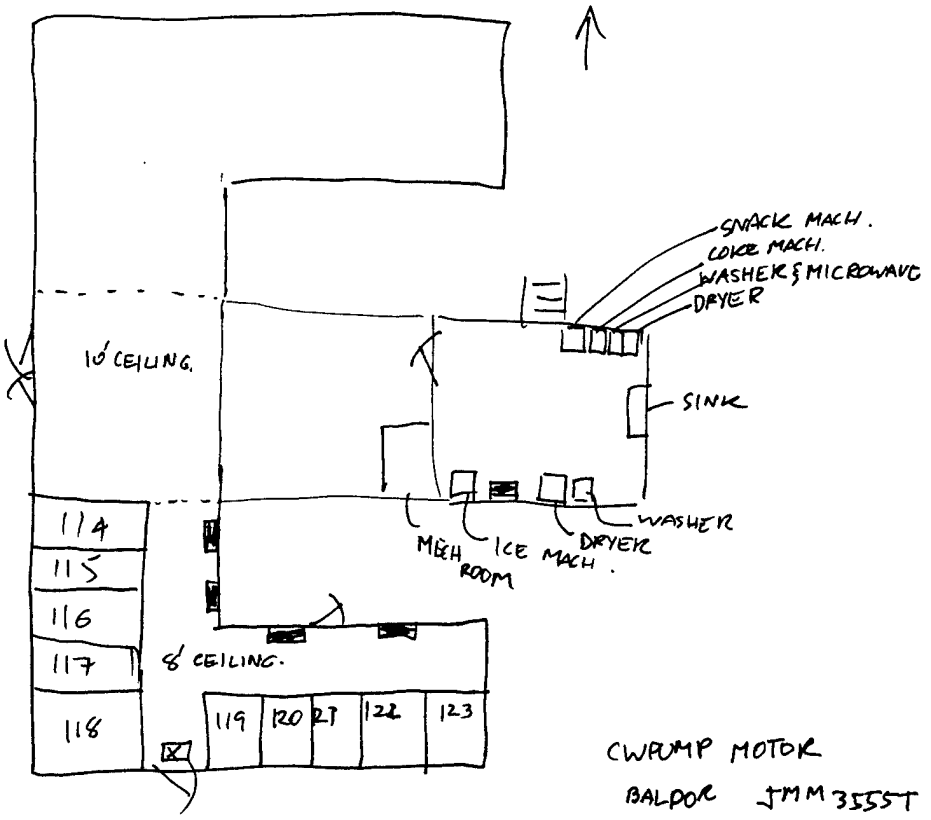
JOB _____

SHEET NO. _____ OF _____

CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____

SCALE _____



CW PUMP MOTOR

BALDOR JMM3355T

FM 145JM 79% eff.

2HP 208V 5.7A 3Ø 3450

NO PUMP INFOR

DHW

HW PUMP

BELL GOSSETT

3/4 HP 1725 RPM

115V 7.0A.

M74792

BELL & GOSSETT

60 PUMP

SEQ 165 1468

IDEN# 172542

SER # 1376498

BOILER

BRADFORD WHITE WATER HEATERS, INC

MOD. M-I-80S-500-3NA

80 ~~M~~ GAL

50,000 BTUH INPUT 454.5 GAL/HR

HW BOILER

THE HB SMITH CO. INC.

G300-S/W-8 INT

NAT GAS.

525 BTUH IN

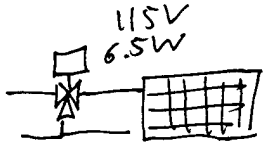
420 BTUH OUT

HW PUMP 1/4" HP 115V.

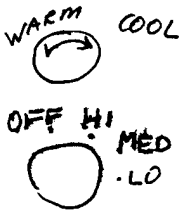
E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB
SHEET NO. OF
CALCULATED BY KC DATE 12-17-91
CHECKED BY DATE
SCALE

BLDG 22
ROOM 107
2-PIPE FAN COIL



FAN { 0.35A 115V.



- 1 HEATER.
- TV (70W)
- 1 TABLE LAMP [60W]
- 1 FRG. (1.2A 120V)
- 1 OVERHEAD (2 LAMP)[60W]
- 1 NIGHT LAMP. (2-60W)
- 1 RADIO ALAM CLOCK (10W)
- 1 LAMP OVER SINK 18" FLOR.
- 1 BATHROOM 60W
- 1 BATHROOM FAN HOMESTYLE

(SOME ROOM MAY HAVE 1 ADDITIONAL FLOOR LAMP)

TRANE CHILLER
200V 3ϕ
MODEL CGABC256AD00F3
SER J83L81208
1 COMP MOTOR 200V 3ϕ 86 RLA
3 FAN " " 200V 3ϕ 4.1 FLA each.

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • Germany

JOB 3105
SHEET NO. _____ OF _____
CALCULATED BY PMS DATE 12/17/91
CHECKED BY _____ DATE _____
SCALE _____

BASE LOADS

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB

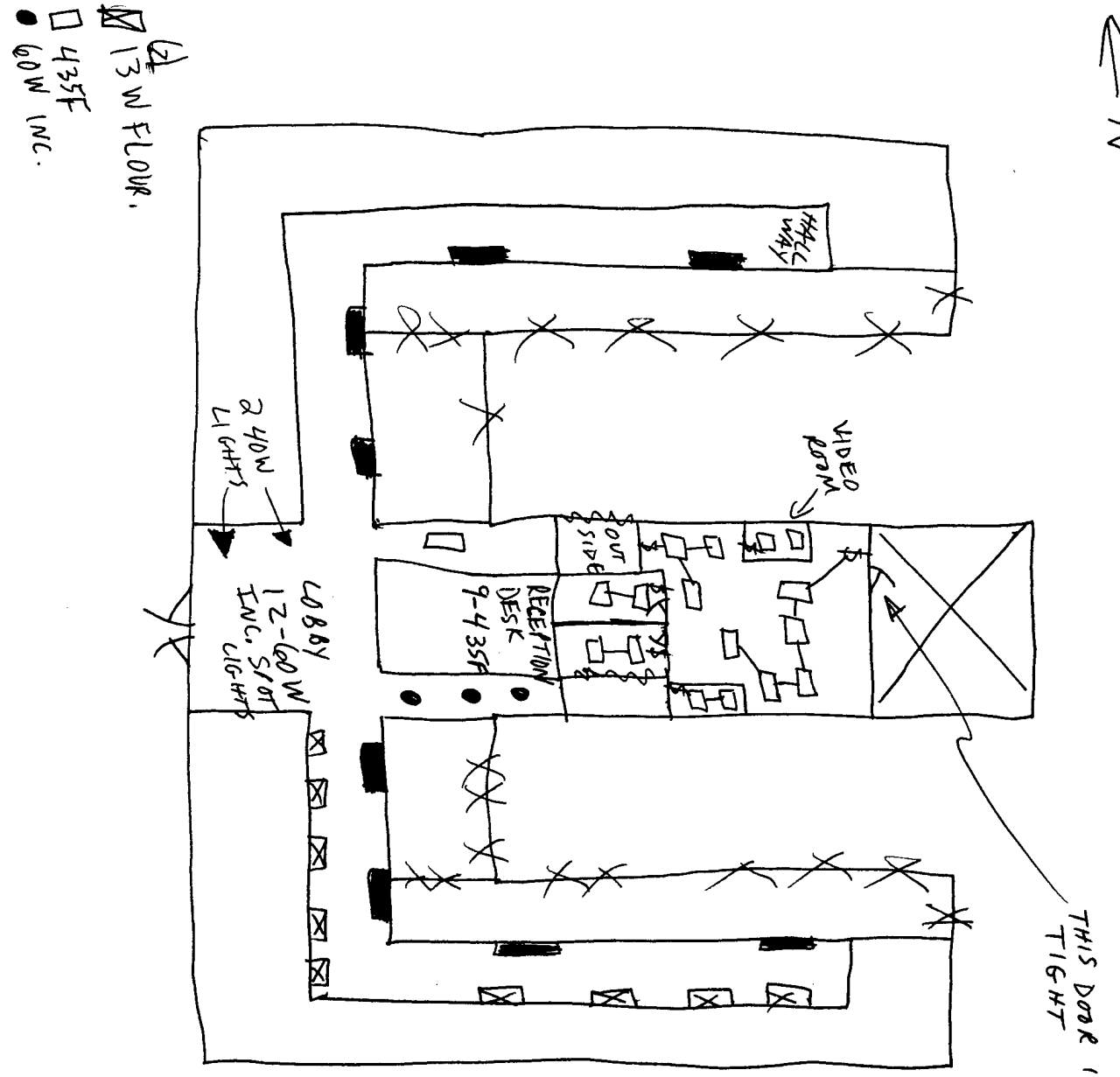
SHEET NO. OF

CALCULATED BY JW DATE

CHECKED BY DATE

SCALE

HALLWAY BDG 22
LIGHTING LAYOUT



E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB _____

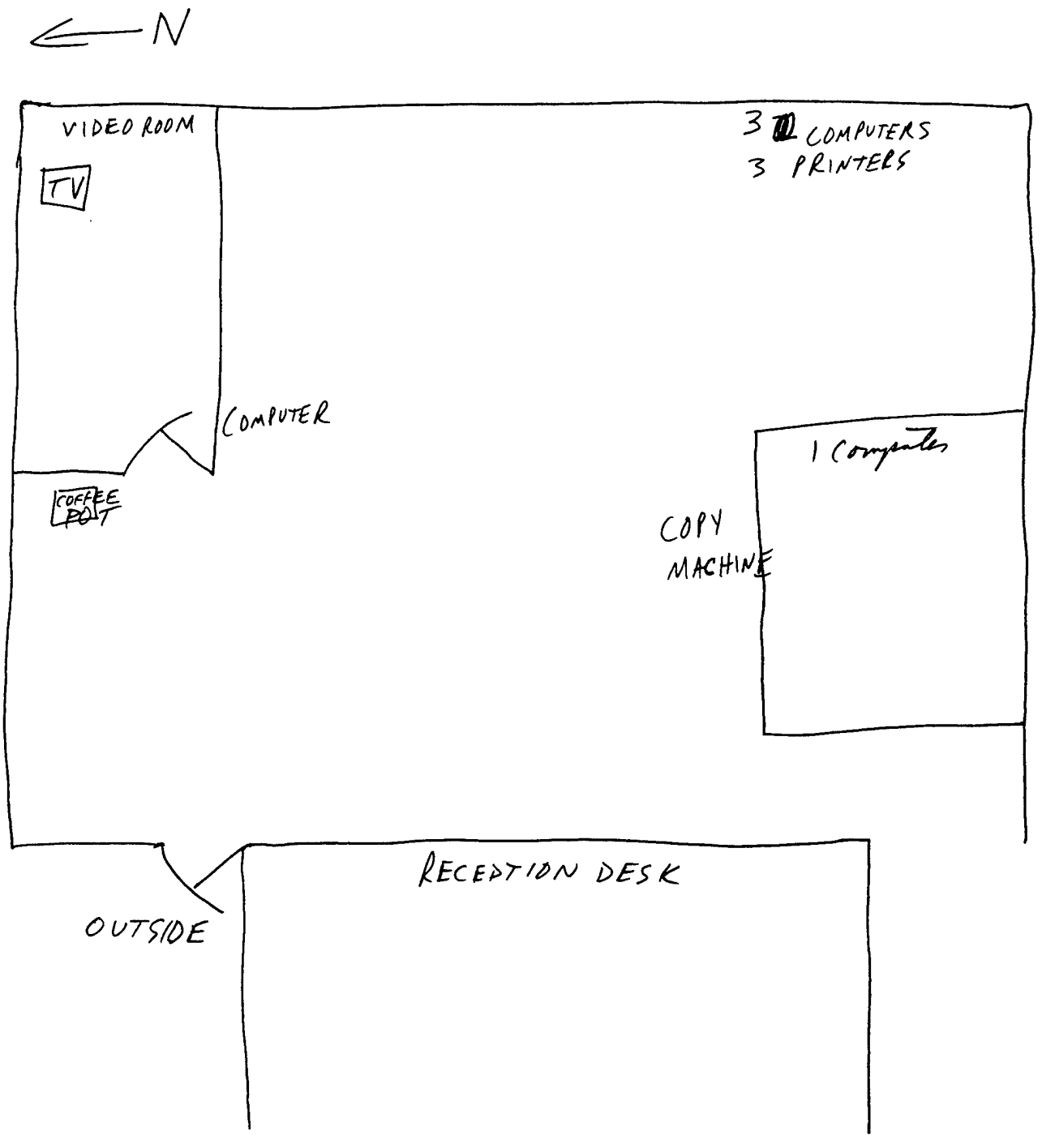
SHEET NO. _____ OF _____

CALCULATED BY JW DATE _____

CHECKED BY _____ DATE _____

SCALE _____

HEATING LOAD OF OFFICES BEHIND RECEPTION DESK



BUILDING 027

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

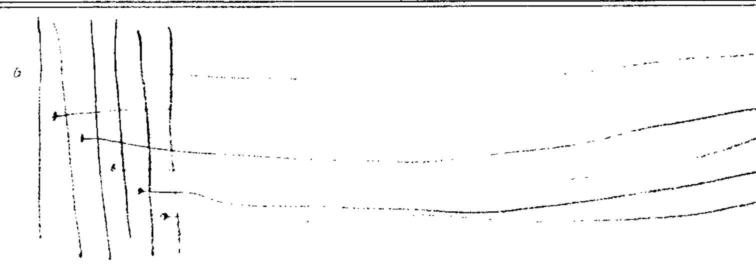
BLDG.# 27
ECO 1

JOB	Ft. McPherson/Ft. Gillem Energy Study
PROJ.#	EMC # 3105.000
SHEET NO.	OF
CALCULATED BY:	CMD
CHECKED BY:	
DATE:	

WALL & ROOF INSULATION

AREAS IN SQ. FEET	NORTH	SOUTH	EAST	WEST
WALLS				
WINDOWS				
OVERHEAD DOORS				
PERSONNEL DOORS				

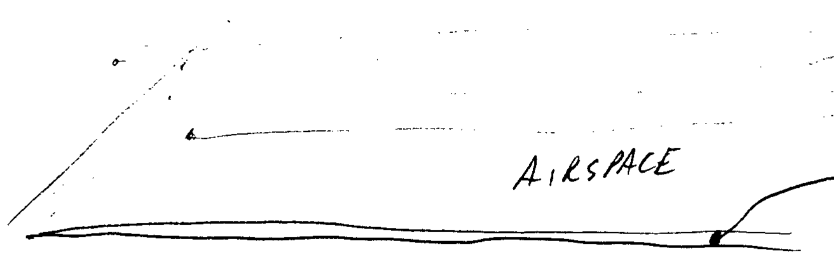
SKETCH WALL CROSS–SECTION



COMPONENTS

1. OUTSIDE AIR FILM	.17
2. Al. siding	.61
3. 1½" Polystyrene	4.17
4. 1x6 Planks	1.25
5. Framing	R-11
6. Gypboard	.45
7. INSIDE AIR FILM	.68
4" BATT INSUL	18.33

SKETCH ROOF CROSS–SECTION



COMPONENTS

1. OUTSIDE AIR FILM	.17
2. Shingles	.44
3. Plywood	1.25
4. Space	1.24
5. 6" BATT INSUL	R-19
6. GYP. CEILING	.45
7. INSIDE AIR FILM	.68
	23.23

PERSONNEL DOOR TYPE ____________

OVERHEAD DOOR TYPE ____________

BASEMENT [ ]
SLAB [ ]
CRAWL SPACE [ ]

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB Ft. McPherson/Ft. Gillem Energy Study
PROJ.# EMC # 3105.000
SHEET NO. OF
CALCULATED BY: JW
CHECKED BY:
DATE: 12/17/91

BLDG.# 27
ECO 1

PIPE INSULATION

LOCATION	PIPE DIAMETER	PIPE LENGTH	FLUID TYPE	FLUID TEMP.	AIR TEMP.	INSULATION TYPE	INSULATION THICKNESS	INSULATION CONDITION
BASEMENT	2"	200'	HOT & COLD WATER			1" FIBERGLASS	1"	GOOD

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

BLDG.# 27 & 28 ← opposite for 28
ECO 2

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: JW
CHECKED BY:
DATE: 12/17/91

WINDOWS SURVEY

WINDOW NO.	SINGLE/DOUBLE PANE	TYPE–SLIDING FIXED, CASEMENT	FRAME MAT'L	ORIENTATION	GLASS SHADING	WINDOW COVER	DIMENSIONS (INCH)
28	DOUBLE	SLIDING	METAL	W	NONE	BLINDS	40X54
21	"	"	WOOD	E	"	"	"
4	"	"	"	N	"	"	"
5	"	"	"	S	"	"	"

COMMENTS: WINDOWS ARE IN GOOD CONDITION

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO. ____ OF ____
CALCULATED BY: JW
CHECKED BY: ____
DATE: 12/17/91

BLDG.# 27 APPT. #2
ECO 3

WEATHERSTRIPING AND CAULKING

DOOR\ WINDOW	CONDITION OF W.S./CAULK	INFILTRATION	ORIENTATION	DIMENSIONS (INCH)	#
Whole Bldg ⇒ W	EXCEL	NONE	W	40x54	
Appt-2 ① D	GOOD	LOW	S	33x80	1
Appt-2 ② D	POOR	LOW	E	33x80	1

COMMENTS: THIS BUILDING IS FULLER IN SUMMER THAN WINTER. ① THIS DOOR OPENS TO HALLWAY. ② THIS DOOR OPENS TO BACK PARKING LOT. IT HAS LARGE AIR GAP BUT ALSO HAS STORM DOOR WITH MED/LOW INFILTRATION.

TOTAL DOORS OPENING OUT/BLDG = 5

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: KC
CHECKED BY:
DATE: 12-18-91

BLDG.# 27
ECO 4

DOMESTIC HOT WATER

FAUCET LOCATION	WATER TEMPERATURE
Apt 2. Kitchen	128
Apt 2 Bathroom	127
Apt 1 Kitchen	130
Apt 1 Bathroom	129
PROBLEMS:	

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: KC
CHECKED BY:
DATE:

BLDG.# 27
ECO 5

MOTORS

MOTOR # 1 HP 1/2 PH 1 RPM 1745
MODEL # 6-332730-02 VOLTS 115/230 AMPS 18/9
SERIAL # PRESENT HR. TO
MFG CENTURY REQUIRED HR. TO
FRAME P145JM EFF.
DESCRIPTION DTW COMMENTS MAKE LOUD NOISE

MOTOR # 2 HP 1/4 PH 1 RPM 1725
MODEL # M95171 VOLTS 115 AMPS 4.9
SERIAL # PRESENT HR. TO
MFG BELL GOSSETT REQUIRED HR. TO
FRAME EFF.
DESCRIPTION BOILE HW CIR. PUMP COMMENTS RUN WHEN BOILER FIRED

MOTOR # 3 HP 1/12 PH 1 RPM 1725
MODEL # M091814-90 VOLTS 115V AMPS 1.75
SERIAL # PRESENT HR. TO
MFG BELL GOSSETT REQUIRED HR. TO
FRAME EFF.
DESCRIPTION DHW CIR. COMMENTS DHW ~~BOILER~~ UNIT.

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: LLC
CHECKED BY:
DATE: 12-18-91

BLDG.# 27
ECO 8

FLOW RESTRICTIONS

SHOWERHEADS	SHOWERS/DAY	NO. OF PEOPLE	PRESENT GPM (QTS/SEC)	GPM w/ LOW-FLOW (QTS/SEC)	LOCATION
1	1	5 or 6	5 - 30	3 / 30	Bathroom Apt 2

FAUCETS	NO. OF PEOPLE	PRESENT GPM OZ.\SEC.	GPM w/ LOW FLOW RESTR.	LOCATION
2	5 or 6	24 / 5	12 / 5	Bathroom & kitchen. Apt. 2

COMMENTS: Total of 6 unit in this building. Stay about 60% occupied.
5 - The unit is 3 - bed room. 1 shower 2 faucets
1 - " —— " 2 " — " 1 shower 2 faucets

BUILDING 028

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: KK
CHECKED BY:
DATE: 12-18-91

BLDG.# 28
ECO 4

DOMESTIC HOT WATER

FAUCET LOCATION	WATER TEMPERATURE
Apt 1 Kitchen	148
Apt 1 Bathroom	149
PROBLEMS:	

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: KC
CHECKED BY:
DATE: 12-18-91

BLDG.# 28
ECO 8

FLOW RESTRICTIONS

SHOWERHEADS	SHOWERS/DAY	NO. OF PEOPLE	PRESENT GPM (QTS/SEC)	GPM w/ LOW-FLOW (QTS/SEC)	LOCATION
1		5	6-30	3-30	Apt 1

FAUCETS	NO. OF PEOPLE	PRESENT GPM OZ.\SEC.	GPM w/ LOW FLOW RESTR.	LOCATION
		20-5	6-5	Apt 1

COMMENTS:
- There are 6 units in this building
- 5 are 3 bedrooms, 1 is 2 bedrooms
- all rooms has 2 faucets & 1 shower.

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB
SHEET NO. OF
CALCULATED BY JW DATE
CHECKED BY DATE
SCALE

BLDG 28

THERE ARE 6 APPARTMENTS / BLDG.
APPT #1 HAS EAST MAIN DOOR OPENING TO OUTSIDE WITH NO STORM DOOR.

THE ~~CRACK~~ WEATHERSTRIP IS PRESENT BUT DOOR DOES NOT CLOSE TOUCHING WEATHERSTRIP, CAUSING ~~AIR~~/HIGH INFILTRATION.

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____

SHEET NO. _____ OF _____

CALCULATED BY KC DATE 12-17-91

CHECKED BY _____ DATE _____

SCALE _____

Bldg 28

- HW and CW PROVIDED FROM BLDG. 27.
- MECH. ROOM HAS ONLY DOMESTIC HW & HW TANK & CIR. PUMP.
- PIPE INSULATION IN SAME CONDITION AS BLDG 27

GENERAL

- BLDG. IS IDENTICAL TO 27.

HOURS = 0-2400 (APARTMENTS)

BUILDING 040

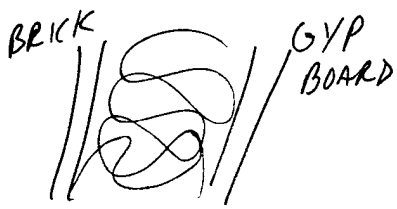
EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

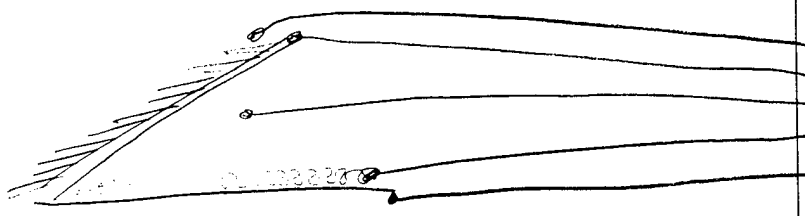
JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: JW
CHECKED BY:
DATE: 12/16/91

BLDG.# 40
ECO 1

WALL & ROOF INSULATION

AREAS IN SQ. FEET	NORTH	SOUTH	EAST	WEST
WALLS				
WINDOWS				
OVERHEAD DOORS				
PERSONNEL DOORS				

SKETCH WALL CROSS-SECTION	COMPONENTS	
	1. OUTSIDE AIR FILM 2. BRICK 3. R-11 4. GYP BOARD 5. 6. 7. INSIDE AIR FILM	.17 1.24 11 0.45 .68 13.54

SKETCH ROOF CROSS-SECTION	COMPONENTS	
	1. OUTSIDE AIR FILM 2. SHINGLES 3. ½" PLYWOOD 4. AIR SPACE 5. R-11 6. DROP CEILING 7. INSIDE AIR FILM	.17 .44 .62 1.24 11 .45 .68 14.6

PERSONNEL DOOR TYPE	BASEMENT [ ]
OVERHEAD DOOR TYPE	SLAB [ ]
	CRAWL SPACE [ ]

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: KC
CHECKED BY:
DATE: 12-16-91

BLDG.# 40
ECO 1

DUCT INSULATION

LOCATION	DUCT CROSSECTION	SHAPE	DUCT TEMP. (°F)	SURROUND AIR TEMP. (°F)	INSULATION TYPE	INSULATION THICKNESS	INSULATION CONDITION
	NO DUCT - 2-PIPE FANCOIL						

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: CMD
CHECKED BY:
DATE: 12-16-91

BLDG.# 40
ECO 1

PIPE INSULATION

LOCATION	PIPE DIAMETER	PIPE LENGTH	FLUID TYPE	FLUID TEMP.	AIR TEMP.	INSULATION TYPE	INSULATION THICKNESS	INSULATION CONDITION
Mech Rm ↓	4"	50'	HW		55°	Rubber	1/2"	FAIR
	1.5"	200'	HW		55°	Fiberglass	.75"	FAIR
	5"	35'	STM		"	Fiberglass	1"	
	1"	20'	STM		"		1"	
	4.5"	75'	CW		"		1/2"	
	3"	39	CW		"	SOLID FOAM	2"	

COMMENTS: BASEMENT — Pump Housing ; joint, coupling need insulation

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

BLDG.# 40
ECO 2

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: JW
CHECKED BY:
DATE: 12/16/91

WINDOWS SURVEY

WINDOW NO.	SINGLE/DOUBLE PANE	TYPE–SLIDING FIXED, CASEMENT	FRAME MAT'L	ORIENTATION	GLASS SHADING	WINDOW COVER	DIMENSIONS (INCH)
1-13	SINGLE	SLIDE	WOOD	S	NONE ~~CURTAINS~~	CURTAINS	40x73
1-22	"	"	"	E	"	"	"
~~#~~13	"	"	"	N	"	"	"
18	"	"	"	W	"	"	64x80

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO. ____ OF ____
CALCULATED BY: JW
CHECKED BY: ____
DATE: 12/16/91

BLDG.# 40
ECO 3

WEATHERSTRIPING AND CAULKING

DOOR\ WINDOW	CONDITION OF W.S./CAULK	INFILTRATION	ORIENTATION	DIMENSIONS (INCH)	#
W	NONE	LOW	S	40x73	13
D	NONE	MED	S	72x30	1
W	NONE	LOW	E	40x73	22
D	NONE	HIGH	N	72x30	1
W	NONE	LOW	N	40x73	13
W	NONE	LOW	W	64x80	18
D	"	"	W	60x84	3
D	"	"	W	~~36x84~~ 34x84	2

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB	Ft. McPherson/Ft. Gillem Energy Study
PROJ.#	EMC # 3105.000
SHEET NO.	OF
CALCULATED BY:	CMD
CHECKED BY:	
DATE:	12-16-91

BLDG.# 40
ECO 4

DOMESTIC HOT WATER

FAUCET LOCATION	WATER TEMPERATURE
1ST FLOOR KITCHEN	131 °F
BASEMENT RESTROOM	129°F
PROBLEMS:	

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: ____ OF ____
CALCULATED BY: RC
CHECKED BY: ____
DATE: 12-16-91

BLDG.# 40
ECO 5

MOTORS

MOTOR # 1 | HP 3 | PH 3 | RPM 1740
MODEL # F-4542-00-471 | VOLTS 230 | AMPS 9.2
SERIAL # ____ | PRESENT HR. 0 | TO 2400
MFG UNICLOSED MOTOR | REQUIRED HR. ____ | TO ____
FRAME 182T | EFF. ____
DESCRIPTION DTW PUMP MANUAL CHANGEOVER | COMMENTS ____

MOTOR # 2 | HP 1/5 ? | PH 1 | RPM ____
MODEL # ____ | VOLTS 115V | AMPS ?
SERIAL # ____ | PRESENT HR. ____ | TO ____
MFG BELL GOSSETT | REQUIRED HR. ____ | TO ____
FRAME ____ | EFF. ____
DESCRIPTION HW CIRCULATOR | COMMENTS NOT RUNNING - OLD.

MOTOR # ____ | HP ____ | PH ____ | RPM ____
MODEL # ____ | VOLTS ____ | AMPS ____
SERIAL # ____ | PRESENT HR. ____ | TO ____
MFG ____ | REQUIRED HR. ____ | TO ____
FRAME ____ | EFF. ____
DESCRIPTION ____ | COMMENTS ____

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: EMD
CHECKED BY:
DATE: 12-13-94

BLDG.# 40
ECO 8

FLOW RESTRICTIONS

SHOWERHEADS	SHOWERS/DAY	NO. OF PEOPLE	PRESENT GPM (QTS/SEC)	GPM w/ LOW-FLOW (QTS/SEC)	LOCATION
~~8~~ 16	2	~~35~~ 30	3.25	1.25	

FAUCETS	NO. OF PEOPLE	PRESENT GPM OZ.\SEC.	GPM w/ LOW FLOW RESTR.	LOCATION
3		4? 7	2?/15	1st Floor KITCHEN

COMMENTS:

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO. _____ OF _____
CALCULATED BY: C.W.D
CHECKED BY: _____
DATE: 12-16-9

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 40 BLDG NAME: _____ JOB: 3105.000
PRIMARY FUNCTION: _____ GROSS SQ FT _____ NO OF FLRS _____
BUILDING MANAGER NAME: _____
PHONE: _____ OFFICE NO. _____
SPECIAL AREAS: COMPUTER FACILITY [ ] - ZONE NO'S. _____
AUDITORIUM [ ] - ZONE NO'S. _____
LABORATORIES [ ] - ZONE NO'S. _____
CAFETERIA [ ] - ZONE NO'S. _____
OTHER [ ] _____ - ZONE NO'S. _____
ZONE NO. 1 FUNCTION: _____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: 1st Floor (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F ____ TO ____, SAT ____ TO ____, SUN ____ TO ____
PRESENT TEMP: WINTER OCC 66.7 °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F
REQUIRE TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F

REMARKS: _____

ZONE NO. 2 FUNCTION: _____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: 2nd Floor (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F ____ TO ____, SAT ____ TO ____, SUN ____ TO ____
PRESENT TEMP: WINTER OCC 66.4 °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F
REQUIRE TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F

REMARKS: _____

ZONE NO. _____ FUNCTION: _____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: _____ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F ____ TO ____, SAT ____ TO ____, SUN ____ TO ____
PRESENT TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F
REQUIRE TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F

REMARKS: _____

ZONE NO. _____ FUNCTION: _____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: _____ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F ____ TO ____, SAT ____ TO ____, SUN ____ TO ____
PRESENT TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F
REQUIRE TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F

REMARKS: _____

BUILDING 041

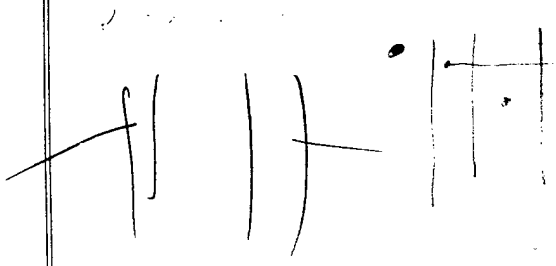
EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

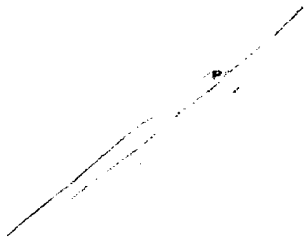
JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY:
CHECKED BY:
DATE:

BLDG.# 41
ECO 1

WALL & ROOF INSULATION

AREAS IN SQ. FEET	NORTH	SOUTH	EAST	WEST
WALLS				
WINDOWS				
OVERHEAD DOORS	0	0	0	0
PERSONNEL DOORS				

SKETCH WALL CROSS–SECTION	COMPONENTS	
	1. OUTSIDE AIR FILM	.17
	2. Brick	1.24
	3. R-5 rigid	1.60
	4.	
	5.	
	6.	
	7. INSIDE AIR FILM	.68

SKETCH ROOF CROSS–SECTION	COMPONENTS	
	1. OUTSIDE AIR FILM	.17
	2. Shingles	.44
	3. Plywood	.62
	4. Air Space	1.24
	5. R-19 insulation	19.0
	6. Drop ceiling	.45
	7. INSIDE AIR FILM	.68
		22.60

PERSONNEL DOOR TYPE: wood	BASEMENT [ ]
OVERHEAD DOOR TYPE:	SLAB [ ]
	CRAWL SPACE [✓]

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: KC
CHECKED BY:
DATE: 12-16-91

BLDG.# 41
ECO 1

PIPE INSULATION

LOCATION	PIPE DIAMETER	PIPE LENGTH	FLUID TYPE	FLUID TEMP.	AIR TEMP.	INSULATION TYPE	INSULATION THICKNESS	INSULATION CONDITION
MECH. RM	1/2 ACCU REF. LINE.	75'	DX	NOT OP.	55°F	NONE	NONE	
BOILER RM	3"	150'	HW			RUBBER	1/2"	
↓	2"	60'	HW			RUBBER	1/2"	

COMMENTS: GOOD CONDITION INSULATION

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: RC
CHECKED BY:
DATE: 12-16-91

BLDG.# 41
ECO 1

DUCT INSULATION

LOCATION	DUCT CROSSECTION	SHAPE	DUCT TEMP. (°F)	SURROUND AIR TEMP. (°F)	INSULATION TYPE	INSULATION THICKNESS	INSULATION CONDITION
MECH RM	24"X24"	□	65°F	55°F	FIBERGLASS	3/4"	GOOD

COMMENTS: AHU HAS OA DAMPER SET TO OPEN IF OA 60°F

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY:
CHECKED BY:
DATE:

BLDG.# 41
ECO 2

WINDOWS SURVEY

WINDOW NO.	SINGLE/DOUBLE PANE	TYPE–SLIDING FIXED, CASEMENT	FRAME MAT'L	ORIENTATION	GLASS SHADING	WINDOW COVER	DIMENSIONS (INCH)
	Double	Sliding	Al	E	None	Blinds	81 x 32
	Type F 8						
	"	"	"	S	"	"	"
	Type of 9						
	" Type of 10	"	"	N	"	"	"
	"	"	"	W	"	"	"
	Type of 16						

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO. ____ OF ____
CALCULATED BY: JW
CHECKED BY: ____
DATE: 12/16/91

BLDG.# 41
ECO 3

WEATHERSTRIPING AND CAULKING

DOOR\ WINDOW	CONDITION OF W.S./CAULK	INFILTRATION	ORIENTATION	DIMENSIONS (INCH)	No.
W	GOOD	LOW	~~0~~E	81 X 32"	8
W			S		9
W			N		10
W			W		16
① D	FAIR	LOW & MED HIGH	E & W	78 X 58	~~0~~ 2
2 D	~~POOR~~ Good	~~0~~ HIGH	W	87 X 34	2
D	Good		W	83 X 36	1
D	GOOD	MED HIGH	N	81 X 35	1
D	Good	LOW	E	82 X 35	1

COMMENTS: ① West D. 1/4" Gap at bottom of door ② HIGH INFILTRATION GAP DUE TO WARPED DOOR.

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB	Ft. McPherson/Ft. Gillem Energy Study
PROJ.#	EMC # 3105.000
SHEET NO.	OF
CALCULATED BY:	CMS
CHECKED BY:	
DATE:	12-13-94

BLDG.# 41
ECO 4

DOMESTIC HOT WATER

FAUCET LOCATION	WATER TEMPERATURE
1st Floor Restroom	154°F
2nd Floor Restroom	148 °F
PROBLEMS:	

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY:
CHECKED BY:
DATE:

BLDG.# 41
ECO 5

MOTORS

MOTOR # 4 HP 1/2 PH 1Ø RPM 1725
MODEL # M80067 VOLTS 115 AMPS 5.2
SERIAL # PRESENT HR. TO
MFG BELL GROSETT REQUIRED HR. TO
FRAME EFF.
DESCRIPTION HWP COMMENTS

MOTOR # 5 HP 0.5 PH 1 RPM 1725
MODEL # CJL1304A VOLTS 115V AMPS 8.4
NOT RUNNING
SERIAL # W2-91 PRESENT HR. TO
MFG BALDOR REQUIRED HR. TO
.62PF
FRAME 56J EFF.
DESCRIPTION CWS COMMENTS

MOTOR # 6 HP 0.5 PH 1 RPM 1725
MODEL # CJL1304A VOLTS 115 AMPS 8.4
SERIAL # PRESENT HR. TO
MFG BAL REQUIRED HR. TO
FRAME 56J EFF. .62 PF
DESCRIPTION CWR COMMENTS NOT RUNNING.

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: KC
CHECKED BY:
DATE: 12-16-~~91~~

BLDG.# 41
ECO 5

MOTORS

MOTOR #	1	HP	1/3	PH	1	RPM	
MODEL #		VOLTS	200	AMPS	3.7 T'STAT		
SERIAL #		PRESENT HR.		0	TO	2400	
MFG	TRANE PACKAGE	REQUIRED HR.			TO		
FRAME		EFF.					
DESCRIPTION	AHU FAN MOTOR MECH ROOM	COMMENTS					

MOTOR #	2, 3	HP	1	PH	3	RPM	
MODEL #		VOLTS	200V	AMPS	3.5		
SERIAL #		PRESENT HR.			TO		
MFG	EDPAC UNIT	REQUIRED HR.			TO		
FRAME		EFF.					
DESCRIPTION	AHU FOR LIBRARY BOOKS AND SMALL OFFICE	COMMENTS					

MOTOR #	~~#~~ 7	HP	1/2	PH	3	RPM	1750
MODEL #	M800 37-~~AA~~88	VOLTS	200	AMPS	~~3~~ 1.8		
SERIAL #		PRESENT HR.			TO		
MFG	BELL GOSSETT	REQUIRED HR.			TO		
FRAME		EFF.					
DESCRIPTION	CWP CIRCULATION	COMMENTS	NEXT TO CHILLER				

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: KC
CHECKED BY:
DATE: 12-16-91

BLDG.# 47
EC0 15

LIGHTING

ROOM #	# OF FIXTURES	LAMPS/ FIXTURE	WATTS/ BULB	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCC. SENSOR	NO. OF SWITCHES	UNOCC LIGHTS ON
1	2	4	34	FLOR	OFF	Y	Y	2	NO
2	2	4	34	FLOR	ON	Y	Y	1	NO
3	4	4	34	FLOR	ON	Y	N	1	NO
4	3	4	34	FLOR	ON	Y	Y	1	NO
5	4	4	34	FLOR	ON	Y	Y	2	NO
6	5	1	60	INC.	ON	Y	N	2	—
7	2	4	34	FLOR	ON	Y	N	1	NO
8	6	4	34	FLOR	OFF	Y	N	1	NO
9	2	4	34	↓	ON	Y	Y	1	NO
10	2	4	34	↓	ON	Y	Y	1	NO
11	1	4	34	↓	ON	Y	N	2	—
12	20	4	34	↓	OFF	Y	N	2	NO
13	3	4	34	FLOR	ON	Y	Y	1	NO
14	3	4	34	↓	ON	Y	Y	1	↓
15	1	1	60	INC	ON	Y	Y	1	
16	1	1	60	↓	ON	Y	Y	1	
17	1	1	60	↓	OFF	Y	Y	1	
18	4	4	34	FLOR	OFF	Y	N	1	↓

OF EXIT SIGNS – 3

COMMENTS: FIRST FLOOR

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: KC
CHECKED BY:
DATE: 12-16-91

BLDG.# 41
EC0 15

LIGHTING

ROOM #	# OF FIXTURES	LAMPS/ FIXTURE	WATTS/ BULB	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCC. SENSOR	NO. OF SWITCHES	UNOCC LIGHTS ON
19	2	4	34	FLOR.	ON	Y	Y	1	NO
20	4	4	34	FLOR.	ON	Y	N	1	NO
21	6	4	34	↓	ON	Y	N	1	NO
22	3	1	60	INC.	ON	Y	N	1	—
23	5	4	34	FLOR.	ON	Y	N	2	—
24	2	4	34	↓	ON	Y	Y	1	No
25	2	4	34	↓	OFF	Y	Y	1	NO

OF EXIT SIGNS – 1

COMMENTS: SECOND FLOOR

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO. _____ OF _____
CALCULATED BY: CMO
CHECKED BY: _____
DATE: 12-13-91

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 41 BLDG NAME: Admin JOB: 3105.000
PRIMARY FUNCTION: _____ GROSS SQ FT _____ NO OF FLRS 2
BUILDING MANAGER NAME: _____
PHONE: _____ OFFICE NO. _____
SPECIAL AREAS: COMPUTER FACILITY [ ] - ZONE NO'S. _____
AUDITORIUM [ ] - ZONE NO'S. _____
LABORATORIES [ ] - ZONE NO'S. _____
CAFETERIA [ ] - ZONE NO'S. _____
OTHER [ ] _____ - ZONE NO'S. _____

ZONE NO. 1 FUNCTION: _____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: 1st Floor (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F 730 TO 1630, SAT ____ TO ____, SUN ____ TO ____
PRESENT TEMP: WINTER OCC 80.9 °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F
REQUIRE TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F

REMARKS: _____

ZONE NO. 2 FUNCTION: _____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: 2nd Floor (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F 730 TO 1630, SAT ____ TO ____, SUN ____ TO ____
PRESENT TEMP: WINTER OCC 74.4 °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F
REQUIRE TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F

REMARKS: _____

ZONE NO. _____ FUNCTION: _____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: _____ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F ____ TO ____, SAT ____ TO ____, SUN ____ TO ____
PRESENT TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F
REQUIRE TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F

REMARKS: _____

ZONE NO. _____ FUNCTION: _____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: _____ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F ____ TO ____, SAT ____ TO ____, SUN ____ TO ____
PRESENT TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F
REQUIRE TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F

REMARKS: _____

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB Ft. McPherson/Ft. Gillem 3105-000

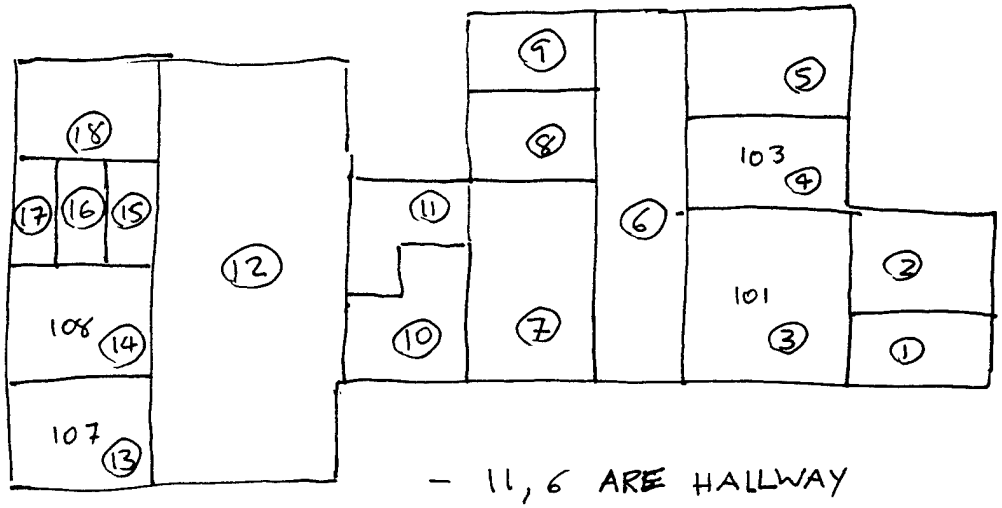
SHEET NO. _____ OF _____

CALCULATED BY KC DATE 12-16-91

CHECKED BY _____ DATE _____

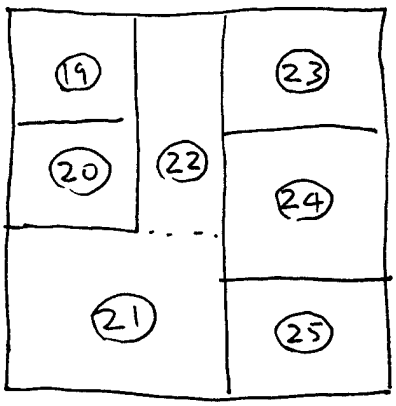
SCALE _____

FIRST FLOOR



- 11, 6 ARE HALLWAY
- 12 IS A CORTROOM

SECOND FLOOR



BUILDING 042

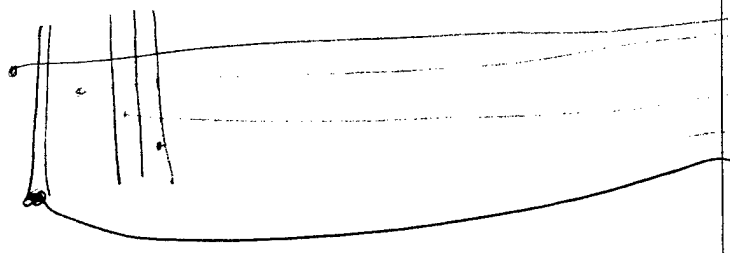
EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

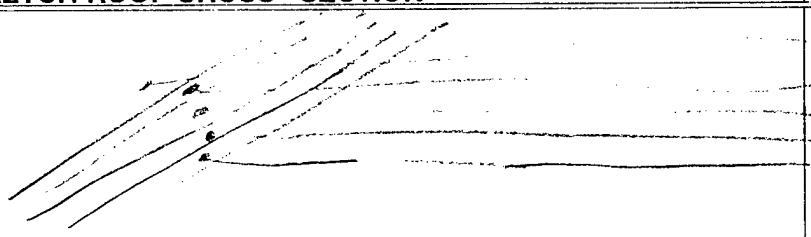
JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: CMD
CHECKED BY:
DATE:

BLDG.# 42
ECO 1

WALL & ROOF INSULATION

AREAS IN SQ. FEET	NORTH	SOUTH	EAST	WEST
WALLS				
WINDOWS				
OVERHEAD DOORS				
PERSONNEL DOORS				

SKETCH WALL CROSS–SECTION	COMPONENTS	
	1. OUTSIDE AIR FILM	.17
	2. BRICK 4 12"	1.25
	3. [illegible]	
	4. GYP BOARD	.45
	5. 4" BATT INSUL	11
	6. [illegible] INSUL	.68
	7. INSIDE AIR FILM	13.55

SKETCH ROOF CROSS–SECTION	COMPONENTS	
	1. OUTSIDE AIR FILM	.17
	2. Shingles	.44
	3. Plywood	.62
	4. 6" R-19 Fiberglass	19
	5. GYP BOARD	.45
	6. AIR SPACE	1.25
	7. INSIDE AIR FILM	.68
		22.61

PERSONNEL DOOR TYPE: _____
OVERHEAD DOOR TYPE: —

BASEMENT [ ]
SLAB [ ]
CRAWL SPACE [ ]

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO. _____ OF _____
CALCULATED BY: KC
CHECKED BY: _____
DATE: 12-16-91

BLDG.# 42
ECO 1

PIPE INSULATION

LOCATION	PIPE DIAMETER	PIPE LENGTH	FLUID TYPE	FLUID TEMP.	AIR TEMP.	INSULATION TYPE	INSULATION THICKNESS	INSULATION CONDITION
2ND FLOOR	1½ DTW TO COIL	40'	WATER		68	FIBERGLASS	1"	FAIR

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB Ft. McPherson/Ft. Gillem Energy Study
PROJ.# EMC # 3105.000
SHEET NO. OF
CALCULATED BY: KC
CHECKED BY:
DATE: 12-16-91

BLDG.# 42
ECO 1

DUCT INSULATION

LOCATION	DUCT CROSSECTION	SHAPE	DUCT TEMP. (°F)	SURROUND AIR TEMP. (°F)	INSULATION TYPE	INSULATION THICKNESS	INSULATION CONDITION
2ND FL	12"X12" SUPPLY BRANCH 8'	□	85	68	NONE		
	24"X 24" SUPPLY 10'	□	85	68	NONE		
					NONE		

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

BLDG.# 42
ECO 2

JOB Ft. McPherson/Ft. Gillem Energy Study
PROJ.# EMC # 3105.000
SHEET NO. OF
CALCULATED BY: JW
CHECKED BY:
DATE: 12/16/91

WINDOWS SURVEY

WINDOW NO.	SINGLE/DOUBLE PANE	TYPE–SLIDING FIXED, CASEMENT	FRAME MAT'L	ORIENTATION	GLASS SHADING	WINDOW COVER	DIMENSIONS (INCH)
1-6	Stain Glass w/plexi glass	SLIDE	WOOD	E	STAIN	1/8" PLEXI	84X36
1-22	SINGLE/STORM WINDOW	SLIDE	WOOD	W	BLINDS	ST. WIN.	27X60

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY:
CHECKED BY: JW
DATE: 12/16/91

BLDG.# 42
ECO 3

WEATHERSTRIPING AND CAULKING

DOOR\ WINDOW	CONDITION OF W.S./CAULK	INFILTRATION	ORIENTATION	DIMENSIONS (INCH)	#
D	NONE	LOW	N	7'X5' = 84X60	1
① W	GOOD		E	84X36	6
D	NONE	LOW	E	84X60	1
D	NONE	LOW	E	84X36	1
① W			S	72X48	1
Permenant closed D	Good	NONE	S	84X30	1
② W	Good	NONE	W	27X60	22
D	NONE	MED	N	84X30	1
③ D	NONE	HEAVY	W	84X60	1

COMMENTS: ① 1/8" Plexiglass panels over all stain glass windows
NOTE: WEST SIDE IS NEW ADDITION (WOOD WALLS, NOT BRICK)
② STORM WINDOWS ③ DOORS are broken and are not operation

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: KC
CHECKED BY:
DATE: 12-16-91

BLDG.# 42 CHAPEL
ECO 4

DOMESTIC HOT WATER

FAUCET LOCATION	WATER TEMPERATURE
KITCHEN	140°F
MEN'S ROOM	142°F
PROBLEMS: NO	

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: CMD
CHECKED BY:
DATE: 12-[illegible]-9[illegible]

BLDG.# 42
ECO 5

MOTORS

MOTOR #		HP	1.5	PH	3	RPM	1725
MODEL #		VOLTS	208	AMPS	5.3		
SERIAL #	F1085	PRESENT HR.	#	TO			
MFG	BALDOR	REQUIRED HR.		TO			
FRAME	56C	EFF.	78%				
DESCRIPTION	CHILLER CIR. PUMP	COMMENTS	# OFF WHEN SURVEYED				

MOTOR #		HP		PH		RPM	
MODEL #		VOLTS		AMPS			
SERIAL #		PRESENT HR.		TO			
MFG		REQUIRED HR.		TO			
FRAME		EFF.					
DESCRIPTION		COMMENTS					

MOTOR #		HP		PH		RPM	
MODEL #		VOLTS		AMPS			
SERIAL #		PRESENT HR.		TO			
MFG		REQUIRED HR.		TO			
FRAME		EFF.					
DESCRIPTION		COMMENTS					

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: _____ OF _____
CALCULATED BY: JW
CHECKED BY: 12/16/91
DATE: _____

BLDG.# 42
ECO 5

MOTORS

MOTOR # AHU FAN | HP 3 | PH 3 | RPM 1755
MODEL # LINCOLN | VOLTS 230/460 | AMPS 8.3/4.1
~~SERIAL #~~ FRAME: 182T | PRESENT HR. 0 | TO 2408
MFG LINCOLN | REQUIRED HR. _____ | TO _____
FRAME 182T | EFF. _____
DESCRIPTION _____ | COMMENTS NAME PLATE MISSING (REPLACEMENT MOTOR) FROM OPERATING MOTOR.

MOTOR # _____ | HP _____ | PH _____ | RPM _____
MODEL # _____ | VOLTS _____ | AMPS _____
SERIAL # _____ | PRESENT HR. _____ | TO _____
MFG _____ | REQUIRED HR. _____ | TO _____
FRAME _____ | EFF. _____
DESCRIPTION _____ | COMMENTS _____

MOTOR # _____ | HP _____ | PH _____ | RPM _____
MODEL # _____ | VOLTS _____ | AMPS _____
SERIAL # _____ | PRESENT HR. _____ | TO _____
MFG _____ | REQUIRED HR. _____ | TO _____
FRAME _____ | EFF. _____
DESCRIPTION _____ | COMMENTS _____

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO. _____ OF _____
CALCULATED BY: CMJ
CHECKED BY: _____
DATE: 12-3-91

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 42 BLDG NAME: Chapel JOB: 3105.000
PRIMARY FUNCTION: _____ GROSS SQ FT _____ NO OF FLRS _____
BUILDING MANAGER NAME: _____
PHONE: _____ OFFICE NO. _____
SPECIAL AREAS: COMPUTER FACILITY [ ] - ZONE NO'S. _____
AUDITORIUM [ ] - ZONE NO'S. _____
LABORATORIES [ ] - ZONE NO'S. _____
CAFETERIA [ ] - ZONE NO'S. _____
OTHER [ ] _____ - ZONE NO'S. _____
ZONE NO. 1 FUNCTION: _____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: SANCTUARY (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F ____ TO ____, SAT ____ TO ____, SUN ____ TO ____
PRESENT TEMP: WINTER OCC 72.3 °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F
REQUIRE TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F

REMARKS: _____

ZONE NO. 2 FUNCTION: _____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: 2nd Floor (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F ____ TO ____, SAT ____ TO ____, SUN ____ TO ____
PRESENT TEMP: WINTER OCC 70.7 °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F
REQUIRE TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F

REMARKS: _____

ZONE NO. _____ FUNCTION: _____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: _____ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F ____ TO ____, SAT ____ TO ____, SUN ____ TO ____
PRESENT TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F
REQUIRE TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F

REMARKS: _____

ZONE NO. _____ FUNCTION: _____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: _____ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F ____ TO ____, SAT ____ TO ____, SUN ____ TO ____
PRESENT TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F
REQUIRE TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F

REMARKS: _____

BUILDING 056

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____

SHEET NO. _____ OF _____

CALCULATED BY CMD DATE 12-18-91

CHECKED BY _____ DATE _____

SCALE _____

Bldg 56

DOORS, WINDOWS, INSUL. ETC,

SAME AS 58

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB	Ft. McPherson/Ft. Gillem Energy Study
PROJ.#	EMC # 3105.000
SHEET NO.	OF
CALCULATED BY:	[illegible]
CHECKED BY:	
DATE:	12-18-91

BLDG.# 56
ECO 4

DOMESTIC HOT WATER

FAUCET LOCATION	WATER TEMPERATURE
1st Floor Lair NE West Wing	140 °F
1st Floor Lair NE East Wing	138 °F
PROBLEMS:	

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: CMD
CHECKED BY:
DATE: 12-18-91

BLDG.# 56
ECO 8

FLOW RESTRICTIONS

SHOWERHEADS	SHOWERS/DAY	NO. OF PEOPLE	PRESENT GPM (QTS/SEC)	GPM w/ LOW-FLOW (QTS/SEC)	LOCATION
			–		

FAUCETS	NO. OF PEOPLE	PRESENT GPM OZ.\SEC.	GPM w/ LOW FLOW RESTR.	LOCATION

COMMENTS: SLC Bldg 58

56

CONTROLS & EQUIPMENT SAME AS 58

WEST WING

1ST FLR	ROOM	FAN COILS	2 (ON)
" "	HALL	" "	1 (ON)
2ND FLR	ROOM	" "	1 (ON) 1 (OFF)

EAST WING

SAME

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB Ft. McPherson/Ft. Gillem Energy Study
PROJ.# EMC # 3105.000
SHEET NO. OF
CALCULATED BY: CSD
CHECKED BY:
DATE: 12-18-91

BLDG.# 56
EC0 15

LIGHTING

ROOM #	# OF FIXTURES	LAMPS/ FIXTURE	WATTS/ BULB	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCC. SENSOR	NO. OF SWITCHES	UNOCC LIGHTS ON

OF EXIT SIGNS – ____

COMMENTS: SEE Bldg 58

BUILDING 058

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: CEL
CHECKED BY:
DATE: 12/18/91

BLDG.# 58
ECO 4

DOMESTIC HOT WATER

FAUCET LOCATION	WATER TEMPERATURE
1ST FLOOR BATH	136°F
PROBLEMS: NONE	

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: 1 OF
CALCULATED BY: CEL
CHECKED BY:
DATE: 12/18

BLDG.# 58
ECO 5

MOTORS

MOTOR #	NAMEPLATE	HP	est. 1/8	PH	1	RPM	3 speed
MODEL #	NOT ACCESSIBLE	VOLTS	115	AMPS	NA		
SERIAL #		PRESENT HR.	0	TO	2400		
MFG		REQUIRED HR.	0	TO	2400		
FRAME		EFF.					
DESCRIPTION	FAN COIL FANS WEST WING	COMMENTS	TYPICAL OF (5)				

MOTOR #		HP		PH		RPM	
MODEL #		VOLTS		AMPS			
SERIAL #		PRESENT HR.		TO			
MFG		REQUIRED HR.		TO			
FRAME		EFF.					
DESCRIPTION		COMMENTS					

MOTOR #		HP		PH		RPM	
MODEL #		VOLTS		AMPS			
SERIAL #		PRESENT HR.		TO			
MFG		REQUIRED HR.		TO			
FRAME		EFF.					
DESCRIPTION		COMMENTS					

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: 1 OF
CALCULATED BY: CRL
CHECKED BY:
DATE: 12/18/91

BLDG.# 58
ECO 8

WEST WING FLOW RESTRICTIONS

	SHOWERHEADS	SHOWERS/DAY	NO. OF PEOPLE	PRESENT GPM (QTS/SEC)	GPM w/ LOW-FLOW (QTS/SEC)	LOCATION
WEST 1ST FLOOR	2	1 per	person	5 - 15	3 - 30	
2ND FLOOR	4	1 "	"			

	FAUCETS	NO. OF PEOPLE	PRESENT GPM OZ.\SEC.	GPM w/ LOW FLOW RESTR.	LOCATION
WEST 1ST FLOOR	4		29/5	*	
2ND FLOOR	8				

COMMENTS:
- WATER PRESSURE IS A PROBLEM, TEMP. VARIES DEPENDING ON SINKS & TOILETS
* RESISTECTOR WOULD NOT FIT

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO. ____ OF ____
CALCULATED BY: CMD
CHECKED BY: ____
DATE: 1 8

BLDG.# 58
EC0 15

LIGHTING

EAST

ROOM #	# OF FIXTURES	LAMPS/ FIXTURE	WATTS/ BULB	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCC. SENSOR	NO. OF SWITCHES	UNOCC LIGHTS ON
121-128	1	2	34	4ft Flour	OFF	Yes	No	1	
[illegible] HALL	4	1	34	4ft Flour	ON	Yes	NO	1	
[illegible]	2	2	[illegible]	[illegible]	ON	Yes	NO	2	
[illegible] HALL	4	1	[illegible]	[illegible]	ON	Yes	No	1	
[illegible]	3	2	34	4ft Flour	ON	Yes	No	1	
[illegible]	1	2	34	4ft Flour	OFF	Yes	NO	1	
121-129	1	1	34	[illegible]	OFF	Yes	NO	1	
131-139	1	1	34	[illegible]	[illegible]	Yes	NO	1	
[illegible]	2	2	34	[illegible]	ON	NO	NO	0	
226	4	1	34	4ft Flour	ON	Yes	NO	1	
[illegible]	1	2	[illegible]	[illegible]	OFF	Yes	NO	1	
[illegible]	1	1	34	[illegible]	OFF	[illegible]	NO	1	
[illegible] HALL	4	1	34	4ft Flour	ON	Yes	NO	1	
231-237	1	2	34	4ft Flour	OFF	Yes	NO	1	
[illegible]	1	1	34	4ft Flour	[illegible]	Yes	NO	1	
[illegible]	13	1	54	INCAN	ON	Yes	NO	5	

X2

OF EXIT SIGNS – 7

COMMENTS: ~~NOTE~~ NOTE: MULT TOTAL LIGHTING X2 TO INCLUDE ~~EAST~~ WEST SIDE ALSO

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB
SHEET NO. OF
CALCULATED BY CWL DATE 12/88
CHECKED BY DATE
SCALE

58

EAST WING

1ST FLR FAN COILS OFF (2)
HALL " " ON (1)

2ND FLR FAN COILS ON (2)

WEST WING

1ST FLR FAN COIL OFF (2)
HALL " " ON (1)
2ND FLR " " ON (2)

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____
SHEET NO. _____ OF _____
CALCULATED BY _____ DATE _____
CHECKED BY _____ DATE _____
SCALE _____

EAST

— 1ST FLOOR HALLWAY
2 PIPE FAN COIL 1/8 HP, 115V, NO NAMEPLATE
3 SPEED FAN, NO VALVE ON COIL
— ROOMS
2 PIPE FAN COILS SEE CONTROL DIAGRAM
ROBERTSHAW DWG. NO. 20CS78020
2 DOWNSTAIRS
2 UPSTAIRS
— HW BASEBOARDS, NO CONTROLS

WATER TEMP 136°F

SHOWER 5 Q / ~~15~~ SEC
3 Q / 30 SEC

FAUCET 29 oz / 5 sec

> CHILLED WATER FROM BLDG 60 AIR COOLED CHILLER

> HEATING FROM CENTRAL PLANT

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

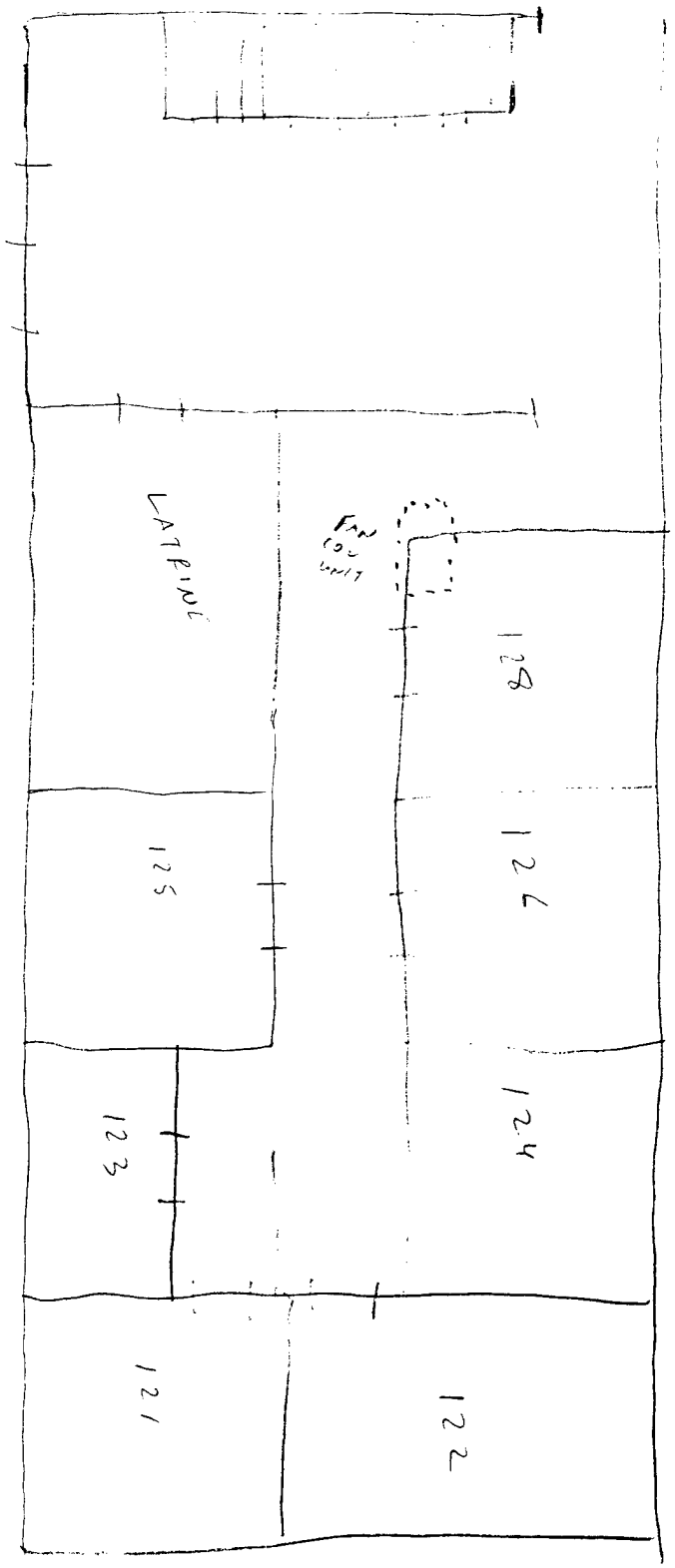
JOB _____

SHEET NO. _____ OF _____

CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____

SCALE _____



Bldg 58

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB

SHEET NO. OF

CALCULATED BY CMD DATE 12-18-91

CHECKED BY DATE

SCALE

WINDOWS 79 x 34 — 4 WEST, 56 NORTH, 4 EAST, 56 SOUTH

WOOD FRAME, SLIDING

WINDOWS ARE LEAKY

WALL SEC. - SEE Bldg 60.

DOORS 5'x7' (DOUBLE) WOOD

TYP OF 4

LARGE AIR GAPS

SEE Bldg 60 FOR TYP. ROOM EQUIPMENT (TV's STEREOS ETC.)

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____

SHEET NO. _____ OF _____

CALCULATED BY CMD DATE _____

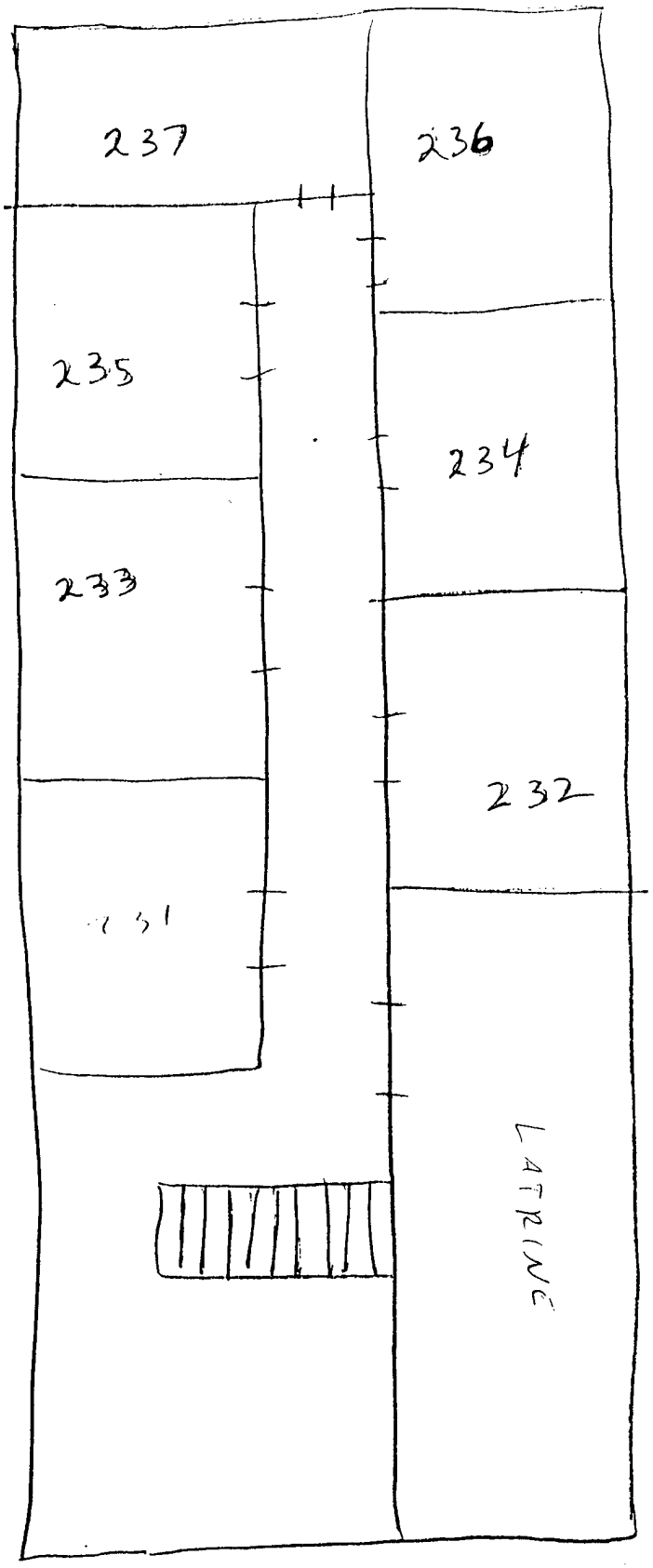
CHECKED BY _____ DATE _____

SCALE _____

2 WASHERS 120V

2 ELECTRIC DRYERS 220V

2 WATER COOLERS



Bldg 58
West Wing
West 2nd
Floor

3105
18-91
BY: CMD

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

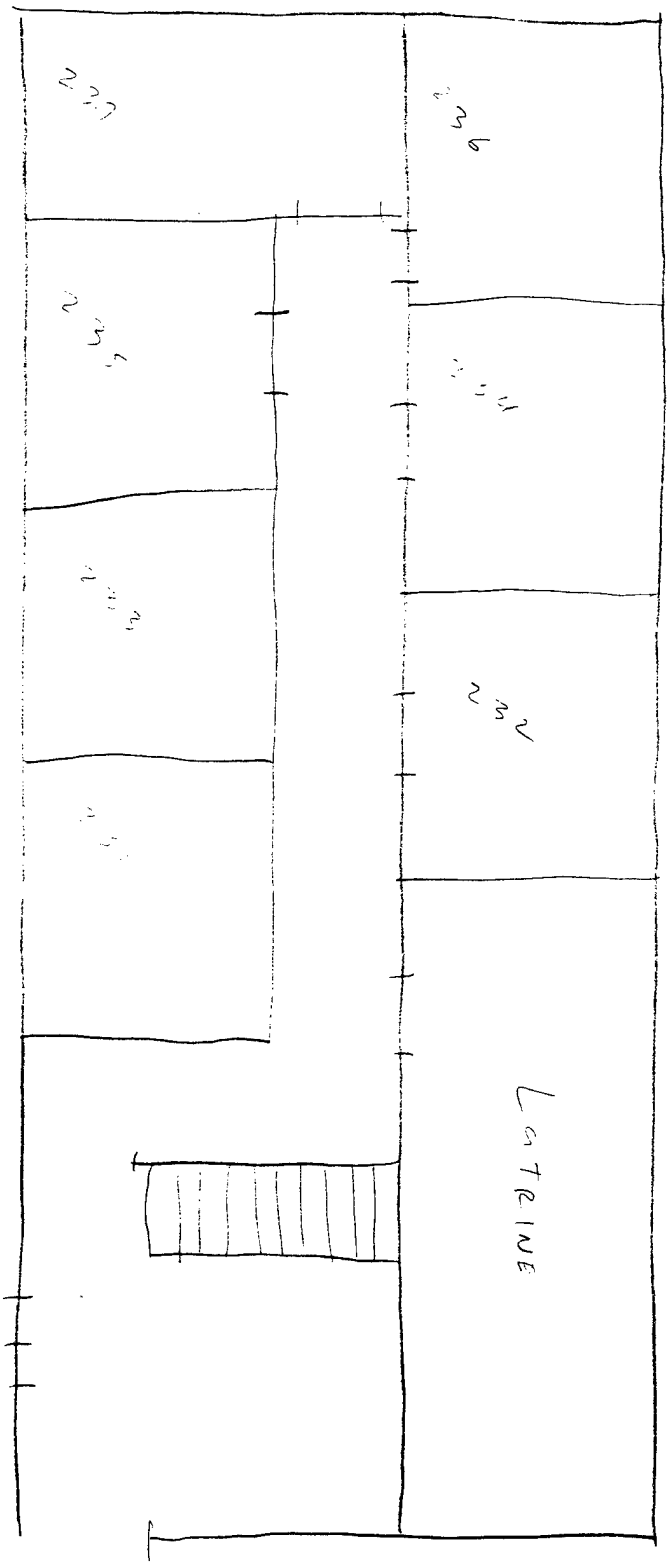
JOB _____

SHEET NO. _____ OF _____

CALCULATED BY CMD DATE 12-13-91

CHECKED BY _____ DATE _____

SCALE _____



BLDG 58
WEST WING
EAST 2ND FLOOR

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

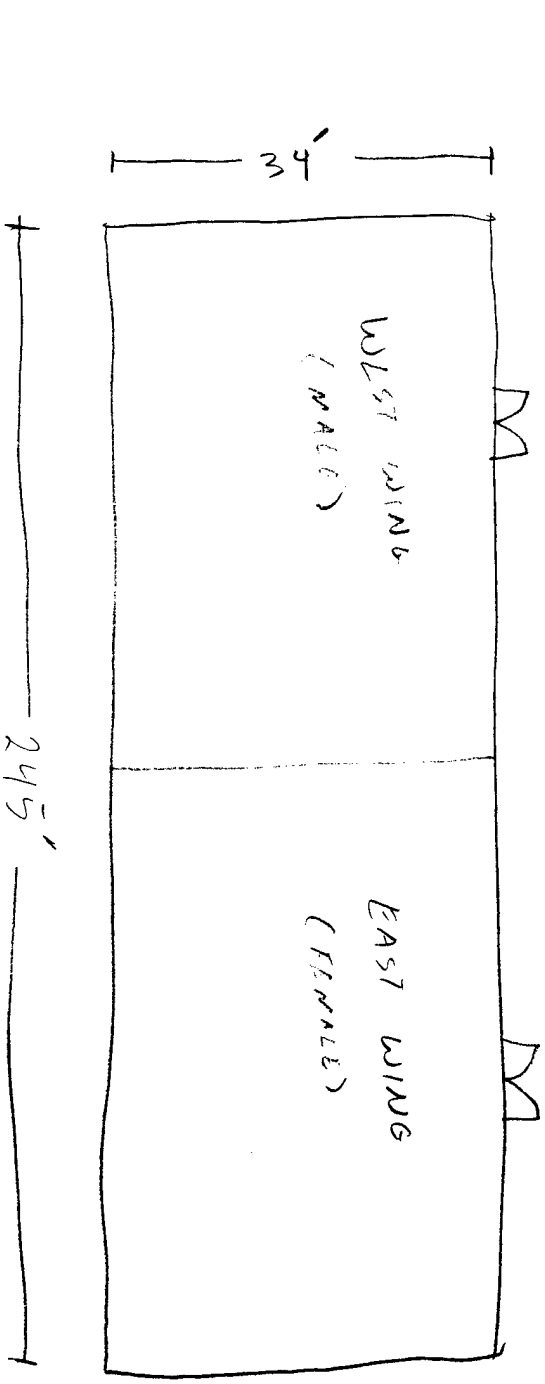
JOB _____

SHEET NO. _____ OF _____

CALCULATED BY CWD DATE 12-18-91

CHECKED BY _____ DATE _____

SCALE _____



EAST WING
MIRROR OF
WEST WING

24'
HEIGT

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

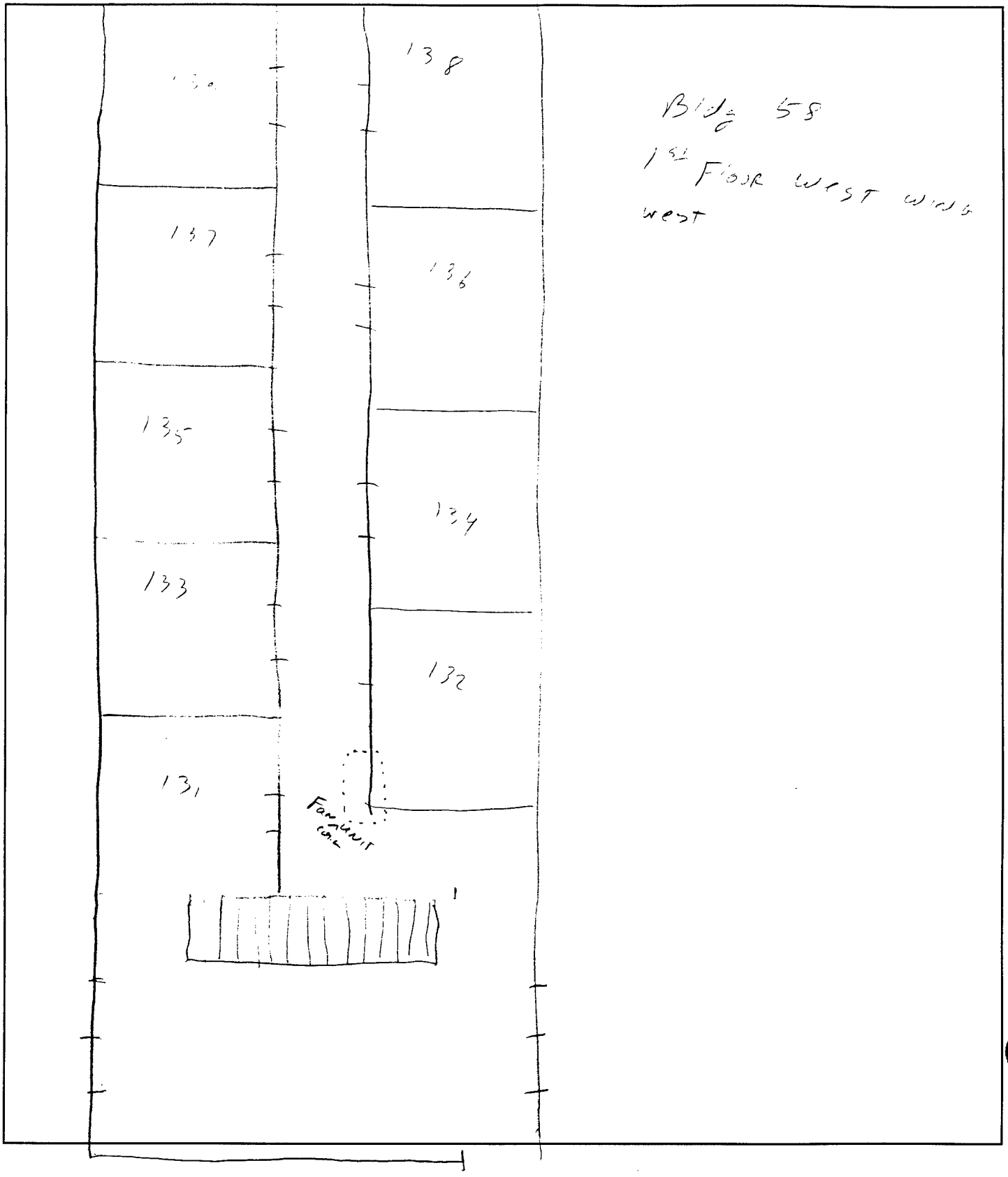
JOB _____

SHEET NO. _____ OF _____

CALCULATED BY CMV DATE 12-18-9

CHECKED BY _____ DATE _____

SCALE _____



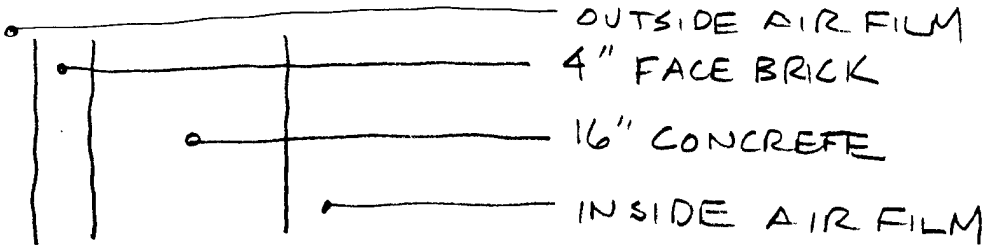
BUILDING 060

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB
SHEET NO. OF
CALCULATED BY CBL DATE 11/26
CHECKED BY DATE
SCALE

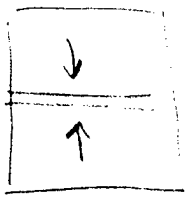
BLDG 60

WALL SECTION:

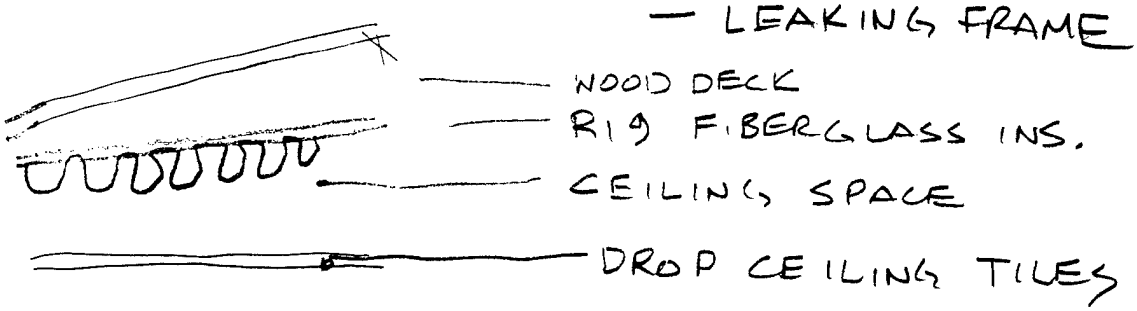


WINDOW:

SLIDING



6'-6"
- 78" x 33"
- WOOD FRAME
- SINGLE PANE
- LEAKING FRAME



DOOR:

WOOD 30" x 84"
WEATHERSTRIP 'POOR'

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB

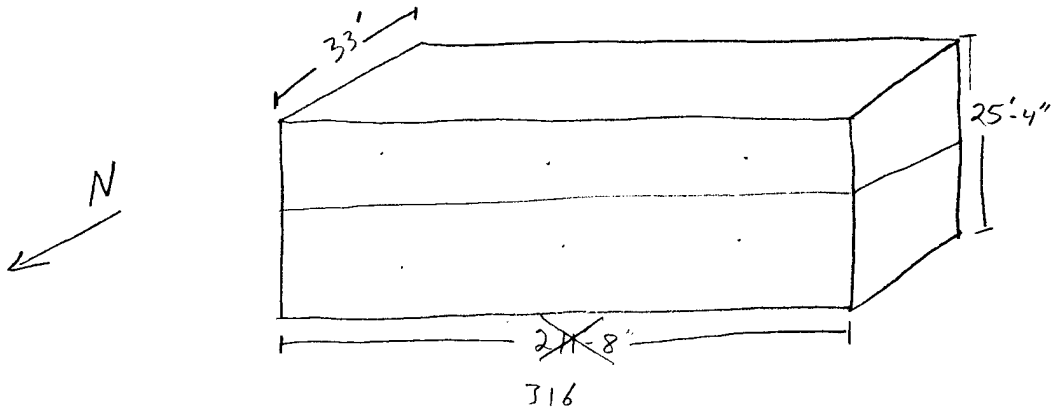
SHEET NO. OF

CALCULATED BY CMD DATE 11-26

CHECKED BY DATE

SCALE

Bldg 60



72 windows each North + South sides of Bldg.

4 windows each East + West side of Bldg.

3 double doors North side of Bldg

6 double doors South side of Bldg

No doors East or West side

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO. ____ OF ____
CALCULATED BY: JW
CHECKED BY: ____
DATE: 2/20/92

BLDG.# 60
ECO 15

167

LIGHTING

ROOM #	# OF FIXTURES	LAMPS/ FIXTURE	WATTS/ BULB	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCC. SENSOR	NO. OF SWITCHES	UNOCC LIGHTS ON
12	↓								
13	↓								
17	↓								
18									
19									
20									
14									
15									
16	↓								
21	2	2	34	F	ON	N	N	0	N
22	5/4/1	2/1	52/52/52	I	ON	Y	Y	5	N
214	1/1	2/1	34/34	F	OFF	Y	N	1	N
216	↓	↓							
217									
219									
220									
218									
215	↓	↓							

X21

OF EXIT SIGNS – ____

COMMENTS: ____

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO. _____ OF _____
CALCULATED BY: JW
CHECKED BY: _____
DATE: 2/20/92

BLDG.# 60
EC0 15

LIGHTING

ROOM #	# OF FIXTURES	LAMPS/ FIXTURE	WATTS/ BULB	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCC. SENSOR	NO. OF SWITCHES	UNOCC LIGHTS ON
1	NA								
2	2/2	2	34	F	ON	N	N	0	N
3	3	1	34	F	ON	Y	N	1	N
4	3	1	34	F	ON	Y	N	1	N
116	1/1	2/1	34/34	F/F	OFF	Y	N	1	N
118	↓								
117									
120									
122									
121									
119	↓								
5	1/1	2/1	34	F	OFF	Y	N	2	N
6	↓								
7									
8									
9									
10									
11	↓								

X2

OF EXIT SIGNS – _____

COMMENTS: _____

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: JW
CHECKED BY:
DATE: 2/20/92

BLDG.# 60
ECO 15

LIGHTING

ROOM #	# OF FIXTURES	LAMPS/ FIXTURE	WATTS/ BULB	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCC. SENSOR	NO. OF SWITCHES	UNOCC LIGHTS ON
X2 23	1/1	2/1	34	F	OFF	Y	N	2	N
24	1/1								
25	1/1								
26	1/1								
27									
28									
29									
30	1/1	2/1	34	F	OFF	Y	N	2	N
31	1/1								
32	2/2								
33	2/2								
34	1/1								
35	1/1								
X2 36	5/8	2/1	54/54	I	ON	Y	Y	5	Y
X2 37	4/3	1/2	40/40	F/F	ON	Y	N	2	N
X2 38	4/1	1/1	40	F	~~ON~~ OFF	Y	N	2	N
X2 CORR. #1	~~0~~ 8	2	40	F	ON	Y	N	2	N

OF EXIT SIGNS – _____

COMMENTS:

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB _____

SHEET NO. _____ OF _____

CALCULATED BY CMD DATE 11/26

CHECKED BY _____ DATE _____

SCALE _____

EAST WING Bldg 60

Room	# OF Fix.	# OF Lamps per Fix.	WATTS /Bulb	BULB TYPE	ON/OFF	Switch Yes/No	Occ. Sens or	# of
MAIN CORR. 1ST Floor	2 2	2 2-3	40	4Ft. Fluorescent Ex- INCAND.	ON ON	NO NO		
WING1 HALL 1st Floor	4 1	1 2-3	40	4Ft Fluorescent EXIT INCAN.	ON ON	Yes		
WING2 HALL 1st Floor	4 1	1 2-3	40	4Ft. Fl. EXIT INCAND.	ON ON	Yes NO		
WING2 ROOMS 1st Floor	9 9	2 1	34 34	4Ft. Fl. OVERHEAD 4Ft Fl BED	OFF OFF	Yes Yes	No NO	
WING1 ROOMS 1st Floor	9 9	2 1	34 34	4Ft OVERHEAD 4Ft BED	OFF OFF	YES YES	NO NO	
MAIN CORR 2ND FLOOR ✓	2	2	40	4Ft Fl.	ON	NO		
WING1 HALL 2nd Floor	4 1	1 2-3	40	4Ft Fl EXIT INCAN.	ON ON	Yes		
2ND FLOOR LATRINE ✓	5 8	2 1	54 54	INCAN. INCAN	ON ON	Yes Yes	Yes Yes	5
WING2 HALL 2nd Floor	4 1	1 2-3	40	4Ft Fl EXIT INCAN.	ON OFF	Yes		
WING2 ROOMS 2nd Floor ✓	7 7	2 1	34 34	4Ft Fl. OVERHEAD 4Ft Fl BED	OFF OFF	Yes Yes	NO NO	
1ST FLOOR LATRINE	3	2	34	4Ft Fl.	ON	YES	YES	1
WING1 2ND Fl. ROOMS ✓	9 9	2 1	34 34	4Ft Fl 4Ft Fl	OFF OFF	YES YES	NO No	

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB

SHEET NO. OF

CALCULATED BY CBL DATE 11/26

CHECKED BY DATE

SCALE

WEST END

60 | LIGHTING SAME AS EAST END

NO. 60

DIFFERENCES

LAVRINE 2ND FLOOR
11 SWITCES

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB
SHEET NO. OF
CALCULATED BY CRR DATE 11/26/91
CHECKED BY DATE
SCALE

LIGHTS 2ND FLOOR CENTER

ROOM	NO. OF	# OF LAMPS PER E.X.	WATTS PER BULB	BULB TYPE	ON/OFF	SWITCH YES/NO	GOOD FOR OCC SENS. NO. OF SW'S TOT
LATRINE	5	2	52W SUPERSAVER	IND.	ON	YES	Y
"	4	1	52W	I	ON	Y	Y 5
"	1	1	52W	I	"	Y	N NA
HALLWAY	3	1	34W	4'-F	"	Y	N NA
COORIDOR	2	2	34W	4'-F	ON	NO	N NA
EXIT SIGNS	4	2		I	ON	NO	

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____

SHEET NO. _____ OF _____

CALCULATED BY CBL DATE 11/26

CHECKED BY _____ DATE _____

SCALE _____

LIGHTS

- LATRINE 1ST FLOOR, [SWITCH YES]
  2 TWO LAMP OVER SINKS (34W & 40W)
  4' FLUOR.

  1 - TWO LAMP, 4' FLUOR, IN MIDDLE OF ROOM
  (34W & ?)

LIGHTS ON

- COORIDOR-1 (ON) [NO SWITCH]

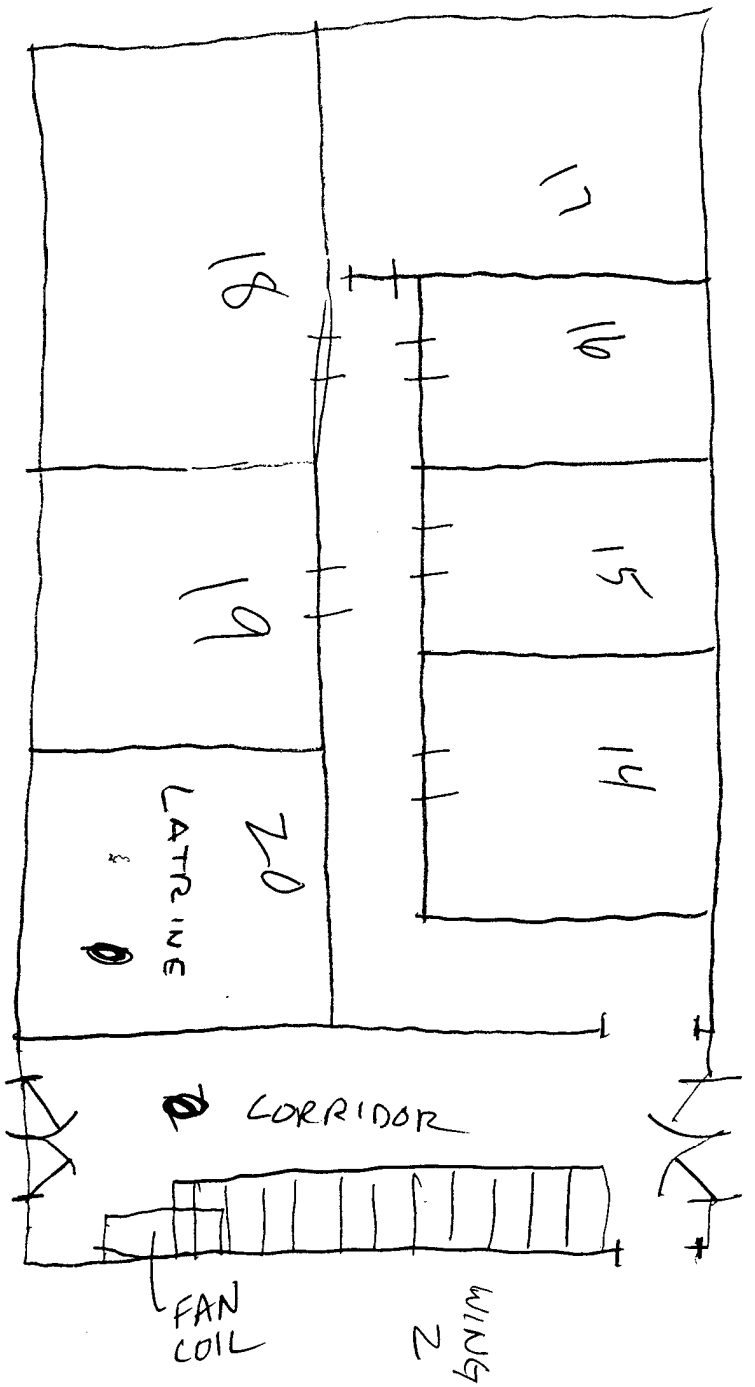
  2 - 2 LAMP, 4', FLUOR, 34W ~~EA~~ ON
  2 - 2 LAMP, INC, EXIT SIGNS
- HALL-1 (ON), [YES SWITCH]
  3 - 1 LAMP, 4', " , 34W
  1 - 2 " , INC. EXIT SIGN
- HALL-2 (ON) [YES SWITCH]
  3 - 1 LAMP, 4', " , 34W

- TYPICAL ROOM HAS [YES SWITCH]
  1 - 2 LAMP, 4', FLUOR, OVERHEAD
  1 - 1 " , 4', " , BEDSIDE LAMP

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____
SHEET NO. _____ OF _____
CALCULATED BY CRL DATE 11/26/91
CHECKED BY _____ DATE _____
SCALE _____

60



1ST FLOOR EAST WING 1

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB _____

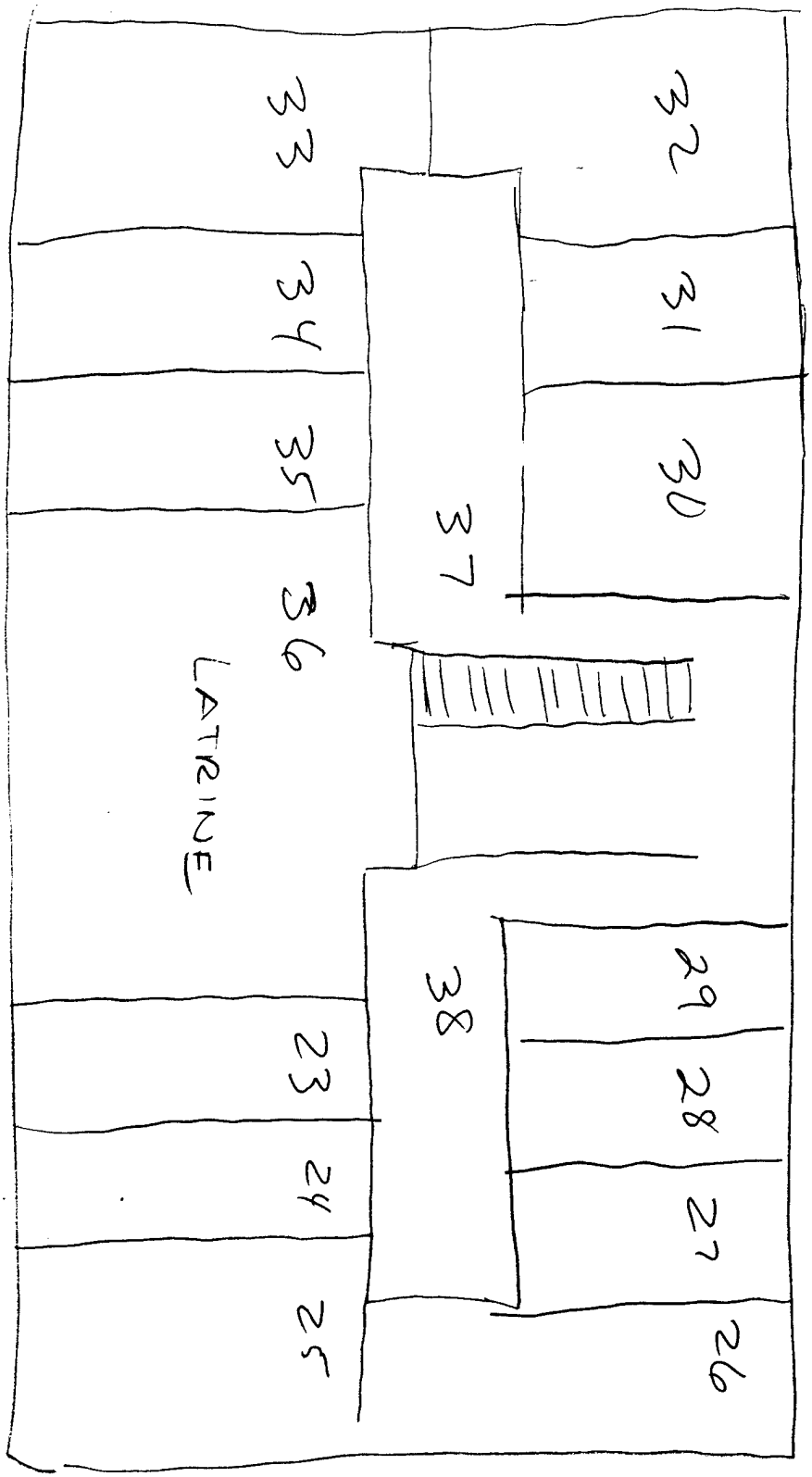
SHEET NO. _____ OF _____

CALCULATED BY CEL DATE 11/26/91

CHECKED BY _____ DATE _____

SCALE _____

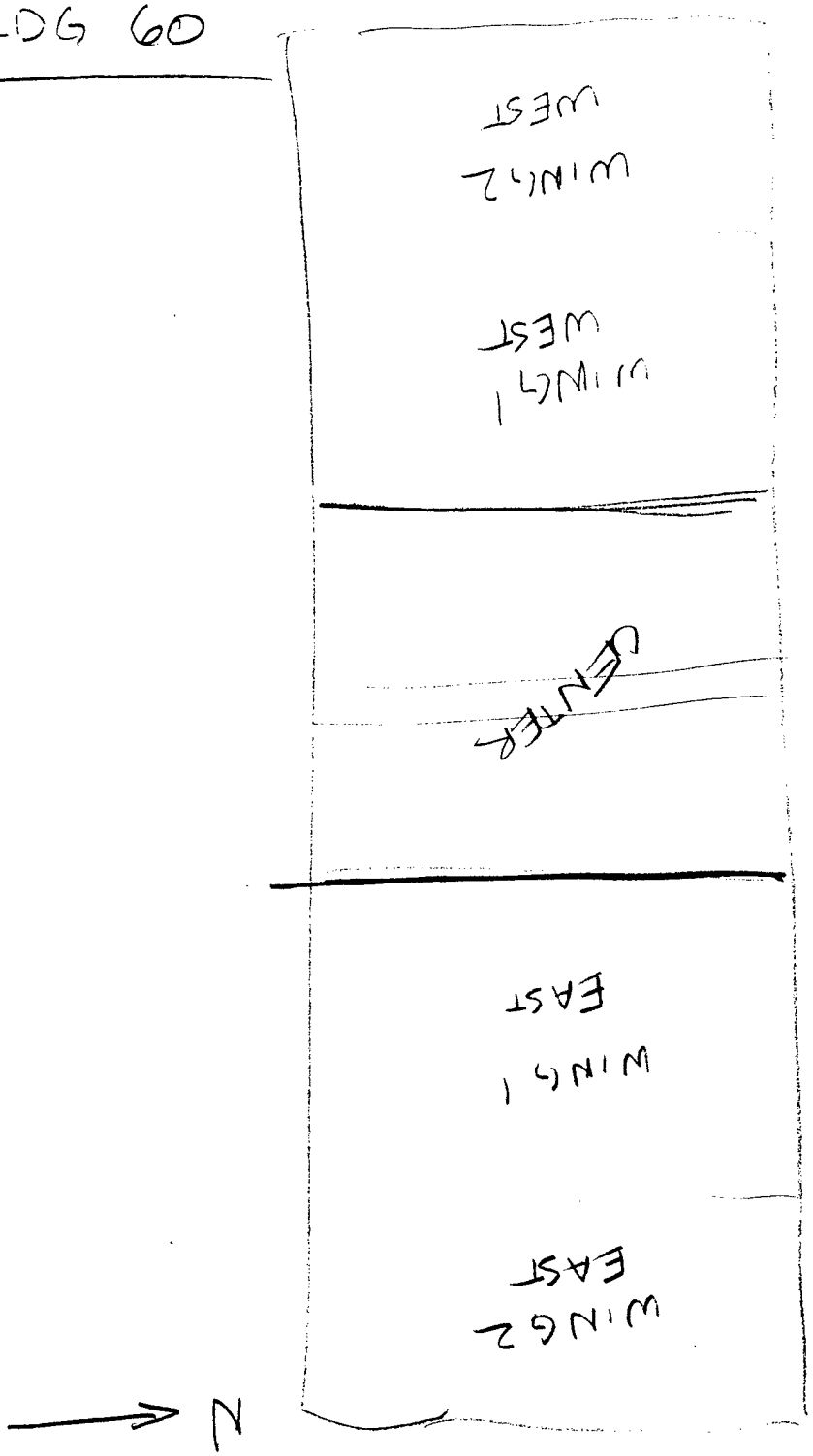
60



E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____
SHEET NO. _____ OF _____
CALCULATED BY CBL DATE 11/26/91
CHECKED BY _____ DATE _____
SCALE _____

BLDG 60



E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

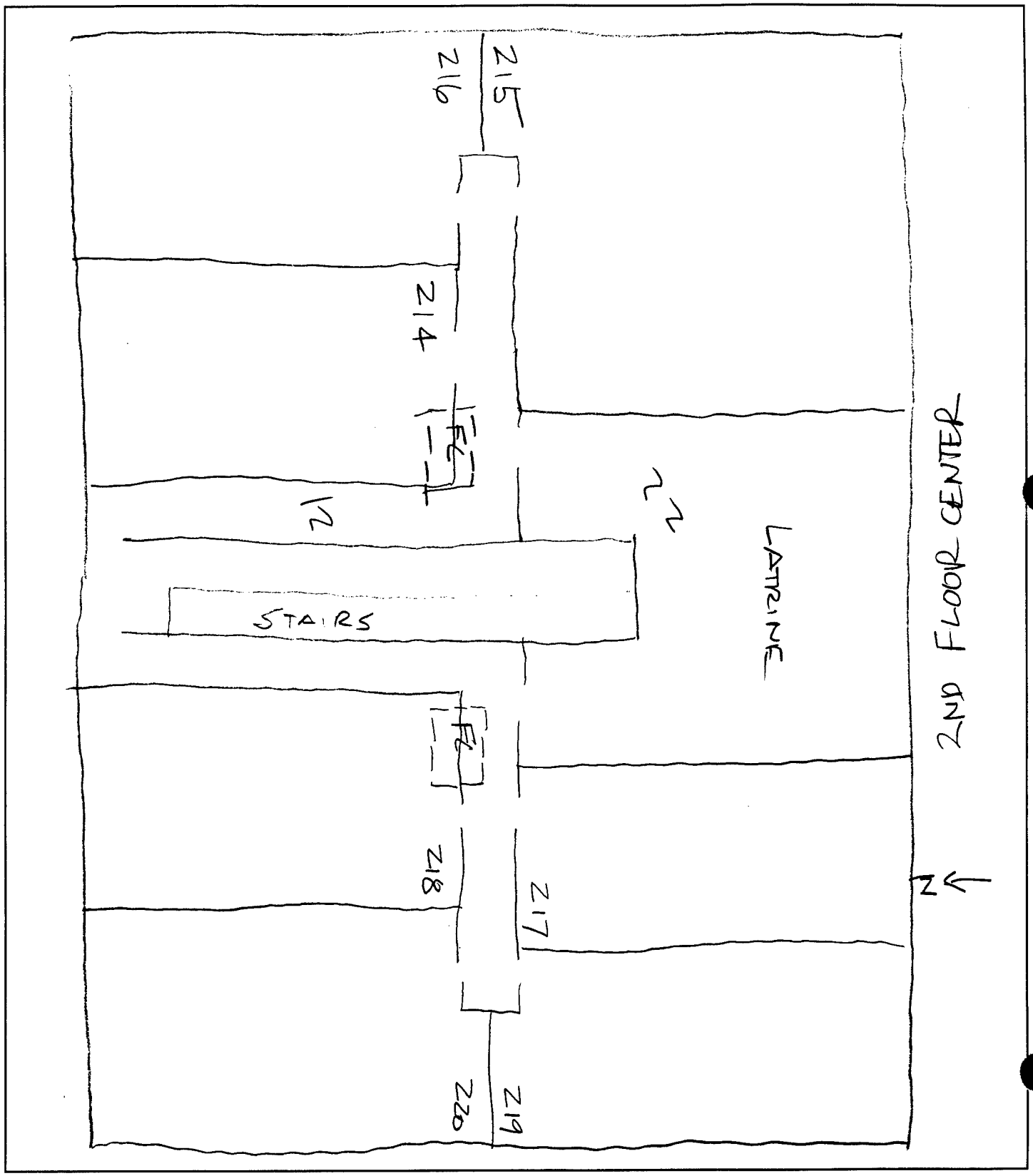
JOB _____

SHEET NO. _____ OF _____

CALCULATED BY CBL DATE 11/26/91

CHECKED BY _____ DATE _____

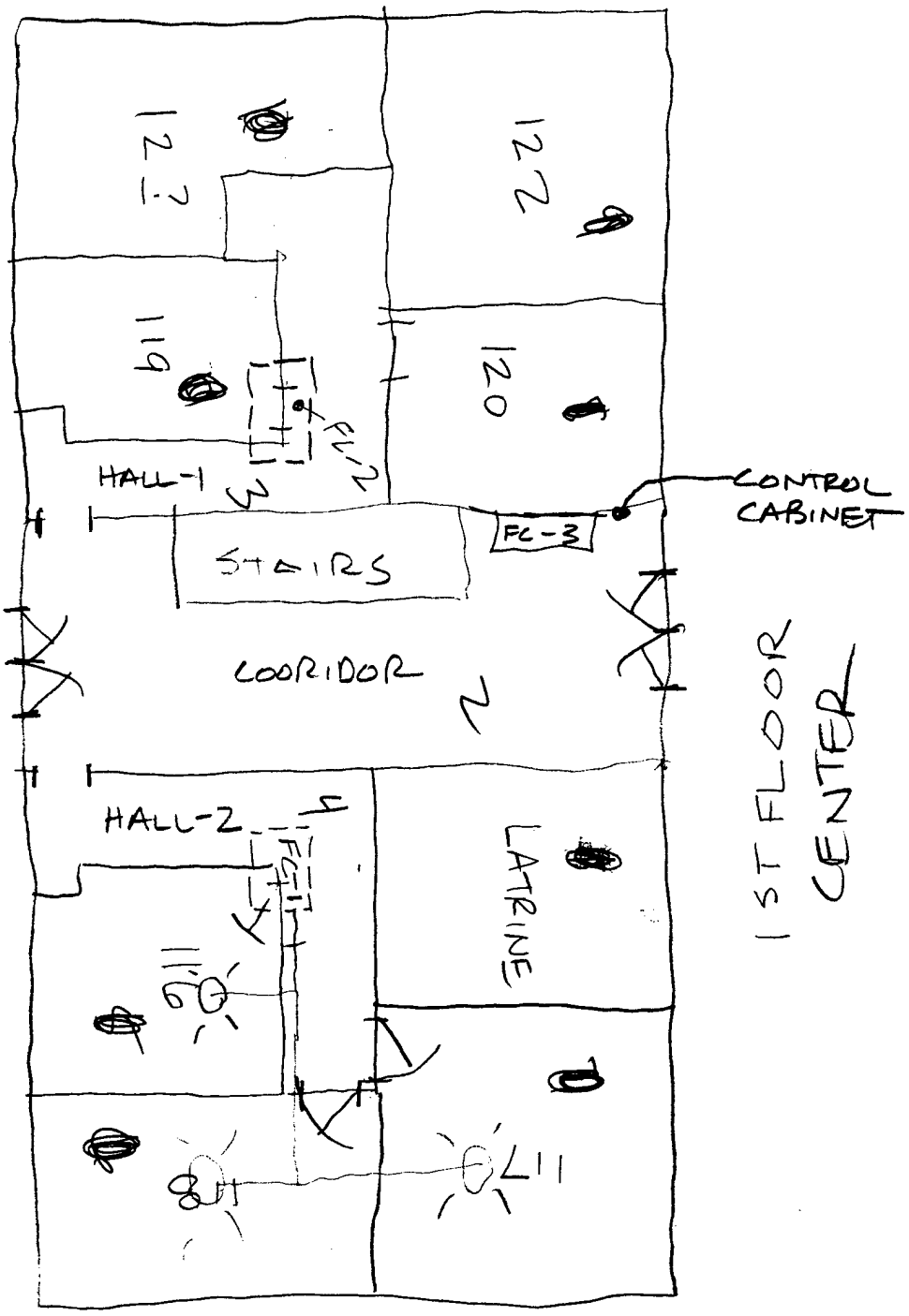
SCALE _____



E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB
SHEET NO. OF
CALCULATED BY OBL DATE 11/26/91
CHECKED BY DATE
SCALE

60



FC-3 ON FLOOR IN COORIDOR

N

FC-1 IN CEILING SERVES 116, 117, 118

FL-2 IN CEILING SERVES 119, 122, 122, 120

HW RADIATION IN LATRINE AND ALL OTHER ROOMS

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB _____

SHEET NO. _____ OF _____

CALCULATED BY UBL DATE 11/26/91

CHECKED BY _____ DATE _____

SCALE _____

601

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____

SHEET NO. _____ OF _____

CALCULATED BY CMD DATE 11/25

CHECKED BY _____ DATE _____

SCALE _____

60

CHILLER

CARRIER MODEL 30GB-150-650 SERIAL T 94 5441

6	RECIP. compressors	460 V	3 ph	52.1 Amps	60 Hz	
6	FANS	460 V	3 ph	60 Hz	3.0 Amps	1.75 HP

≈ 150 TONS EST.

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

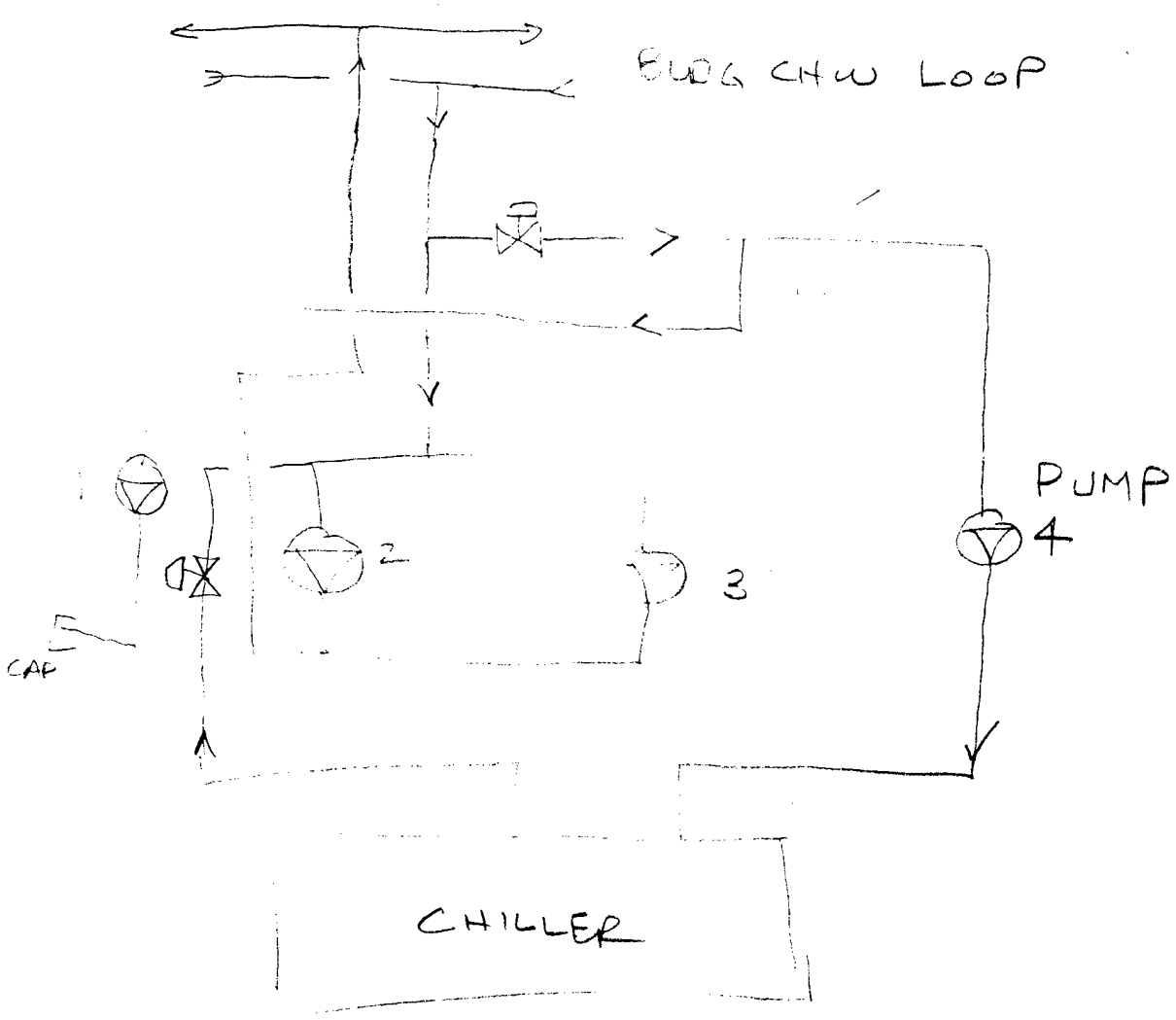
JOB _____

SHEET NO. _____ OF _____

CALCULATED BY CBL DATE 11/25/91

CHECKED BY _____ DATE _____

SCALE _____



E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB
SHEET NO. OF
CALCULATED BY CBL DATE 11/26
CHECKED BY DATE
SCALE

BLDG 60
BARRACKS

- OCCUPIED 0-2400 SUN - SAT
- MOST OF BLDG UNOCCUPIED DURING WEEKDAY 0700 - 1600

- TYPICAL BARRACK ROOM
  - STEREO
  - TV
  - REFRIG
  - COFFEE
  - MICROWAVE (SOME)

- COMPLAINTS ABOUT HOT & COLD ROOMS
- TROUBLE MAINTAINING CONSTANT TEMPERATURE IN SHOWER

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB
SHEET NO. OF
CALCULATED BY CEL DATE 11/26/91
CHECKED BY DATE
SCALE

60 | BLDG 60
LIST OF EQUIPMENT (CENTER)

— FAN COIL FC-1 1ST FLOOR, RM 116, NO NAMEPLATE
— * FC-2 " " RM 119, " "
— NOT RUNNING
— SEE CONTROL DWG
— HW RAD. BASEBOARDS, NO CONTROLS
— FAN COIL FC-3, 1ST FLOOR, , RUNNING DURING SURVEY BUT NO COOL/NO HEAT
*2 PIPE FANS
NO NAME PLATE
—MOTOR 3 SPEED
— 1/8 HP
— NO CFM LISTED
— NO O.A.
NO CONTROL VALVE

— ASSUMPTION—
- FAN COILS USED FOR COOLING ONLY
- HW BASEBOARDS USED FOR HEATIN

— FAN COIL FC-3, 2ND FLR, RM , NO NAMEPLATE
— " " FC-4, " " , RM , " "
—NOT RUNNING

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB
SHEET NO. OF
CALCULATED BY CBL DATE 11/26/91
CHECKED BY DATE
SCALE

60 | EAST WING

FAN COIL FC-1, 1ST FLOOR, RM , RUNNING
FC-2, 1ST FLOOR, RM , RUNNING
FC-3, 1ST FLOOR COORIDOR, RUNNING
HEAT COMING OUT
FC-4, 2ND FLOOR, RM 228, RUNNING
FC-5, 2ND FLOOR, RM 221, RUNNING

CONTROLS
- SEE DWG
- SINGLE SETPOINT PNEUMATIC

HAND VALVES HW RADIATION ON

TEMPERATURE — 67°F

E. WING

WEST WING

FAN COIL FC-1 OFF
FC-2 OFF
FC-3 OFF
FC-4 ON
FC-5 OFF

HW RADIATION H

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB
SHEET NO. OF
CALCULATED BY CAEL DATE 11/25
CHECKED BY DATE
SCALE

O.A. TEMP
BUILDING 60, SPACE TEMP 68°F

> 1ST FLOOR LATRINE 1-> 150.°F HW TEMP
2-> 145 " "

> 2ND FLOOR LATRINE 1-> 101°F HW TEMP
2-> 120°F " "

48 PEOPLE IN BLDG AS OF 11/22/91

NO COMPLAINTS ABOUT COLD SHOWERS

TEST 1 > 10 QUARTS IN 40 SECONDS
TEST 2 > 11 QUARTS IN 40 SECONDS
} EXISTING SHOWER HEAD

TEST 1 > 9.5 QUARTS 1 MIN 25 SECONDS
TEST 2 > 6.5 QUARTS 1 MIN Ø SECONDS
} LOW FLOW RATED @ 2.5 GPM

1ST FLOOR CENTER, 2 SHWR HEADS, 4 SINKS
2ND " " , 4 " " , 4 "
1ST FLOOR EAST , 2 " " , 4 "
2ND " " , 4 " " , 4"
1ST FLOOR WEST ,
2ND FLOOR WEST, DITTO

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB
SHEET NO. OF
CALCULATED BY CBL DATE 11/25
CHECKED BY DATE
SCALE

EQUIPMENT

1ST FLOOR LATRINE (CENTER) — WASHER (1) — DRYER (1), 5400 W	WATER COOLER 1/5 HP 120 VAC
2ND FLOOR (CENTER) LATRINE — WASHER (1) — DRYER (1) 5400 W	WATER COOLER 1/5 HP 120 VAC
1ST FLOOR LATRINE (EAST) — 1 WASHER — 1 DRYER	WATER COOLER
2ND FLOOR " (~~WEST~~ EAST) DITTO	WATER COOLER

WEST WING DITTO

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____

SHEET NO. _____ OF _____

CALCULATED BY CBL DATE 11/26

CHECKED BY _____ DATE _____

SCALE _____

BLDG 60

SINK FLOW

- 22 OZ (2.75 CUPS) IN 5 SECONDS
- 24 OZ (3 CUPS) IN 5 SECONDS

- TEST AREATOR WONT FIT
  - LOW FLOW

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB
SHEET NO. OF
CALCULATED BY CBL DATE 11/26/91
CHECKED BY DATE
SCALE

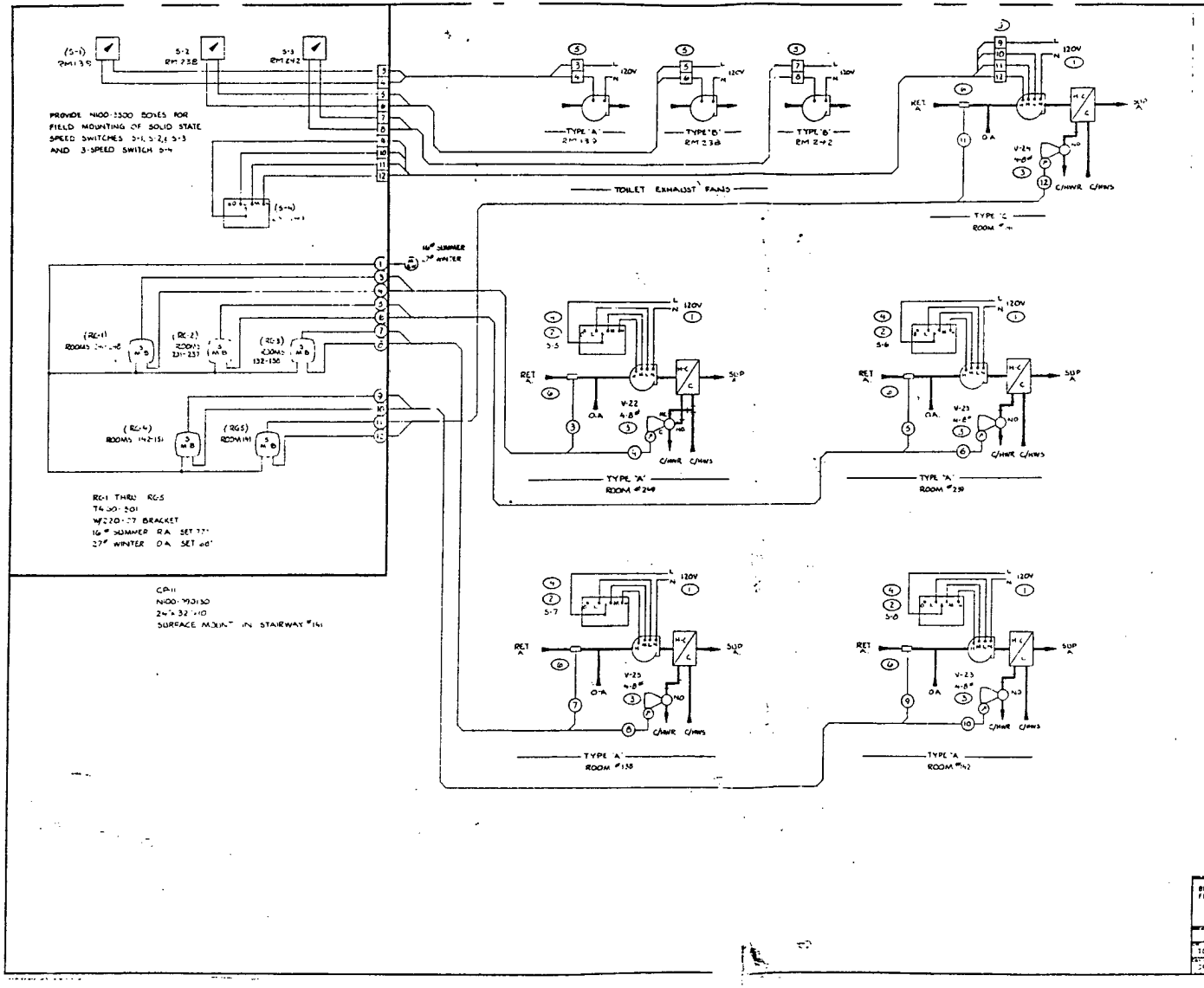
Bldg 60 CRAWLSPACE } CHILLED WATER PUMPS

MOTORS

	HP	PH	Hz	FRAME	VOLTS	AMPS	MFG
1	5	3	60	145JP	230	5.4	US ELECTRIC motor
2	10/7.5	3	60	215 JP	208	29	MARATHON ELECTRIC
3	10	3	60	215 JP	230	27	US ELECTRIC
4	3	3	60	182 JP	230	9	US ELECTRIC

Pumps

	MFG	MODEL	NUMBER	GPM	FT HEAD	RPM
1						
2	WEINMAN	2G1-4	735945	160	25	1750
3	WEINMAN	3K3-4	726319-2	300	70	1750
4	WEINMAN	3F3-4	735944	300	23	1750



SEQUENCE OF OPERATION

FAN COIL UNITS:

TYPE "A" FAN COIL UNITS ARE STARTED AND STOPPED BY SWITCHES S-5, S-6, S-7, AND S-8 IN THE CEILING.

TYPE "B" FAN COIL UNIT IS STARTED AND STOPPED BY SWTICH S-4 IN THE CONTROL PANEL.

RECEIVER CONTROLLER RC-1 THROUGH RC-5, WITH THEIR SENSEING ELEMENTS IN THE RETURN AIR, MODULATE THEIR RESPECTIVE VALVES V-22, V-23, AND V-24.

TOILET EXHAUST FANS, TYPE "A" AND "B":

THE SPEED OF THE TOILET EXHAUST FANS IS SELECTED BY SWITCHES S-1, S-2, OR S-3 IN THE CONTROL PANEL.

NOTES:

1. POWER WIRING NOT BY RCC.
2. CONTROL WIRING BY RCC.
3. SEE VALVE SCHEDULE SHEET #12.
4. 3 SPEED FAN SPEED SWITCH, NOT BY RCC, MOUNT ABOVE CEILING NEAR UNIT.
5. WIRING NOT BY RCC.
6. 10C-50 SENSING ELEMENT, RELOCATED FROM RC-1 THROUGH RC-5.

PLAN REFERENCE:

M-13, M-14, M-15, M-16, AND M-17

BLDG 60

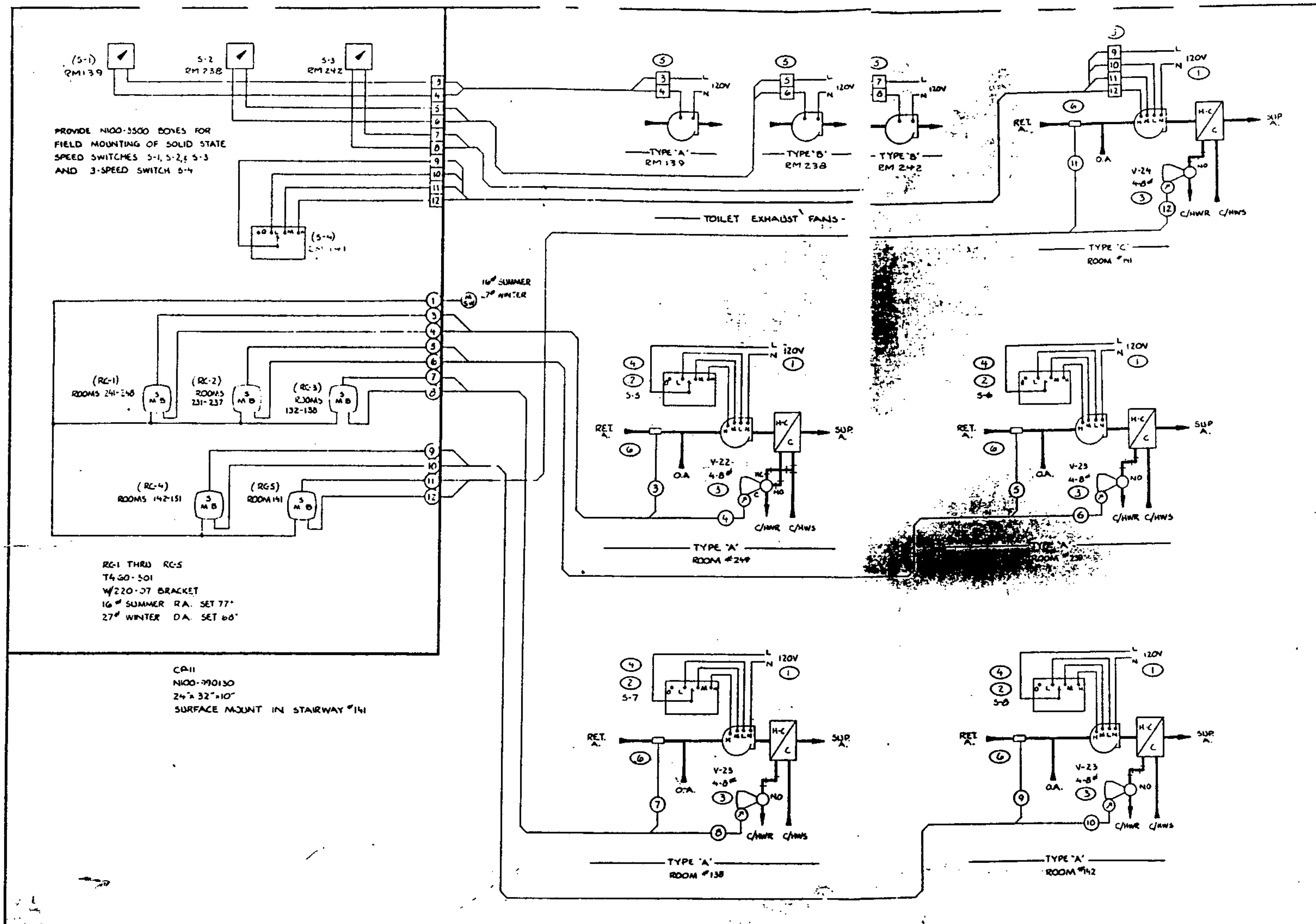
BUILDINGS 56-58-60
FORT MCPHERSON, GA

Robert Shaw

TOLSON-LEE-SIMPSON

SPECIALTY PARTS SERVICE INC.

EXHAUST FANS



SEQUEN... ...ERATION

FAN COIL UNITS:

TYPE "A" FAN COIL UNITS ARE STARTED AND STOPPED BY SWITCHES S-5, S-6, S-7, AND S-8 IN THE CEILING.

TYPE "C" FAN COIL UNIT IS STARTED AND STOPPED BY SWTICH S-4 IN THE CONTROL PANEL.

RECEIVER CONTROLLER RC-1 THROUGH RC-5, WITH THEIR SENSEING ELEMENTS IN THE RETURN AIR, MODULATE THEIR RESPECTIVE VALVES V-22, V-23, AND V-24.

TOILET EXHAUST FANS, TYPE "A" AND "B":

THE SPEED OF THE TOILET EXHAUST FANS IS SELECTED BY SWITCHES S-1, S-2, OR S-3 IN THE CONTROL PANEL.

THREE SETS LIKE THIS

NOTES:

1. POWER WIRING NOT BY RCC.
2. CONTROL WIRING BY RCC.
3. SEE VALVE SCHEDULE SHEET #12.
4. 3 SPEED FAN SPEED SWITCH, NOT BY RCC, MOUNT ABOVE CEILING NEAR UNIT.
5. WIRING NOT BY RCC.
6. 100-50 SENSING ELEMENT, RELOCATED FROM RC-1 THROUGH RC-5.

PLAN REFERENCE:

M-13, M-14, M-15, M-16, AND M-17

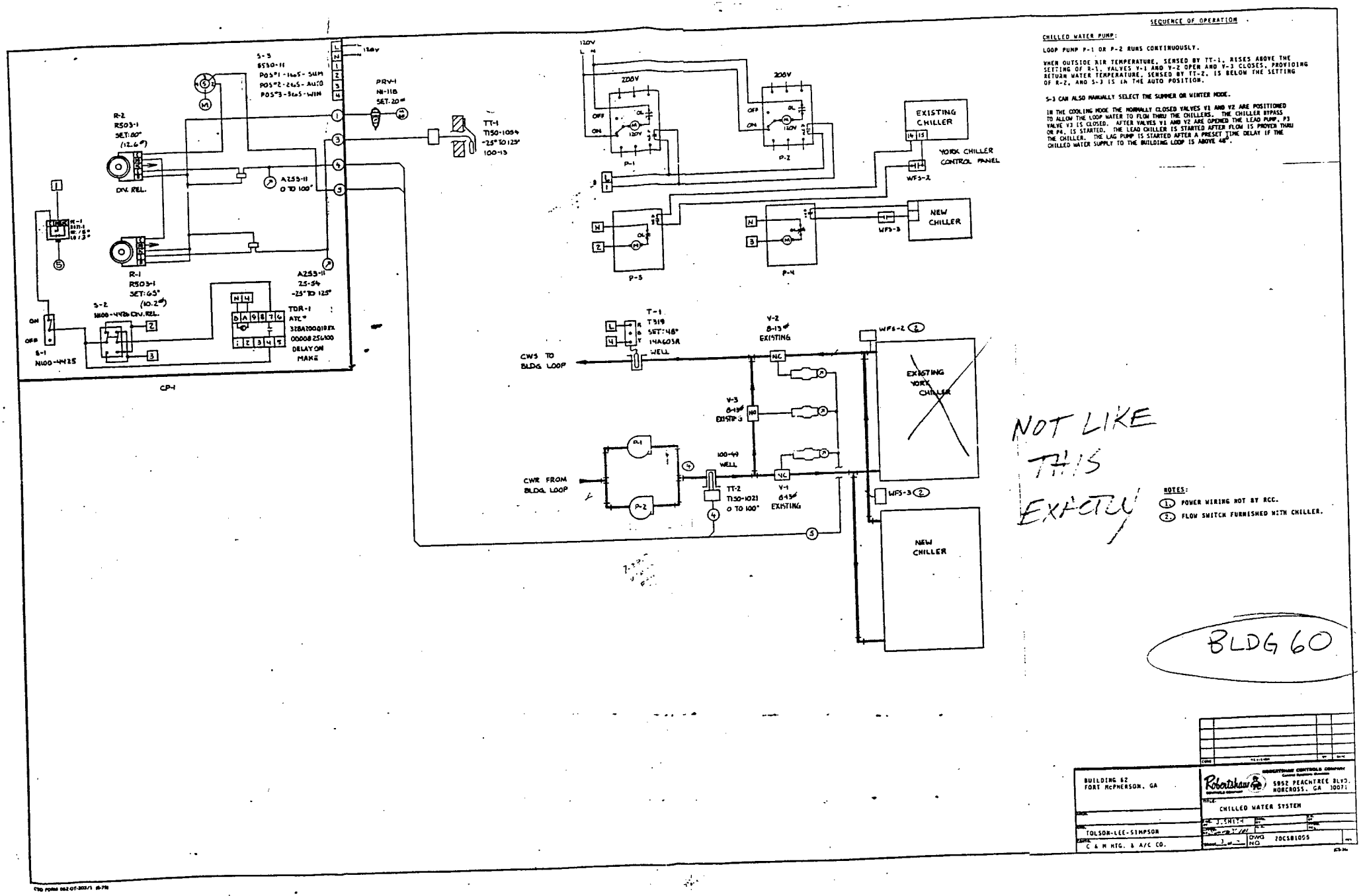
BLDG 60

BUILDINGS 56-58-60
FORT McPHERSON, GA

TOLSON-LEE-SIMPSON
SPECIALTY PIPING SERVICE INC.

Robertshaw
...SHAW CONTROLS COMPANY
... PEACHTREE BLVD.
...CROSS, GA 30071

FAN C... ...S EXHAUST FANS
"A" & "B"
D. HARRIS
DWG NO 20CS78020



SEQUENCE OF OPERATION

CHILLED WATER PUMP:

LOOP PUMP P-1 OR P-2 RUNS CONTINUOUSLY.

WHEN OUTSIDE AIR TEMPERATURE, SENSED BY TT-1, RISES ABOVE THE SETTING OF R-1, VALVES V-1 AND V-2 OPEN AND V-3 CLOSES, PROVIDING RETURN WATER TEMPERATURE, SENSED BY TT-2, IS BELOW THE SETTING OF R-2, AND S-3 IS IN THE AUTO POSITION.

S-3 CAN ALSO MANUALLY SELECT THE SUMMER OR WINTER MODE.

IN THE COOLING MODE THE NORMALLY CLOSED VALVES V1 AND V2 ARE POSITIONED TO ALLOW THE LOOP WATER TO FLOW THRU THE CHILLERS. THE CHILLER BYPASS VALVE V3 IS CLOSED. AFTER VALVES V1 AND V2 ARE OPENED THE LEAD PUMP, P1 OR P4, IS STARTED. THE LEAD CHILLER IS STARTED AFTER FLOW IS PROVEN THRU THE CHILLER. THE LAG PUMP IS STARTED AFTER A PRESET TIME DELAY IF THE CHILLED WATER SUPPLY TO THE BUILDING LOOP IS ABOVE 48°.

NOTES:

1. POWER WIRING NOT BY RCC.
2. FLOW SWITCH FURNISHED WITH CHILLER.

NOT LIKE THIS EXACTLY

BLDG 60

BUILDING 62 FORT McPHERSON, GA	Robertshaw 5952 PEACHTREE BLVD. NORCROSS, GA 30071
	TITLE: CHILLED WATER SYSTEM
TOLSON-LEE-SIMPSON	DWG NO. 20CS81055
C & M HTG. & A/C CO.	

BUILDING 061

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB
SHEET NO. OF
CALCULATED BY CRL DATE 11/25
CHECKED BY DATE
SCALE

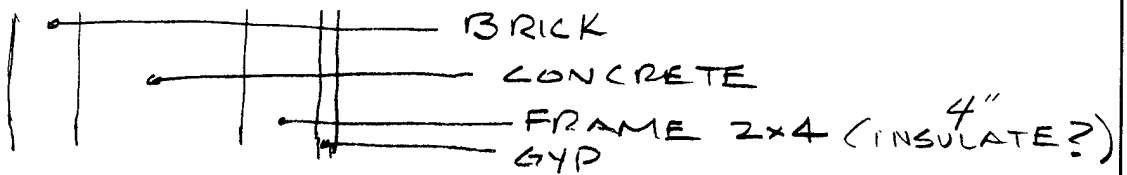
61

ECO 1 INSULATION

WALLS:

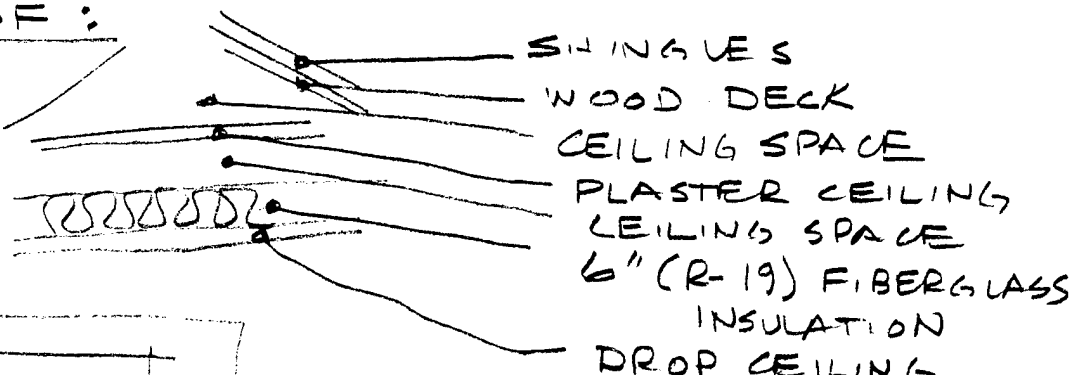
HISTORICAL, CANNOT CHANGE WALLS

.17
1.24
1.24
11
1.24
.45
.68
16.02



ROOF:

0.17
0.22
0.62
1.25
0.15
1.24
19.0
1.79
0.68
25.12



DUCT:

SOME PARTS NO CEILING INSULATION, SEE

- COOLING DUCT IN CEILING SPACE
- 3" FIBERGLASS INSULATED DUCTS

PIPE:

STEAM —
HW —
REFRIGERANT —

DHW —

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB
SHEET NO. OF
CALCULATED BY DAD DATE 11-26
CHECKED BY DATE
SCALE

Boiler Room

61

PIPE INSULATION

2" STM 40 FT
1.5" COND. RET 40.

1" INSULATION ON DOMESTIC HOT WTR. LINES
3/4" Dom. Hot Wtr 40 FT
2" " " MISC. VALVES & SHORT PIPE
4" " "

2" STEAM 10'FT UNINS.
1" COND 10'FT UNINS.

HOT WATER Pump #1

MOTOR - 2 Hp Frame - 145 P 1735 RPM 6.8 Amps 200 V
Pump - M# 1.5 K2-4 WEINMAN 70 GPM 45 FT. HD. 1735 RPM

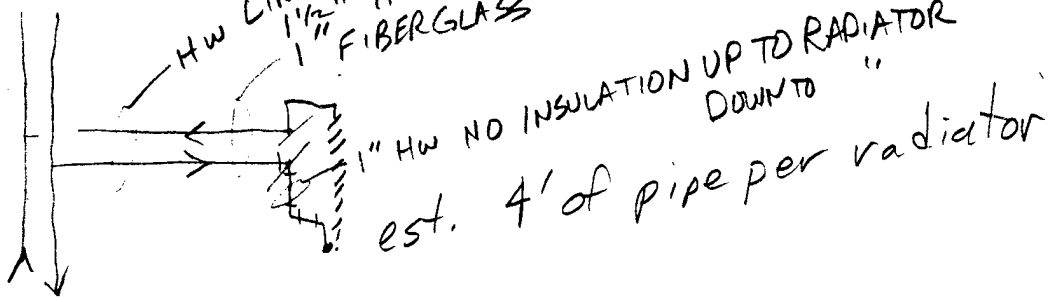
HOT WATER Pump #2

MOTOR - MAGNATEK 1740 RPM 200V 9.2 A 3 HP 3PH 60 Hz
pump - N/A

CONTINUOUS OPERATION
Pumps ON WHEN SURVEYED

LAB

1" Fiberglass ON HOT WATER LINES



E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB _____

SHEET NO. _____ OF _____

CALCULATED BY PWD DATE 11-26

CHECKED BY _____ DATE _____

SCALE _____

PIPE INSULATION

Bldg 61

TYPE	INSULATION	PIPE DIAMETER
✓ COND.	1" Fib[illegible]	2"
✓ HOT WATER	2" Foam	4"
✓ LOW PRESS STM	1.5" F.G.	4" ✓
✓ LOW PRESS STM	1" FG	3"
✓ HOT WATER	1"	3"
HI PRESS STM	1.5"	2"
DOM. HOT WATER TANK	2"	
DOM. HOT WATER	1"	2"

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____

SHEET NO. _____ OF _____

CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____

SCALE _____

DUCT INSULATION 3" Fiber Glass w/ OUTSIDE METAL FOIL

CEILING 6½" Fiber Glass R-19 UNFACED ON TOP OF CEILING TILE

61

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____
SHEET NO. _____ OF _____
CALCULATED BY CMD DATE 11-26
CHECKED BY _____ DATE _____
SCALE _____

Bldg 61

Door/Window	No.	N/S/E/W Orientation	Dim	Material	Frame	Window Cover	Insulation Thickness
D	1	N	2@30 x 84	S.P. GLASS	METAL		FAIR
W	1,2,3,4	N	4@ 40"x85"	S.P. Glass	WOOD	DRAPES	FAIR
W	13-17	S	5 @ 40" x 85"	SP. GLASS	WOOD	DRAPES	FAIR
D	2	N			WOOD	* SEALED	
W	18	S	39"x63"	S.P. Glass	METAL	DRAPES	FAIR
D	4	S	36" x 80"	WOOD w/SP Glass	WOOD	—	BAD
W	19,20	S	39"x63"	SP GLASS	METAL	DRAPES	FAIR
W	21, ~~22~~	W	44" x 53"	SP. GLASS	WOOD	DRAPES	BAD
W	22	E	"	"	"	"	"
D	5	N	2@ 30" x 80"	METAL	WOOD		FAIR
D	6	N	2@ 30" x 80	WOOD	WOOD		BAD
W	23, 24	S	39"x63"	S.P. GLASS	METAL	—	FAIR
W	25-27	N	31" x 63" W.C in 25	S.P. GLASS	WOOD	DRAPES	BAD
W	28-30 * 28 " , E N	N	36x36"	SP GLASS	WOOD	—	FAIR
W	31-33	S	39"x63"	SP GLASS	METAL	—	FAIR
D	8	W	36x80"	WOOD/SP. GLASS	WOOD	—	BAD
D	3	N	2 @ 30x84	GLASS (S.P.)	METAL	CURTAINS	BAD
W	5,6	N	40x85	SP GLASS	WOOD	DRAPES	FAIR
W	7,8	E	"	"	"	"	"
W	9 10	S	"	"	"	"	"

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB
SHEET NO. OF
CALCULATED BY CBL DATE 11/25
CHECKED BY DATE
SCALE

611

MOTORS

> AC UNIT-3 serves CONF. ROOM

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____

SHEET NO. _____ OF _____

CALCULATED BY CRL DATE _____

CHECKED BY _____ DATE _____

SCALE _____

61

MOTORS:

EXH FAN — 1, ON ROOF, EST. 2 HP FROM PLANS
— KITCHEN HOOD
— ON

EXH FAN — 2, ON ROOF
— SERVING LINE HOOD, EST 1 HP FROM PLANS
— ON

MUAU — 1, ON GROUND
— SERVES KITCHEN
— OFF

MAIL ROOM
UNIT HEATER — ~~at~~ 1/10 HP — NOT RUNNING
2 W.AC. FOR MAIL ROOM
11 W.AC UNITS FOR LAB IN BASEMENT

RUN YEAR ROUND TO COOL & DEHUMIDIFY

6 / 1

MOTORS:

> AC-UNIT-1 SERVES DINING AREA
CARRIER MODEL 40RR-016-540
SERIAL T 792 255
EVAP FAN 230/460 V
6.2/3.1 A
2 HP
1.49 KW OUT
> COOLING ONLY
> WIT OFF DURING SURVEY
> RUNS 24 HRS/DAY IN SUMMER

AC-UNIT-2 SERVES KITCHEN
> YORK 1½ HP (PER DESIGN DRAWINGS)
> COOLING & HEATING
> UNIT OFF DURING SURVEY
> RUNS 24 HRS/DAY IN SUMMER
> CONDENSER

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB
SHEET NO. OF
CALCULATED BY CMD DATE 11-26
CHECKED BY DATE
SCALE

Bldg 61

ACCU-1

CARRIER 38AE 016 600
1 COMP. 460V 3ph 60 Hz 29 Amps
2 FANS 460 V 1 phase 60 Hz 1.9A FAN1 2.3A FAN2

NOT RUNNING WHEN SURVEYED

ACCU-2

YORK CA91 15E S FM1199 44 NOT RUNNING WHEN SURVEYED
440/480 V 3 ph 60 Hz 23 A
1 Comp.
1 FAN ½ HP 3ph 60 Hz 440/480 V 4.4 A

ACCU-3

CARRIER SMALL
1 comp 1-FAN

MAKE UP AIR

Rupp Temp Air No Plate
NOT RUNNING WHEN SURVEYED
EST 5HP From plans

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB
SHEET NO. OF
CALCULATED BY CBL DATE 11/25
CHECKED BY DATE
SCALE

61

COOLING SOURCE DX-AC UNIT
HEATING " CENTRAL PLANT STEAM

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB _____

SHEET NO. _____ OF _____

CALCULATED BY CMD DATE 11-27

CHECKED BY _____ DATE _____

SCALE _____

Bldg 61

Occupied Hours

M-F	Breakfast	0600 - 0730
	Lunch	1130 - 1300
	Dinner	1630 - 1800
Sat-Sun	B'fast	0800 - 0930
	Lunch	1200 - 1300
	Dinner	1700 - 1830

BUILDING 062

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: CMD
CHECKED BY:
DATE: 12-18-91

BLDG.# 62
ECO 4

DOMESTIC HOT WATER

FAUCET LOCATION	WATER TEMPERATURE
1st Floor Lavatory East Wing	127 °F
PROBLEMS:	

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: CMD
CHECKED BY:
DATE: 12-13-..

BLDG.# 62
ECO 8

FLOW RESTRICTIONS

SHOWERHEADS	SHOWERS/DAY	NO. OF PEOPLE	PRESENT GPM (QTS/SEC)	GPM w/ LOW–FLOW (QTS/SEC)	LOCATION
			–		

FAUCETS	NO. OF PEOPLE	PRESENT GPM OZ.\SEC.	GPM w/ LOW FLOW RESTR.	LOCATION

COMMENTS: St E Bldg 58

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB

SHEET NO. OF

CALCULATED BY CBL DATE 12/18/91

CHECKED BY DATE

SCALE

62

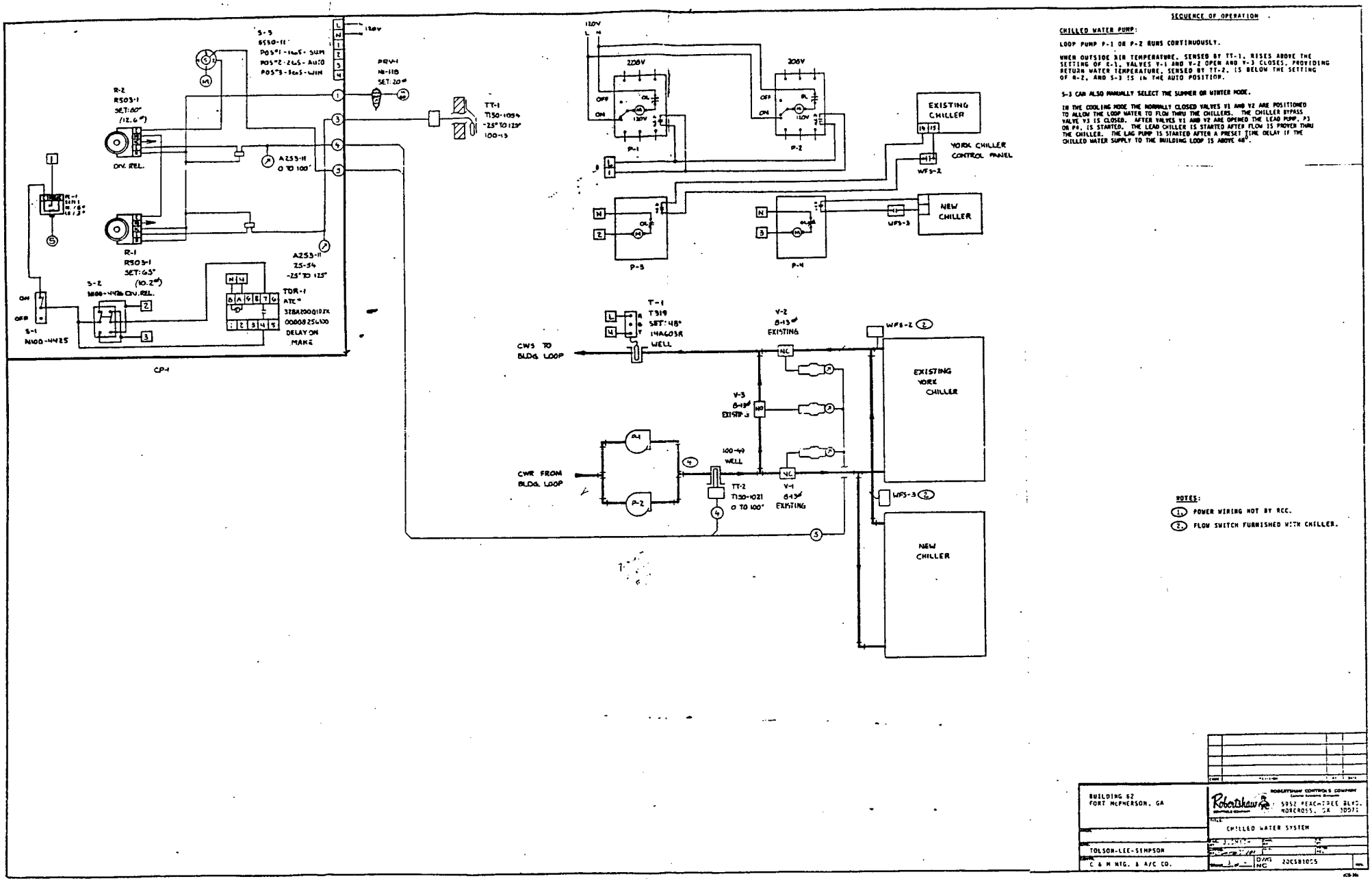
CONTROLS & EQUIPMENT SAME AS 58

2-PIPE FAN COILS

HW BASEBOARDS

FAN COILS-ON

127°F HW



SEQUENCE OF OPERATION

CHILLED WATER PUMP:

LOOP PUMP P-1 OR P-2 RUNS CONTINUOUSLY.

WHEN OUTSIDE AIR TEMPERATURE, SENSED BY TT-1, RISES ABOVE THE SETTING OF R-1, VALVES V-1 AND V-2 OPEN AND V-3 CLOSES, PROVIDING RETURN WATER TEMPERATURE, SENSED BY TT-2, IS BELOW THE SETTING OF R-2, AND S-3 IS IN THE AUTO POSITION.

S-3 CAN ALSO MANUALLY SELECT THE SUMMER OR WINTER MODE.

IN THE COOLING MODE THE NORMALLY CLOSED VALVES V1 AND V2 ARE POSITIONED TO ALLOW THE LOOP WATER TO FLOW THRU THE CHILLERS. THE CHILLER BYPASS VALVE V3 IS CLOSED. AFTER VALVES V1 AND V2 ARE OPENED THE LEAD PUMP, P3 OR P4, IS STARTED. THE LEAD CHILLER IS STARTED AFTER FLOW IS PROVEN THRU THE CHILLER. THE LAG PUMP IS STARTED AFTER A PRESET TIME DELAY IF THE CHILLED WATER SUPPLY TO THE BUILDING LOOP IS ABOVE 48°.

NOTES:

1. POWER WIRING NOT BY RCC.
2. FLOW SWITCH FURNISHED WITH CHILLER.

BUILDING 62 FORT McPHERSON, GA	Robertshaw CONTROLS COMPANY 5952 PEACHTREE BLVD. NORCROSS, GA 30071
	TITLE: CHILLED WATER SYSTEM
TOLSON-LEE-SIMPSON	
C & M HTG. & A/C CO.	DWG NO: 20CS81005

Building 62

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: C-D
CHECKED BY:
DATE: 1-8-91

BLDG.# 62
EC0 15

LIGHTING

ROOM #	# OF FIXTURES	LAMPS/ FIXTURE	WATTS/ BULB	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCC. SENSOR	NO. OF SWITCHES	UNOCC LIGHTS ON

OF EXIT SIGNS –

COMMENTS: SEE Bldg 58

BUILDING 100

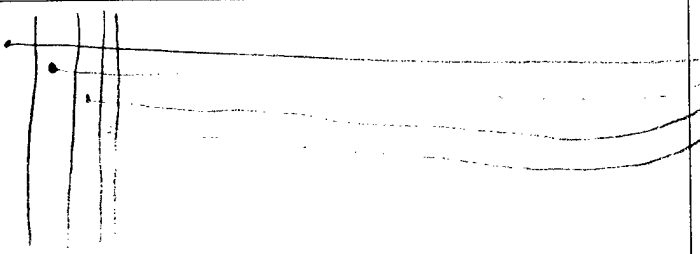
EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

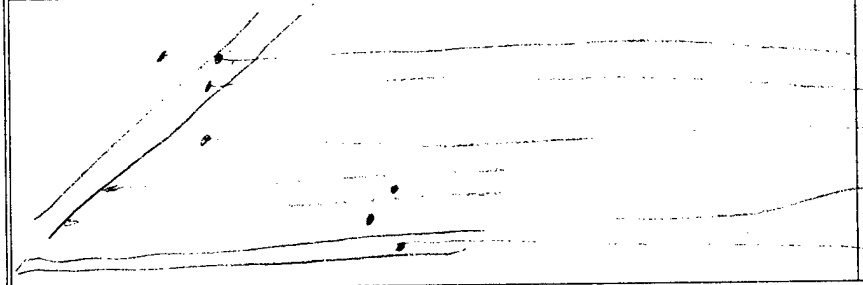
JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY:
CHECKED BY:
DATE:

BLDG.# 122
ECO 1

WALL & ROOF INSULATION

AREAS IN SQ. FEET	NORTH	SOUTH	EAST	WEST
WALLS	416	416	1495	1495
WINDOWS				
OVERHEAD DOORS	0	0	0	0
PERSONNEL DOORS				

SKETCH WALL CROSS–SECTION	COMPONENTS
	1. OUTSIDE AIR FILM 2. BRICK 3. FRAMI [illegible] 4. GYPBOARD 5. 6. 7. INSIDE AIR FILM

SKETCH ROOF CROSS–SECTION	COMPONENTS
	1. OUTSIDE AIR FILM 2. Shingles 3. PLY [illegible] 4. SPAC 5. 6½" R-19 FIB[illegible] 6. SPACE 7. INSIDE AIR FILM CEILING TILE

PERSONNEL DOOR TYPE: WOOD	BASEMENT [ ]
OVERHEAD DOOR TYPE: —	SLAB [ ]
	CRAWL SPACE [✓]

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: KC
CHECKED BY:
DATE: 12-17-91

BLDG.# 100
ECO 1

PIPE INSULATION

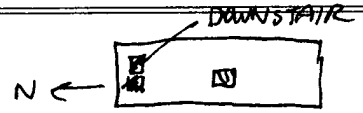
LOCATION	PIPE DIAMETER	PIPE LENGTH	FLUID TYPE	FLUID TEMP.	AIR TEMP.	INSULATION TYPE	INSULATION THICKNESS	INSULATION CONDITION
DOWN MECH RM.	3 1/2"	200'	HW	130	55	FIBERGLASS	1"	GOOD
	3/4"	200'	DX			RUBBER	1/2"	GOOD

COMMENTS: NEED SMALL INSULATION AROUND JOINT & COULPLINGS 7' LONG.

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: ____ OF ____
CALCULATED BY: KC
CHECKED BY:
DATE: 12-17-91

BLDG.# 100
ECO 1



DUCT INSULATION

LOCATION	DUCT CROSSECTION	SHAPE	DUCT TEMP. (°F)	SURROUND AIR TEMP. (°F)	INSULATION TYPE	INSULATION THICKNESS	INSULATION CONDITION
MECH ROOM	2-24"X24"	□	72°F	68°F	FIBERGLASS & FOIL	1 1/2"	FAIR
DOWN MECH ROOM	12"X12"	□			↓	1/2"	GOOD

COMMENTS: THE ROOM IS USED AS RETURN AIR PLENUM, AHU IS COOLED BY DX COIL AND HEATING THROUGH HW COIL. MANUAL SUM/WINTER CHANGEOVER SWITCH. THE ROOM HAS OA GRILL FOR MIN OA REQUIREMENT, TOO HOT IN WINTER AND TOO COLD IN SUMMER. NEED CONTROL REPAIR. TC HAS NO PINS.

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: JW
CHECKED BY:
DATE: 12/17/91

BLDG.# 100
ECO 2

WINDOWS SURVEY

WINDOW NO.	SINGLE/DOUBLE PANE	TYPE–SLIDING FIXED, CASEMENT	FRAME MAT'L	ORIENTATION	GLASS SHADING	WINDOW COVER	DIMENSIONS (INCH)
	DOUBLE	NEW METAL CASEMENT	METAL	W	NONE	BLINDS	30X60
	"	"	"	S	"	"	"
	"	"	"	E	"	"	"
	"	"	"	N	"	"	"

COMMENTS: ALL windows are new w/ caulk w/ no infiltration

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: JW
CHECKED BY:
DATE: 12/17/91

BLDG.# 100
ECO 3

WEATHERSTRIPING AND CAULKING

DOOR\ WINDOW	CONDITION OF W.S./CAULK	INFILTRATION	ORIENTATION	DIMENSIONS (INCH)	#
W	EXC,	NONE	W	30 x 60	10
W	"	"	S	"	4
W	"	"	E	"	9
W	"	"	N	"	4
D	NONE	HIGH	S	80 X 36	1

COMMENTS:

~~Only~~ ENTRANCE AT FRONT DOOR HAS 2 DOOR AIR SPACE W/ VERY LITTLE INFILTRATION. BUILDING IS VERY TIGHT.

SOUTH END DOOR DOES NOT COMPLETELY SHUT ∴ @ A ½" AIR GAP.

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: C A D
CHECKED BY:
DATE: 12-17-91

BLDG.# 100
ECO 4

DOMESTIC HOT WATER

FAUCET LOCATION	WATER TEMPERATURE
Main Pump	143 °F
PROBLEMS:	

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: CMD
CHECKED BY:
DATE: 12-17-91

BLDG.# 100
ECO 5

MOTORS

MOTOR #	1	HP	2	PH	3	RPM	
MODEL #		VOLTS	200	AMPS	7.1		
SERIAL #		PRESENT HR.	*			TO	
MFG	●	REQUIRED HR.				TO	
FRAME		EFF.					
DESCRIPTION	● S.F. on AHU-1	COMMENTS	* AHU OPERATED BY MANUAL SWITCH.				

MOTOR #	2	HP	1/2	PH	1	RPM	
MODEL #		VOLTS	230	AMPS	4.2		
SERIAL #		PRESENT HR.				TO	
MFG	?	REQUIRED HR.				TO	
FRAME		EFF.					
DESCRIPTION	SF ON AHU-2	COMMENTS	TRANE AHU ● TWH046-140S0				

MOTOR #	3	HP	1/3	PH	1	RPM	1725
MODEL #	UVA56C17F5312A	VOLTS	115	AMPS	6.6		
SERIAL #		PRESENT HR.				TO	
MFG	MARATHON ELECTRIC	REQUIRED HR.				TO	
FRAME	56C-65	EFF.					
DESCRIPTION	HW PUMP MOTOR	COMMENTS					

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO. _____ OF _____
CALCULATED BY: CMP
CHECKED BY: _____
DATE: 12-17-9

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 100 BLDG NAME: Dental Clinic JOB: 3105.000
PRIMARY FUNCTION: _____ GROSS SQ FT _____ NO OF FLRS 1
BUILDING MANAGER NAME: _____
PHONE: _____ OFFICE NO. _____
SPECIAL AREAS: COMPUTER FACILITY [ ] - ZONE NO'S. _____
AUDITORIUM [ ] - ZONE NO'S. _____
LABORATORIES [ ] - ZONE NO'S. _____
CAFETERIA [ ] - ZONE NO'S. _____
OTHER [ ] _____ - ZONE NO'S. _____

ZONE NO. 1 FUNCTION: _____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: Reception Area (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F 730 TO 1615, SAT ____ TO ____, SUN ____ TO ____
PRESENT TEMP: WINTER OCC 73.7 °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F
REQUIRE TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F

REMARKS: _____

ZONE NO. 2 FUNCTION: _____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: Main HALL By T-STAT (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F ____ TO ____, SAT ____ TO ____, SUN ____ TO ____
PRESENT TEMP: WINTER OCC 71.9 °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F
REQUIRE TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F

REMARKS: _____

ZONE NO. _____ FUNCTION: _____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: _____ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F ____ TO ____, SAT ____ TO ____, SUN ____ TO ____
PRESENT TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F
REQUIRE TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F

REMARKS: _____

ZONE NO. _____ FUNCTION: _____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: _____ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F ____ TO ____, SAT ____ TO ____, SUN ____ TO ____
PRESENT TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F
REQUIRE TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F

REMARKS: _____

BUILDING 101

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

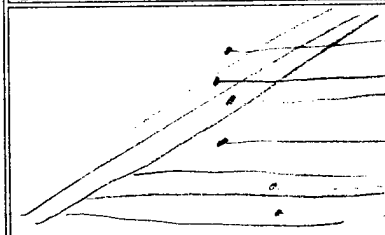
JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: CMD
CHECKED BY:
DATE: 12-17-9

BLDG.# 101
ECO 1

WALL & ROOF INSULATION

AREAS IN SQ. FEET	NORTH	SOUTH	EAST	WEST
WALLS	640	640	3000	3000
WINDOWS				
OVERHEAD DOORS	0	0	0	0
PERSONNEL DOORS				

SKETCH WALL CROSS-SECTION	COMPONENTS	
	1. OUTSIDE AIR FILM	.17
	2. BRICK	1.24
	3. FRAME	.45
	4. G TP BOARD	
	5.	
	6.	
	7. INSIDE AIR FILM	.68
		2,54

SKETCH ROOF CROSS-SECTION	COMPONENTS	
	1. OUTSIDE AIR FILM	.17
	2. Shingles	.44
	3. PLYWOOD	.62
	4. SPACE	1.0
	5. ≈8" Blown Fiberglass	19
	6. CEILING TILE	1.79
	7. INSIDE AIR FILM	.68
		23.7

PERSONNEL DOOR TYPE	BASEMENT [-]
OVERHEAD DOOR TYPE	SLAB [ ]
	CRAWL SPACE [ ]

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO. ____ OF ____
CALCULATED BY: KC
CHECKED BY:
DATE: 12-17-91

BLDG.# 101
ECO 1

PIPE INSULATION

LOCATION	PIPE DIAMETER	PIPE LENGTH	FLUID TYPE	FLUID TEMP.	AIR TEMP.	INSULATION TYPE	INSULATION THICKNESS	INSULATION CONDITION
OUTSIDE NORTH END	4"	80'	CW	NA	55°	FIBERGLASS ALUMINUM	1 1/2"	*
↓	4"	25'	HW	.	55	FIBERGLASS	1 1/2"	**

COMMENTS: * GOOD FOR STRAIGHT RUN - NEED REPAIR ON ELBOWS (8) ON STREET LEVEL.

** NEED INSULATION AROUND COUPLING & VALVE.

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB Ft. McPherson/Ft. Gillem Energy Study
PROJ.# EMC # 3105.000
SHEET NO. OF
CALCULATED BY: KC
CHECKED BY:
DATE: 12-17-91

BLDG.# 101
ECO 1

DUCT INSULATION

LOCATION	DUCT CROSSECTION	SHAPE	DUCT TEMP. (°F)	SURROUND AIR TEMP. (°F)	INSULATION TYPE	INSULATION THICKNESS	INSULATION CONDITION
	NO DUCT - 2-PIPE FAN COIL.						

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: J W
CHECKED BY:
DATE: 12/17/91

BLDG.# 101
ECO 2

WINDOWS SURVEY

WINDOW NO.	SINGLE/DOUBLE PANE	TYPE–SLIDING FIXED, CASEMENT	FRAME MAT'L	ORIENTATION	GLASS SHADING	WINDOW COVER	DIMENSIONS (INCH)
23	SINGLE	SLIDING	WOOD	E	NONE	SHADES	34X80
25	"	"	"	W	"	"	"
3	"	"	"	N	"	"	"
2	"	"	"	S	"	"	"

COMMENTS: IT IS COMMON IN THIS BUILDING TO OPEN WINDOWS WITH FAN COIL UNITS REMAINING ON TO REACH DESIRED OFFICE TEMP.

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO. ____ OF ____
CALCULATED BY: JW
CHECKED BY: ____
DATE: 12/17/91

BLDG.# 101
ECO 3

WEATHERSTRIPING AND CAULKING

DOOR\ WINDOW	CONDITION OF W.S./CAULK	INFILTRATION	ORIENTATION	DIMENSIONS (INCH)	#
W	BAD	MED	E	34X80	23
D	NONE	MED	N	80x34	1
D (MAIN DOOR)	GOOD	HIGH	W	80x34	✓
W	BAD	MED/low	W	34x80	25
D (ADMIN OFFICES)	NONE	HIGH	W	80x34	1
W	BAD	MED	N	80x34	3
"	"	"	S	"	3

COMMENTS: ~~BUILDING IS AT POS. PRESSURE AT TIME OF SURVEY.~~ ~~LOW~~ ~~INFILTRATION~~ (MAIN) FRONT DOOR IS WARPED CAUSING AIR GAP.

NOTE: THIS BUILDING ONLY HAS A FEW OPERATIONAL WINDOWS — MOST ARE NAILED OR PAINTED SHUT. HOWEVER MANY OF THE PERMENANTY CLOSED WINDOWS HAVE NO CAULK. THIS SHOULD BE IMPLEMENTED.

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB	Ft. McPherson/Ft. Gillem Energy Study
PROJ.#	EMC # 3105.000
SHEET NO.	OF
CALCULATED BY:	CMD
CHECKED BY:	
DATE:	12-17-91

BLDG.# 101
ECO 4

DOMESTIC HOT WATER

FAUCET LOCATION	WATER TEMPERATURE
Men's Room	124 °F
Men's Room [illegible]	128 °F
PROBLEMS:	

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: KC
CHECKED BY:
DATE: 12-17-91

BLDG.# 101
ECO 5

N ←

MOTORS

MOTOR #	1	HP	5	PH	3	RPM	1725
MODEL #	JMM 3218T	VOLTS	208	AMPS	14.8		
SERIAL #		PRESENT HR.	0	TO	2000		
MFG	BALDOR	REQUIRED HR.		TO			
FRAME	184JM	EFF.					
DESCRIPTION	DTW PUMP MOTOR BASEMENT	COMMENTS	CONTROLS TC HAS NO PINS. BUILDING OP. 7:30 — 16:30 M-F				

MOTOR #	2	HP	1	PH	1	RPM	1725
MODEL #	VL3510	VOLTS	115	AMPS	12.4		
SERIAL #		PRESENT HR.		TO			
MFG	BALDOR	REQUIRED HR.		TO			
FRAME	56C	EFF.	67%				
DESCRIPTION	SUMP PUMP	COMMENTS	FAIRLY NEW				

MOTOR #		HP		PH		RPM	
MODEL #		VOLTS		AMPS			
SERIAL #		PRESENT HR.		TO			
MFG		REQUIRED HR.		TO			
FRAME		EFF.					
DESCRIPTION		COMMENTS					

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY:
CHECKED BY:
DATE:

BLDG.# 101
ECO 5

10+ HP MOTORS

MEASURED

MOTOR# HW Pump
DESCRIPTION
MFG
MODEL #
SERIAL #
FRAME
HP 30 RPM
VOLT
AMPS
EFF.
COMMENTS

	PHASE A	PHASE B	PHASE C
VOLTS	203	203	
AMPS	90.6	93.6	
KVAR	17.8		
KVA	32.4		
KW	27		
PF	83.6		

PRESENT TO
REQ HR. TO

MOTOR#
DESCRIPTION
MFG
MODEL #
SERIAL #
FRAME
HP RPM
VOLT
AMPS
EFF.
COMMENTS

	PHASE A	PHASE B	PHASE C
VOLTS			
AMPS			
KVAR			
KVA			
KW			
PF			

PRESENT TO
REQ HR. TO

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB Ft. McPherson/Ft. Gillem Energy Study
PROJ.# EMC # 3105.000
SHEET NO. _____ OF _____
CALCULATED BY: _____
CHECKED BY: _____
DATE: _____

Ft. Gillem

BLDG.# 101
ECO 7

HW PUMPS

CIRCULATION PUMPS

RPM	FT HD	GPM	MODEL #	SERIAL #	MFG.	HOURS REQUIRED	HOURS PRESENT	PUMP #
1750	130	625	77-10137-2	SIZE 4-15	AURORA PUMP		0-2400	HWP1
1750	130	625	77-10137-1	↓	AURORA PUMP			HWP2
1750	~~90~~ 80	~~72~~ ~~90~~	2BBG-3/8BF		BELL & GOSSETT			CWP 1 & 2

PUMP MOTORS

VOLTS	AMPS	PHASE	MODEL #	SERIAL #	MFG.	HOURS REQUIRED	HOURS PRESENT	FRAME	MOTOR#

COMMENTS: _____

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB
SHEET NO. OF
CALCULATED BY DATE
CHECKED BY DATE
SCALE

101.

HW PUMP 30 HP.

V	
203	203
90.6 V	93.6 A
27 KW	
17.8 KVAR	
32.4 KVA	
83.6 PF	

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB
SHEET NO. OF
CALCULATED BY KC DATE 12-17-91
CHECKED BY DATE
SCALE

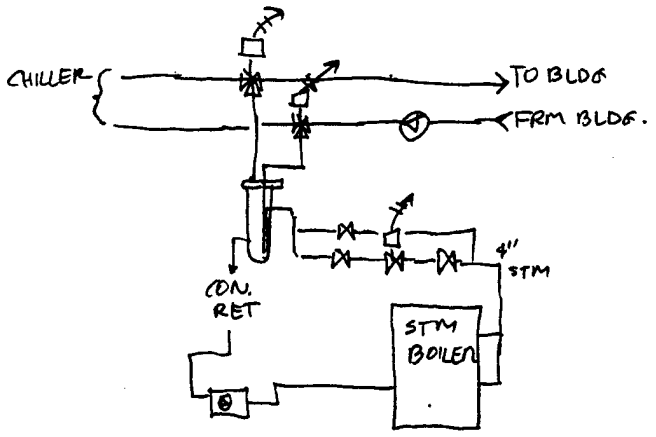
ECO-12

BLDG 101 CHILLER MODEL 30GB040510

COMP 1	208/230	3φ	60HZ	76 RLA	345 LRA	R-22
COMP 1	208/230	3φ	60HZ	76 RLA	345 LRA	
FAN 2	↓	1φ	↓	4.6 PLA	0.43 HP	
2		1φ		4.6	↓	

PUMP THROUGH BF120
NO OTHER INFO.

BOILER AMERICAN STANDARD



- HW OA RESET CONTROL
- TC NO ~~TIME CLOCK~~ PINS
- ELEC. ACTUATOR POOR COND.
- 1 AC WINDOW UNIT

T1 T2 T3
☐ ☐ ☐

JC GQ-4000-5 8236
☐ ☐ ☐

HAS 2 EXH ROOF FORM.

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO. ____ OF ____
CALCULATED BY: CMD
CHECKED BY: ____
DATE: 12-17-8_

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 1 BLDG NAME: MP 5 JOB: 3105.000
PRIMARY FUNCTION: ____ GROSS SQ FT ____ NO OF FLRS 2
BUILDING MANAGER NAME: ____
PHONE: ____ OFFICE NO. ____
SPECIAL AREAS: COMPUTER FACILITY [ ] - ZONE NO'S. ____
AUDITORIUM [ ] - ZONE NO'S. ____
LABORATORIES [ ] - ZONE NO'S. ____
CAFETERIA [ ] - ZONE NO'S. ____
OTHER [ ] ____ - ZONE NO'S. ____

ZONE NO. 1 FUNCTION: ____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: 1ST FLOOR HALL (BY T-STAT) (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F 730 TO 1630, SAT ____ TO ____, SUN ____ TO ____
PRESENT TEMP: WINTER OCC 74.3 °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F
REQUIRE TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F

REMARKS: ____

ZONE NO. 2 FUNCTION: ____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: 2ND FLOOR HALL (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F ____ TO ____, SAT ____ TO ____, SUN ____ TO ____
PRESENT TEMP: WINTER OCC 74.5 °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F
REQUIRE TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F

REMARKS: ____

ZONE NO. 3 FUNCTION: [illegible] SPECIAL REQ. YES [ ] NO [ ]
LOCATION: OFFICE (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F 730 TO 1615, SAT ____ TO ____, SUN ____ TO ____
PRESENT TEMP: WINTER OCC 76.8 °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F
REQUIRE TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F

REMARKS: ____

ZONE NO. 4 FUNCTION: DENTAL SPECIAL REQ. YES [ ] NO [ ]
LOCATION: DENTAL AREA (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F 730 TO 1615, SAT ____ TO ____, SUN ____ TO ____
PRESENT TEMP: WINTER OCC 78.3 °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F
REQUIRE TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F

REMARKS: ____

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB _____

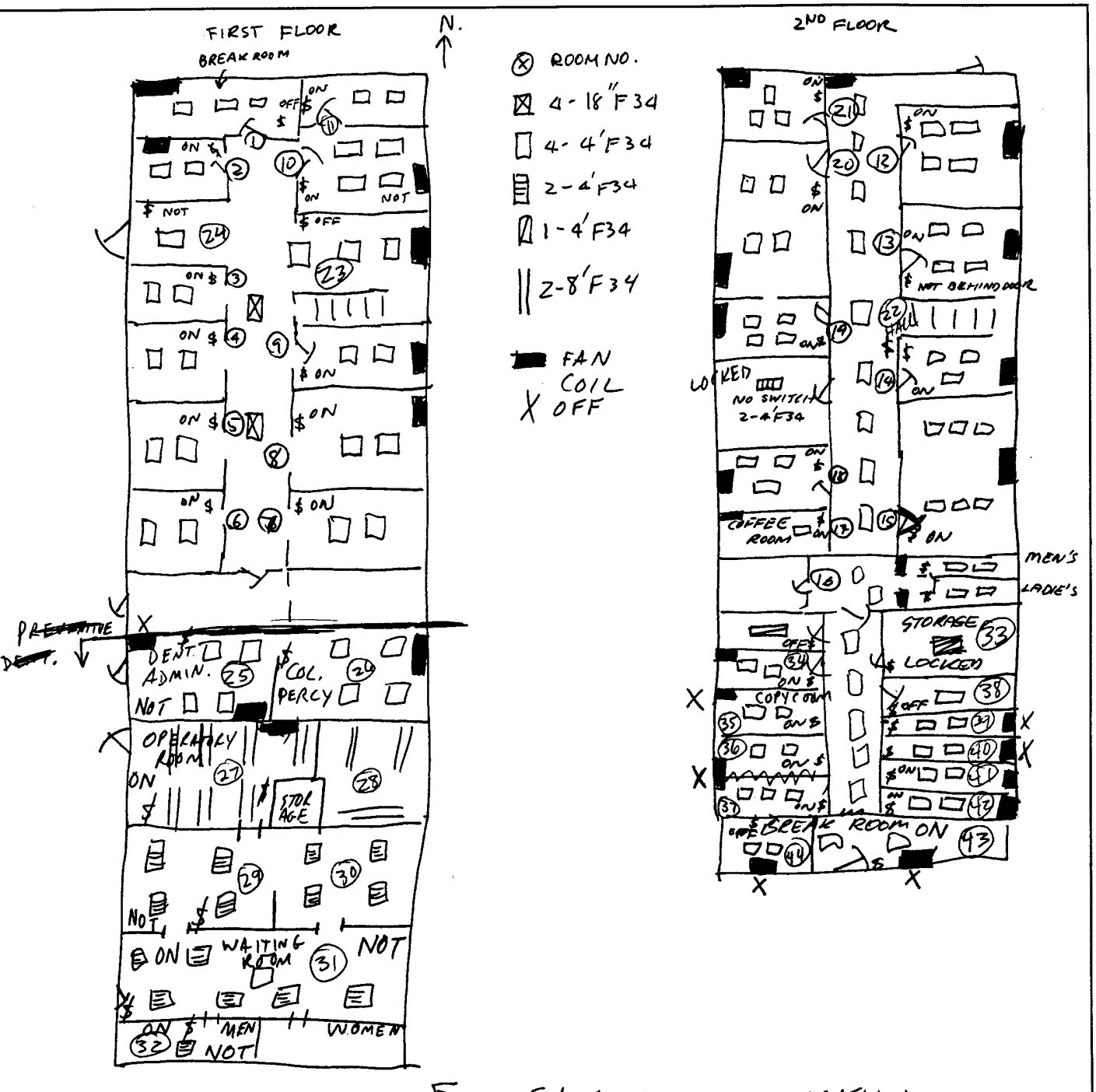
SHEET NO. _____ OF _____

CALCULATED BY JW DATE _____

CHECKED BY _____ DATE _____

SCALE _____

BLDG. 101



← SAME FAN COIL LOCATION AS 2nd floor

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO. ____ OF ____
CALCULATED BY: JW
CHECKED BY:
DATE: 2/11/92

BLDG.# M-101
EC0 15

LIGHTING

ROOM #	# OF FIXTURES	LAMPS/ FIXTURE	WATTS/ BULB	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCC. SENSOR	NO. OF SWITCHES	UNOCC LIGHTS ON
1	3	4	34	F	~~OFF~~	Y	Y	1	N
2	2	4			ON	Y	Y	1	N
3	2	4			ON	Y	Y	1	Y
4	2	4			ON	Y	Y	1	Y
5	2	4			ON	Y	Y	1	Y
6	2	4			ON	Y	Y	1	N
7	2	4			ON	Y	Y	1	N
8	2	4			ON	Y	Y	1	N
9	2	4			ON	Y	Y	1	Y
10	4	4			ON	Y	N	1	N
11	2	4			ON	Y	Y	1	Y
12	4	4			ON	Y	Y	1	N
13	4	4			ON	Y	N	1	N
14	3	4			ON	Y	Y	1	Y
15	6	4			ON	Y	Y	1	N
16	6	4			ON	Y	N	1	N
17	1	4			ON	Y	Y	1	Y
18	3	4			ON	Y	Y	1	N

OF EXIT SIGNS – _____

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO. ____ OF ____
CALCULATED BY: JW
CHECKED BY: ____
DATE: 2/11/92

BLDG.# M-101
EC0 15

LIGHTING

ROOM #	# OF FIXTURES	LAMPS/ FIXTURE	WATTS/ BULB	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCC. SENSOR	NO. OF SWITCHES	UNOCC LIGHTS ON
19	4	4			ON	Y	Y	1	N
20	4	4			ON	Y	N	1	N
21	3	4			ON	Y	Y	1	Y
22	9	4			ON	Y	N	2	N
23	3	4			OFF	Y	N	1	N
24	1	4			OFF	Y	N	1	N
25	4	4			ON	Y	N	1	N
26	4	4			ON	Y	Y	1	Y
27	7	8'			ON	Y	N	2	N
28	3	8'			ON	Y	N	1	N
29	4	2	34	F	ON	Y	N	1	N
30	4	2	34	F	ON	Y	N	1	N
31	7	2	34	F	ON	Y	N	1	Y
32	1	2			ON	Y	N	1	N
34	2	4	34	F	ON	Y	Y	1	Y
35	2	4			ON	Y	Y	1	Y
36	2	4			ON	Y	Y	1	N
37	3	4			ON	Y	N	1	N

OF EXIT SIGNS – ____

COMMENTS: ____

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: JW
CHECKED BY:
DATE: 2/11/92

BLDG.# M-101
EC0 15

LIGHTING

ROOM #	# OF FIXTURES	LAMPS/ FIXTURE	WATTS/ BULB	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCC. SENSOR	NO. OF SWITCHES	UNOCC LIGHTS ON
38	1	4	34	F	~~ON~~ OFF	Y	Y ~~N~~	1	N
39	2	4			ON	Y	Y	1	N
40	2	4			ON	Y	Y	1	Y
41	2	4			ON	Y	Y	1	Y
42	2	4			ON	Y	Y	1	N
43	2	4			ON	Y	Y	1	Y
44	2	4			ON	Y	Y	1	N

OF EXIT SIGNS – _____

COMMENTS: _____

BUILDING 102

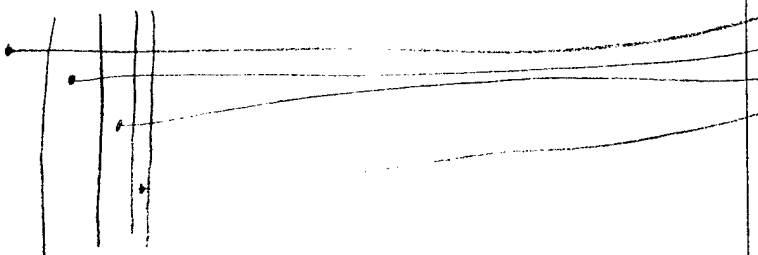
EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

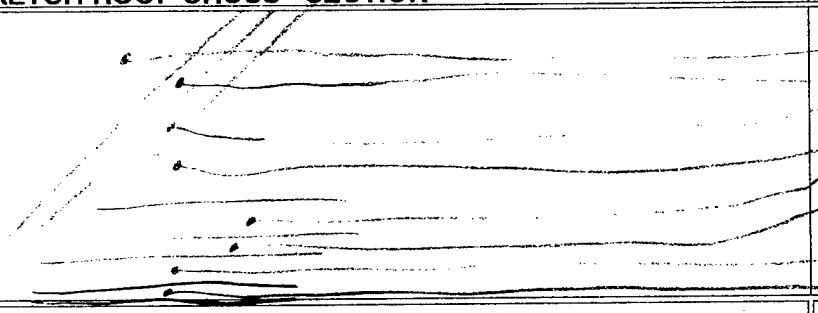
JOB	Ft. McPherson/Ft. Gillem Energy Study
PROJ.#	EMC # 3105.000
SHEET NO.	OF
CALCULATED BY:	MD
CHECKED BY:	
DATE:	12-16-19

BLDG.# 102
ECO 1

WALL & ROOF INSULATION

AREAS IN SQ. FEET	NORTH	SOUTH	EAST	WEST
WALLS	372	372	732	732
WINDOWS				
OVERHEAD DOORS	1	1	1	1
PERSONNEL DOORS				

SKETCH WALL CROSS–SECTION	COMPONENTS
	1. OUTSIDE AIR FILM 2. BRICK 3. 2x4 STUD WALL 4. GYPBOARD 5. 6. 7. INSIDE AIR FILM

SKETCH ROOF CROSS–SECTION	COMPONENTS
	1. OUTSIDE AIR FILM 2. Shingles 3. Plywood 4. SPACE 5. 8" Blown Fiberglass 6. PLASTER 7. INSIDE AIR FILM SPACE ORIGINAL CEILING

PERSONNEL DOOR TYPE: GLASS	BASEMENT [ ] SLAB [ ] CRAWL SPACE [ ]
OVERHEAD DOOR TYPE: —	

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: _____ OF
CALCULATED BY: CMD
CHECKED BY:
DATE: 12-16-91

BLDG.# 102
ECO 1

PIPE INSULATION

LOCATION	PIPE DIAMETER	PIPE LENGTH	FLUID TYPE	FLUID TEMP.	AIR TEMP.	INSULATION TYPE	INSULATION THICKNESS	INSULATION CONDITION

COMMENTS: NO PIPES

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: CMD
CHECKED BY:
DATE: 12-16-91

BLDG.# 102
ECO 1

DUCT INSULATION

LOCATION	DUCT CROSSECTION	SHAPE	DUCT TEMP. (°F)	SURROUND AIR TEMP. (°F)	INSULATION TYPE	INSULATION THICKNESS	INSULATION CONDITION
Above drop ceiling	12 x 16	□			Fiberglass	3/4	Good
	10 - 10	□			Fiberglass	3/4	Good

COMMENTS: 12x16 runs length of bldg.

10x10 = 50 ft, diffuser blanks

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: JW
CHECKED BY:
DATE: 12/16/91

BLDG.# 102
ECO 2

WINDOWS SURVEY

WINDOW NO.	SINGLE/DOUBLE PANE	TYPE–SLIDING FIXED, CASEMENT	FRAME MAT'L	ORIENTATION	GLASS SHADING	WINDOW COVER	DIMENSIONS (INCH)
	S	FIXED	WOOD	N	No	SHADES	78X33
	TYP OF ALL						

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: JW
CHECKED BY:
DATE: 12/16/91

BLDG.# 102
ECO 3

WEATHERSTRIPING AND CAULKING

DOOR\ WINDOW	CONDITION OF W.S./CAULK	INFILTRATION	ORIENTATION	DIMENSIONS (INCH)	#
W	NONE	NONE	N	78X33	2
W	"	"	S	32X54	3
W	"	"	E	"	2
W	"	"	W	"	4
D	NONE	LOW	W	82X36	2

Cased METAL

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: CMD
CHECKED BY:
DATE: 12-15-4

BLDG.# 102
ECO 4

DOMESTIC HOT WATER

FAUCET LOCATION	WATER TEMPERATURE
Restroom	119 °F
PROBLEMS:	

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: CMD
CHECKED BY:
DATE: 12-16-91

BLDG.# 102
ECO 5

MOTORS

MOTOR # 1 HP .75 PH 1 RPM 1000
MODEL # 5KCP39RG VOLTS AMPS 12.5
SERIAL # PRESENT HR. TO
MFG G.E. REQUIRED HR. TO
FRAME EFF.
DESCRIPTION Blower on Gr. Furnace COMMENTS

MOTOR # HP PH RPM
MODEL # VOLTS AMPS
SERIAL # PRESENT HR. TO
MFG REQUIRED HR. TO
FRAME EFF.
DESCRIPTION COMMENTS

MOTOR # HP PH RPM
MODEL # VOLTS AMPS
SERIAL # PRESENT HR. TO
MFG REQUIRED HR. TO
FRAME EFF.
DESCRIPTION COMMENTS

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO. _____ OF _____
CALCULATED BY: CMD
CHECKED BY: _____
DATE: 12-16-91

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 102 BLDG NAME: MP JOB: 3105.000
PRIMARY FUNCTION: _____ GROSS SQ FT _____ NO OF FLRS _____
BUILDING MANAGER NAME: _____
PHONE: _____ OFFICE NO. _____
SPECIAL AREAS: COMPUTER FACILITY [ ] - ZONE NO'S. _____
AUDITORIUM [ ] - ZONE NO'S. _____
LABORATORIES [ ] - ZONE NO'S. _____
CAFETERIA [ ] - ZONE NO'S. _____
OTHER [ ] _____ - ZONE NO'S. _____
ZONE NO. 1 FUNCTION: _____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: HALLWAY (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F ____ TO ____, SAT ____ TO ____, SUN ____ TO ____
PRESENT TEMP: WINTER OCC 67.1 °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F
REQUIRE TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F

REMARKS: _____

ZONE NO. _____ FUNCTION: _____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: _____ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F 0000 TO 2400, SAT 0 TO 2400, SUN 0 TO 2400
PRESENT TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F
REQUIRE TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F

REMARKS: _____

ZONE NO. _____ FUNCTION: _____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: _____ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F ____ TO ____, SAT ____ TO ____, SUN ____ TO ____
PRESENT TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F
REQUIRE TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F

REMARKS: _____

ZONE NO. _____ FUNCTION: _____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: _____ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F ____ TO ____, SAT ____ TO ____, SUN ____ TO ____
PRESENT TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F
REQUIRE TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F

REMARKS: _____

BUILDING 105

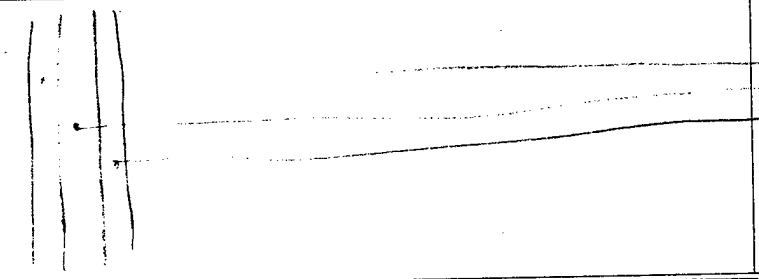
EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

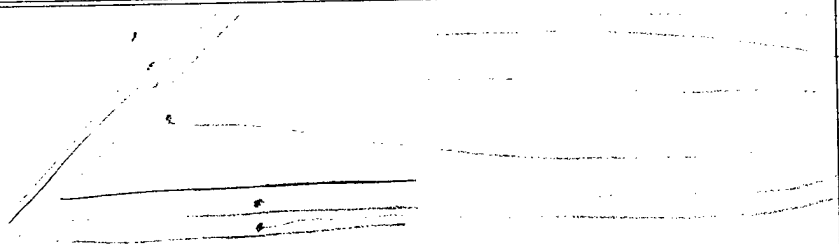
JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: CMD
CHECKED BY:
DATE:

BLDG.# 105
ECO 1

WALL & ROOF INSULATION

AREAS IN SQ. FEET	NORTH	SOUTH	EAST	WEST
WALLS	540	540	576	576
WINDOWS				
OVERHEAD DOORS	0	0	0	0
PERSONNEL DOORS				

SKETCH WALL CROSS–SECTION	COMPONENTS	
	1. OUTSIDE AIR FILM	.17
	2. BRICK	1.24
	3. FRAME	
	4. GYP BOARD	.45
	5.	
	6.	
	7. INSIDE AIR FILM	.68
		2.54

SKETCH ROOF CROSS–SECTION	COMPONENTS	
	1. OUTSIDE AIR FILM	.17
	2. Shingles	.44
	3. PLY WOOD	.62
	4. SPACE	1.0
	5. 6½" Fiberglass (R-19?)	19
	6. CEILING TILES	1.79
	7. INSIDE AIR FILM	.68
		23.7

PERSONNEL DOOR TYPE: W001?	BASEMENT [ ]
OVERHEAD DOOR TYPE:	SLAB [✓]
	CRAWL SPACE [ ]

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO. _____ OF _____
CALCULATED BY: CMD
CHECKED BY: _____
DATE: 12-12-9

BLDG.# 105
ECO 1

PIPE INSULATION

LOCATION	PIPE DIAMETER	PIPE LENGTH	FLUID TYPE	FLUID TEMP.	AIR TEMP.	INSULATION TYPE	INSULATION THICKNESS	INSULATION CONDITION

COMMENTS: NO PIPING

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: CMD
CHECKED BY:
DATE: 12-6-91

BLDG.# 105
ECO 1

DUCT INSULATION

LOCATION	DUCT CROSSECTION	SHAPE	DUCT TEMP. (°F)	SURROUND AIR TEMP. (°F)	INSULATION TYPE	INSULATION THICKNESS	INSULATION CONDITION
OUTSIDE BLDG	20 X 16	RECT			—	—	INTERNAL

COMMENTS:

ALL but 4ft is internally insulated
Duct in bldg runs above dropceiling.

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: JW
CHECKED BY:
DATE: 12/16/91

BLDG.# 105
ECO 2

WINDOWS SURVEY

WINDOW NO.	SINGLE/DOUBLE PANE	TYPE–SLIDING FIXED, CASEMENT	FRAME MAT'L	ORIENTATION	GLASS SHADING	WINDOW COVER	DIMENSIONS (INCH)
-2	Double	SLIDING	Wood	S	NO	BLINDS	48X56
-5	"	"	"	W	"	"	"

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: JW
CHECKED BY:
DATE: 12/16/91

BLDG.# 105
ECO 3

WEATHERSTRIPING AND CAULKING

DOOR\ WINDOW	CONDITION OF W.S./CAULK	INFILTRATION	ORIENTATION	DIMENSIONS (INCH)	#
W	FAIR	FAIR	W	48X56	6
D	↓	↓	W	38 x 84	1
W			N	48x56	2
D			E	38X84	2
W			E	28X40	2
W	↓	↓	S	28X40	2

COMMENTS: WINDOWS FIXED SHUT, DRAFTY

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB	Ft. McPherson/Ft. Gillem Energy Study
PROJ.#	EMC # 3105.000
SHEET NO.	OF
CALCULATED BY:	CMD
CHECKED BY:	
DATE:	12-[illegible]-01

BLDG.# 105
ECO 4

DOMESTIC HOT WATER

FAUCET LOCATION	WATER TEMPERATURE
Common Restroom	137°F
Exam Room	137°F
PROBLEMS:	

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: [illegible]
CHECKED BY:
DATE: 12-16-91

BLDG.# 105
ECO 5

MOTORS

MOTOR #	1	HP	1.5	PH	3	RPM	1725
MODEL #		VOLTS	230	AMPS	5.2		
SERIAL #	3277488	PRESENT HR.		TO			
MFG	A.O. Smith	REQUIRED HR.		TO			
FRAME	56	EFF.					
DESCRIPTION		COMMENTS	AHU-1 Supply Fan				

MOTOR #		HP		PH		RPM	
MODEL #		VOLTS		AMPS			
SERIAL #		PRESENT HR.		TO			
MFG		REQUIRED HR.		TO			
FRAME		EFF.					
DESCRIPTION		COMMENTS					

MOTOR #		HP		PH		RPM	
MODEL #		VOLTS		AMPS			
SERIAL #		PRESENT HR.		TO			
MFG		REQUIRED HR.		TO			
FRAME		EFF.					
DESCRIPTION		COMMENTS					

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO. _____ OF _____
CALCULATED BY: CMD
CHECKED BY: _____
DATE: 12-17-9

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 105 BLDG NAME: VETERINARIAN JOB: 3105.000
PRIMARY FUNCTION: _____ GROSS SQ FT _____ NO OF FLRS 1
BUILDING MANAGER NAME: _____
PHONE: _____ OFFICE NO. _____
SPECIAL AREAS: COMPUTER FACILITY [ ] - ZONE NO'S. _____
AUDITORIUM [ ] - ZONE NO'S. _____
LABORATORIES [ ] - ZONE NO'S. _____
CAFETERIA [ ] - ZONE NO'S. _____
OTHER [ ] _____ - ZONE NO'S. _____
ZONE NO. 1 FUNCTION: _____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: WAITING ROOM (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F 830 TO 1500, SAT ____ TO ____, SUN ____ TO ____
PRESENT TEMP: WINTER OCC 70.1 °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F
REQUIRE TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F

REMARKS: _____

ZONE NO. 2 FUNCTION: _____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: CONFERENCE ROOM (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F ____ TO ____, SAT ____ TO ____, SUN ____ TO ____
PRESENT TEMP: WINTER OCC 71.3 °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F
REQUIRE TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F

REMARKS: _____

ZONE NO. _____ FUNCTION: _____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: _____ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F ____ TO ____, SAT ____ TO ____, SUN ____ TO ____
PRESENT TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F
REQUIRE TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F

REMARKS: _____

ZONE NO. _____ FUNCTION: _____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: _____ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F ____ TO ____, SAT ____ TO ____, SUN ____ TO ____
PRESENT TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F
REQUIRE TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F

REMARKS: _____

When cleaning crew dusts building they often accidentally change the set point on the T-stat

BUILDING 109

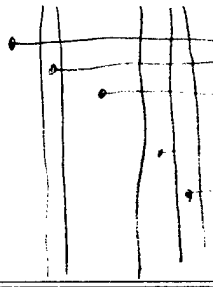
EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

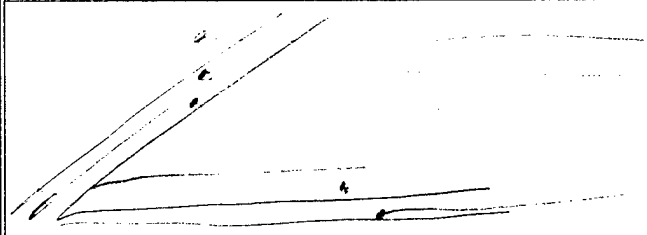
JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY:
CHECKED BY:
DATE: 12-13-91

BLDG.# 109
ECO 1

WALL & ROOF INSULATION

AREAS IN SQ. FEET	NORTH	SOUTH	EAST	WEST
WALLS				
WINDOWS				
OVERHEAD DOORS				
PERSONNEL DOORS				

SKETCH WALL CROSS–SECTION	COMPONENTS
	1. OUTSIDE AIR FILM 2. VINYL SIDING 3. POURED CONCRETE 8" 4. FRAME WALL 5. GYP BOARD 6. 7. INSIDE AIR FILM

SKETCH ROOF CROSS–SECTION	COMPONENTS
	1. OUTSIDE AIR FILM 2. SHINGLES 3. PLYWOOD 4. R-30 ? 5. GYP BOARD 6. 7. INSIDE AIR FILM

PERSONNEL DOOR TYPE: METAL / GLASS
OVERHEAD DOOR TYPE: —

BASEMENT [ ]
SLAB [ ]
CRAWL SPACE [✓]

COMMENTS:

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____

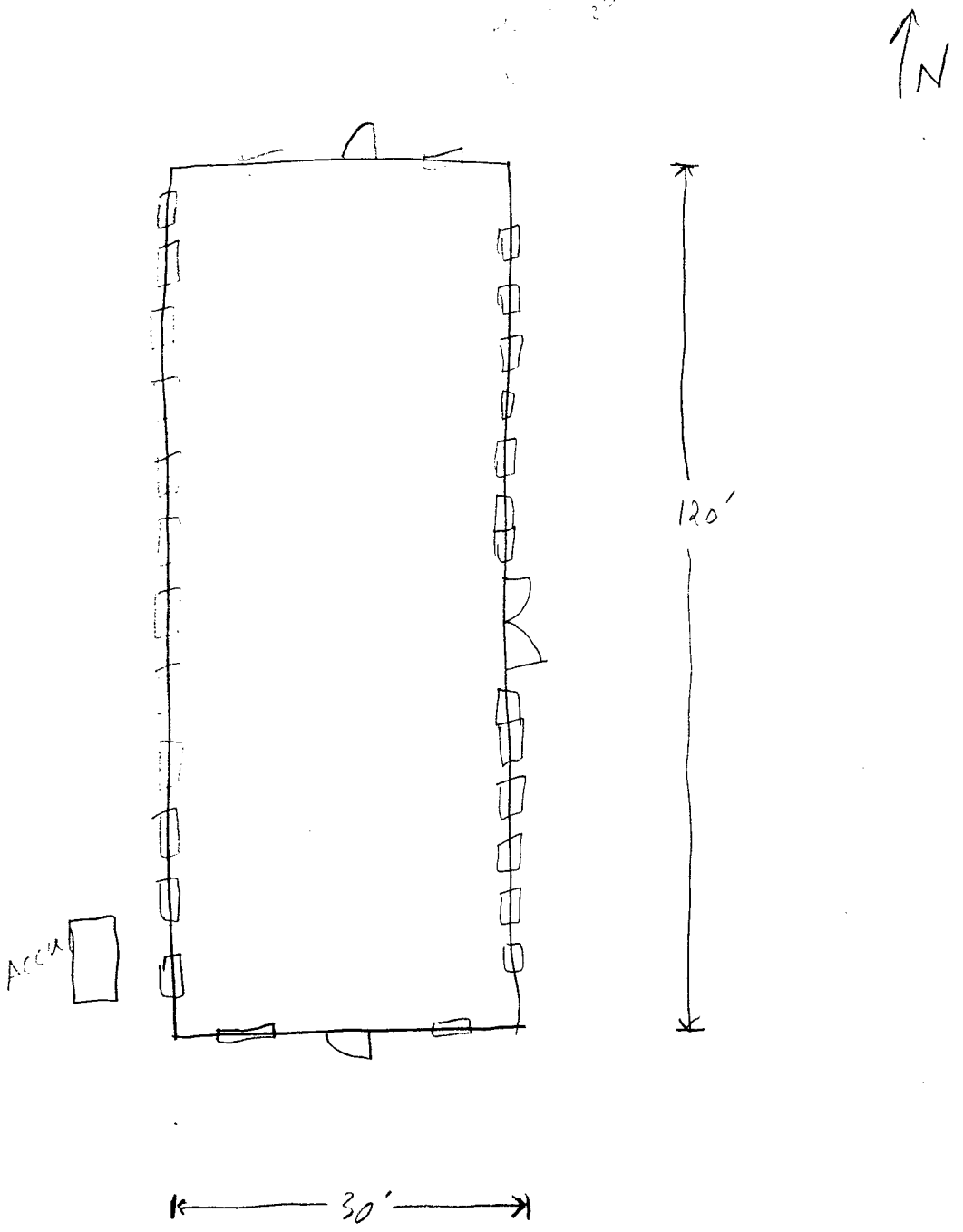
SHEET NO. _____ OF _____

CALCULATED BY CMD DATE 12-13-

CHECKED BY _____ DATE _____

SCALE NTS

109



EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: _____ OF _____
CALCULATED BY: KC
CHECKED BY: _____
DATE: 12-13-91

BLDG.# 109
ECO 1

PIPE INSULATION

LOCATION	PIPE DIAMETER	PIPE LENGTH	FLUID TYPE	FLUID TEMP.	AIR TEMP.	INSULATION TYPE	INSULATION THICKNESS	INSULATION CONDITION
MECH. RM	2½"	50'	CW	NA	66°	FIBERGLASS	1"	GOOD
MECH. RM	2½"	50'	HW		66°	FIBERGLASS	1"	GOOD

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB Ft. McPherson/Ft. Gillem Energy Study
PROJ.# EMC # 3105.000
SHEET NO. OF
CALCULATED BY: RC
CHECKED BY:
DATE: 12-13-91

BLDG.# 109
ECO 1

DUCT INSULATION

LOCATION	DUCT CROSSECTION	SHAPE	DUCT TEMP. (°F)	SURROUND AIR TEMP. (°F)	INSULATION TYPE	INSULATION THICKNESS	INSULATION CONDITION

COMMENTS: NO DUCT WORK; 2-PIPE FAN COILS.

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

BLDG.# 109
ECO 2

JOB Ft. McPherson/Ft. Gillem Energy Study
PROJ.# EMC # 3105.000
SHEET NO. OF
CALCULATED BY: CMD
CHECKED BY:
DATE: 12-13-91

WINDOWS SURVEY

WINDOW NO.	SINGLE/DOUBLE PANE	TYPE–SLIDING FIXED, CASEMENT	FRAME MAT'L	ORIENTATION	GLASS SHADING	WINDOW COVER	DIMENSIONS (INCH)
1	SINGLE	SLIDING	WOOD	W	NONE	Blinds	53 x 41

COMMENTS: TYP OF 29

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO. ____ OF ____
CALCULATED BY: CMD
CHECKED BY: ____
DATE: 12-13-91

BLDG.# 109
ECO 3

WEATHERSTRIPING AND CAULKING

DOOR\ WINDOW	CONDITION OF W.S./CAULK	INFILTRATION	ORIENTATION	DIMENSIONS (INCH)
W	FAIR	FAIR		53x43
	TYPOF 29			
D1	GOOD	LOW	N	79 x 31
D2	BAD	HIGH	E	83 x 60
D3	FAIR	FAIR	S	79 x 31

COMMENTS:

WINDOWS DO NOT SEAL TIGHTLY WHERE 2 SECTIONS MEET.

D2- 2 GLASS DOORS, SPACE WHERE DOORS MEET IN MIDDLE.

D3- SPACE UNDER DOOR

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB	Ft. McPherson/Ft. Gillem Energy Study
PROJ.#	EMC # 3105.000
SHEET NO.	OF
CALCULATED BY:	CMD
CHECKED BY:	
DATE:	12-13-91

BLDG.# 109
ECO 4

DOMESTIC HOT WATER

FAUCET LOCATION	WATER TEMPERATURE
Sink, Room 1	131 °F
KITCHEN	129 °F
PROBLEMS:	

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: KC
CHECKED BY:
DATE: 12-13-91

BLDG.# 109T
ECO 5

MOTORS

MOTOR # 1 HP 1/2 PH 3/1 RPM 3450
MODEL # 3K954 VOLTS ~~230~~ 115 AMPS ~~4.3~~ 8.6
SERIAL # C55CXDBR-1950 PRESENT HR. 0 TO 2400
MFG DAYTON REQUIRED HR. ____ TO ____
FRAME 56C EFF. ____
DESCRIPTION HOT WATER PUMP COMMENTS RUNS IN WINTER
IN MECH. ROOM

MOTOR # 2 HP 3/4 PH 1 RPM 3450
MODEL # 5KC39NH50X VOLTS 115V AMPS 11.2
SERIAL # ____ PRESENT HR. ____ TO ____ NOT RUNNING.
MFG GENERAL ELECTRIC REQUIRED HR. ____ TO ____
FRAME 56 G EFF. ____
DESCRIPTION CW PUMP. COMMENTS RUNS IN SUMMER
IN MECH ROOM

MOTOR # 3 HP ____ PH 3 RPM ____
MODEL # ____ VOLTS ____ AMPS 20.8 A
SERIAL # ____ PRESENT HR. ____ TO ____
MFG ____ REQUIRED HR. ____ TO ____
FRAME ____ EFF. ____
DESCRIPTION AIR COOLED CHILLER COMMENTS 2 - COMP. MOTOR, 2 FAN

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO. ____ OF ____
CALCULATED BY:
CHECKED BY:
DATE:

BLDG.# 109
ECO 8

FLOW RESTRICTIONS

SHOWERHEADS	SHOWERS/DAY	NO. OF PEOPLE	PRESENT GPM (QTS/SEC)	GPM w/ LOW-FLOW (QTS/SEC)	LOCATION
4	1	16	3.5/30 sec	3.5/30 sec	Bathrooms

FAUCETS	NO. OF PEOPLE	PRESENT GPM OZ.\SEC.	GPM w/ LOW FLOW RESTR.	LOCATION
5		32	16	one in each bathroom & 1 in kitchen -

COMMENTS:

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO. _____ OF _____
CALCULATED BY: KC
CHECKED BY: _____
DATE: 12-13-91

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 109 BLDG NAME: VOQ JOB: 3105.000
PRIMARY FUNCTION: _____ GROSS SQ FT _____ NO OF FLRS _____
BUILDING MANAGER NAME: _____
PHONE: _____ OFFICE NO. _____
SPECIAL AREAS: COMPUTER FACILITY [ ] - ZONE NO'S. _____
AUDITORIUM [ ] - ZONE NO'S. _____
LABORATORIES [ ] - ZONE NO'S. _____
CAFETERIA [ ] - ZONE NO'S. _____
OTHER [ ] _____ - ZONE NO'S. _____

ZONE NO. ROOM 1 FUNCTION: VOQ ROOM SPECIAL REQ. YES [ ] NO [✓]
LOCATION: NORTH END (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F 0 TO 2400, SAT 0 TO 2400, SUN 0 TO 2400
PRESENT TEMP: WINTER OCC 65.7 °F UNOCC _____ °F, SUMMER OCC _____ °F UNOCC _____ °F
REQUIRE TEMP: WINTER OCC _____ °F UNOCC _____ °F, SUMMER OCC _____ °F UNOCC _____ °F

REMARKS: ALL ROOMS HAVE 2-PIPE FAN COIL FOR HVAC

ZONE NO. ROOM 2 FUNCTION: VOQ ROOM SPECIAL REQ. YES [ ] NO [✓]
LOCATION: _____ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F 0 TO 2400, SAT 0 TO 2400, SUN 0 TO 2400
PRESENT TEMP: WINTER OCC 67.5 °F UNOCC _____ °F, SUMMER OCC _____ °F UNOCC _____ °F
REQUIRE TEMP: WINTER OCC _____ °F UNOCC _____ °F, SUMMER OCC _____ °F UNOCC _____ °F

REMARKS: 2-PIPE FAN COIL

ZONE NO. HALL FUNCTION: _____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: _____ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F _____ TO _____, SAT _____ TO _____, SUN _____ TO _____
PRESENT TEMP: WINTER OCC 72.8 °F UNOCC _____ °F, SUMMER OCC _____ °F UNOCC _____ °F
REQUIRE TEMP: WINTER OCC _____ °F UNOCC _____ °F, SUMMER OCC _____ °F UNOCC _____ °F

REMARKS: _____

ZONE NO. _____ FUNCTION: _____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: _____ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F _____ TO _____, SAT _____ TO _____, SUN _____ TO _____
PRESENT TEMP: WINTER OCC _____ °F UNOCC _____ °F, SUMMER OCC _____ °F UNOCC _____ °F
REQUIRE TEMP: WINTER OCC _____ °F UNOCC _____ °F, SUMMER OCC _____ °F UNOCC _____ °F

REMARKS: _____

1 STM/HW CONVERTER
1 DHW UNIT N. GAS
1 ~~AGGU~~ AIR COOLED CHILLER
1 CHWP
1 HWP

HAS TC NO PINS
- SUM/WIN CHANGE OVER
- HW OA RESET

BUILDING 111

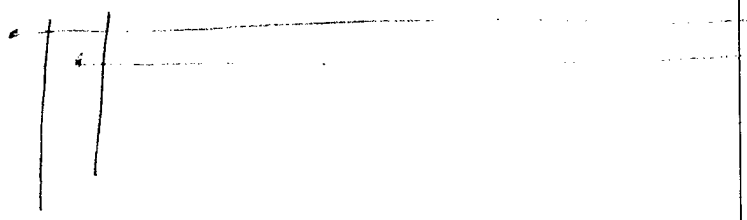
EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

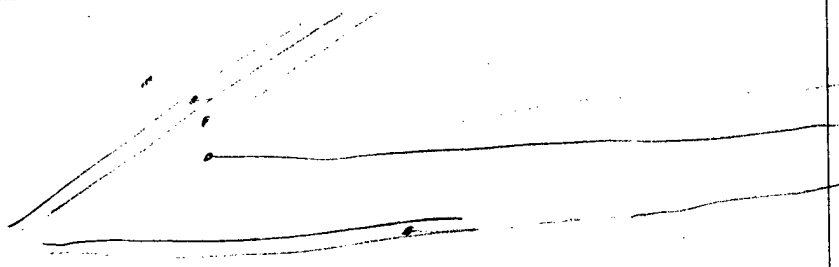
JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: CMD
CHECKED BY:
DATE: 12-13-91

BLDG.# 111
ECO 1

WALL & ROOF INSULATION

AREAS IN SQ. FEET	NORTH	SOUTH	EAST	WEST
WALLS				
WINDOWS				
OVERHEAD DOORS	—	—	—	—
PERSONNEL DOORS				

SKETCH WALL CROSS–SECTION	COMPONENTS	
	1. OUTSIDE AIR FILM	.17
	2. CMU	1.23
	3.	
	4.	
	5.	
	6.	
	7. INSIDE AIR FILM	.68
		2.08

SKETCH ROOF CROSS–SECTION	COMPONENTS	
	1. OUTSIDE AIR FILM	.17
	2. SHINGLES	.44
	3. PLYWOOD	.62
	4. SPACE	1.0
	5.	
	6. CEILING TILE	1.79
	7. INSIDE AIR FILM	.68
		4.7

PERSONNEL DOOR TYPE: WOOD
OVERHEAD DOOR TYPE: —

BASEMENT [ ]
SLAB [ ]
CRAWL SPACE [ ]

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO. _____ OF _____
CALCULATED BY: RE
CHECKED BY: _____
DATE: 12-13-91

BLDG.# 111
ECO 1

PIPE INSULATION

LOCATION	PIPE DIAMETER	PIPE LENGTH	FLUID TYPE	FLUID TEMP.	AIR TEMP.	INSULATION TYPE	INSULATION THICKNESS	INSULATION CONDITION
MECH. RM	2"	15'	CW	NA	63°F	RUBBER	1/2"	BAD
u — u	2"	15'	HW	120°F	63°F	NONE	—	—

COMMENTS: NEED TO INSULATE HW PIPE.

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO. ____ OF ____
CALCULATED BY: KC
CHECKED BY:
DATE: 12-13-91

BLDG.# 111
ECO 1

DUCT INSULATION

LOCATION	DUCT CROSSECTION	SHAPE	DUCT TEMP. (°F)	SURROUND AIR TEMP. (°F)	INSULATION TYPE	INSULATION THICKNESS	INSULATION CONDITION
*	NO DUCTWORK						

COMMENTS:

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB _____

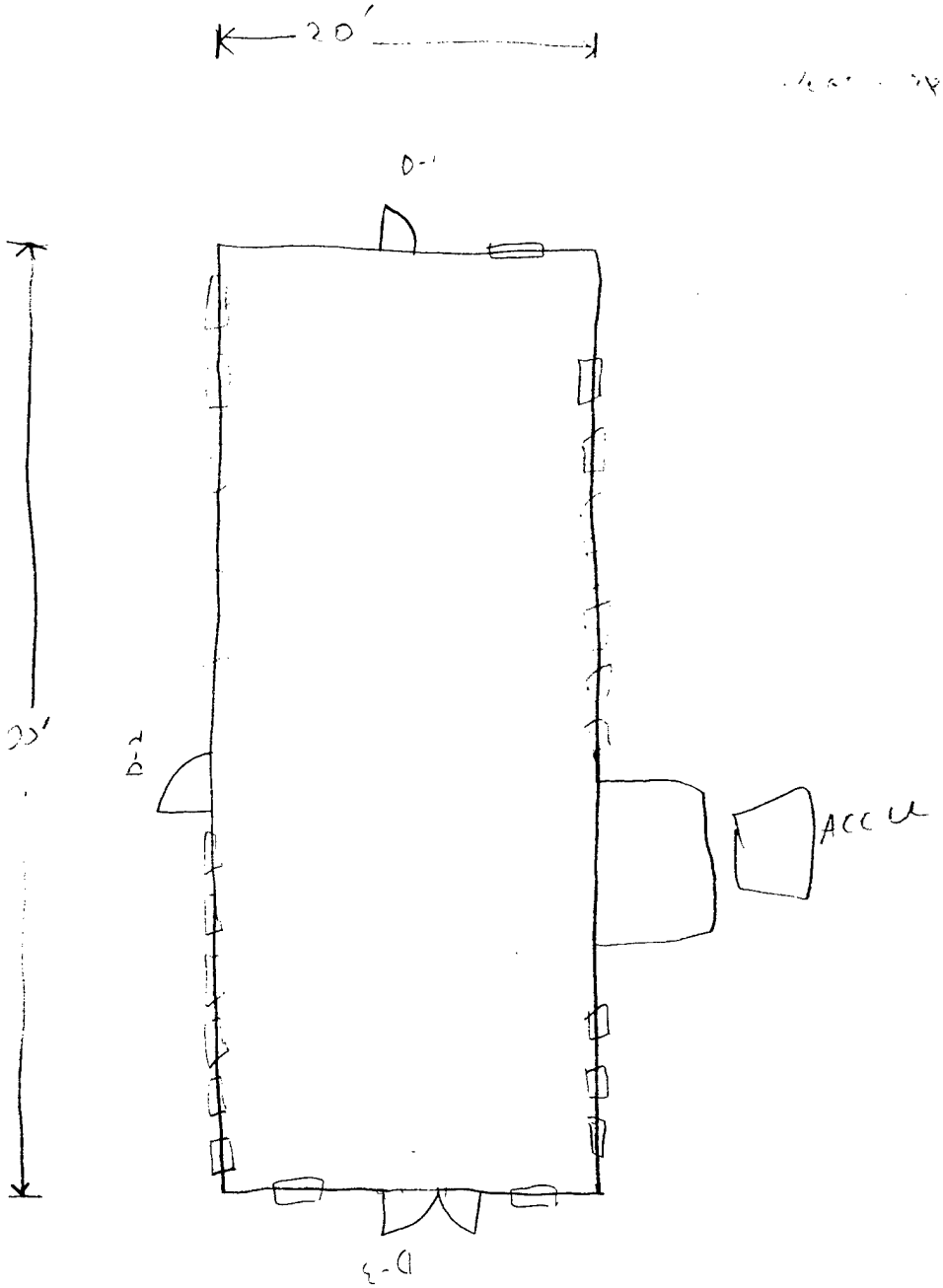
SHEET NO. _____ OF _____

CALCULATED BY CMD DATE _____

CHECKED BY _____ DATE _____

SCALE NTS

111



EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: CMD
CHECKED BY:
DATE: 12-12-94

BLDG.# 111
ECO 2

WINDOWS SURVEY

WINDOW NO.	SINGLE/DOUBLE PANE	TYPE–SLIDING FIXED, CASEMENT	FRAME MAT'L	ORIENTATION	GLASS SHADING	WINDOW COVER	DIMENSIONS (INCH)
1	SINGLE	SLIDING	WOOD		NONE		

COMMENTS: TYP OF 24

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: CMG
CHECKED BY:
DATE: 12-13-91

BLDG.# 111
ECO 3

WEATHERSTRIPING AND CAULKING

DOOR\ WINDOW	CONDITION OF W.S./CAULK	INFILTRATION	ORIENTATION	DIMENSIONS (INCH)
W	BAD	HIGH		52 x 33
	TYP OF 24			
D-1	FAIR	FAIR		80 x 31
* D-2	BAD	VERY HIGH		80 x 35
D-3	FAIR	FAIR		70 x 60

COMMENTS:
D-2 DOOR DOES NOT CLOSE TIGHTLY.

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB	Ft. McPherson/Ft. Gillem Energy Study
PROJ.#	EMC # 3105.000
SHEET NO.	OF
CALCULATED BY:	EC
CHECKED BY:	
DATE:	12-13-91

BLDG.# 111
ECO 4

DOMESTIC HOT WATER

FAUCET LOCATION	WATER TEMPERATURE
MEN'S ROOM	114°F
WOMEN'S ROOM	114°F
PROBLEMS:	

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: KC
CHECKED BY:
DATE: 12-13-91

BLDG.# 111
ECO 5

MOTORS

MOTOR # 1 HP 3/4 PH 1 RPM 3450
MODEL # 5K66IC VOLTS 115 AMPS 9.6
SERIAL # CA55XPD-2749 PRESENT HR. 0 TO 400
MFG DAYTON REQUIRED HR. ____ TO ____
FRAME 56J EFF. ____
DESCRIPTION DTW PUMP COMMENTS PUMP IS ON TC; NO PINS.

MOTOR # ____ HP ____ PH ____ RPM ____
MODEL # ____ VOLTS ____ AMPS ____
SERIAL # ____ PRESENT HR. ____ TO ____
MFG ____ REQUIRED HR. ____ TO ____
FRAME ____ EFF. ____
DESCRIPTION ____ COMMENTS ____

MOTOR # ____ HP ____ PH ____ RPM ____
MODEL # ____ VOLTS ____ AMPS ____
SERIAL # ____ PRESENT HR. ____ TO ____
MFG ____ REQUIRED HR. ____ TO ____
FRAME ____ EFF. ____
DESCRIPTION ____ COMMENTS ____

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO. _____ OF _____
CALCULATED BY: CMD
CHECKED BY: _____
DATE: 12-3-91

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 111 BLDG NAME: Admin JOB: 3105.000
PRIMARY FUNCTION: _____ GROSS SQ FT _____ NO OF FLRS 1
BUILDING MANAGER NAME: _____
PHONE: _____ OFFICE NO. _____
SPECIAL AREAS: COMPUTER FACILITY [ ] - ZONE NO'S. _____
AUDITORIUM [ ] - ZONE NO'S. _____
LABORATORIES [ ] - ZONE NO'S. _____
CAFETERIA [ ] - ZONE NO'S. _____
OTHER [ ] _____ - ZONE NO'S. _____
ZONE NO. Rm 2 FUNCTION: _____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: Rm 2 (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F 730 TO 1600, SAT ___ TO ___, SUN ___ TO ___
PRESENT TEMP: WINTER OCC 72.4 °F UNOCC _____ °F, SUMMER OCC _____ °F UNOCC _____ °F
REQUIRE TEMP: WINTER OCC _____ °F UNOCC _____ °F, SUMMER OCC _____ °F UNOCC _____ °F

REMARKS: _____

ZONE NO. Rm 5 FUNCTION: _____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: Rm 5 (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F ___ TO ___, SAT ___ TO ___, SUN ___ TO ___
PRESENT TEMP: WINTER OCC 72.2 °F UNOCC _____ °F, SUMMER OCC _____ °F UNOCC _____ °F
REQUIRE TEMP: WINTER OCC _____ °F UNOCC _____ °F, SUMMER OCC _____ °F UNOCC _____ °F

REMARKS: _____

ZONE NO. _____ FUNCTION: _____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: _____ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F ___ TO ___, SAT ___ TO ___, SUN ___ TO ___
PRESENT TEMP: WINTER OCC _____ °F UNOCC _____ °F, SUMMER OCC _____ °F UNOCC _____ °F
REQUIRE TEMP: WINTER OCC _____ °F UNOCC _____ °F, SUMMER OCC _____ °F UNOCC _____ °F

REMARKS: _____

ZONE NO. _____ FUNCTION: _____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: _____ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F ___ TO ___, SAT ___ TO ___, SUN ___ TO ___
PRESENT TEMP: WINTER OCC _____ °F UNOCC _____ °F, SUMMER OCC _____ °F UNOCC _____ °F
REQUIRE TEMP: WINTER OCC _____ °F UNOCC _____ °F, SUMMER OCC _____ °F UNOCC _____ °F

REMARKS: _____

BUILDING 112

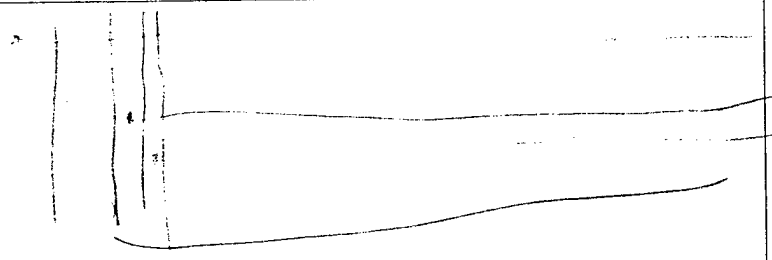
EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

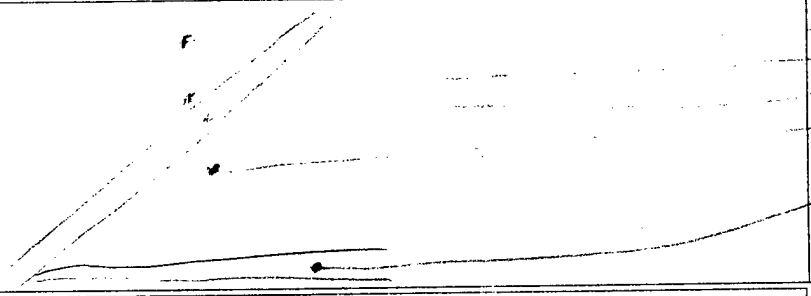
JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: CMD
CHECKED BY:
DATE: 12-13-91

BLDG.# 112
ECO 1

WALL & ROOF INSULATION

AREAS IN SQ. FEET	NORTH	SOUTH	EAST	WEST
WALLS				
WINDOWS				
OVERHEAD DOORS	Ø	Ø	Ø	Ø
PERSONNEL DOORS				

SKETCH WALL CROSS–SECTION	COMPONENTS	R	no R
	1. OUTSIDE AIR FILM	.17	
	2. CMU	1.2	
	3. FRAME		
	4. WOOD PANELING	1.25	
	5.		
	6.		
	7. INSIDE AIR FILM	.68	
		3.3	
		+ R-10	
		13.3	

SKETCH ROOF CROSS–SECTION	COMPONENTS	
	1. OUTSIDE AIR FILM	.17
	2. SHINGLES	0.44
	3. PLYWOOD	0.62
	4. SPACE	1.24
	5.	
	6. CEILING TILE	1.79
	7. INSIDE AIR FILM	.68
		4.94
		+R-19
		23.94

PERSONNEL DOOR TYPE: WOOD
OVERHEAD DOOR TYPE: Ø

BASEMENT [ ]
SLAB [ ]
CRAWL SPACE [✓]

COMMENTS:

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

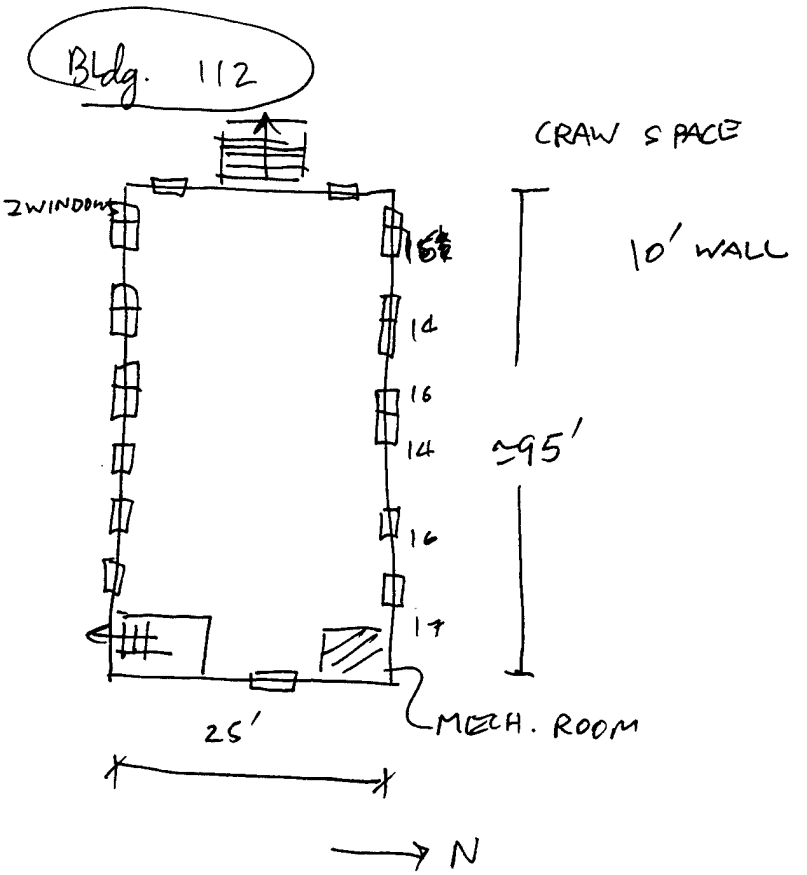
JOB _____

SHEET NO. _____ OF _____

CALCULATED BY KC DATE 12-13-91

CHECKED BY _____ DATE _____

SCALE _____



EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB Ft. McPherson/Ft. Gillem Energy Study
PROJ.# EMC # 3105.000
SHEET NO. OF
CALCULATED BY:
CHECKED BY:
DATE: KC

BLDG.# 112
ECO 1

PIPE INSULATION

LOCATION	PIPE DIAMETER	PIPE LENGTH	FLUID TYPE	FLUID TEMP.	AIR TEMP.	INSULATION TYPE	INSULATION THICKNESS	INSULATION CONDITION
MECH. RM.	4"	25'	STM	NOT RUNNING	88 F	FIBERGLASS	3/4"	FAIR
	3"	6'	STM		"	—	0	
	3.5"	38'	STM		"	Fiberglass	1"	
	2"	185'	STM		"	Fiberglass	1"	
	1.5	185'	STM			Fiberglass	1"	

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB Ft. McPherson/Ft. Gillem Energy Study
PROJ.# EMC # 3105.000
SHEET NO. _____ OF
CALCULATED BY:
CHECKED BY:
DATE:

BLDG.# 112
ECO 1

DUCT INSULATION

LOCATION	DUCT CROSSECTION	SHAPE	DUCT TEMP. (°F)	SURROUND AIR TEMP. (°F)	INSULATION TYPE	INSULATION THICKNESS	INSULATION CONDITION
	NO DUCT WORK						

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: JMD
CHECKED BY:
DATE: 12-3-91

BLDG.# 112
ECO 2

WINDOWS SURVEY

WINDOW NO.	SINGLE/DOUBLE PANE	TYPE–SLIDING FIXED, CASEMENT	FRAME MAT'L	ORIENTATION	GLASS SHADING	WINDOW COVER	DIMENSIONS (INCH)
	SINGLE	SLIDING	WOOD		NO	WINDOW 1-3	53-42

COMMENTS: TYP. OF 23

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB Ft. McPherson/Ft. Gillem Energy Study
PROJ.# EMC # 3105.000
SHEET NO. OF
CALCULATED BY: CMD
CHECKED BY:
DATE: 12-19-91

BLDG.# 112
ECO 3

WEATHERSTRIPING AND CAULKING

DOOR\ WINDOW	CONDITION OF W.S./CAULK	INFILTRATION	ORIENTATION	DIMENSIONS (INCH)
W	FAIR	FAIR		53x43
	TYP. OF 20			
D-1	BAD	HIGH	N	80x32
D-2	"	"	S	"

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB	Ft. McPherson/Ft. Gillem Energy Study
PROJ.#	EMC # 3105.000
SHEET NO.	OF
CALCULATED BY:	CMD
CHECKED BY:	
DATE:	12-15-9

BLDG.# 112
ECO 4

DOMESTIC HOT WATER

FAUCET LOCATION	WATER TEMPERATURE
Men's Room	134 °F
Women's Room	136 °F

PROBLEMS:	

COMMENTS:

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____

SHEET NO. _____ OF _____

CALCULATED BY KC DATE 12-13-91

CHECKED BY _____ DATE _____

SCALE _____

BLDG. 112

- 1 STM GENERATOR
- 1 DHW UNIT
- 9 AC WINDOW UNITS
- HEATING THROUGH BASEBOARD RADIATION.

JOB Ft. McPherson/Ft. Gillem Energy Study
PROJ.# EMC # 3105.000
SHEET NO. ______ OF ______
CALCULATED BY: CMD
CHECKED BY: ______
DATE: 12-3-9

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 112 BLDG NAME: ______ JOB: 3105.000
PRIMARY FUNCTION: ______ GROSS SQ FT ______ NO OF FLRS 1
BUILDING MANAGER NAME: ______
PHONE: ______ OFFICE NO. ______
SPECIAL AREAS: COMPUTER FACILITY [ ] - ZONE NO'S. ______
AUDITORIUM [ ] - ZONE NO'S. ______
LABORATORIES [ ] - ZONE NO'S. ______
CAFETERIA [ ] - ZONE NO'S. ______
OTHER [ ] ______ - ZONE NO'S. ______

ZONE NO. 1 FUNCTION: ADMIN SPECIAL REQ. YES [ ] NO [ ]
LOCATION: ______ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F 730 TO 1630, SAT – TO –, SUN – TO –
PRESENT TEMP: WINTER OCC 77.6 °F UNOCC ______ °F, SUMMER OCC ______ °F UNOCC ______ °F
REQUIRE TEMP: WINTER OCC ______ °F UNOCC ______ °F, SUMMER OCC ______ °F UNOCC ______ °F

REMARKS: ______

ZONE NO. ______ FUNCTION: ______ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: ______ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F ______ TO ______, SAT ______ TO ______, SUN ______ TO ______
PRESENT TEMP: WINTER OCC ______ °F UNOCC ______ °F, SUMMER OCC ______ °F UNOCC ______ °F
REQUIRE TEMP: WINTER OCC ______ °F UNOCC ______ °F, SUMMER OCC ______ °F UNOCC ______ °F

REMARKS: ______

ZONE NO. ______ FUNCTION: ______ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: ______ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F ______ TO ______, SAT ______ TO ______, SUN ______ TO ______
PRESENT TEMP: WINTER OCC ______ °F UNOCC ______ °F, SUMMER OCC ______ °F UNOCC ______ °F
REQUIRE TEMP: WINTER OCC ______ °F UNOCC ______ °F, SUMMER OCC ______ °F UNOCC ______ °F

REMARKS: ______

ZONE NO. ______ FUNCTION: ______ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: ______ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F ______ TO ______, SAT ______ TO ______, SUN ______ TO ______
PRESENT TEMP: WINTER OCC ______ °F UNOCC ______ °F, SUMMER OCC ______ °F UNOCC ______ °F
REQUIRE TEMP: WINTER OCC ______ °F UNOCC ______ °F, SUMMER OCC ______ °F UNOCC ______ °F

REMARKS: ______

JOB	Ft. McPherson/Ft. Gillem Energy Study
PROJ #	EMC # 3105.000
SHEET NO.	OF
CALCULATED BY:	CMD
CHECKED BY:	
DATE:	12-13-91

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 112 BLDG NAME: ______ JOB: 3105.000
PRIMARY FUNCTION: ADMIN GROSS SQ FT ______ NO OF FLRS ______
BUILDING MANAGER NAME: ______
PHONE: ______ OFFICE NO. ______
SPECIAL AREAS: COMPUTER FACILITY [ ] - ZONE NO'S. ______
AUDITORIUM [ ] - ZONE NO'S. ______
LABORATORIES [ ] - ZONE NO'S. ______
CAFETERIA [ ] - ZONE NO'S. ______
OTHER [ ] ______ - ZONE NO'S. ______

ZONE NO. 1 FUNCTION: ______ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: HALLWAY (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F 730 TO 330, SAT 0 TO 0, SUN 0 TO 0
PRESENT TEMP: WINTER OCC 77.8 °F UNOCC ______ °F, SUMMER OCC ______ °F UNOCC ______ °F
REQUIRE TEMP: WINTER OCC ______ °F UNOCC ______ °F, SUMMER OCC ______ °F UNOCC ______ °F

REMARKS: ______

ZONE NO. ______ FUNCTION: ______ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: ______ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F ____ TO ____, SAT ____ TO ____, SUN ____ TO ____
PRESENT TEMP: WINTER OCC ______ °F UNOCC ______ °F, SUMMER OCC ______ °F UNOCC ______ °F
REQUIRE TEMP: WINTER OCC ______ °F UNOCC ______ °F, SUMMER OCC ______ °F UNOCC ______ °F

REMARKS: ______

ZONE NO. ______ FUNCTION: ______ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: ______ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F ____ TO ____, SAT ____ TO ____, SUN ____ TO ____
PRESENT TEMP: WINTER OCC ______ °F UNOCC ______ °F, SUMMER OCC ______ °F UNOCC ______ °F
REQUIRE TEMP: WINTER OCC ______ °F UNOCC ______ °F, SUMMER OCC ______ °F UNOCC ______ °F

REMARKS: ______

ZONE NO. ______ FUNCTION: ______ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: ______ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F ____ TO ____, SAT ____ TO ____, SUN ____ TO ____
PRESENT TEMP: WINTER OCC ______ °F UNOCC ______ °F, SUMMER OCC ______ °F UNOCC ______ °F
REQUIRE TEMP: WINTER OCC ______ °F UNOCC ______ °F, SUMMER OCC ______ °F UNOCC ______ °F

REMARKS: ______

BUILDING 114

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____

SHEET NO. _____ OF _____

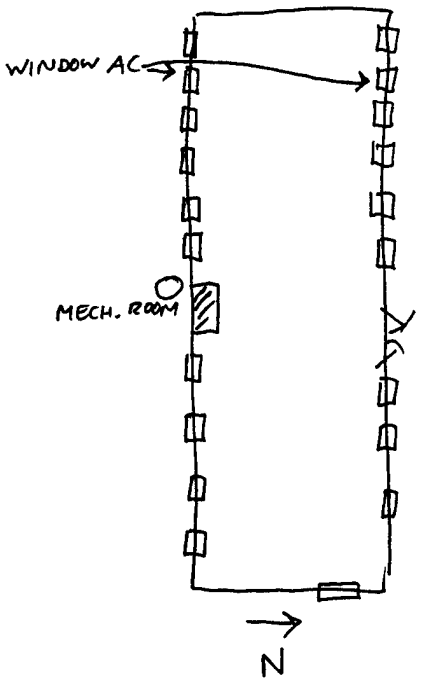
CALCULATED BY KC DATE 12-13-91

CHECKED BY _____ DATE _____

SCALE _____

BLDG 114

- WINDOW CONSTRUCTION, INSULATION, WALL, DOOR - SAME AS 111
- 1 AHU DX & FURNACE
- 1 ACCU
-



EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: _____ OF _____
CALCULATED BY: KC
CHECKED BY: _____
DATE: 12-13-91

BLDG.# 114
ECO 1

PIPE INSULATION

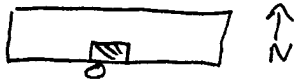
LOCATION	PIPE DIAMETER	PIPE LENGTH	FLUID TYPE	FLUID TEMP.	AIR TEMP.	INSULATION TYPE	INSULATION THICKNESS	INSULATION CONDITION
*	NO PIPE							

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB Ft. McPherson/Ft. Gillem Energy Study
PROJ.# EMC # 3105.000
SHEET NO. OF
CALCULATED BY:
CHECKED BY:
DATE:

BLDG.# 114
ECO 1



DUCT INSULATION

LOCATION	DUCT CROSSECTION	SHAPE	DUCT TEMP. (°F)	SURROUND AIR TEMP. (°F)	INSULATION TYPE	INSULATION THICKNESS	INSULATION CONDITION
MECH. RM	2'x2'	▭	NOT RUNNING	NOT RUNNING	FIBERGLASS	1"	GOOD
	10"	○			FIBERGLASS	1"	"

COMMENTS:
INSULATION IS FIBERGLASS WITH FOIL
2'x2' runs length of bldg., 10" round feeds diffusers ≈ 40 ea

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB

SHEET NO. OF

CALCULATED BY JW DATE 1/27/92

CHECKED BY DATE

SCALE

BLDG 117 HAS NO RUNNING ~~CA~~ DOM. WATER.

BLDG 114 DOM. ~~HW~~. TEMP ⇒ 101°F

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: KC
CHECKED BY:
DATE: 12-13-91

BLDG.# 114
ECO 5

MOTORS

MOTOR # 1 HP 1½ PH 1 RPM 3450
MODEL # XUFS6C34D5317A L VOLTS 115 AMPS 18
SERIAL # PRESENT HR. TO T'STAT CONTROL
MFG MARATHON
REQUIRED HR. TO
FRAME EFF.
DESCRIPTION AHU COMMENTS
- N. GAS FURNACE
- DX COOLING.

MOTOR # HP PH RPM
MODEL # VOLTS AMPS
SERIAL # PRESENT HR. TO
MFG REQUIRED HR. TO
FRAME EFF.
DESCRIPTION COMMENTS

MOTOR # HP PH RPM
MODEL # VOLTS AMPS
SERIAL # PRESENT HR. TO
MFG REQUIRED HR. TO
FRAME EFF.
DESCRIPTION COMMENTS

BUILDING 116

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____

SHEET NO. _____ OF _____

CALCULATED BY CMD DATE 12-13-91

CHECKED BY _____ DATE _____

SCALE _____

Bldg 116 windows, insul.,
construction same as 111.

Glass doors

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

116

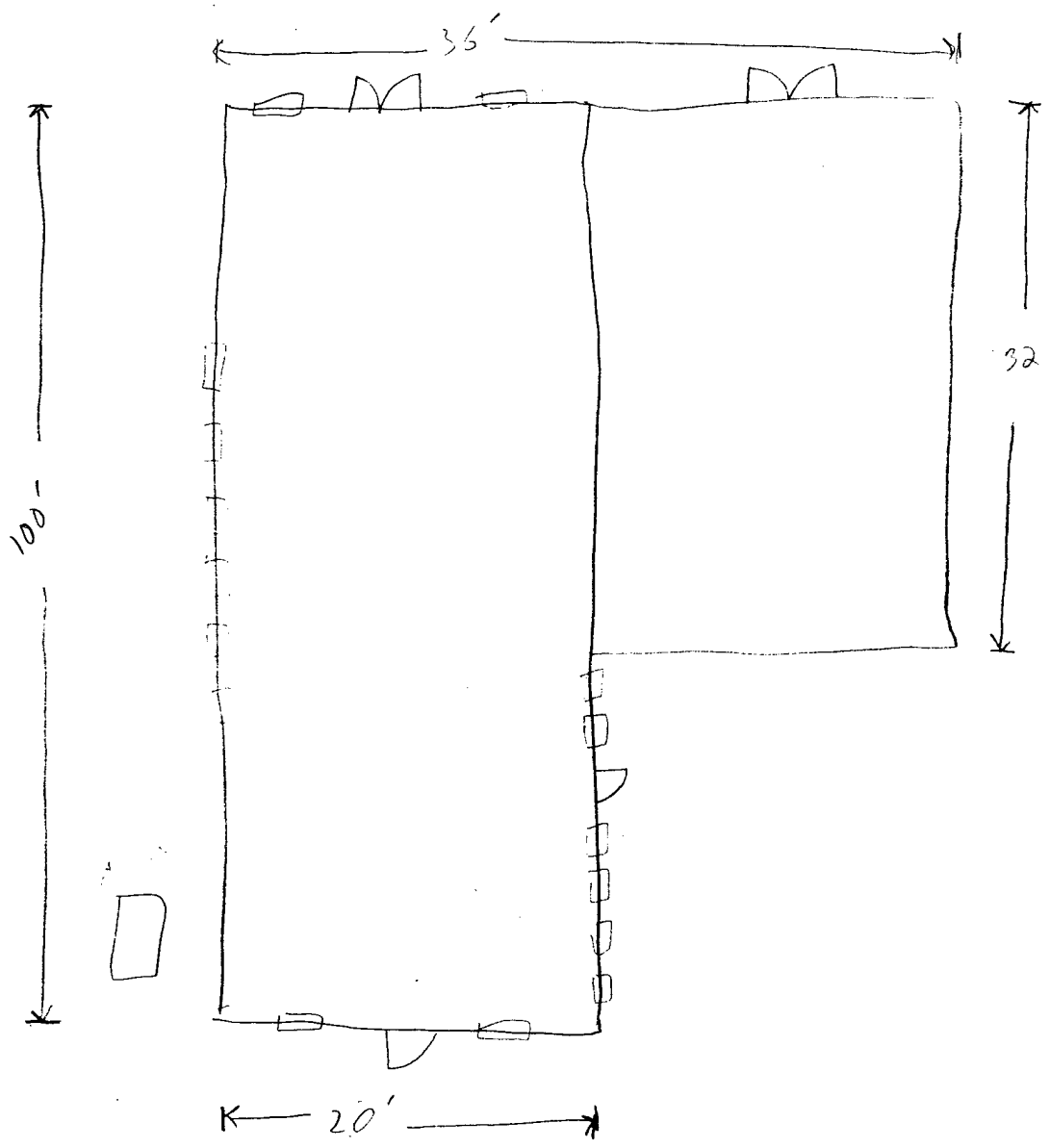
JOB

SHEET NO. OF

CALCULATED BY CMD DATE 12-13-91

CHECKED BY DATE

SCALE NTS



EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: KC
CHECKED BY:
DATE: 12-13-91

BLDG.# 116
ECO 1

PIPE INSULATION

LOCATION	PIPE DIAMETER	PIPE LENGTH	FLUID TYPE	FLUID TEMP.	AIR TEMP.	INSULATION TYPE	INSULATION THICKNESS	INSULATION CONDITION
	* NO PIPE EXPOSED							

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB Ft. McPherson/Ft. Gillem Energy Study
PROJ.# EMC # 3105.000
SHEET NO. OF
CALCULATED BY: C.M.D
CHECKED BY:
DATE: 12/13/91

BLDG.# 116
ECO 1

DUCT INSULATION

LOCATION	DUCT CROSSECTION	SHAPE	DUCT TEMP. (°F)	SURROUND AIR TEMP. (°F)	INSULATION TYPE	INSULATION THICKNESS	INSULATION CONDITION	
OUTSIDE	12x 14	▭			—	0	—	11 Ft
ATTIC	20 x 20	□			—	0	—	90 Ft
* ATTIC	12"	○			—	0	—	40 Ft

COMMENTS: * Feeds diffusers

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: C. E
CHECKED BY:
DATE: 1' 3-91

BLDG.# 116
ECO 4

DOMESTIC HOT WATER

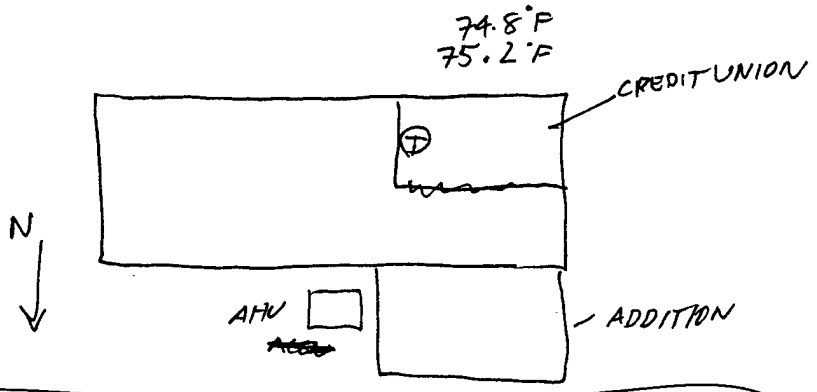
FAUCET LOCATION	WATER TEMPERATURE
Mens Lav	113° F *
PROBLEMS:	

COMMENTS: * Both Restrooms served by 1 ~ 5 gal water htr.
Temp. reached 113 briefly + began dropping

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____
SHEET NO. _____ OF _____
CALCULATED BY KC DATE 12-13-91
CHECKED BY KC DATE _____
SCALE _____

BUILDING 116



FAN MOTOR 8.6A 208V 3ϕ 3 HP CENTURY
SER: U012 RPM: 17
FM: N56H2

TRANE AHU PACKAGE UNIT
MODEL SFCA-1003-LD
TYPE NO. 268-515-1-13
INPUT 200,000 BTUH
CAP. 150,000 BTUH
208V 24A 3ϕ
1 COMP. 3ϕ 208V 24A.
1 COMP 3ϕ 208 24A
3 COND FAN 1ϕ 230V 4.1A
NAT GAS HEATING.

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO. _____ OF _____
CALCULATED BY: CMD
CHECKED BY: _____
DATE: 12-17-91

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 116 BLDG NAME: CREDIT UNION JOB: 3105.000
PRIMARY FUNCTION: _____ GROSS SQ FT _____ NO OF FLRS 1
BUILDING MANAGER NAME: _____
PHONE: _____ OFFICE NO. _____
SPECIAL AREAS: COMPUTER FACILITY [ ] - ZONE NO'S. _____
AUDITORIUM [ ] - ZONE NO'S. _____
LABORATORIES [ ] - ZONE NO'S. _____
CAFETERIA [ ] - ZONE NO'S. _____
OTHER [ ] _____ - ZONE NO'S. _____

ZONE NO. 1 FUNCTION: _____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: _____ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F 800 TO 1530, SAT _____ TO _____, SUN _____ TO _____
PRESENT TEMP: WINTER OCC 75.2 °F UNOCC _____ °F, SUMMER OCC _____ °F UNOCC _____ °F
REQUIRE TEMP: WINTER OCC _____ °F UNOCC _____ °F, SUMMER OCC _____ °F UNOCC _____ °F

REMARKS: _____

ZONE NO. 2 FUNCTION: E.O. OFFICE / UNIT SPECIAL REQ. YES [ ] NO [ ]
LOCATION: _____ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F 700 TO 1800, SAT 0 TO 0, SUN 0 TO 0
PRESENT TEMP: WINTER OCC 74.0 °F UNOCC _____ °F, SUMMER OCC _____ °F UNOCC _____ °F
REQUIRE TEMP: WINTER OCC _____ °F UNOCC _____ °F, SUMMER OCC _____ °F UNOCC _____ °F

REMARKS: _____

ZONE NO. _____ FUNCTION: _____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: _____ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F _____ TO _____, SAT _____ TO _____, SUN _____ TO _____
PRESENT TEMP: WINTER OCC _____ °F UNOCC _____ °F, SUMMER OCC _____ °F UNOCC _____ °F
REQUIRE TEMP: WINTER OCC _____ °F UNOCC _____ °F, SUMMER OCC _____ °F UNOCC _____ °F

REMARKS: _____

ZONE NO. _____ FUNCTION: _____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: _____ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F _____ TO _____, SAT _____ TO _____, SUN _____ TO _____
PRESENT TEMP: WINTER OCC _____ °F UNOCC _____ °F, SUMMER OCC _____ °F UNOCC _____ °F
REQUIRE TEMP: WINTER OCC _____ °F UNOCC _____ °F, SUMMER OCC _____ °F UNOCC _____ °F

REMARKS: _____

BUILDING 117

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____
SHEET NO. _____ OF _____
CALCULATED BY CMD DATE 12-13-91
CHECKED BY _____ DATE _____
SCALE 1

Bldg 117

Windows, Doors, Insulation, Construction,
Dimensions - SAME AS Bldg 111

Unoccupied DURING SURVEY.

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: KC
CHECKED BY:
DATE: 12/13/91

BLDG.# 117
ECO 1

PIPE INSULATION

LOCATION	PIPE DIAMETER	PIPE LENGTH	FLUID TYPE	FLUID TEMP.	AIR TEMP.	INSULATION TYPE	INSULATION THICKNESS	INSULATION CONDITION
MECH RM	2"	15'	HW	116°F	63	RUBBER	1/2"	FAIR
↓	2"	25'	CW	NA	63	RUBBER	1/2"	GOOD
	2"	10'	HW	NA	63	RUBBER	1.25"	
	2"	4'	HW	NA	63	—	0"	

COMMENTS:

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB
SHEET NO. OF
CALCULATED BY JW DATE 1/27/93
CHECKED BY DATE
SCALE

BLDG 117 HAS NO RUNNING ~~CW~~ DOM. WATER.

BLDG 114 DOM. ~~HW~~. TEMP ⇒ 101 °F

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: KC
CHECKED BY:
DATE: 12-13-91

BLDG.# 117
ECO 5

MOTORS

MOTOR # 1 HP 1 PH 1 RPM 3450
MODEL # 8718 VOLTS 115V AMPS
SERIAL # TYP CS. PRESENT HR. 0 TO 2400
MFG Century, Magnetek REQUIRED HR. TO
FRAME G56C EFF.
DESCRIPTION DIW PUMP COMMENTS ON TC; NO PINS. LOOKS NEW

MOTOR # HP PH RPM
MODEL # VOLTS AMPS
SERIAL # PRESENT HR. TO
MFG REQUIRED HR. TO
FRAME EFF.
DESCRIPTION COMMENTS

MOTOR # HP PH RPM
MODEL # VOLTS AMPS
SERIAL # PRESENT HR. TO
MFG REQUIRED HR. TO
FRAME EFF.
DESCRIPTION COMMENTS

JOB Ft. McPherson/Ft. Gillem Energy Study
PROJ.# EMC # 3105.000
SHEET NO. ____ OF ____
CALCULATED BY: KC
CHECKED BY: ____
DATE: 12-13-91

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 117 BLDG NAME: ADMIN JOB: 3105.000
PRIMARY FUNCTION: ____ GROSS SQ FT ____ NO OF FLRS ____
BUILDING MANAGER NAME: ____
PHONE: ____ OFFICE NO. ____
SPECIAL AREAS: COMPUTER FACILITY [ ] - ZONE NO'S. ____
AUDITORIUM [ ] - ZONE NO'S. ____
LABORATORIES [ ] - ZONE NO'S. ____
CAFETERIA [ ] - ZONE NO'S. ____
OTHER [ ] ____ - ZONE NO'S. ____

ZONE NO. ____ FUNCTION: ____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: ____ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F ____ TO ____, SAT ____ TO ____, SUN ____ TO ____
PRESENT TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F
REQUIRE TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F

REMARKS: BUILDING UNOCCUPIED.

ZONE NO. ____ FUNCTION: ____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: ____ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F ____ TO ____, SAT ____ TO ____, SUN ____ TO ____
PRESENT TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F
REQUIRE TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F

REMARKS: ____

ZONE NO. ____ FUNCTION: ____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: ____ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F ____ TO ____, SAT ____ TO ____, SUN ____ TO ____
PRESENT TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F
REQUIRE TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F

REMARKS: ____

ZONE NO. ____ FUNCTION: ____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: ____ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F ____ TO ____, SAT ____ TO ____, SUN ____ TO ____
PRESENT TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F
REQUIRE TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F

REMARKS: ____

BUILDING 118

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____

SHEET NO. _____ OF _____

CALCULATED BY CMD DATE 12-13-91

CHECKED BY _____ DATE _____

SCALE _____

Bldg 118 -

WINDOWS, INSUL., DOORS

CONSTRUCTION, DIMENSIONS,

SAME AS 111.

1 BROKEN WINDOW

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO. _____ OF _____
CALCULATED BY: CMD
CHECKED BY: _____
DATE: 12-3-9_

BLDG.# 118
ECO 1

PIPE INSULATION

LOCATION	PIPE DIAMETER	PIPE LENGTH	FLUID TYPE	FLUID TEMP.	AIR TEMP.	INSULATION TYPE	INSULATION THICKNESS	INSULATION CONDITION

COMMENTS: NO PIPING IN BLDG.

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB Ft. McPherson/Ft. Gillem Energy Study
PROJ.# EMC # 3105.000
SHEET NO. OF
CALCULATED BY:
CHECKED BY:
DATE: 12-13-91

BLDG.# 118
ECO 1

DUCT INSULATION

LOCATION	DUCT CROSSECTION	SHAPE	DUCT TEMP. (°F)	SURROUND AIR TEMP. (°F)	INSULATION TYPE	INSULATION THICKNESS	INSULATION CONDITION
EAST	2'X2'	▭	NOT RUNNING	65°F	FIBERGLASS	1/2"	FAIR.

COMMENTS:

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB _____

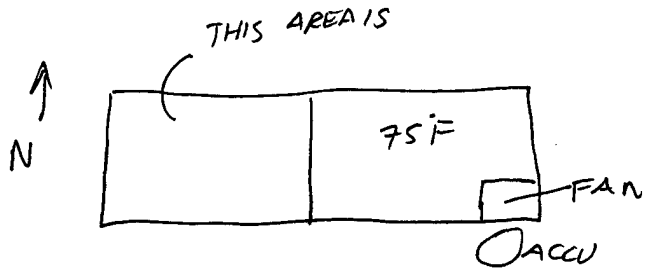
SHEET NO. _____ OF _____

CALCULATED BY KC DATE 12-13-91

CHECKED BY _____ DATE _____

SCALE _____

BLDG 118



EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY:
CHECKED BY:
DATE: 12-13-91

BLDG.# 118
ECO 4

DOMESTIC HOT WATER

FAUCET LOCATION	WATER TEMPERATURE
NO HW IN THE FACILITY; NO BATHROOM	NA
PROBLEMS:	

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: KL
CHECKED BY:
DATE: 12-13-91

BLDG.# 118
ECO 5

MOTORS

MOTOR # 1 HP ? PH 1 RPM
MODEL # VOLTS 115V AMPS 960W
SERIAL # SINGER PRESENT HR. TO
MFG REQUIRED HR. TO
FRAME EFF.
DESCRIPTION COMMENTS

MOTOR # HP PH RPM
MODEL # VOLTS AMPS
SERIAL # PRESENT HR. TO
MFG REQUIRED HR. TO
FRAME EFF.
DESCRIPTION COMMENTS

MOTOR # HP PH RPM
MODEL # VOLTS AMPS
SERIAL # PRESENT HR. TO
MFG REQUIRED HR. TO
FRAME EFF.
DESCRIPTION COMMENTS

BUILDING 120

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • Germany

JOB _____

SHEET NO. _____ OF _____

CALCULATED BY _____ DATE 12 - 13 - 91

CHECKED BY _____ DATE _____

SCALE _____

BUILDING WAS LOCKED

- BUILDING SAME AS #111

- SEE NOTES ON BLDG 111

BUILDING 121

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • Germany

JOB _____

SHEET NO. _____ OF _____

CALCULATED BY _____ DATE 12-13-91

CHECKED BY _____ DATE _____

SCALE _____

Bldg 121

SAME AS Bldg 111

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

121

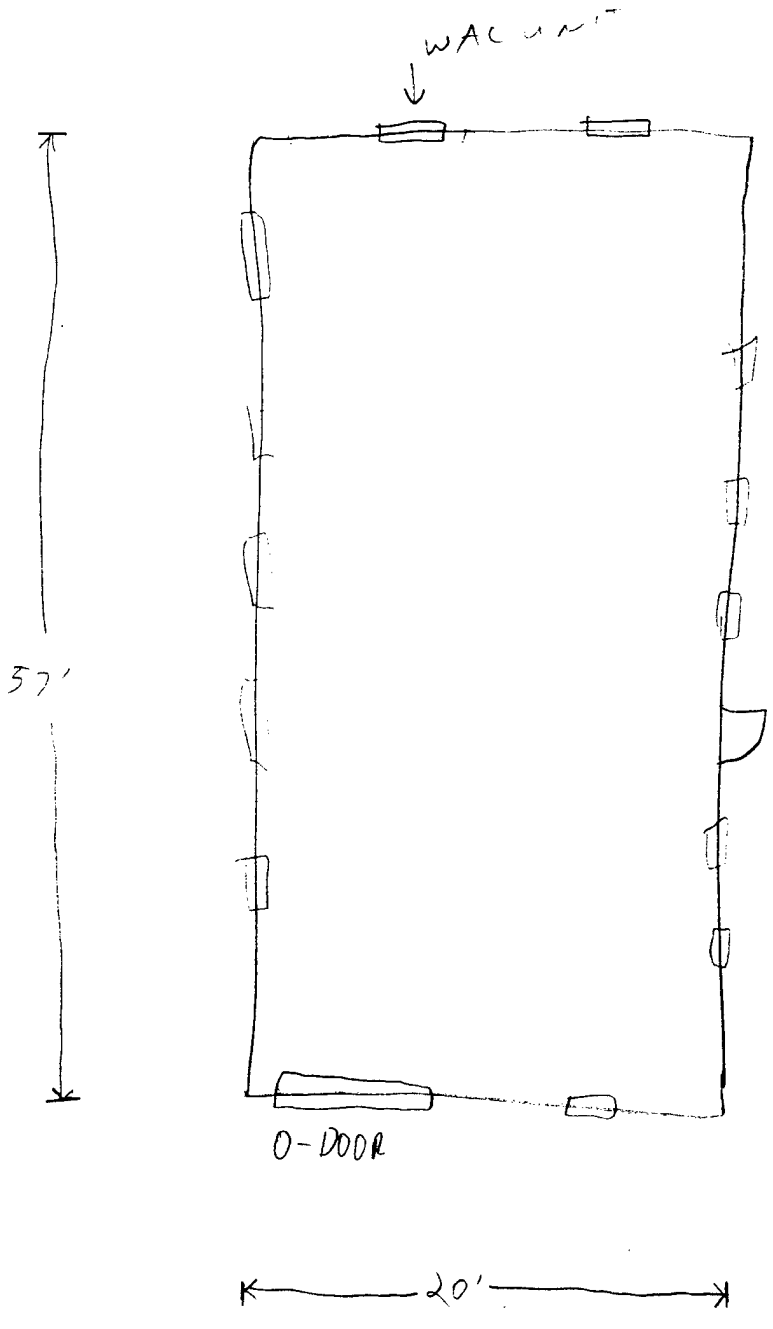
JOB _____

SHEET NO. _____ OF _____

CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____

SCALE NTS



O-DOOR
9'x 7'

WINDOWS
5 3 x 3 3

DROP CEILING
BLOCK CONSTRUCTION
SLAB

INSULATION
VERY BAD

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB

SHEET NO. OF

CALCULATED BY KC DATE 12-13-91

CHECKED BY DATE

SCALE

BLDG 121

- USE AS SMALL OFFICE
- 2 UNIT HEATERS (NAT. GAS)
- 1 AC WINDOW UNIT.
- 7:00 - 4:00 PM.

BUILDING 122

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____

SHEET NO. _____ OF _____

CALCULATED BY C. D. DATE 12-12-8.

CHECKED BY _____ DATE _____

SCALE _____

Bldg. 122

CONSTRUCTION, WINDOWS, DIMENSIONS, INSULATION. SAME AS 111.

SPACE TEMP - 75.5 °F

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: CMD
CHECKED BY:
DATE:

BLDG.# 122
ECO 4

DOMESTIC HOT WATER

FAUCET LOCATION	WATER TEMPERATURE
KITCHEN 3A ROOM	113 °F
PROBLEMS:	

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY:
CHECKED BY:
DATE: 12-13-91

BLDG.# 120122
ECO 5

MOTORS

MOTOR #	?	HP	2	PH	3	RPM	
MODEL #	?	VOLTS	208	AMPS	NOT ACCESSIBLE		
SERIAL #	?	PRESENT HR.			TO		
MFG	?	REQUIRED HR.			TO		
FRAME	?	EFF.					
DESCRIPTION		COMMENTS	OLD ORIGINAL UNIT - DX - ELECTRIC DUCT HEATERS (2) 46.2A 240V 3Ø 19.2kW				

MOTOR #		HP		PH		RPM	
MODEL #		VOLTS		AMPS			
SERIAL #		PRESENT HR.			TO		
MFG		REQUIRED HR.			TO		
FRAME		EFF.					
DESCRIPTION		COMMENTS					

MOTOR #		HP		PH		RPM	
MODEL #		VOLTS		AMPS			
SERIAL #		PRESENT HR.			TO		
MFG		REQUIRED HR.			TO		
FRAME		EFF.					
DESCRIPTION		COMMENTS					

JOB	Ft. McPherson/Ft. Gillem Energy Study
PROJ.#	EMC # 3105.000
SHEET NO.	OF
CALCULATED BY:	KL
CHECKED BY:	
DATE:	12-13-91

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 1202 BLDG NAME: ADMIN JOB: 3105.000
PRIMARY FUNCTION: ADMIN. GROSS SQ FT ______ NO OF FLRS ______
BUILDING MANAGER NAME: ______
PHONE: ______ OFFICE NO. ______
SPECIAL AREAS: COMPUTER FACILITY [ ] - ZONE NO'S. ______
AUDITORIUM [ ] - ZONE NO'S. ______
LABORATORIES [ ] - ZONE NO'S. ______
CAFETERIA [ ] - ZONE NO'S. ______
OTHER [ ] ______ - ZONE NO'S. ______

ZONE NO. 1 FUNCTION: ______ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: ______ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F ____ TO ____, SAT ____ TO ____, SUN ____ TO ____
PRESENT TEMP: WINTER OCC 75.5 °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F
REQUIRE TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F

REMARKS: 7:00 - 1800 M-F SOMETIME WEEKEND

ZONE NO. ______ FUNCTION: ______ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: ______ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F ____ TO ____, SAT ____ TO ____, SUN ____ TO ____
PRESENT TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F
REQUIRE TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F

REMARKS: ______

ZONE NO. ______ FUNCTION: ______ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: ______ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F ____ TO ____, SAT ____ TO ____, SUN ____ TO ____
PRESENT TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F
REQUIRE TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F

REMARKS: ______

ZONE NO. ______ FUNCTION: ______ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: ______ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F ____ TO ____, SAT ____ TO ____, SUN ____ TO ____
PRESENT TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F
REQUIRE TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F

REMARKS: ______

BUILDING 124

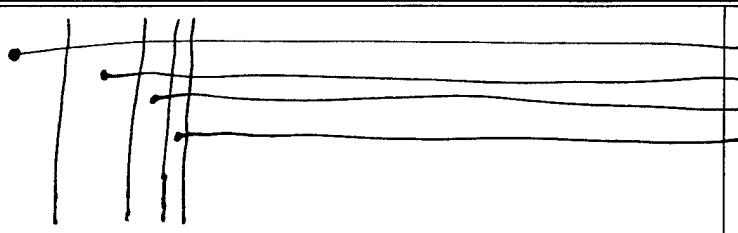
EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

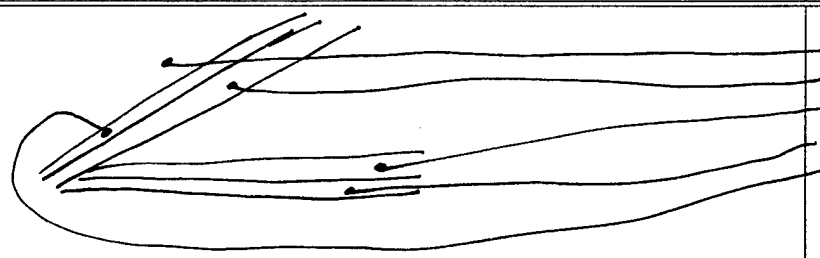
JOB: Ft. McPhereson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: CMD
CHECKED BY:
DATE: 12-12-91

BLDG.# 124

WALL & ROOF INSULATION

AREAS IN SQ. FEET	NORTH	SOUTH	EAST	WEST
WALLS	900	900	180	180
WINDOWS	140	117	23	23
OVERHEAD DOORS	—	—	—	—
PERSONNEL DOORS	0	0	40	40

SKETCH WALL CROSS–SECTION	COMPONENTS	
	1. OUTSIDE AIR FILM	.17
	2. Block	1.23
	3. 2x4 STUD	0
	4. GYP BOARD	0.45
	5. R-11 INSUL	11.0
	6.	
	7. INSIDE AIR FILM	.69
		13.54

SKETCH ROOF CROSS–SECTION	COMPONENTS	
	1. OUTSIDE AIR FILM	.17
	2. 2x6 PLANKS	
	3. 3" Fiberglass Insulation R-11	
	4. GYPBOARD	.45
	5. Shingles	.44
	6. AIR SPACE	1.0
	7. INSIDE AIR FILM	13.06

PERSONNEL DOOR TYPE: Glass/METAL
OVERHEAD DOOR TYPE: —

BASEMENT [ ]
SLAB [✓]
CRAWL SPACE [ ]

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPhereson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO. _____ OF _____
CALCULATED BY: LLC
CHECKED BY: _____
DATE: 12-12-91

BLDG.# 124

PIPE INSULATION

LOCATION	PIPE DIAMETER	PIPE LENGTH	FLUID TYPE	FLUID TEMP.	AIR TEMP.	INSULATION TYPE	INSULATION THICKNESS	INSULATION CONDITION
NE	1/2"	30'	REFRIGERIN	—	—	RUBBER	3/8"	GOOD

COMMENTS: DX. LINE FROM COMPRESSOR OUTSIDE

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: LEC
CHECKED BY:
DATE: 12-12-91

BLDG.# 124

DUCT INSULATION

LOCATION	DUCT CROSSECTION	SHAPE	DUCT TEMP. (°F)	SUPPLY AIR TEMP. (°F)	INSULATION TYPE	INSULATION THICKNESS	INSULATION CONDITION

COMMENTS: NO DUCT INSULATION, EXPOSED TO INTERIOR ZONE

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB _____

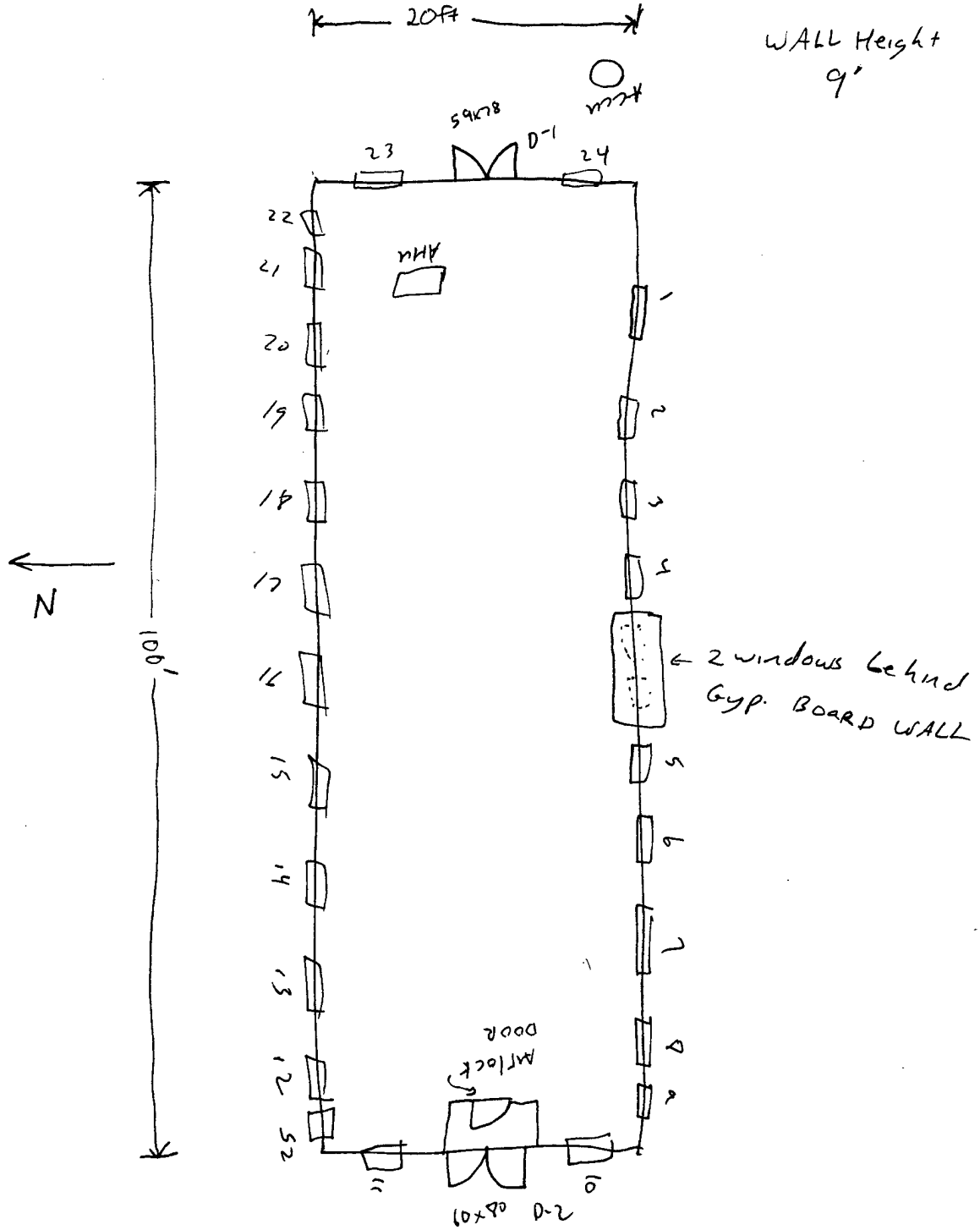
SHEET NO. _____ OF _____

CALCULATED BY CMD DATE 12-12-91

CHECKED BY _____ DATE _____

SCALE NTS

Bldg. 124 Doors & Windows



EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. Mcphereson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: CmD
CHECKED BY:
DATE: 12-12-91

BLDG.# 124

WINDOWS SURVEY

WINDOW NO.	SINGLE/DOUBLE PANE	TYPE–SLIDING FIXED, CASEMENT	FRAME MAT'L	ORIENTATION	GLASS SHADING	WINDOW COVER	DIMENSIONS (INCH)
* 1	Single	Sliding	WOOD	S	NONE	Blinds	51 x 33
23	"	"	"	E	Painted	—	"
24	"	"	"	"	"	"	"

COMMENTS: * Typ. of 22

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPhereson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: CMO
CHECKED BY:
DATE: 12-12-91

BLDG.# 124

WEATHERSTRIPING AND CAULKING

DOOR\ WINDOW	CONDITION OF W.S./CAULK	INFILTRATION	ORIENTATION	DIMENSIONS (INCH)
⌀ W	FAIR	FAIR	S	51 x 33
"	Typ. of 22			

COMMENTS: Most windows fixed shut.

All windows in approximately the same condition

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPhereson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: KC
CHECKED BY:
DATE: 12-12-9~~3~~

BLDG.# 124

DOMESTIC HOT WATER

FAUCET LOCATION	WATER TEMPERATURE
~~MEN~~ COMMON BATHROOM	121 °F
PROBLEMS:	

COMMENTS: ~~MEN~~ ONLY Faucet Available

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPhereson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: KC
CHECKED BY:
DATE: 12-12-91

BLDG.# 124

MOTORS

MOTOR # 1 HP 1/2 PH 1 RPM
MODEL # VOLTS 115V AMPS 8 Amp (MAX)
SERIAL # PRESENT HR. 0700 TO 1600
MFG REQUIRED HR. TO
FRAME EFF.
DESCRIPTION COMMENTS T'STAT CONTROL
CARRIER UNIT MODEL 48SSB120-CC SERIES 120
INPUT 143,000 BTUH 5 TONS COOLING. UNIT IS NEW, INSTALLED IN FALL 89.

MOTOR # 2 HP ¾ ? PH 1 RPM
MODEL # VOLTS 230V AMPS 26
SERIAL # PRESENT HR. TO
MFG REQUIRED HR. TO
FRAME EFF.
DESCRIPTION COMP MOTOR COMMENTS

MOTOR # 3 HP 1/3 PH 1 RPM
MODEL # VOLTS 230V AMPS 1.9
SERIAL # PRESENT HR. TO
MFG REQUIRED HR. TO
FRAME EFF.
DESCRIPTION COMP. FAN COMMENTS

DATE: 12-12-91
BY: KC

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 124 BLDG NAME: ADMIN JOB: 3105.000
PRIMARY FUNCTION: OFFICES GROSS SQ FT______ NO OF FLRS____
BUILDING MANAGER NAME: ______
PHONE: ______ OFFICE NO. ______
SPECIAL AREAS: COMPUTER FACILITY [ ] - ZONE NO'S. ______
AUDITORIUM [ ] - ZONE NO'S. ______
LABORATORIES [ ] - ZONE NO'S. ______
CAFETERIA [ ] - ZONE NO'S. ______
OTHER [ ] ______ - ZONE NO'S. ______

ZONE NO. 1 FUNCTION: OFFICE SPECIAL REQ. YES [ ] NO [✓]
LOCATION: HALLWAY (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F 07:15 TO 16:00, SAT – TO –, SUN – TO –
PRESENT TEMP: WINTER OCC 66.4 °F UNOCC____ °F, SUMMER OCC____ °F UNOCC____ °F
REQUIRE TEMP: WINTER OCC____ °F UNOCC____ °F, SUMMER OCC____ °F UNOCC____ °F

REMARKS: SYSTEM IS NEW – T'STAT

ZONE NO.____ FUNCTION:____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION:____ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F____ TO____, SAT____ TO____, SUN____ TO____
PRESENT TEMP: WINTER OCC____ °F UNOCC____ °F, SUMMER OCC____ °F UNOCC____ °F
REQUIRE TEMP: WINTER OCC____ °F UNOCC____ °F, SUMMER OCC____ °F UNOCC____ °F

REMARKS:____

ZONE NO.____ FUNCTION:____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION:____ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F____ TO____, SAT____ TO____, SUN____ TO____
PRESENT TEMP: WINTER OCC____ °F UNOCC____ °F, SUMMER OCC____ °F UNOCC____ °F
REQUIRE TEMP: WINTER OCC____ °F UNOCC____ °F, SUMMER OCC____ °F UNOCC____ °F

REMARKS:____

ZONE NO.____ FUNCTION:____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION:____ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F____ TO____, SAT____ TO____, SUN____ TO____
PRESENT TEMP: WINTER OCC____ °F UNOCC____ °F, SUMMER OCC____ °F UNOCC____ °F
REQUIRE TEMP: WINTER OCC____ °F UNOCC____ °F, SUMMER OCC____ °F UNOCC____ °F

REMARKS:____

BUILDING IS SCHEDULED TO BE CONDEM BY THE POST. IT IS OCCUPIED BY THE AIRFORCE – AIRFORCE PAID FOR ELECTRICITY & NAT. GAS.

BUILDING 126

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____

SHEET NO. _____ OF _____

CALCULATED BY CMD DATE 12-12-91

CHECKED BY _____ DATE _____

SCALE _____

Bldg 126 SAME AS Bldg 124

Exceptions

1. Window AC units
2. Drop ceiling
3. Different AHU, probably older
   Diffusers only in center of Bldg.

Bldg. ~~[illegible]~~ Unoccupied during survey.
Some window units on.

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

Bldg 126

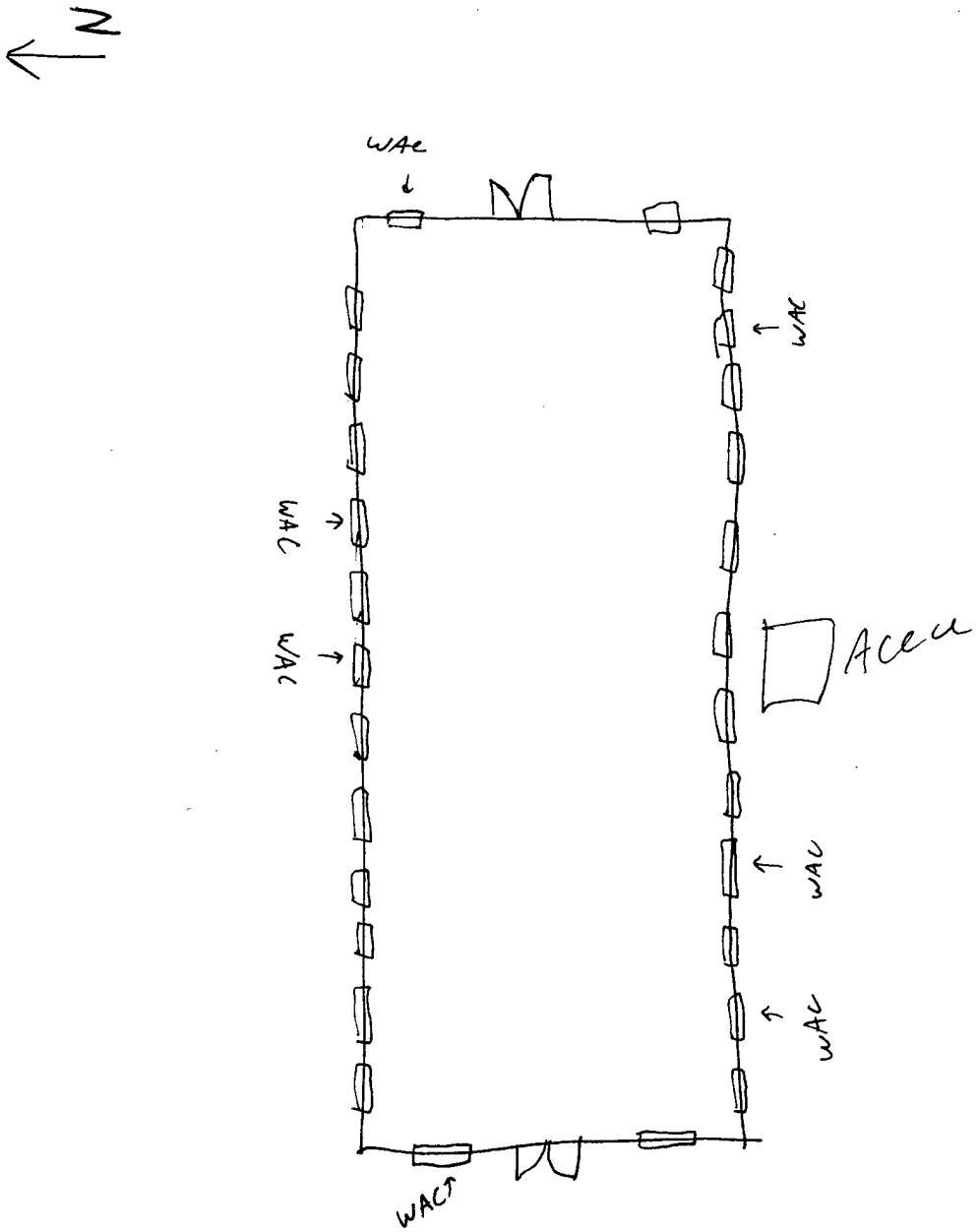
JOB 3105

SHEET NO. _____ OF _____

CALCULATED BY CMD DATE 12-12-91

CHECKED BY _____ DATE _____

SCALE NTS



EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPhereson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: KC
CHECKED BY:
DATE: 12-12-91

BLDG.# 126

MOTORS

BUILDING IS UNOCCUPIED

MOTOR #	1	HP	1/12	PH	1	RPM	
MODEL #		VOLTS	115V	AMPS	0.7		
SERIAL #		PRESENT HR.				TO	
MFG	CARRIER	REQUIRED HR.				TO	
FRAME		EFF.					
DESCRIPTION	WINDOW UNIT TYP. OF 6.	COMMENTS					

MOTOR #	2	HP		PH		RPM	
MODEL #		VOLTS		AMPS			
SERIAL #		PRESENT HR.				TO	
MFG		REQUIRED HR.				TO	
FRAME		EFF.					
DESCRIPTION		COMMENTS					

MOTOR #		HP		PH		RPM	
MODEL #		VOLTS		AMPS			
SERIAL #		PRESENT HR.				TO	
MFG		REQUIRED HR.				TO	
FRAME		EFF.					
DESCRIPTION		COMMENTS					

BUILDING 131

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB	Ft. McPhereson/Ft. Gillem Energy Study
PROJ.#	EMC # 3105.000
SHEET NO.	OF
CALCULATED BY:	CMD
CHECKED BY:	
DATE:	12-12-91

BLDG.# 131

DOMESTIC HOT WATER

FAUCET LOCATION	WATER TEMPERATURE
~~UPSTAIRS~~ COMMON BATHROOM 2ND FLOOR	124 °F
1ST FLOOR MEN'S ROOM	124 °F

PROBLEMS:	

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPhereson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: KC
CHECKED BY:
DATE: 12-12-91

BLDG.# 131

MOTORS

MOTOR # 1 HP 5 PH 3 RPM 1740
MODEL # RVE 184TTDR7026DF L VOLTS 208 AMPS 13.8
SERIAL # H124 PRESENT HR. ____ TO ____
MFG MARATHON REQUIRED HR. ____ TO ____
FRAME 184T EFF. 85.5
DESCRIPTION HWP 1 COMMENTS MANUAL ON/OFF
LOCATED IN BASEMENT
* HAS OA RESET CONTROL.

MOTOR # 2 HP 5 PH 3 RPM 1740
MODEL # RVE184TTDR7026DF L VOLTS 208 AMPS 13.8
SERIAL # ____ PRESENT HR. ____ TO ____
MFG MARATHON REQUIRED HR. ____ TO ____
FRAME 184T EFF. 85.5
DESCRIPTION HWP2 COMMENTS MANUAL ON/OFF
* HAS OA RESTET CONTROL

MOTOR # 3 HP 1/12 PH 1 RPM 1725
MODEL # 58JV VOLTS 115 AMPS 1.71
SERIAL # ____ PRESENT HR. ____ TO ____
MFG BELL & GOSSETT B&G REQUIRED HR. ____ TO ____
FRAME ____ EFF. ____
DESCRIPTION HW CIR. PUMP COMMENTS ____

DATE: 12-12-91
BY: CMD

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 131 BLDG NAME: _____ JOB: 3105.000
PRIMARY FUNCTION: ADMIN GROSS SQ FT _____ NO OF FLRS 3
BUILDING MANAGER NAME: _____
PHONE: _____ OFFICE NO. _____
SPECIAL AREAS: COMPUTER FACILITY [ ] - ZONE NO'S. _____
AUDITORIUM [ ] - ZONE NO'S. _____
LABORATORIES [ ] - ZONE NO'S. _____
CAFETERIA [ ] - ZONE NO'S. _____
OTHER [ ] _____ - ZONE NO'S. _____
ZONE NO. 1 FUNCTION: _____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: 2ND FLOOR (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F 730 TO 1730, SAT 0 TO 0, SUN 0 TO 0
PRESENT TEMP: WINTER OCC _____ °F UNOCC _____ °F, SUMMER OCC _____ °F UNOCC _____ °F
REQUIRE TEMP: WINTER OCC _____ °F UNOCC _____ °F, SUMMER OCC _____ °F UNOCC _____ °F

REMARKS: _____

ZONE NO. 2 FUNCTION: Admin SPECIAL REQ. YES [ ] NO [ ]
LOCATION: 1ST Floor (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F 0730 TO 1600, SAT 0 TO 0, SUN 0 TO 0
PRESENT TEMP: WINTER OCC _____ °F UNOCC _____ °F, SUMMER OCC _____ °F UNOCC _____ °F
REQUIRE TEMP: WINTER OCC _____ °F UNOCC _____ °F, SUMMER OCC _____ °F UNOCC _____ °F

REMARKS: _____

ZONE NO. _____ FUNCTION: _____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: _____ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F _____ TO _____, SAT _____ TO _____, SUN _____ TO _____
PRESENT TEMP: WINTER OCC _____ °F UNOCC _____ °F, SUMMER OCC _____ °F UNOCC _____ °F
REQUIRE TEMP: WINTER OCC _____ °F UNOCC _____ °F, SUMMER OCC _____ °F UNOCC _____ °F

REMARKS: _____

ZONE NO. _____ FUNCTION: _____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: _____ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F _____ TO _____, SAT _____ TO _____, SUN _____ TO _____
PRESENT TEMP: WINTER OCC _____ °F UNOCC _____ °F, SUMMER OCC _____ °F UNOCC _____ °F
REQUIRE TEMP: WINTER OCC _____ °F UNOCC _____ °F, SUMMER OCC _____ °F UNOCC _____ °F

REMARKS: _____

BUILDING 155

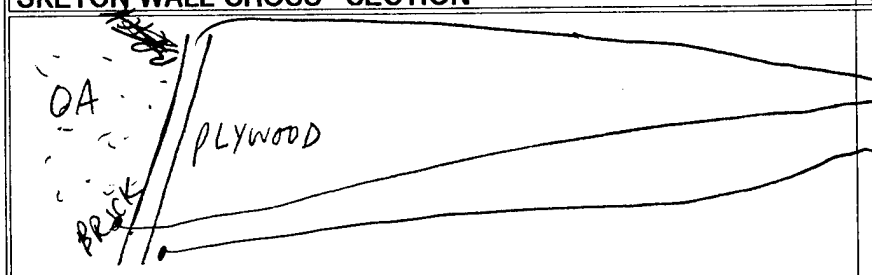
EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

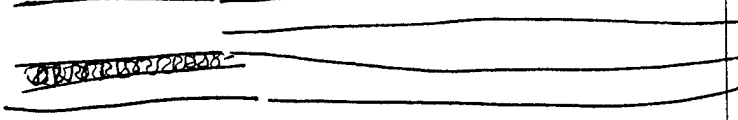
JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: JW
CHECKED BY:
DATE: 12/18/91

BLDG.# 155
ECO 1

WALL & ROOF INSULATION

AREAS IN SQ. FEET	NORTH	SOUTH	EAST	WEST
WALLS				
WINDOWS				
OVERHEAD DOORS				
PERSONNEL DOORS				

SKETCH WALL CROSS–SECTION	COMPONENTS	
	1. OUTSIDE AIR FILM	.17
	2. R-11 6"	6.0
	3. BRICK	1.24
	4. ½" PLYWOOD	0.62
	5.	
	6.	.68
	7. INSIDE AIR FILM	8.71

SKETCH ROOF CROSS–SECTION	COMPONENTS	
	1. OUTSIDE AIR FILM	.17
	2. WOOD ½"	1.00
	3. AIR GAP 12"	1.24
	4. R 19 6"	19
	5. DROP CEILING	1.24
	6.	1.79
	7. INSIDE AIR FILM	.68
		25.12

PERSONNEL DOOR TYPE _____	BASEMENT [ ]
OVERHEAD DOOR TYPE _____	SLAB [ ]
	CRAWL SPACE [ ]

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: KC
CHECKED BY:
DATE: 12-18-91

BLDG.# 155
ECO 1

PIPE INSULATION

LOCATION	PIPE DIAMETER	PIPE LENGTH	FLUID TYPE	FLUID TEMP.	AIR TEMP.	INSULATION TYPE	INSULATION THICKNESS	INSULATION CONDITION
1 * crawl sp.	3½ STEAM	200'	STM 5PSI		55°F	NONE	NONE	
crawl sp.	1"	200'	CONDENSATE		"	"	"	

COMMENTS: * There is insulation where steam & condensate pipes enter building - throughout the building no insulation or in bad condition.

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: KC
CHECKED BY:
DATE: 12-18-91

BLDG.# 155
ECO 1

DUCT INSULATION

LOCATION	DUCT CROSSECTION	SHAPE	DUCT TEMP. (°F)	SURROUND AIR TEMP. (°F)	INSULATION TYPE	INSULATION THICKNESS	INSULATION CONDITION
LOW LEVEL AHU 1	15" X 30"	▭	NOT OP.	60°F	NONE	NONE	—
AHU 2	24" X 24"	▭	↓		FIBERGLASS FOIL	1 1/2"	FAIR
AHU 3,4	18" X 18"	▭	~~72~~	RM ~~72~~	↓	1"	GOOD
AHU 5	30" X 30"	▭	—	—	FIBERGLASS CANVAS	1 1/2"	GOOD

COMMENTS: AHU-1 HAS NO HEATING COIL (REMOVED) D+ COOLING.

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

BLDG.# 155
ECO 2

JOB Ft. McPherson/Ft. Gillem Energy Study
PROJ.# EMC # 3105.000
SHEET NO. OF
CALCULATED BY: JW
CHECKED BY:
DATE: 12/18/91

WINDOWS SURVEY

WINDOW NO.	SINGLE/DOUBLE PANE	TYPE–SLIDING FIXED, CASEMENT	FRAME MAT'L	ORIENTATION	GLASS SHADING	WINDOW COVER	DIMENSIONS (INCH)
3	SINGLE	SLIDING	OLD WOOD	S	NONE	NONE	30×40
1	"	"	"	S DINING ROOM	"	BLINDS	30×60
5	"	"	"	N	"	NONE	30×60
1	"	"	"	W	"	"	"
5	"	"	"	E	"	BLACKED OUT FOR BAR	30×60

(1)

COMMENTS: NO CAULK (1) ALL EAST WINDINGS PANELED OVER ON INSIDE

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: J W
CHECKED BY:
DATE: 12/17/91

BLDG.# 155
ECO 3

WEATHERSTRIPING AND CAULKING

DOOR\ WINDOW	CONDITION OF W.S./CAULK	INFILTRATION	ORIENTATION	DIMENSIONS (INCH)	#
W	NONE	MED	S	30 x 40	1
① W	NONE	VERY HIGH	SOUTH DINING ROOM	30 x 60	1
② D	METAL GLASS DOUBLE DOOR UNIT	HIGH	N	60 x 80	1

COMMENTS:
① WINDOW HAS ½" AIR GAP W/ NO CAULK. THIS WINDOW SHOULD BE REPLACED OR NAILED SHUT & CAULKED.
② MAIN FRONT DOORS HAVE ½" AIR GAP ON BOTTOM & SOME INFILTRATION IN BETWEEN.

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO. ____ OF ____
CALCULATED BY: JW
CHECKED BY:
DATE: 12/18/91

BLDG.# 155
ECO 4

DOMESTIC HOT WATER

FAUCET LOCATION	WATER TEMPERATURE
NE BATHROOM	180°F
DOWNSTAIRS BAR	170°F
PROBLEMS:	

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: KS
CHECKED BY:
DATE: 12-18-91

BLDG.# 155
ECO 5

MOTORS

MOTOR # 1 (AHU-1) HP 1 PH 3 RPM 1725
MODEL # 5K43MG8047X VOLTS 200 AMPS 3.8
SERIAL # PRESENT HR. TO
MFG GE REQUIRED HR. TO
FRAME EFF.
DESCRIPTION COMMENTS SUMMER COOLING ONLY
NOT RUNNING @ SURVEY

MOTOR # 2 (AHU-2) HP 2 PH 3 RPM 1725
MODEL # M3157T VOLTS 208 AMPS 6.8
SERIAL # PRESENT HR. TO
MFG BALDOR REQUIRED HR. TO
FRAME 145T EFF. 78.5
DESCRIPTION COMMENTS NOT RUNNING @ SURVEY.

MOTOR # AHU-3 HP 1/4 PH 1 RPM
MODEL # VOLTS 115V AMPS 1.3
SERIAL # PRESENT HR. TO
MFG TRANE PACKAGE REQUIRED HR. TO
FRAME EFF.
DESCRIPTION COMMENTS BY THE FRONT OFFICE, ABOVE CEILING TOWER.

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____

SHEET NO. _____ OF _____

CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____

SCALE _____

AHU-4 ABOVE CEILING TOWER SAME AS AHU-3

AHU-5 BALDOR 3Ø

CAT. M3311T FM 213T F688 1725 RPM.

7½ HP 3Ø 208V 23A 85.5% eff.

LOCATE IN BASEMENT (LOWER LEVEL)

SERVE MAIN ROOM UPSTAIR.

JOB Ft. McPherson/Ft. Gillem Energy Study
PROJ.# EMC # 3105.000
SHEET NO. ____ OF ____
CALCULATED BY: ____
CHECKED BY: ____
DATE: ____

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 155 BLDG NAME: NCO CLUB JOB: 3105.000
PRIMARY FUNCTION: ____ GROSS SQ FT ____ NO OF FLRS ____
BUILDING MANAGER NAME: ____
PHONE: ____ OFFICE NO. ____
SPECIAL AREAS: COMPUTER FACILITY [ ] - ZONE NO'S. ____
AUDITORIUM [ ] - ZONE NO'S. ____
LABORATORIES [ ] - ZONE NO'S. ____
CAFETERIA [ ] - ZONE NO'S. ____
OTHER [ ] ____ - ZONE NO'S. ____

ZONE NO. ____ FUNCTION: ____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: ____ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F 7:00 TO 2400, SAT ____ TO ____, SUN ____ TO ____
PRESENT TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F
REQUIRE TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F

REMARKS: ____

ZONE NO. ____ FUNCTION: ____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: ____ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F ____ TO ____, SAT ____ TO ____, SUN ____ TO ____
PRESENT TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F
REQUIRE TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F

REMARKS: ____

ZONE NO. ____ FUNCTION: ____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: ____ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F ____ TO ____, SAT ____ TO ____, SUN ____ TO ____
PRESENT TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F
REQUIRE TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F

REMARKS: ____

ZONE NO. ____ FUNCTION: ____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: ____ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F ____ TO ____, SAT ____ TO ____, SUN ____ TO ____
PRESENT TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F
REQUIRE TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F

REMARKS: ____

BUILDING 168

EMC ENGINEERS, INC.

DENVER * ATLANTA * GERMANY

BLDG.#

JOB Ft. Macpherson Energy Study EMC#3105.000
PROJ.#
SHEET NO. OF
CALCULATED BY
CHECKED BY
DATE

WALL & ROOF INSULATION

AREAS	NORTH	SOUTH	EAST	WEST
WALLS				
WINDOWS				
OVERHEAD DOORS				
PERSONNEL DOORS				

SKETCH WALL CROSS-SECTION	COMPONENTS
	1. OUTSIDE AIR FILM 2. 3. 4. 5. 6. 7. INSIDE AIR FILM

SKETCH ROOF CROSS-SECTION	COMPONENTS
	1. OUTSIDE AIR FILM 2. 3. 4. 5. 6. 7. INSIDE AIR FILM

PERSONNEL DOOR TYPE

OVERHEAD DOOR TYPE

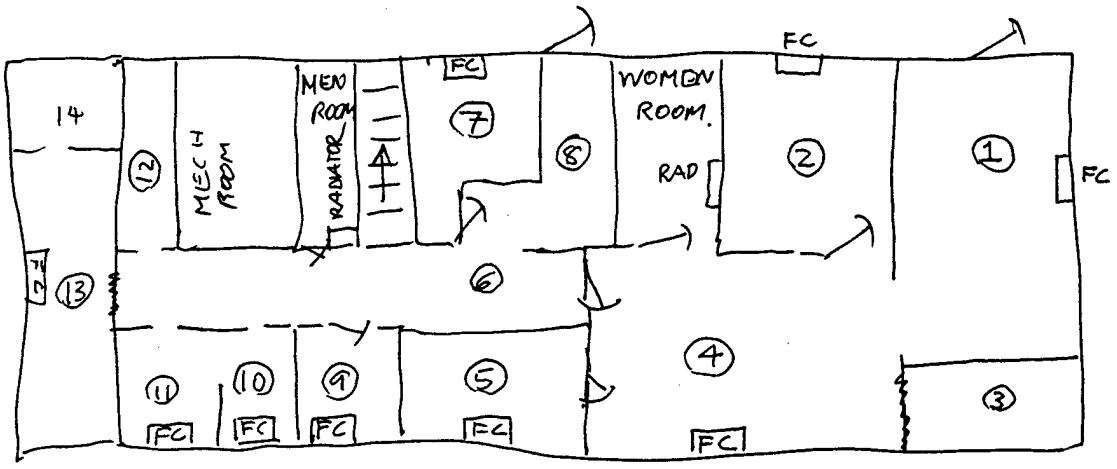
BASEMENT [X]
SLAB [ ]
CRAWL SPACE [ ]

COMMENTS:

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB 3105.000
SHEET NO. _____ OF _____
CALCULATED BY KC DATE 12-9-91
CHECKED BY _____ DATE _____
SCALE _____

BASEMENT



FRONT

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB Ft. Macpherson Energy Study EMC# 3105.000
PROJ.#
SHEET NO. OF
CALCULATED BY
CHECKED BY
DATE

BLDG.#

WINDOWS

WINDOW#	SINGLE/DOUBLE PANE	TYPE–SLIDING FIXED, CASEMENT	FRAME MAT'L.	ORIENTATION	GLASS SHADING	WINDOW COVER	DIMENSIONS

COMMENTS:

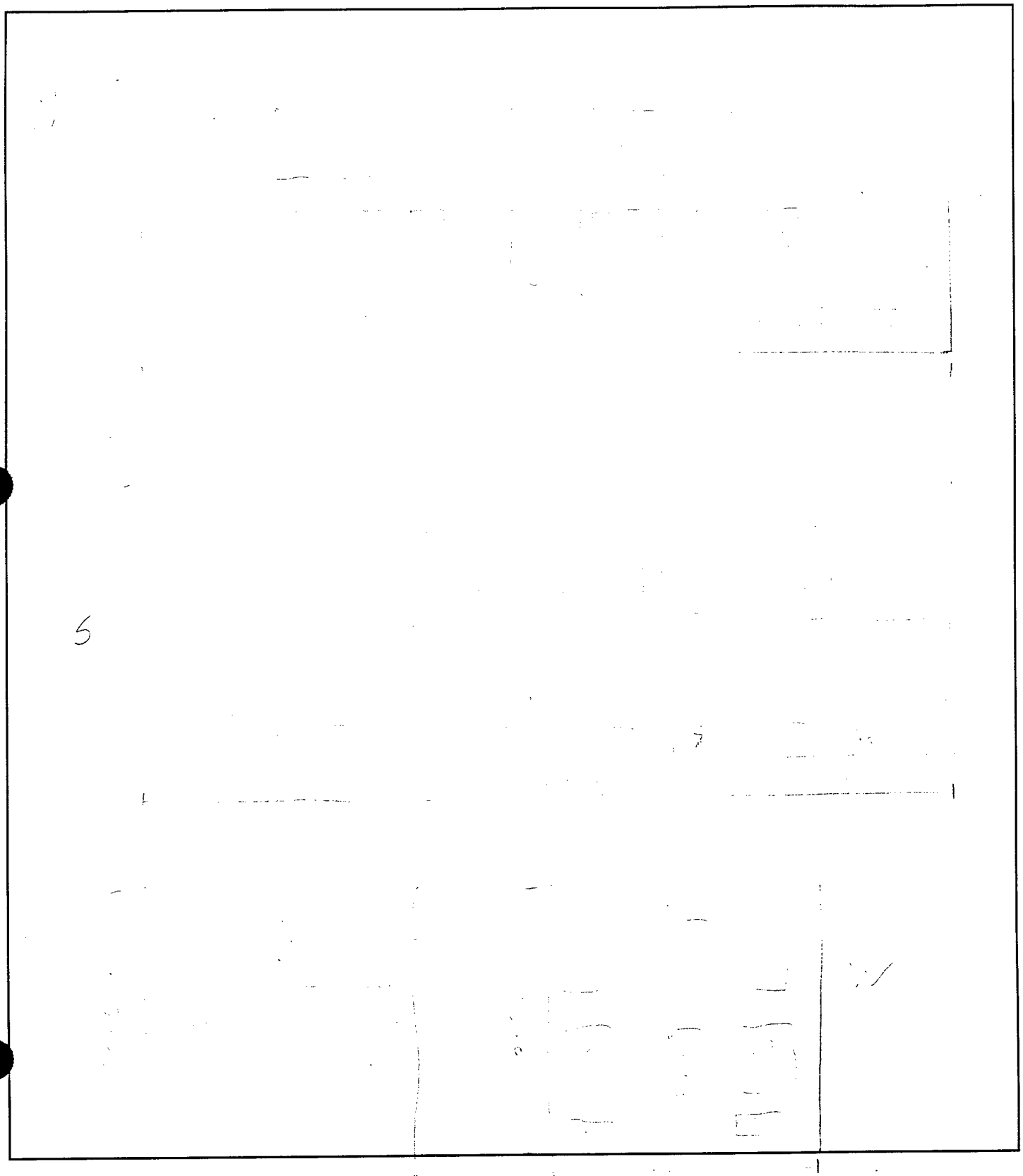
JOB

SHEET NO. OF

CALCULATED BY DATE

CHECKED BY DATE

SCALE



EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB Ft. Macpherson Energy Study EMC# 3105.000
PROJ.#
SHEET NO. OF
CALCULATED BY KC
CHECKED BY
DATE 12-9-91

BLDG.# 168

DOMESTIC HOT WATER

FAUCET LOCATION	WATER TEMPERATURE
RM 209	127°F
RM 103	125°F

PROBLEMS:

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB Ft. Macpherson Energy Study EMC# 3105.000
PROJ.#
SHEET NO. OF
CALCULATED BY KC
CHECKED BY
DATE 12-9-91

BLDG.# 168

MOTORS

MOTOR#	LOCATION (EQUIPMENT DESCRIPTION)	MFG.	MODEL #	SERIAL #	FRAME	HP	VOLTS	AMPS	PH	RPM	PRESENT OPPERATION HOURS
1	BTW PUMP MECH ROOM	GOULD CENTURY	6-333055-03		5184TCZ	5	208	16	3		0-2400

% REQUIRED EFF.

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. Macpherson Energy Study EMC# 3105.000
PROJ.#:
SHEET NO.: OF
CALCULATED BY: KC
CHECKED BY:
DATE: 12-9-91

BLDG.# 168

FLOW RESTRICTIONS

SHOWERHEADS	SHOWERS/DAY	NO. OF PEOPLE	PRESENT GPM	GPM w/ FLOW RESTRICTOR
17	1	*	Rm 209 10 QUARTS 45 SEC Rm 107 6 QUARTS 30 SEC	5½ QUARTS 1 MIN.
1	1	1	10 QUARTS 45 SEC	5½ QUARTS 1 MIN.

FAUCETS		PEOPLE	PRESENT GPM	GPM w/ FLOW RESTRICTOR
17	BATHROOMS	*	40 OZ. 10 SEC	22 OZ. 60 SEC
1	KITCHEN		" — "	" — "
3	ADMIN. RESTROOMS		" — "	" — "

COMMENTS: * CHECK W/BLDG 22 FOR BOQ OCCUPATION

DATE: 12/9/91
BY: CRL

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 168 BLDG NAME: VOQ & WEATHER SERVICES JOB: _____
PRIMARY FUNCTION: _____ GROSS SQ FT _____ NO OF FLRS 2 + BASEMENT
BUILDING MANAGER NAME: _____
PHONE: _____ OFFICE NO. _____
SPECIAL AREAS: COMPUTER FACILITY [ ] - ZONE NO'S. _____
AUDITORIUM [ ] - ZONE NO'S. _____
LABORATORIES [ ] - ZONE NO'S. _____
CAFETERIA [ ] - ZONE NO'S. _____
OTHER [ ] _____ - ZONE NO'S. _____

ZONE NO. 1 FUNCTION: HOTEL VOQ SPECIAL REQ. YES [ ] NO [✓]
LOCATION: 1ST & 2ND FLOOR (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F 0 TO 2400, ~~SAT TO , SUN TO~~
PRESENT TEMP: WINTER OCC 74 °F UNOCC _____ °F, SUMMER OCC _____ °F UNOCC _____ °F
REQUIRE TEMP: WINTER OCC 68 °F UNOCC _____ °F, SUMMER OCC _____ °F UNOCC _____ °F

REMARKS: EMPTY DURING THE DAY, 0700 - 1630

ZONE NO. 2 FUNCTION: ADMIN/WEATHER SERVICE SPECIAL REQ. YES [ ] NO [ ]
LOCATION: BASEMENT (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F 0700 TO 1700, SAT 0 TO 0, SUN 0 TO 0
PRESENT TEMP: WINTER OCC 77 °F UNOCC _____ °F, SUMMER OCC _____ °F UNOCC _____ °F
REQUIRE TEMP: WINTER OCC 68 °F UNOCC _____ °F, SUMMER OCC _____ °F UNOCC _____ °F

REMARKS: HOT IN SUMMER PER OCCUPANTS

ZONE NO. _____ FUNCTION: _____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: _____ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F _____ TO _____, SAT _____ TO _____, SUN _____ TO _____
PRESENT TEMP: WINTER OCC _____ °F UNOCC _____ °F, SUMMER OCC _____ °F UNOCC _____ °F
REQUIRE TEMP: WINTER OCC _____ °F UNOCC _____ °F, SUMMER OCC _____ °F UNOCC _____ °F

REMARKS: _____

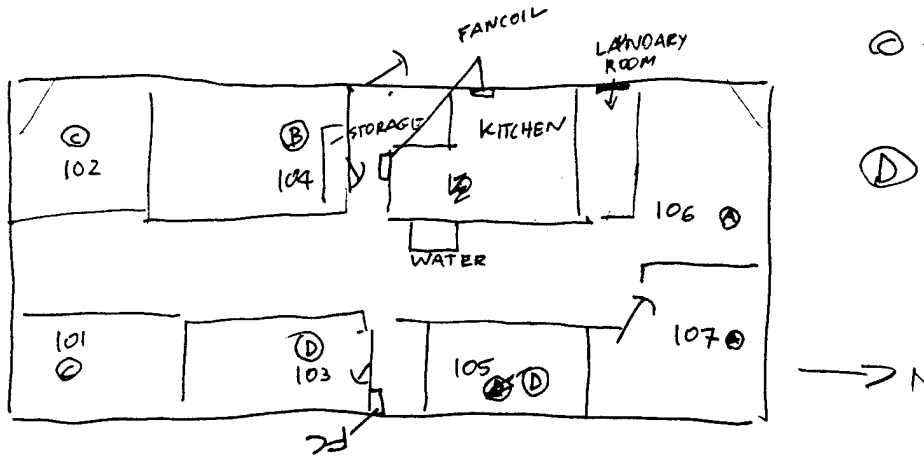
ZONE NO. _____ FUNCTION: _____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: _____ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F _____ TO _____, SAT _____ TO _____, SUN _____ TO _____
PRESENT TEMP: WINTER OCC _____ °F UNOCC _____ °F, SUMMER OCC _____ °F UNOCC _____ °F
REQUIRE TEMP: WINTER OCC _____ °F UNOCC _____ °F, SUMMER OCC _____ °F UNOCC _____ °F

REMARKS: _____

OTHER ECO's, PIPE INSULATION, SECTIONS
, GAS DRYERS IN PLACE OF ELECTRIC DRYERS
, DIS. LITE IN ~~VEND~~ COKE MACHINE
, DELAMP ADMIN. BASEMENT

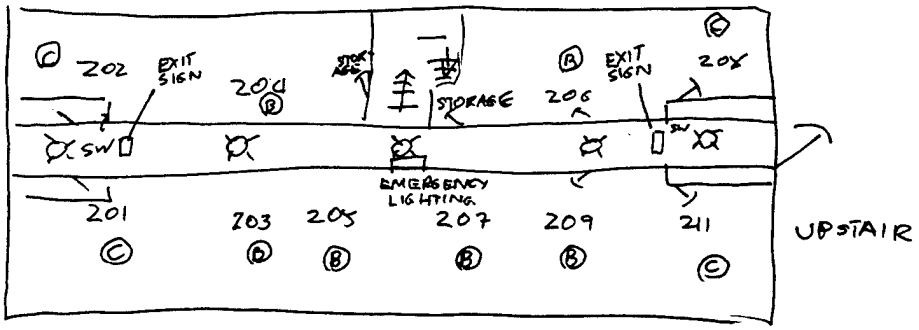
E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany
584-4797

JOB 3105.000
SHEET NO. _____ OF _____
CALCULATED BY KC DATE 12-10-91
CHECKED BY _____ DATE _____
SCALE _____

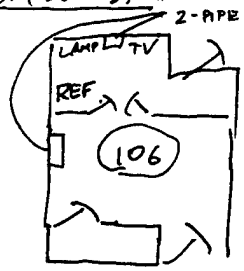


Ⓒ - 2 - FAN COILS
1 - TV
1 - FRIG.
1 - CLOCK
1 - RADIATOR

Ⓓ 1 - FC
1 - RADIATOR
1 - TV
1 - FRIG.
1 - CLOCK
1 - BATH VENT



ROOM DOWNSTAIR



KITCHEN.
- 1 COKE MACHINE
- 1 ICE MAKER SCOTSMAN
- 1 BIG REFRIGERATOR 115V 5.5A.
- 1 MICROWAVE (FULL SIZE)
- 1 STOVE/OVEN (GAS)
- 1 DISHWASHER

WATER COOLER
- SUNROC CORP. GLEN RIDDLE, PA.
- NSF-20W MODEL
- 115V 7.2A HP 1/3

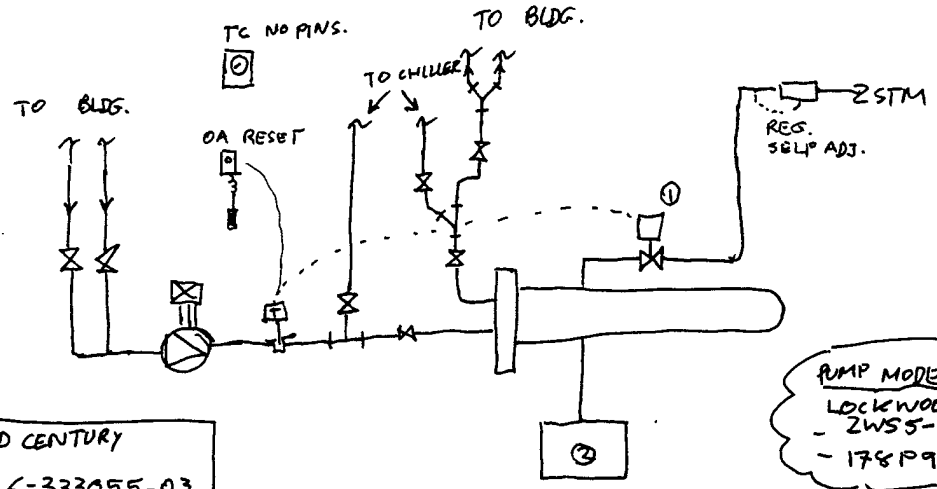
LAUNDARY ROOM
2 - WASHERS. → 8 LOADS/DAY + OTHERS.
2 - DRYERS (ELEC)
1 - 4 TUBE 4' FLORESCENT W/SW.
1 - VENT FAN (HOME STYLE).
WASH TOWERS EVERY DAY
1 - RADIATOR (LIKE BATH ROOM)

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB 3105.000
SHEET NO. _____ OF _____
CALCULATED BY KC DATE 12-10-91
CHECKED BY _____ DATE _____
SCALE _____

L1 L3
DTW PUMP.

① HONEYWELL ELEC. ACTUATOR.
② COND. PUMP 2-1½ HP 115V PUMP



PUMP MODEL
LOCKWOOD PRODUCT
- 2WS5-4YX MODEL
- 178P985 SERIAL

GOULD CENTURY
PART 6-333055-03
FRAME S184TCZ
TYPE SC
HP 5 CODE J
VOLT 200-208
AMPS 16
CAT 0242

NOTES:
- DTW PUMP CONNECT TO EEP, BUT NOT OA RESET NOR TC
- OA RESET DOES NOT WORK
- TC HAS NO PINS.
- HONEYWELL VALVE LOOKS NEW.
- OA & TC COULD BE FOR STM VALVE.

CHILLER LOCATE ON PAD BEHIND BLDG.

TRANE
MODEL # CGAA-1506-JB
COMP. MOTORS 2 - 3Ø 60 HZ 37.8 RLA each 179 LRA each
COND FAN 3 - 1Ø 60 HZ 2.3 FLA each 1/3 HP. each
SERIAL # L78E13306
TYPE # 561-0049-1B
VOLT 208/240
R-22.

- SHOULD INSULATE COND. RET PIPE.

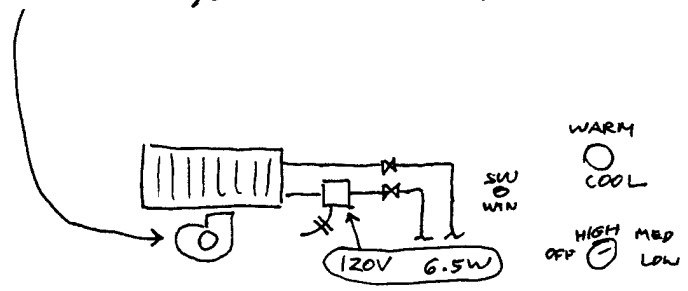
E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB 3105.000
SHEET NO. _____ OF _____
CALCULATED BY KC DATE 12-10-91
CHECKED BY _____ DATE _____
SCALE _____

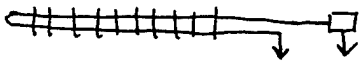
TYP. FOR ROOM (209)

- ALARM CLOCK 5W
- REFRIGERATOR 120V 1.65A. SMALL.
- TV. 120V 1A.
- 1 LIGHT IN BEDROOM (OVER HEAD) 2 —
- 1 LAMP 52W

2-PIPE FAN COIL.
TRANE
FAN MOTOR 1/60 HP 120V 1.1A.



BATH ROOM HAS RADIATOR
1 —



MANUAL SETTING 1—5
2 — EXH. FAN. 120V (HOME STYLE.)

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB 3105,000

SHEET NO. _____ OF _____

CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____

SCALE _____

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB Ft. Macpherson Energy Study EMC# 3105.000
PROJ.#
SHEET NO. 1 OF 2
CALCULATED BY LBL
CHECKED BY
DATE 12/9/91

BLDG.# 168

BASEMENT

LIGHTING

ROOM #	NO. OF FIXTURES	LAMPS/FIXTURE	BULB TYPE	ON\OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCC. SENSOR	NO. OF SWITCHES
1	4	4	FLUOR	ON	Y	Y	1
2	4	4	F 34	OF	Y	Y	1
3	2	4	F 34	F	Y	Y	1
4	6	4	F 34	ON	Y	Y	1
WOMENS RM	1	4	F 34	OFF	Y	Y	1
	1	1	I 52	OFF	Y	Y	
5 DOR	6	4	F 34	O	Y	Y	1
6	4	4	F 34	O	Y	Y	1
7	4	4	F 34	F	Y	Y	1
8	2	4	F 34	O	Y	Y	1
EXIT SIGNS	III	2					
MENS	1	4	F 34	O	Y	Y	1
	2	1	I 52				
9	2	4	F 34	O	Y(G)	Y	1
10	2	4	F 34	O	Y	Y	1
11	4	4	F 34	O	Y	Y	1
12	2	1	I 100W	O	N	N	—
13	4	4	F 34W	O	Y	Y	1
14	2	4	F "	O	Y	Y	1

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB Ft. Macpherson Energy Study EMC# 3105.000
PROJ.#
SHEET NO. 1 OF 2
CALCULATED BY CBL
CHECKED BY
DATE 12/9/91

BLDG.# 168

LIGHTING

ROOM #	NO. OF FIXTURES	LAMPS/FIXTURE	WATTS PER BULB	BULB TYPE	ON\OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCC. SENSOR	NO. OF SWITCHES
1ST & 2ND FLOOR TYP ROOM	1	2	52	INC	OFF	Y	N	1
209	1	1	52	INC	OFF	TABLE LAMP	N	1
BATH	1	1	52	INC	OFF	Y	N	1
2ND FLR HALLWAY	1	5	52	INC	OFF	Y	Y	1
"	5	3	52	INC	ON	Y	Y	1
"	1	5	52	INC	OFF	Y	Y	1
LAUNDRY	1	4	34	FLOOR	ON	Y	Y (G)	1
106	2	2	52	INC	ON	Y	N	1
106 BATH	1	1	52	INC	OFF	Y	N	1
106	1	5	52	INC	OFF	Y	Y	1
EXIT SIGNS	IIII 1	2	45	I	O			
1ST FLOOR HALL	4	5	52	INC	ON	Y	Y	1
COMMENTS:	1	5	52	INC	OFF	Y	Y	1
106	3	1	52	INC	OFF	TABLE LAMP	N	3
102	1	5	52	INC	OFF	Y	Y	1
102	1	5	52	"	"	"	"	"
102	4	1	52	"	OFF	TABLE LAMP	N	4
102 BATH	1	1	52	"	"	Y	N	1
103	2	2	52	"	OFF	Y	N	1
103 BATH	1	1	52	"	OFF	Y	N	1
103	2	1	52	"	"	TABLE LAMP	N	2
KITCHEN	1	4	34	FLOOR	ON(G)	Y	Y	1

BUILDING 170

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: JW
CHECKED BY:
DATE: 12/31/91

BLDG.# 170
ECO 5

10+ HP MOTORS

MEASURED

		PHASE A	PHASE B	PHASE C
MOTOR# HW Pump				
LOCATION MECH ROOM	KVAR	7.5		
MFG BALDOR	KVA	13.5		
MODEL # M2333T	KW	11.3		
SERIAL # 10784G	PF	83		
FRAME 254T	HP			
HP 15	VOLTS	208	208	
RPM 1760	AMPS	38	38	
PRESENT 0 TO 2400	PH			
REQ HR. TO				

230V 38A 87% PF 86%

		PHASE A	PHASE B	PHASE C
MOTOR #				
LOCATION	KVAR			
MFG	KVA			
MODEL #	KW			
SERIAL #	PF			
FRAME	HP			
HP	VOLTS			
RPM	AMPS			
PRESENT TO	PH			
REQ HR. TO				

COMMENTS

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB
SHEET NO. OF
CALCULATED BY CBL DATE 11/26/91
CHECKED BY DATE
SCALE

170

HW PUMP
MANUFACTURER: BALDOR
MODEL M2333T
SPEC. 09A51Z36
FRAME 254T
HP 15
VOLTS 230 60 Hz
AMPS 38 3 ϕ
RPM 1760
EFF 87% PF 86%

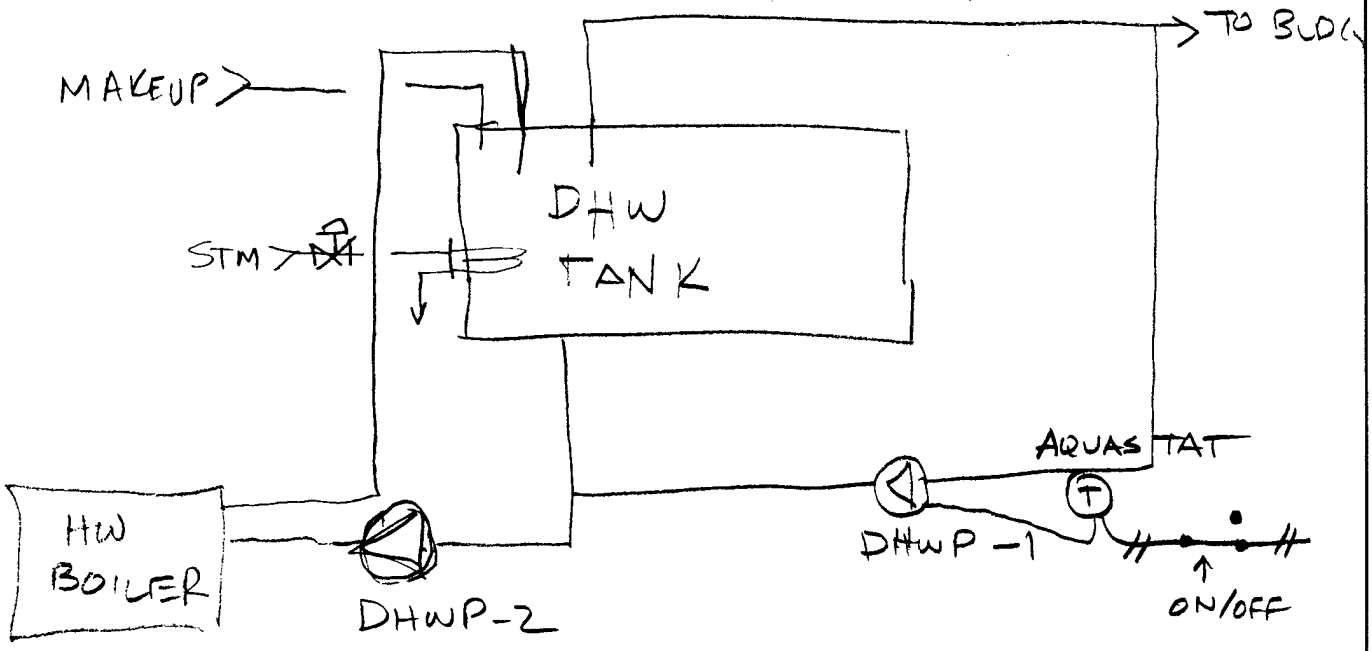
PEERLESS PUMP

NO NAMEPLATE

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB
SHEET NO. OF
CALCULATED BY DATE 11/26/91
CHECKED BY DATE
SCALE

170



DHWP-1, RECIRC WATER IN BUILDING
- B&G PUMP, NO NAMEPLATE, EST 1/10 HP
- OFF DURING SURVEY

DHWP-2, HW CIRC
- NO NAMPLATE
- OFF DURING SURVEY

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB
SHEET NO. OF
CALCULATED BY CBL DATE 11/26/91
CHECKED BY DATE
SCALE

170

CHW PUMP

MOTOR:

MANUFACTURER	DAYTON
MODEL	3N662A
HP	15
RPM	1750
NEMA DESIGN	B
FRAME	254T
PHASE	3
HZ	60
NEMA NOMINAL EFF,	88.5
POWER FACTOR	81.5
VOLTS	208
AMPS	42.0

PUMP:

MANUFACTURER PEERLESS PUMP
SIZE/MODEL 2.5AD13 TYPE 5300
RPM 1750 SER. No. 431238
GPM 250 FT HD 98

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB
SHEET NO. OF
CALCULATED BY CEL DATE 11/26/91
CHECKED BY DATE
SCALE

170

TRANE CHILLER (OFF @ SURVEY)

MODEL NO. CG AA12 06R J51 CA4C 4C36 1AER

COMP. 2 @ 236 A ea 3 ∅ 60 H
200 V

COND FANS 3 25.4 A ea 7.5 HP

CARRIER HEAT PUMP (RUNNING @ SURVEY)

MODEL 38BQ008530

SER. NO. 1289 G34 108

COMP 1 208 V
38.5 A

FAN 1 208 V
3.6 A

- COMPUTER A/C UNIT
  - IGNORE, SPECIAL PURPOSE
  - LARKIN, PFG-8
    2.6 A, 208 V, 3 ∅,
    COND. FAN UNIT ONLY
  - DATEC FAN & COMP. NO NAMEPLATE

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB
SHEET NO. OF
CALCULATED BY CEL DATE 11/26/91
CHECKED BY DATE
SCALE

170

HOURS MON – FRI 0730 – 1615

> BLDG HAS TWO PIPE FAN COILS

> 34 W ECONO-WATT FLUORS. LIGHTS
SPOT CHECK (3)

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB
SHEET NO. OF
CALCULATED BY CEL DATE 11/26/91
CHECKED BY DATE
SCALE

170

- CONDENSATE RECEIVER OVERFLOWING
- PUMPS OFF
  - CN RETURN

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

BLD G-170

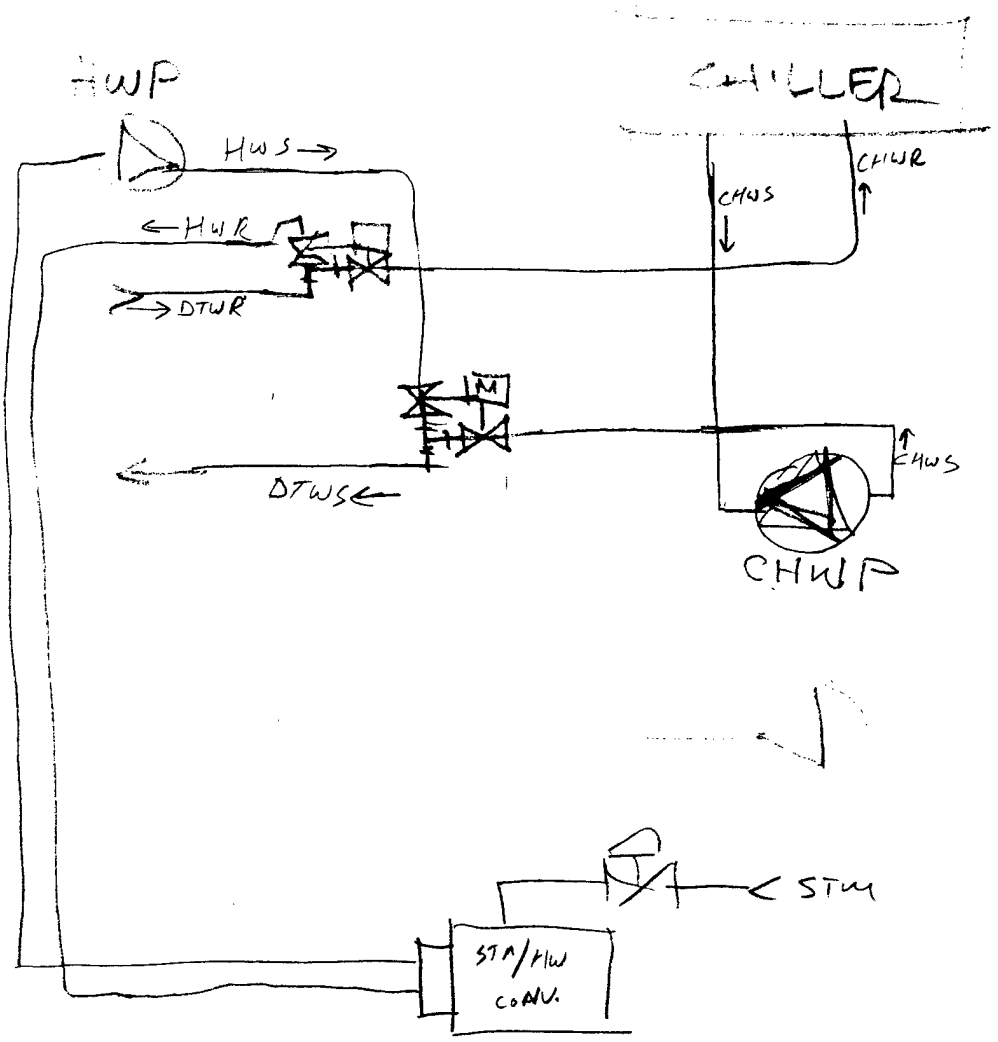
JOB _____

SHEET NO. _____ OF _____

CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____

SCALE _____



E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____

SHEET NO. _____ OF _____

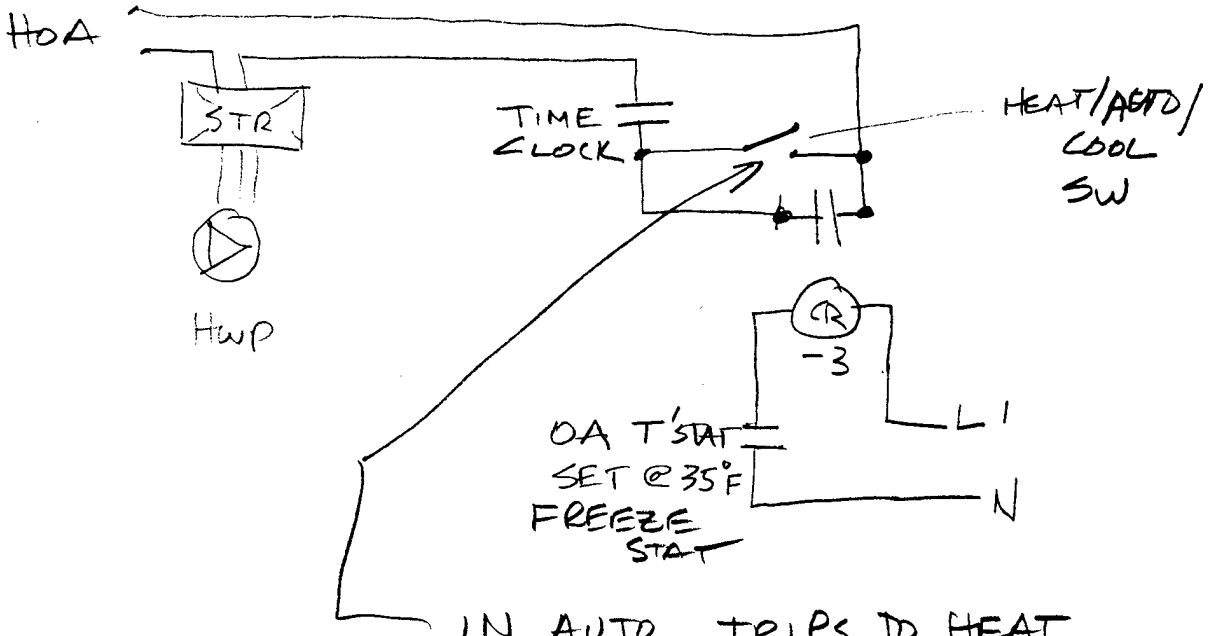
CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____

SCALE _____

170 | PER CONTROLS DWG

— TIMECLOCK HAS NO PINS
— HEAT/AUTO/COOL SW IN HEAT POSITION



IN AUTO, TRIPS TO HEAT @ OR BELOW 65°F

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____
SHEET NO. _____ OF _____
CALCULATED BY _____ DATE _____
CHECKED BY _____ DATE _____
SCALE _____

HOSPITAL

AHU 9 Zone 3 says "Temp. Never Correct"

AHU 15 Zone 1 Works 24hrs 7days/wk "Temp. Never Correct"
~~adj. to blood bank~~

AHU-16 Zone 2 T-STAT Not Responding well

AHU-17 H-3 Not working
H-4 Not working
H-2 Not working

ANNEX

No T-STAT FORMS

FT. MAC ENERGY STUDY

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

BLDG: 170

JOB EMC # 3105.000

SHEET NO. ____ OF ____

CALCULATED BY CMD DATE 11-27

CHECKED BY ____ DATE ____

SCALE NTS

ROOM NO.	NO. OF FIXTURES	NO. OF LAMPS PER FIXTURE	WATTS PER BULB	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCCUPANCY SENSOR Y/N	NO. OF SWITCHES
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	ON	Y	Y	1
[illegible]	1	[illegible]	[illegible]	[illegible]	[illegible]	Y	Y	1
150	1	4	[illegible]	[illegible]	ON	Y	[illegible]	1
149	1	5	[illegible]	F	ON	Y	N	1
153	3	5	[illegible]	[illegible]	ON	Y	Y	1

PT. MAL ENERGY STUDY

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB EMC # 3105.000

SHEET NO. _____ OF _____

CALCULATED BY CMJ DATE 11-2

CHECKED BY _____ DATE _____

SCALE NTS

BLDG # 70

ROOM NO.	NO. OF FIXTURES	NO. LAMPS PER FIXTURE	MAPS PER BLDG	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR COMPANY DECISION MAKING	NO. OF TIMES SURVEYED
HALL 1	7	2	34	F	ON	Y	N	1
HALL 2	1	2	34	F	ON	Y	N	1
[illegible]	1	2	34	F	ON	Y	N	1
[illegible]	1	2	34	F	ON	Y	N	1
HALL 5	12	2	34	F	ON	Y	N	1
[illegible]	5	2	34	F	ON	Y	N	1
130	1	2	34	F	ON	Y	N	1
[illegible]	2	2	34	F	ON	Y	N	1
140	1	4	34	F1	ON	Y	N	1
141	1	4	34	F	ON	Y	N	1
142	1	4	34	F	ON	Y	N	1
143	1	4	34	F	ON	Y	N	1
144	1	4	34	F	ON	Y	N	1
154	1	2	34	F	OFF	Y	N	1
145	2	2	34	F	OFF	Y	N	1
146	2	2	34	F	ON (1)	Y	N	1

FT. MAC ENERGY STUDY

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

BLDG: 170

JOB EMC #3105.000

SHEET NO. ______ OF ______

CALCULATED BY CMD DATE 11-27

CHECKED BY ______ DATE ______

SCALE NTS

ROOM NO. 2ND FLOOR	NO. OF FIXTURES	NO. OF LAMPS PER FIXTURE	WATTS PER BULB	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCCUPANCY SENSOR Y/N	NO. OF SWITCHES
100								
101								
102	2	4	34	FI	ON (G)	Y	Y	1
103	1	1	52	INCAN	OFF	Y	Y	1
104	1	4	34*	F	OFF	Y	Y	1
105								
106	1	4	34	F	ON	Y	Y	1
107								
108	1	4	34	F	ON	Y	Y	1
109	1	2	34	F	ON (G)	Y	Y	1
110	3	2	34	F	ON (G)	Y	Y	2
CLOSET 111	1	2	34	F	OFF	Y	N	1
112	1	4	34	F	ON	Y	Y	1
113								
114								
115								
116	1	2	34	F	ON	Y	Y	1
117								
118	1	4	34	F	ON (G)	Y	Y	1
119	1	1	150	I	ON	Y	Y	1
120	6	4	34	F	ON	Y	Y	1
121								
122	1	4	34	F	OFF	Y	Y	1
119A	2	2	34	FI	ON (G)	Y	Y	1
(Typ of all "A" Rooms)	1	1	52	I	ON	Y	Y	1

FT. MAC ENERGY STUDY

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB EMC # 3105.000

SHEET NO. _____ OF _____

CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____

SCALE NTS

BLDG # 71

ROOM NO.	NO. OF FIXTURES	NO. OF LAMPS PER FIXTURE	MARKS ON BULB	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCCUPANCY SENSOR	NO. OF SWITCHES
41	1	4		F1 (18')	ON	N		1
42	1	4		F1	ON	Y		1
43	2	4		F1	ON	Y		1
44	1	4		F1	OFF	Y		1
45	1	4		F1	ON	Y		1
46	1	4		F1	"	"		1
47	1	4		F1	"	"		1

FT. MAC ENERGY STUDY

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB EMC # 3105.000

SHEET NO. ______ OF ______

CALCULATED BY EMC DATE 11-2?

CHECKED BY ______ DATE ______

SCALE NTS

BLDG: 70

Entries are listed left to right as written on the sheet:

- **ROOM NO.:** 40, 55, 54, 58, 53, 59, 61, 71, 70, 69, 68, 60, 65, 66, 67, 68, 64, 100, 81, 80, 72, 73, 74
- **NO. OF FIXTURES:** 1, 6, 2, 4, 7, 3, 2, 3, 4, 3, •, 3, 2, 1, 1, 1, 1, 2, 1, 1, 1, 1, 2
- **NO. OF LAMPS PER FIXTURE:** 4, 4, 4, 2, 4, 2, 2, 4, 4, 4, 4, 4, 4, 4, 4, 4, 2, 4, 2, 4, 4, 4, 4
- **WATTS PER BULB:** 34
- **BULB TYPE:** Fl, Fl, Fl, Fl, Fl, Fl, Fl, Fl, Fl, Fl, Fl, Fl, Fl, Fl, Fl, Fl, Fl, Fl, Fl, Fl, Fl, Fl, Fl (18')
- **ON/OFF DURING SURVEY:** ON, ON, ON, ON, ON, ON, ON, ON, ON, ON, ON, ON, ON, ON, ON, ON, ON, ON, ON, ON, ON, ON, ON
- **SWITCH YES/NO:** N, Y, Y, Y, Y, Y, N/A, Y, -, Y, Y, Y, N, N, N, Y, Y, Y, Y, Y, Y, Y, Y
- **GOOD FOR OCCUPANCY SENSOR Y/N:** Y, N, Y, Y
- **NO. OF SWITCHES:** -, -, -, -, 3, -, -, -, -, -, -, -, -, -, -, -, -, -, -

FT. MAC ENERGY STUDY

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB EMC # 3105.000

SHEET NO. ______ OF ______

CALCULATED BY ______ DATE ______

CHECKED BY ______ DATE ______

SCALE NTS

BLDG: 170

ROOM NO.	NO. OF FIXTURES	NO. OF LAMPS PER FIXTURE	WATTS PER BULB	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCCUPANCY SENSOR Y/N	NO. OF SWITCHES
1	1	2 / 4		Fl. 4' / 4' Fl.	OFF / OFF	Y Y		
2	1	1	150	INCAN.	OFF	Y		
28	4	2	"	Fl.	ON	Y	N	
5	1	4		Fl	ON	Y		
6	"	"	"	"	"	"	"	"
9	6	4		Fl	ON	Y	N	
9	15	1	25	INCAN	ON	Y	N	
29	6	2	"	Fl	ON	Y	N	
17	1	4		Fl 8	ON	Y	Y	1
21	7	2		Fl	ON	Y		
27	1	1	52	INCAN	ON	Y		
25	1	2	"	Fl	ON	Y	N	
24	4	2		Fl	ON	Y		
23	2	2		Fl	ON	N		
22	4	2		Fl	ON	Y		
18	4	4		Fl	OFF	Y	N	
15	7	2		Fl 8ft	ON	N/A	N	
14	25	2		Fl 8ft	ON	N/A	N	
3	6	2		Fl	ON	Y	N	
30	7	4		Fl	ON	Y	N	
31	3	4		Fl	ON	Y	N	
34	2	4		Fl	ON	Y		1
37	2	4		Fl	ON	Y		2
35	1	4		Fl	ON	Y		1
41	1	4		Fl	ON	Y		1

BUILDING 171

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____

SHEET NO. _____ OF _____

CALCULATED BY CMD DATE 1-27

CHECKED BY _____ DATE _____

SCALE _____

Bldg. 171

1st FLOOR All Fixtures are 4 Bulb except-
HALLWAY FIXTURES which ARE 2 Bulb

2ND FLOOR

Unoccupied offices - Lights ON
10

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • Germany

JOB
SHEET NO. OF
CALCULATED BY CEL DATE 11/26/91
CHECKED BY DATE
SCALE

171

2 Showers IN Bldg.

1/28/92 DHW TEMP. 104°F

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: JW
CHECKED BY:
DATE: 2/12/92

BLDG.# 171
EC0 15

LIGHTING

ROOM #	# OF FIXTURES	LAMPS/ FIXTURE	WATTS/ BULB	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCC. SENSOR	NO. OF SWITCHES	UNOCC LIGHTS ON
1	8	4	34	F	ON	Y	N	1	N
1	13	2-4			ON	Y	N	1	N
2	2	4	34	F	ON	Y	N	1	N
3	15	8'			ON	Y	N	2	N
4	2	8'			ON	Y	N	1	N
5	2	8'			ON	Y	N	1	N
103	10	4			ON	Y	N	2	N
108	5	4			N/A	Y N/A	N/A	2	N/A
109	2	4				Y		1	
101	2	4				Y		1	
107	5	4				Y		1	
125	3	4				Y		1	
128	4	4				Y		1	
127	4	2				Y		1	
126	4	2				Y		1	
111	8	2				Y		2	
106	2	4				Y		1	
102	2	4				Y		2	

OF EXIT SIGNS – _____

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO. ____ OF ____
CALCULATED BY: JW
CHECKED BY: ____
DATE: 2/12/92

BLDG.# 171
EC0 15

LIGHTING

ROOM #	# OF FIXTURES	LAMPS/ FIXTURE	WATTS/ BULB	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCC. SENSOR	NO. OF SWITCHES	UNOCC LIGHTS ON
120	3	4				Y		1	
201	2	4				Y		1	
203	8	4				Y		3	
202	2	4				Y		1	
205	2	2				Y		1	
206	1	4				Y		1	
207	1	4				Y		1	
208	2	2				Y		1	
209	2	4				Y		1	
212	3	2				Y		1	
210	1	4				Y		1	
213	1	4				Y		1	
214	1	4				Y		1	
215	1	2				Y		1	
217	1	2				Y		1	
218	4	2				Y		1	
219	4	2				Y		1	
220	4	4				Y		1	

OF EXIT SIGNS – _____

COMMENTS: _____

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO. ____ OF ____
CALCULATED BY: JW
CHECKED BY: ____
DATE: 2/12/92

BLDG.# 171
EC0 15

LIGHTING

ROOM #	# OF FIXTURES	LAMPS/ FIXTURE	WATTS/ BULB	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCC. SENSOR	NO. OF SWITCHES	UNOCC LIGHTS ON
243	2	4			Ø	Y		1	
242	2	4				Y		1	
244	1	4				Y		1	
238	3	4				Y		1	
240	6	2				Y		2	
222	1	4				Y		1	
223	3	4				Y		1	
225	3	4				Y		1	
239	2	4				Y		2	
228	2	4				Y		1	
229	2	4				Y		1	
230	2	4				Y		1	
231	2	4				Y		1	
227	3Ø	2				Y		4	
238	2	4				Y		1	
232	4Ø	2				Y		1	
234	1	4				Y		1	
233	4	2				Y		1	

OF EXIT SIGNS – ____

COMMENTS: ____

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: JW
CHECKED BY:
DATE: 2/12/92

BLDG.# 171
EC0 15

LIGHTING

ROOM #	# OF FIXTURES	LAMPS/ FIXTURE	WATTS/ BULB	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCC. SENSOR	NO. OF SWITCHES	UNOCC LIGHTS ON
235	2	2				Y		1	
237	1	4				Y		1	

OF EXIT SIGNS – _____

COMMENTS: _____

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO. _____ OF _____
CALCULATED BY: JW
CHECKED BY: _____
DATE: 2/12/92

BLDG.# 171
EC0 15

LIGHTING

ROOM #	# OF FIXTURES	LAMPS/ FIXTURE	WATTS/ BULB	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCC. SENSOR	NO. OF SWITCHES	UNOCC LIGHTS ON
104	10	4				Y		2	
105	4	4				Y		1	
144	1	2				Y		1	
143	1	4				Y		1	
112	4	2				Y		1	
113	4	2				Y		1	
114	4	2				Y		1	
115	1	4				Y		1	
116	2	2				Y		1	
123	1	2				Y		1	
124	1	4				Y		1	
122	1	4				Y		1	
121	12	2				Y		1	
135	2	4				Y		1	
117	10	2				Y		4	
118	1	4				Y		1	
136	1	2				Y		1	
119	1	4				Y		1	

OF EXIT SIGNS – _____

COMMENTS: _____

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB

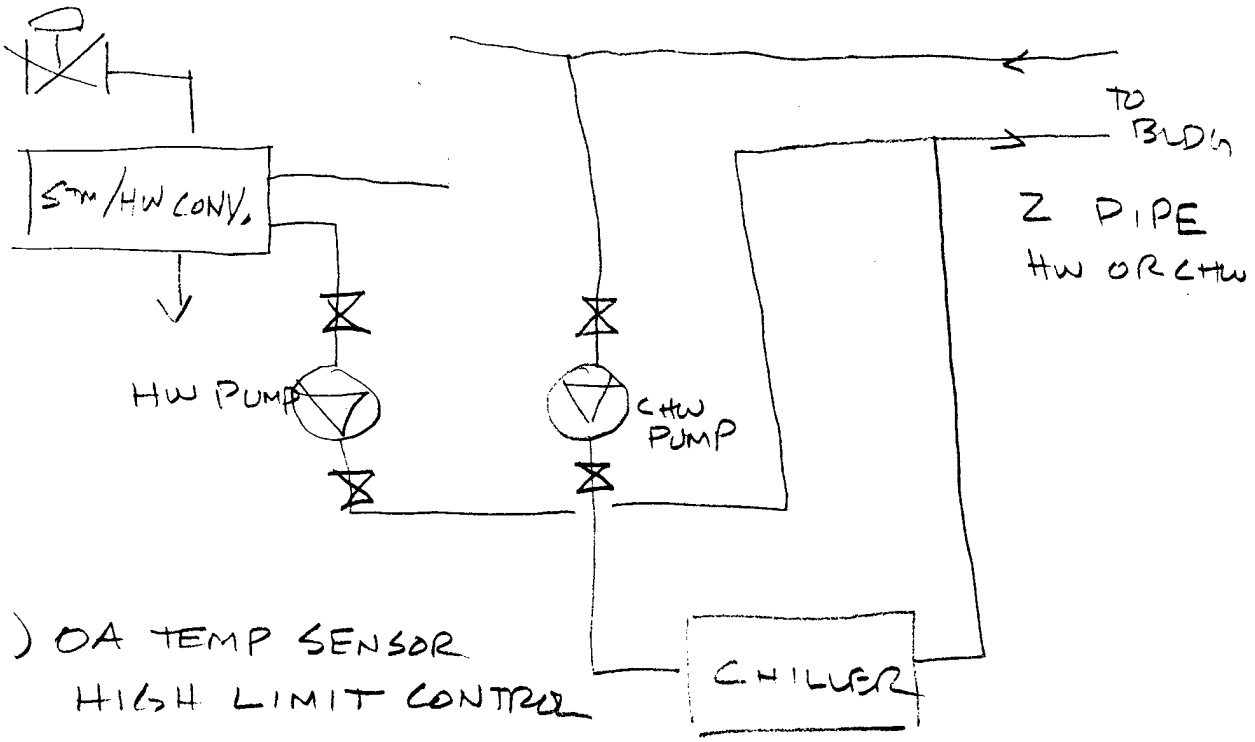
SHEET NO. OF

CALCULATED BY CEL DATE 11/26/91

CHECKED BY DATE

SCALE

171



(2) OA TEMP SENSOR
HIGH LIMIT CONTROL

SET @ 60° & 90°

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB
SHEET NO. OF
CALCULATED BY CEL DATE 11/26/91
CHECKED BY DATE
SCALE

171

AHU -

MARATHON ELECTRIC

MODEL EVR 184TTD 87627AC WF1

5 HP

FRAME 184T

TYPE TDR-BE

3 Ø

60 HZ

1740 RPM

200 ~~E~~ V

16.2 A

> OFF

> NOT USED ANY MORE

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB
SHEET NO. OF
CALCULATED BY CEL DATE 11/26/91
CHECKED BY DATE
SCALE

171

AHU-2

GOULD CENTURY
PART-6-322467-01
FRAME S-184T
HP 5.0
RPM 1740
3 ϕ
200 V 16 AMPS

- OFF DURING SURVEY
- SERVES OUTDOOR AREA
- 100% O.A., DUCT RA ON OUTSIDE OF BLDG?
- SEE CONTROL DWG

- NOT USED ANY MORE

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

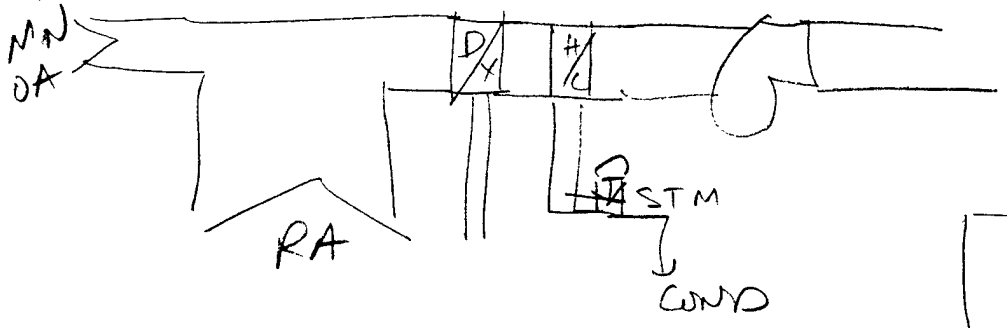
JOB
SHEET NO. OF
CALCULATED BY CRL DATE 11/26/91
CHECKED BY DATE
SCALE

YORK AHU-3

MODEL EBV242-A ~~EB~~ MOTOR EST. 5HP
SER NO. ES 042576

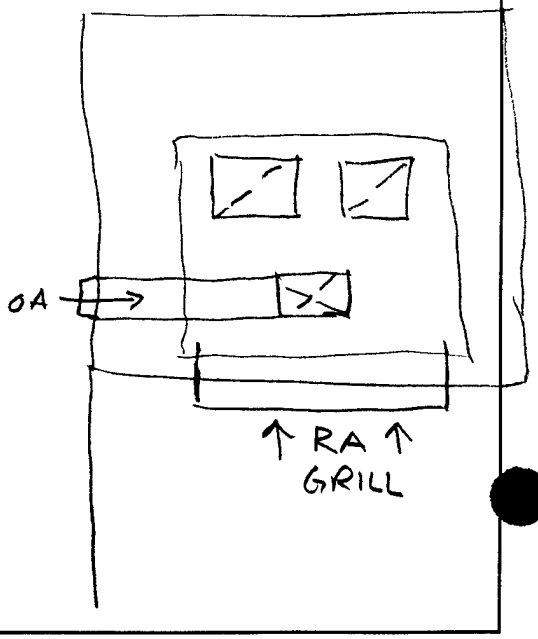
✓STEAM
✓DX

— EASY TO RETROFIT FOR 100% OA
— NO DAMPERS



— SERVES PHYSICAL THERAPY

— RUNS IN SUMMER ONLY
— OFF DURING SURVEY
— EST. 5 PEOPLE MAX



171

CONDENSING UNIT WHICH SERVES
AHU-B4
YORK
MODEL CA181-25A
SER. NO. FM-084766
V - 208
A - 69.7
3 ϕ
60 Hz
} COMP

3 FANS
1/2 HP ea
208 V 3.4 A

MAIN CHILLER AIR COOLED
TRANE
MODEL CGAA0756ED51CC5C4C361
AJFE
SER. NO. L83D11356
COMP. 1 - 3ϕ, 60 Hz, 264 A, 200 V
COND FAN 2 @ 7.5 HP ea

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____

SHEET NO. _____ OF _____

CALCULATED BY CBL DATE 11/26/91

CHECKED BY _____ DATE _____

SCALE _____

171

M - F - 0700 - 1500

SAT - CLOSED

SUN -

ECO -

- DISCONNECT LIGHTS ON VENDING MACHINES
- LOW FLOW SHOWERHEADS
-

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____
SHEET NO. _____ OF _____
CALCULATED BY (MD) DATE 11/27
CHECKED BY _____ DATE _____
SCALE _____

Bldg 171

BOILER Rm.

CHILL WATER Pump - 1
US MOTOR M# F-5882-30-542
10 HP FAME .215 SP
200V 1755 RPM
31.2 A
60 Hz
3ph
OFF

H/W pump - 1
GOULD motor M# 8-338519-01
15 ~~15~~ HP FRAME N145JM
200 V 1745 RPM
4.7 A
60 HZ
3 ph
Bell & GOSSETT pump
M# 1-1/4 AC 6-3/8 BF
69 GPM 1750 RPM 33 FT HD.
ON

Domestic H/W Pump - 1
Bell & Gossett pump
Small circulating pump
ON

SEQUENCE OF OPERATION

START/STOP

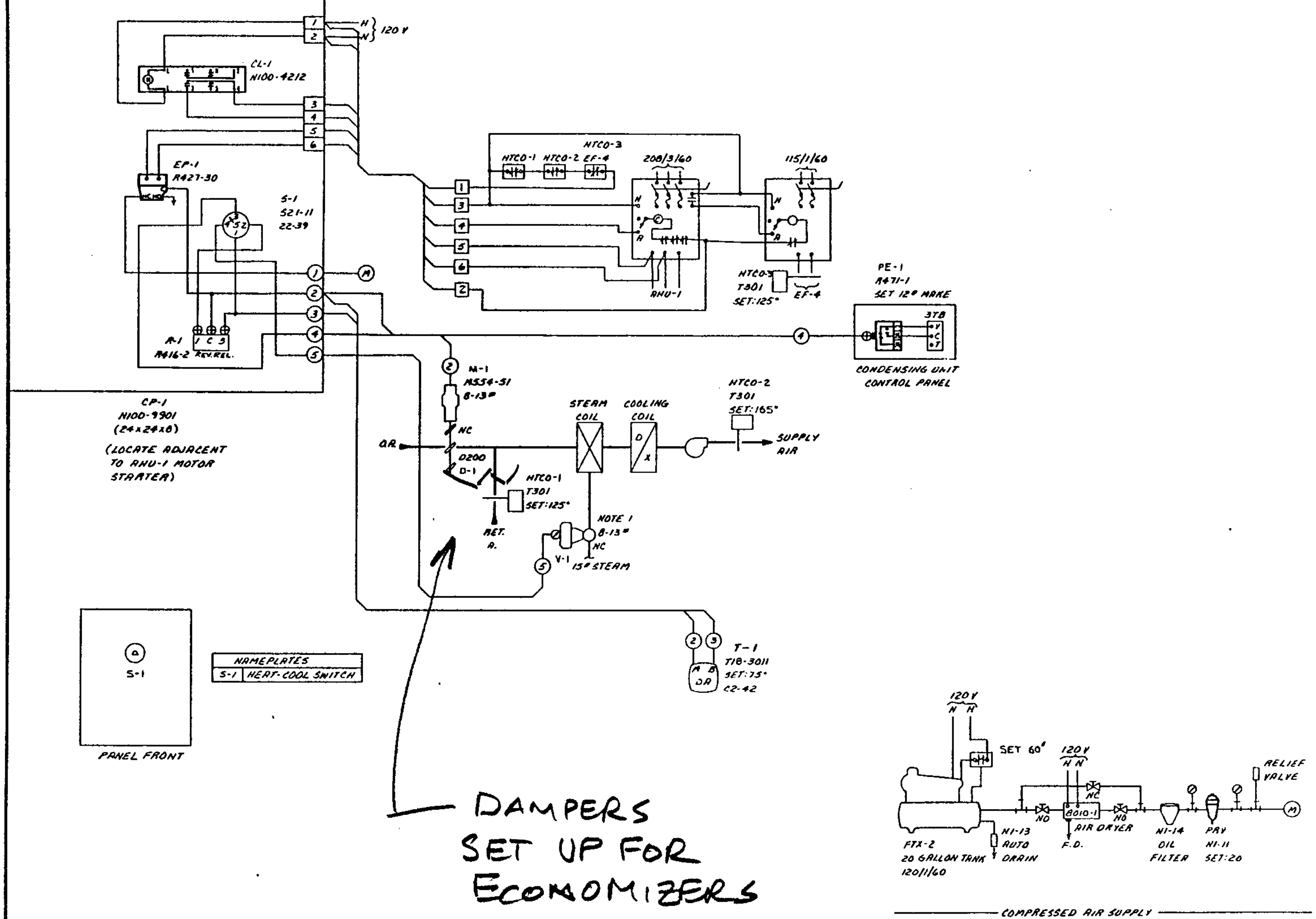
THE UNIT FAN WILL BE STARTED BY A 7-DAY PROGRAM TIME CLOCK. HTCO'S ARE PROVIDED IN THE RETURN AIR, SUPPLY AIR AND EF-4 INTAKE AND WILL STOP FAN IF THEIR SET POINT IS EXCEEDED. WHEN THE UNIT FAN STARTS THE CONTROL SYSTEM WILL BE ENERGIZED, AND THE O.A. DAMPER WILL OPEN. EF-4 IS INTERLOCKED TO RUN WITH UNIT.

SPACE TEMPERATURE CONTROL

A HEAT-COOL SWITCH IS PROVIDED AND WILL ALLOW THE MANUAL SELECTION OF HEATING OR COOLING.

WHEN THE SWITCH IS IN THE HEAT POSITION THE SPACE THERMOSTAT WILL MODULATE THE N.C. STEAM COIL VALVE AS REQUIRED TO MAINTAIN SPACE TEMPERATURE.

WHEN THE SWITCH IS IN THE COOL POSITION THE SPACE THERMOSTAT WILL CYCLE THE CONDENSING UNIT AS REQUIRED TO MAINTAIN SPACE TEMPERATURE.



NOTE:
1. SEE VALVE SCHEDULE SHEET #2

171

A201-01 - ⊘
N4-40 - ⊕
(TYPICAL)

DWG. REF.

AHU-1 — — — — — — SHEET 1
AIR COMP — — — — — SHEET 1

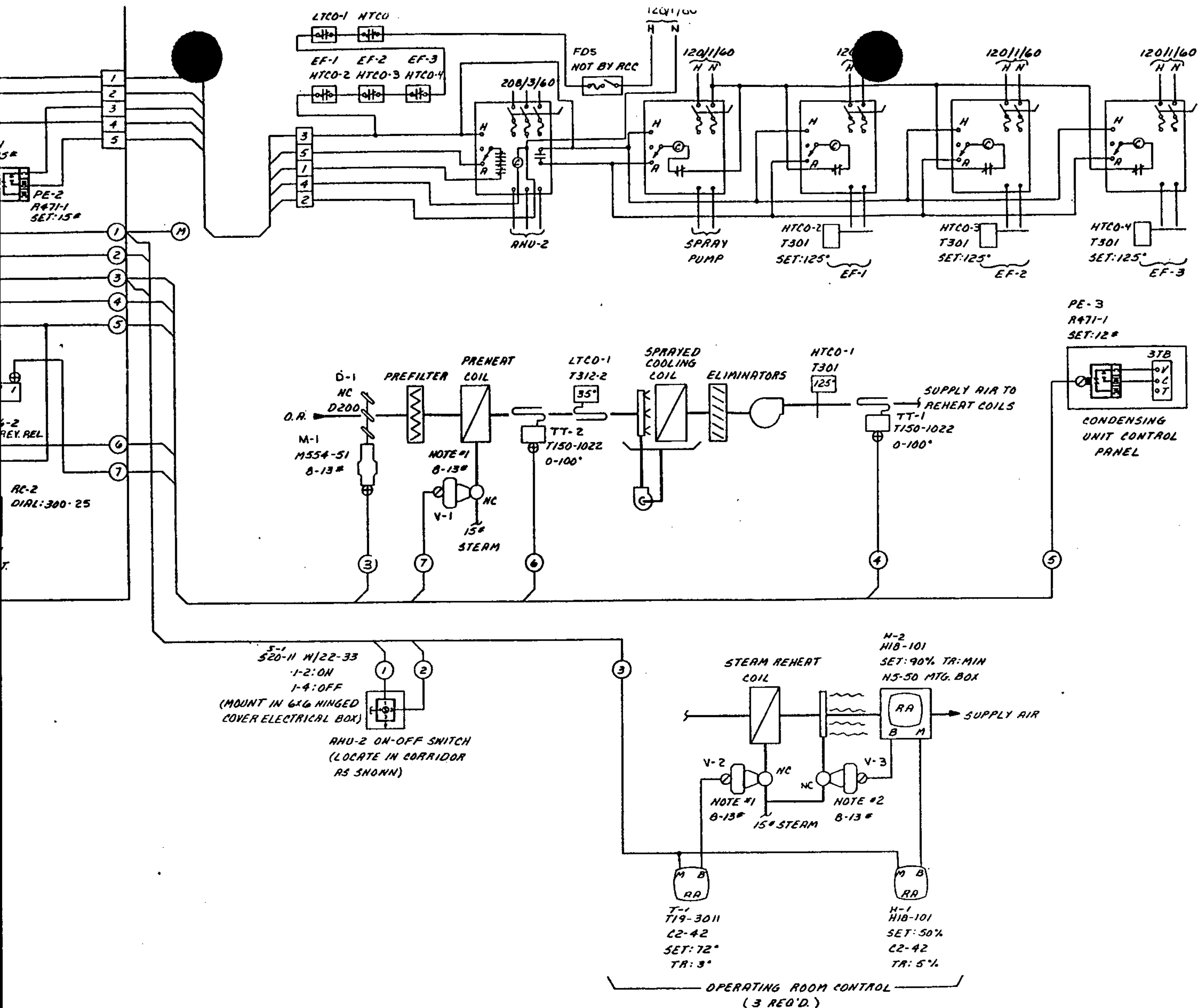
BUILDING 171
FORT McPHERSON

DIRECTORATE OF FACILITIES ENGINEERING
ACE CONTRACTING CO.

Robertshaw — ROBERTSHAW CONTROLS COMPANY
5952 PEACHTREE BOULEVARD, NORCROSS, GEORGIA 30071

AHU-1 CONTROLS

KINSLETT — S.D. — 3/25
Sheet 1 of 2 — DWG NO 20CS77008



ITEM NO.	DWG SYMBOL	COMPLETE MODEL NO.	LOCATION	SIZE	BODY PATTERN	N.O./N.C.	QUANTITY	CAPACITY G.P.M.	CAPACITY #/HR.	SYSTEM PRESS	C_v	ΔP	ACTUATOR SIZE	POSITIVE POSITIONER	SPRING RANGE
1	V-1	V6700-163072	AHU-1 STEAM COIL	3/4	2-WAY	N.C.	1		194	15	5.7	6.0			8-13
2	V-1	V6700-163072	AHU-2 STEAM COIL	3/4	2-WAY	N.C.	1		152	15	5.7	3.4			8-13
3	V-2	V6700-033072	AHU-2 COIL #3	1/2	2-WAY	N.C.	1		41	15	1.2	5.6			8-13
4	V-2	V6700-033072	AHU-2 COIL #4	1/2	2-WAY	N.C.	1		41	15	1.2	5.6			8-13
5	V-2	V6700-033072	AHU-2 COIL #5	1/2	2-WAY	N.C.	1		41	15	1.2	5.6			8-13
6															
7															
8															

SEQUENCE OF OPERATION

START/STOP

A SYSTEM ON/OFF SWITCH IS PROVIDED FOR MANUA ING AND STOPPING OF THE UNIT. WHEN PLACED IN THE ON POSITION THE O.A. DAMPER WILL OPEN. AFTER A 30 SECOND (ADJUSTABLE) TIME DELAY THE UNIT FAN WILL START AND CONTROL SYSTEM WILL BE ENERGIZED. THE SPRAY PUMP AND EXHAUST FANS ARE INTERLOCKED TO OPERATE WITH THE UNIT FAN. A HTCO AND LTCO ARE PROVIDED IN THE SUPPLY AIR AND THE PREHEAT COIL DISCHARGE RESPECTIVELY AND WILL STOP FAN AND CLOSE THE O.A. DAMPER IF AN UNSAFE CONDITION EXISTS. EXHAUST FAN HTCO'S WILL ALSO STOP FAN IF AN UNSAFE CONDITION EXISTS.

DISCHARGE AIR CONTROL

A SENSOR LOCATED IN THE FAN DISCHARGE WILL OPERATE THROUGH ITS RECEIVER CONTROLLER (RC-1) TO MODULATE THE N.C. STEAM COIL VALVE AS REQUIRED FOR HEAT IN SEQUENCE WITH CYCLING THE CONDENSING UNIT AS REQUIRED FOR COOLING TO MAINTAIN SET POINT. A SENSOR LOCATED IN THE PREHEAT COIL DISCHARGE WILL OPERATE THROUGH ITS RECEIVER CONTROLLER (RC-2) AND WILL OVERRIDE RC-1 TO MODULATE THE STEAM VALVE OPEN IF TEMPERATURE FALLS BELOW ITS SETPOINT.

SPACE TEMPERATURE AND HUMIDITY CONTROL

A SPACE THERMOSTAT WILL MODULATE ITS REHEAT COIL VALVE AS REQUIRED TO MAINTAIN SPACE TEMPERATURE.

A SPACE HUMIDISTAT WILL MODULATE ITS N.C. HUMIDIFIER VALVE AS REQUIRED TO MAINTAIN SPACE HUMIDITY. A HUMIDIFIER HIGH LIMIT CONTROL LOCATED DOWNSTREAM OF THE HUMIDIFIER WILL OVERCALL SPACE HUMIDISTAT AND CLOSE THE HUMIDIFIER VALVE IF ITS SET POINT IS EXCEEDED.

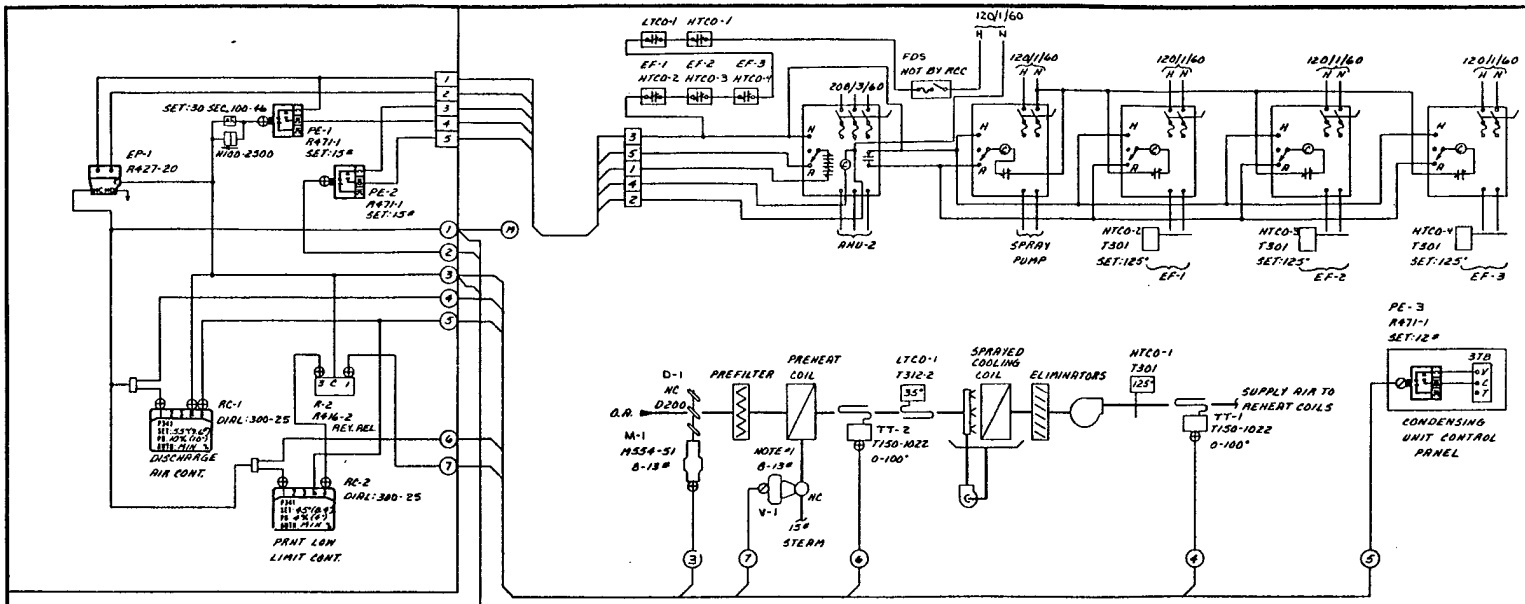
171

NOTES:
1. SEE VALVE SCHEDULE THIS SHEET
2. NORMALLY CLOSED, 8-13# HUMIDIFIER STEAM VALVE FURNISHED WITH HUMIDIFIER.

A201-01 — ⊘
N4-40 — ⊕
(TYPICAL)

DWG. REF.
AHU-2 — — — — SHEET 1
EF-1,2,3 — — — — SHEET 1

BUILDING 171 FORT McPHERSON	ROBERTSHAW CONTROLS COMPANY 5952 PEACHTREE BOULEVARD NORCROSS, GEORGIA 30	TITLE	AHU-2 CONTROLS
DIRECTORATE OF FACILITIES ENGINEERING	WINSLETT	S.D. 3/25	3-25-7
ACE CONTRACTING CO.	Sheet 2 of 2	DWG NO	20C577008



SEQUENCE OF OPERATION

START/STOP

A SYSTEM ON/OFF SWITCH IS PROVIDED FOR MANUAL STARTING AND STOPPING OF THE UNIT. WHEN PLACED IN THE ON POSITION THE O.A. DAMPER WILL OPEN. AFTER A 30 SECOND (ADJUSTABLE) TIME DELAY THE UNIT FAN WILL START AND CONTROL SYSTEM WILL BE ENERGIZED. THE SPRAY PUMP AND EXHAUST FANS ARE INTERLOCKED TO OPERATE WITH THE UNIT FAN. A HTCO AND LTCO ARE PROVIDED IN THE SUPPLY AIR AND THE PREHEAT COIL DISCHARGE RESPECTIVELY AND WILL STOP FAN AND CLOSE THE O.A. DAMPER IF AN UNSAFE CONDITION EXISTS. EXHAUST FAN HTCO'S WILL ALSO STOP FAN IF AN UNSAFE CONDITION EXISTS.

DISCHARGE AIR CONTROL

A SENSOR LOCATED IN THE FAN DISCHARGE WILL OPERATE THROUGH ITS RECEIVER CONTROLLER (RC-1) TO MODULATE THE N.C. STEAM COIL VALVE AS REQUIRED FOR HEAT IN SEQUENCE WITH CYCLING THE CONDENSING UNIT AS REQUIRED FOR COOLING TO MAINTAIN SET POINT. A SENSOR LOCATED IN THE PREHEAT COIL DISCHARGE WILL OPERATE THROUGH ITS RECEIVER CONTROLLER (RC-2) AND WILL OVERRIDE RC-1 TO MODULATE THE STEAM VALVE OPEN IF TEMPERATURE FALLS BELOW ITS SETPOINT.

SPACE TEMPERATURE AND HUMIDITY CONTROL

A SPACE THERMOSTAT WILL MODULATE ITS REHEAT COIL VALVE AS REQUIRED TO MAINTAIN SPACE TEMPERATURE.

A SPACE HUMIDISTAT WILL MODULATE ITS N.C. HUMIDIFIER VALVE AS REQUIRED TO MAINTAIN SPACE HUMIDITY. A HUMIDIFIER HIGH LIMIT CONTROL LOCATED DOWNSTREAM OF THE HUMIDIFIER WILL OVERCALL SPACE HUMIDISTAT AND CLOSE THE HUMIDIFIER VALVE IF ITS SET POINT IS EXCEEDED.

		COMPLETE MODEL NO	LOCATION	SIZE	BODY MATERIAL	C	QUANTITY	CAPACITY GPM	CAPACITY PSIG	SYSTEM PRESS	Δ	OP	SPRING RANGE
1	V-1	V6700-163072	AHU-1 STEAM COIL	3/4	2-WAY	N.C.	1		194	15	5.7	6.0	8-13
2	V-1	V6700-163072	AHU-2 STEAM COIL	3/4	2-WAY	N.C.	1		152	15	5.7	3.4	8-13
3	V-2	V6700-033072	AHU-2 COIL # 3	1/2	2-WAY	N.C.	1		41	15	1.2	5.6	8-13
4	V-2	V6700-033072	AHU-2 COIL #4	1/2	2-WAY	N.C.	1		41	15	1.2	5.6	8-13
5	V-2	V6700-033072	AHU-2 COIL #5	1/2	2-WAY	N.C.	1		41	15	1.2	5.6	8-13
6													
7													
8													

NOTES:
1. SEE VALVE SCHEDULE THIS SHEET
2. NORMALLY CLOSED, 8-13# HUMIDIFIER STEAM VALVE FURNISHED WITH HUMIDIFIER.

A201-01 — ∅
N4-40 — ⊕
(TYPICAL)

171

DWG. REF.
AHU-2 — — — — SHEET 1
EF-1,2,3 — — — SHEET 1

BUILDING 171
FORT McPHERSON

DIRECTORATE OF FACILITIES ENGINEERING

ACE CONTRACTING CO.

ROBERTSHAW CONTROLS COMPANY
5952 PEACHTREE BOULEVARD
NORCROSS, GEORGIA 30

AHU-2 CONTROLS

DWG NO 20C577008

BUILDING 178

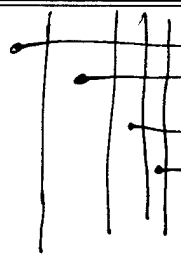
EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

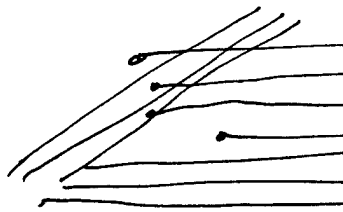
JOB: Ft. McPhereson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: CMD
CHECKED BY:
DATE: 12-12-91

BLDG.# 178

WALL & ROOF INSULATION

AREAS IN SQ. FEET	NORTH	SOUTH	EAST	WEST
WALLS	~~608~~ 608	608	~~1456~~ 1456	~~1456~~ 1456
WINDOWS	68	0	221	0
OVERHEAD DOORS	—	—	—	—
PERSONNEL DOORS	70	35	0	35

SKETCH WALL CROSS–SECTION	COMPONENTS
	1. OUTSIDE AIR FILM 2. CMU 3. 2x4 4. GYPBoard 5. 6. 7. INSIDE AIR FILM

SKETCH ROOF CROSS–SECTION	COMPONENTS
	1. OUTSIDE AIR FILM 2. Shingles 3. Plywood 4. Space 5. 3" ≈ R-11 Fiberglass 6. Ceiling tile 7. INSIDE AIR FILM

PERSONNEL DOOR TYPE	BASEMENT [ ]
OVERHEAD DOOR TYPE —	SLAB [ ]
	CRAWL SPACE [~~ ~~]

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPhereson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: _____ OF _____
CALCULATED BY: KCL
CHECKED BY: _____
DATE: 12-12-91

BLDG.# 178

PIPE INSULATION

LOCATION	PIPE DIAMETER	PIPE LENGTH	FLUID TYPE	FLUID TEMP.	AIR TEMP.	INSULATION TYPE	INSULATION THICKNESS	INSULATION CONDITION
ACU-1	1¼" COPPER	25'	REFRIG.	–	–	RUBBER	3/8"	GOOD
ACU-2	1¼" COPPER	50'	↓	–	–	↓	↓	↓
ACU-3	1" COPPER	25'	↓	–	–	↓	↓	↓
			↓					

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPhereson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: EC
CHECKED BY:
DATE: 12-12-91

BLDG.# 178

DUCT INSULATION

LOCATION	DUCT CROSSECTION	SHAPE	DUCT TEMP. (°F)	~~SUPPLY~~ SURR. AIR TEMP. (°F)	INSULATION TYPE	INSULATION THICKNESS	INSULATION CONDITION
ACU-1	24" X 24"	□	NOT RUNNIN	NOT RUNNING	FIBERG.	1/2"	GOOD
ACU-2	16" X 16"	□	↓	↓	FIBERGLASS	1/2"	GOOD
ACU-3	24" X 24"	□	↓	↓	↓	1/2"	GOOD
	50" x 8"	▭			Fiberglass	1.5"	
	60" x 8"	▭			Fiberglass	1.5"	

COMMENTS: FIBERGLASS WITH WHITE PAINT

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. Mcphereson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: CMD
CHECKED BY:
DATE: 12-12-91

BLDG.# 178

WINDOWS SURVEY

WINDOW NO.	SINGLE/DOUBLE PANE	TYPE–SLIDING FIXED, CASEMENT	FRAME MAT'L	ORIENTATION	GLASS SHADING	WINDOW COVER	DIMENSIONS (INCH)
1	Double	Sliding	AL	N	NONE	NONE	53x46

COMMENTS: Typ. of 17

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPhereson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: CMD
CHECKED BY:
DATE: 12-12-91

BLDG.# 178

WEATHERSTRIPING AND CAULKING

DOOR\ WINDOW	CONDITION OF W.S./CAULK	INFILTRATION	ORIENTATION	DIMENSIONS (INCH)
* 1	Good	—	N	53x46

COMMENTS: Windows look new, tight, good insul., caulk.

* Typ. of 17

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPhereson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: CMD
CHECKED BY:
DATE: 12-12-91

BLDG.# 178

DOMESTIC HOT WATER

FAUCET LOCATION	WATER TEMPERATURE
1st Floor Men's Room	126 °F
PROBLEMS:	

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPhereson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: kc
CHECKED BY:
DATE: 12-12-91

BLDG.# 178

MOTORS

GAS WATER HEATER

MOTOR #	1	HP	2	PH	3	RPM	
MODEL #		VOLTS	208	AMPS	6.6		
SERIAL #		PRESENT HR.				TO	
MFG	TRANE	REQUIRED HR.				TO	
FRAME	NOT ACCESSIBLE	EFF.					
DESCRIPTION	ACU-1	COMMENTS	TRANE PACKAGE '87				
	T'STAT CONTROL		BWE120C400GA				
			DX - FURNACE (N. GAS)				

MOTOR #	2	HP		PH	1	RPM	
MODEL #	BLU162F960B2	VOLTS	115	AMPS	12		
SERIAL #		PRESENT HR.				TO	
MFG	TRANE	REQUIRED HR.				TO	
FRAME	NOT ACCESSIBLE	EFF.					
DESCRIPTION	ACU-2	COMMENTS	SMALL UNT				
	N GAS. T'STAT CONTROL		INPUT 162,000 BTUH.				

MOTOR #	3	HP	2	PH	3	RPM	
MODEL #		VOLTS	208	AMPS	6.6		
SERIAL #		PRESENT HR.				TO	
MFG	TRANE	REQUIRED HR.				TO	
FRAME	NOT ACCESSIBLE	EFF.					
DESCRIPTION	ACU-3	COMMENTS					
	UPSTAIR						

DATE: 12-12-91
BY: CMD

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 178 BLDG NAME: Music JOB: 3105.000
PRIMARY FUNCTION: _____ GROSS SQ FT _____ NO OF FLRS 2
BUILDING MANAGER NAME: _____
PHONE: _____ OFFICE NO. _____
SPECIAL AREAS: COMPUTER FACILITY [ ] - ZONE NO'S. _____
AUDITORIUM [ ] - ZONE NO'S. _____
LABORATORIES [ ] - ZONE NO'S. _____
CAFETERIA [ ] - ZONE NO'S. _____
OTHER [ ] _____ - ZONE NO'S. _____

ZONE NO. 1 FUNCTION: _____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: 1st Floor (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F 0730 TO 1615, SAT 0 TO 0, SUN 0 TO 0
PRESENT TEMP: WINTER OCC 68.9 °F UNOCC _____ °F, SUMMER OCC _____ °F UNOCC _____ °F
REQUIRE TEMP: WINTER OCC _____ °F UNOCC _____ °F, SUMMER OCC _____ °F UNOCC _____ °F

REMARKS: _____

ZONE NO. 2 FUNCTION: _____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: 1st Floor (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F 0730 TO 1615, SAT 0 TO 0, SUN 0 TO 0
PRESENT TEMP: WINTER OCC 70.8 °F UNOCC _____ °F, SUMMER OCC _____ °F UNOCC _____ °F
REQUIRE TEMP: WINTER OCC _____ °F UNOCC _____ °F, SUMMER OCC _____ °F UNOCC _____ °F

REMARKS: _____

ZONE NO. 3 FUNCTION: _____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: 2nd Floor (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F 730 TO 1615, SAT _____ TO _____, SUN _____ TO _____
PRESENT TEMP: WINTER OCC _____ °F UNOCC _____ °F, SUMMER OCC _____ °F UNOCC _____ °F
REQUIRE TEMP: WINTER OCC _____ °F UNOCC _____ °F, SUMMER OCC _____ °F UNOCC _____ °F

REMARKS: _____

ZONE NO. _____ FUNCTION: _____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: _____ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F _____ TO _____, SAT _____ TO _____, SUN _____ TO _____
PRESENT TEMP: WINTER OCC _____ °F UNOCC _____ °F, SUMMER OCC _____ °F UNOCC _____ °F
REQUIRE TEMP: WINTER OCC _____ °F UNOCC _____ °F, SUMMER OCC _____ °F UNOCC _____ °F

REMARKS: _____

BUILDING 179

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

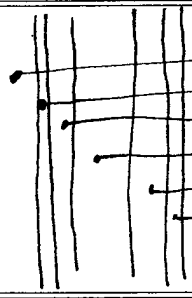
JOB: Ft. McPhereson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: CMD
CHECKED BY:
DATE: 12-12-91

BLDG.# 179

WALL & ROOF INSULATION

AREAS IN SQ. FEET	NORTH	SOUTH	EAST	WEST
WALLS	516	516	1575	1575
WINDOWS	73	0	175	204
OVERHEAD DOORS	—	—	—	—
PERSONNEL DOORS	0 ~~3~~	0	24.5	24.5

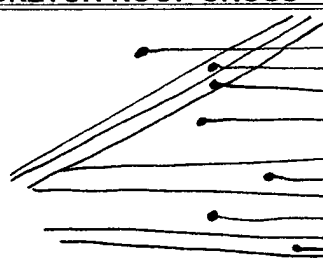
SKETCH WALL CROSS-SECTION



COMPONENTS

1. OUTSIDE AIR FILM
2. STUCCO
3. 2" POLYSTYRENE
4. CMU
5. 2½" STEEL STUDS
6. GYP BOARD
7. INSIDE AIR FILM

SKETCH ROOF CROSS-SECTION



COMPONENTS

1. OUTSIDE AIR FILM
2. SHINGLES
3. Plywood
4. SPACE
5. BLOW IN INSULATION, R-30
6. SPAC
7. INSIDE AIR FILM
8. ~~CEILING~~ CEILING TILE

PERSONNEL DOOR TYPE: METAL
OVERHEAD DOOR TYPE: —

BASEMENT [ ]
SLAB [ ]
CRAWL SPACE [~~+~~]

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO. _____ OF _____
CALCULATED BY: EC
CHECKED BY: _____
DATE: 12-12-91

BLDG.# 175

PIPE INSULATION

LOCATION	PIPE DIAMETER	PIPE LENGTH	FLUID TYPE	FLUID TEMP.	AIR TEMP.	INSULATION TYPE	INSULATION THICKNESS	INSULATION CONDITION
MECH. RM	* 3"	40'	DTW			Rubber	1"	GOOD
"	2"	25'	"			Rubber	1"	"
CRAWL SPACE	3"	2x Bldg length	"			"	"	"

COMMENTS: * ALL PIPES (HW & CW) HAVE GOOD RUBBER INSULATION.

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPhereson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY:
CHECKED BY:
DATE: 12-12-91

BLDG.# 179

DUCT INSULATION

LOCATION	DUCT CROSSECTION	SHAPE	DUCT TEMP. (°F)	SUPPLY AIR TEMP. (°F)	INSULATION TYPE	INSULATION THICKNESS	INSULATION CONDITION

COMMENTS: NO DUCT INSULATION - 2-PIPE FAN COIL

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. Mcphereson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: CMD
CHECKED BY:
DATE: 12-12-91

BLDG.# 179

WINDOWS SURVEY

WINDOW NO.	SINGLE/DOUBLE PANE	TYPE–SLIDING FIXED, CASEMENT	FRAME MAT'L	ORIENTATION	GLASS SHADING	WINDOW COVER	DIMENSIONS (INCH)
1-31	Double	Sliding	AL		NONE	NONE	44 x 48

COMMENTS: Windows Look good

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPhereson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: CMD
CHECKED BY:
DATE: 12-12-91

BLDG.# 179

WEATHERSTRIPING AND CAULKING

DOOR\ WINDOW	CONDITION OF W.S./CAULK	INFILTRATION	ORIENTATION	DIMENSIONS (INCH)
# W	Good	—	~~S~~ ~~E~~	44 x 48
D-1	Good	Low	W	42 x 84
D-2	Good	Low	E	42 x 84

COMMENTS: # Typ. of 31

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB	Ft. McPhereson/Ft. Gillem Energy Study
PROJ.#	EMC # 3105.000
SHEET NO.	OF
CALCULATED BY:	CMD
CHECKED BY:	
DATE:	12-12-91

BLDG.# 179

DOMESTIC HOT WATER

FAUCET LOCATION	WATER TEMPERATURE
1st Floor Men's Room	149° F
PROBLEMS:	

COMMENTS: Temp. seems high – only HW use is in sinks in Bathrooms (2).

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPhereson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: LRC
CHECKED BY:
DATE: 12-12-91

BLDG.# 179

MOTORS

MANUAL CHANGE OVER (SUM-WIN)

MOTOR #	2	HP	3/4	PH	3	RPM	1725
MODEL #	TVH 56T17D5540A L	VOLTS	208	AMPS	2.9		
SERIAL #		PRESENT HR.	0	TO	2400		
MFG	MARATHON	REQUIRED HR.		TO			
FRAME	56C-6S	EFF.					
DESCRIPTION	DTW PUMP FOR BLDG.	COMMENTS	RUNNING				

MOTOR #	1	HP	1/2	PH	3	RPM	1725
MODEL #	TVC56T17D5539A L	VOLTS	208	AMPS	2.3		
SERIAL #		PRESENT HR.	0	TO			
MFG	MARATHON	REQUIRED HR.		TO			
FRAME	56C-6S	EFF.					
DESCRIPTION	CWP PUMP THROUGH CHILLER	COMMENTS	OFF				

MOTOR #	3	HP	1/6	PH	1	RPM	1725
MODEL #		VOLTS	115V	AMPS	2.4A		
SERIAL #		PRESENT HR.	0	TO	2400		
MFG	BELL & GOSSETT	REQUIRED HR.		TO			
FRAME		EFF.					
DESCRIPTION	DOMESTIC HW PUMP	COMMENTS					

TRANE CHILLER CGACC206KBNBB20G
1-COMP. MOTOR 200V 3Ø 72.2A
2- FAN MOTOR 200V 3Ø 4.1A 1HP. each

DATE: 12-12-91
BY: CMD

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 179 BLDG NAME: Army Ed. JOB: 3105.000
PRIMARY FUNCTION: Education GROSS SQ FT _____ NO OF FLRS 2
BUILDING MANAGER NAME: _____
PHONE: _____ OFFICE NO. _____
SPECIAL AREAS: COMPUTER FACILITY [ ] - ZONE NO'S. _____
AUDITORIUM [ ] - ZONE NO'S. _____
LABORATORIES [ ] - ZONE NO'S. _____
CAFETERIA [ ] - ZONE NO'S. _____
OTHER [ ] _____ - ZONE NO'S. _____

ZONE NO. 1 FUNCTION: Admin SPECIAL REQ. YES [ ] NO [ ]
LOCATION: 1st Floor (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F 700 TO 1615, SAT 0 TO 0, SUN 0 TO 0
PRESENT TEMP: WINTER OCC 78.1 °F UNOCC _____ °F, SUMMER OCC _____ °F UNOCC _____ °F
REQUIRE TEMP: WINTER OCC _____ °F UNOCC _____ °F, SUMMER OCC _____ °F UNOCC _____ °F

REMARKS: _____

ZONE NO. 2 FUNCTION: Education SPECIAL REQ. YES [ ] NO [ ]
LOCATION: 2nd Floor (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F 700 TO 1615, SAT _____ TO _____, SUN _____ TO _____
PRESENT TEMP: WINTER OCC 78.3 °F UNOCC _____ °F, SUMMER OCC _____ °F UNOCC _____ °F
REQUIRE TEMP: WINTER OCC _____ °F UNOCC _____ °F, SUMMER OCC _____ °F UNOCC _____ °F

REMARKS: _____

ZONE NO. _____ FUNCTION: _____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: _____ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F _____ TO _____, SAT _____ TO _____, SUN _____ TO _____
PRESENT TEMP: WINTER OCC _____ °F UNOCC _____ °F, SUMMER OCC _____ °F UNOCC _____ °F
REQUIRE TEMP: WINTER OCC _____ °F UNOCC _____ °F, SUMMER OCC _____ °F UNOCC _____ °F

REMARKS: _____

ZONE NO. _____ FUNCTION: _____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: _____ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F _____ TO _____, SAT _____ TO _____, SUN _____ TO _____
PRESENT TEMP: WINTER OCC _____ °F UNOCC _____ °F, SUMMER OCC _____ °F UNOCC _____ °F
REQUIRE TEMP: WINTER OCC _____ °F UNOCC _____ °F, SUMMER OCC _____ °F UNOCC _____ °F

REMARKS: _____

BUILDING 181

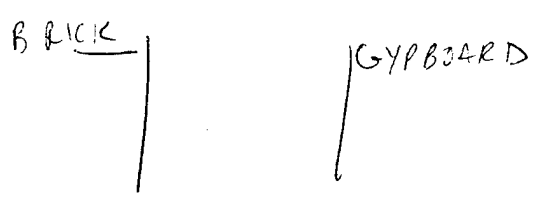
EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

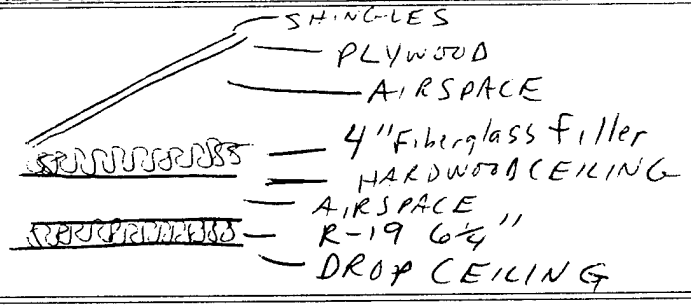
JOB	Ft. McPherson/Ft. Gillem Energy Study
PROJ.#	EMC # 3105.000
SHEET NO.	OF
CALCULATED BY:	JW
CHECKED BY:	
DATE:	12/19/91

BLDG.# 181
ECO 1

WALL & ROOF INSULATION

AREAS IN SQ. FEET	NORTH	SOUTH	EAST	WEST
WALLS				
WINDOWS				
OVERHEAD DOORS				
PERSONNEL DOORS				

SKETCH WALL CROSS-SECTION	COMPONENTS
	1. OUTSIDE AIR FILM 2. ____ 3. ____ 4. ____ 5. ____ 6. ____ 7. INSIDE AIR FILM

SKETCH ROOF CROSS-SECTION	COMPONENTS
	1. OUTSIDE AIR FILM 2. ____ 3. ____ 4. ____ 5. ____ 6. ____ 7. INSIDE AIR FILM

PERSONNEL DOOR TYPE ____	BASEMENT [ ]
OVERHEAD DOOR TYPE ____	SLAB [ ]
	CRAWL SPACE [ ]

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: JW
CHECKED BY:
DATE: 12/18/91

BLDG.# 181
ECO 2

WINDOWS SURVEY

WINDOW NO.	SINGLE/DOUBLE PANE	TYPE–SLIDING FIXED, CASEMENT	FRAME MAT'L	ORIENTATION	GLASS SHADING	WINDOW COVER	DIMENSIONS (INCH)
	~~All~~ SEE NOTE						

COMMENTS: ALL WINDOWS HAVE BEEN BOARDED & SEALED.

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: C M D
CHECKED BY:
DATE: 12-8-97

BLDG.# 181
ECO 4

DOMESTIC HOT WATER

FAUCET LOCATION	WATER TEMPERATURE
Mens Room, 1st Floor	168 °F

PROBLEMS:	

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: JW
CHECKED BY:
DATE: 12/20/91

BLDG.# 181
ECO 5

MOTORS

MOTOR # AHU #1 HP 10 PH 3/60Hz RPM 1720
MODEL # 3N386-A VOLTS 200 230 460 AMPS ~~29.4~~ 27 13.5
SERIAL # H5609406 PRESENT HR. 0 TO 2400
MFG LEROY-SOMER (EXTRADUTY) REQUIRED HR. ~~0~~ 0700 TO 1630
FRAME EFF. 86% (PF=81%)
DESCRIPTION BA?: TE215T COMMENTS INSULATION ON DUCTS (2'x2') 25'l NEED REPAIR, PIPE INSUL. OK. ECONOMIZER WAS "OFF" AT TIME OF SURVEY, WITH OA DAMPER "CLOSED". IT IS NOW "ON" WITH OA DAMPER FUNCTIONING PROPERLY.

MOTOR # HP PH RPM
MODEL # VOLTS AMPS
SERIAL # PRESENT HR. TO
MFG REQUIRED HR. TO
FRAME EFF.
DESCRIPTION COMMENTS

MOTOR # HP PH RPM
MODEL # VOLTS AMPS
SERIAL # PRESENT HR. TO
MFG REQUIRED HR. TO
FRAME EFF.
DESCRIPTION COMMENTS

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: LC
CHECKED BY:
DATE: 12-31-91

BLDG.# 181
ECO 5

10+ HP MOTORS

MEASURED

		PHASE A	PHASE B	PHASE C
MOTOR# AHU [redacted] 1				
LOCATION	KVAR	4.7		
MFG LEROY SOMER	KVA	7.4		
MODEL # 3N386-8	KW	5.8		
SERIAL # 85609406	PF	78.7		
FRAME	HP	10		
HP 10	VOLTS	204	204	Ø
RPM 1720	AMPS	21	21	
PRESENT 0 TO 2400	PH			
REQ HR. TO	200V 29.4 A .3Ø 86% eff.			

		PHASE A	PHASE B	PHASE C
MOTOR #				
LOCATION	KVAR			
MFG	KVA			
MODEL #	KW			
SERIAL #	PF			
FRAME	HP			
HP	VOLTS			
RPM	AMPS			
PRESENT TO	PH			
REQ HR. TO				

COMMENTS

(Silver Spoon)

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: JW
CHECKED BY:
DATE: 2/11/92

BLDG.# 181
EC0 15

LIGHTING

ROOM #	# OF FIXTURES	LAMPS/ FIXTURE	WATTS/ BULB	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCC. SENSOR	NO. OF SWITCHES	UNOCC LIGHTS ON
105	2	4	34	F	ON	Y	N	1	N
101	06	4			ON	Y	N	1	N
107	20	4			ON	Y	N	4	N
108	20	4	34		ON	Y	N	4	N
110	24	4			ON	Y	N	4	N
117	80	4			ON	Y	N	10	N
212	07	4			ON	Y	N	1	N
211	2	4			ON	Y	N	1	N
201	6	4			ON	Y	N	1	N
202	6	4			ON	Y	N	1	N
209	1	4			ON	Y	N	1	N
103	8	4			ON	Y	N	1	N
104	2	4			ON	Y	N	1	N
102	03	2			ON	Y	N	1	N
121	3	40			ON	Y	N	1	N
106	12	4			ON	Y	N	1	N
107	5	4			ON	Y	N	1	N
111	14	4			ON	Y	N	1	N

OF EXIT SIGNS – _____

COMMENTS: _____

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: JW
CHECKED BY:
DATE: 2/19/92

BLDG.# 181
EC0 15

LIGHTING

ROOM #	# OF FIXTURES	LAMPS/ FIXTURE	WATTS/ BULB	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCC. SENSOR	NO. OF SWITCHES	UNOCC LIGHTS ON
PAY AREA	15	4	34	F	ON	Y	N	3	N
LOBBY	20	4			ON	Y	N	4	N
ENTRY	2	2			ON	Y	N	1	N
~~TRAVEL~~ AREA	25	4			ON	Y	N	4	N
JUMP RESERVE ~~LOBBY~~	25	4			ON	Y	N	4	N

OF EXIT SIGNS – _____

COMMENTS: _____

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: JW
CHECKED BY:
DATE: 2/11/92

BLDG.# 181
EC0 15

LIGHTING

ROOM #	# OF FIXTURES	LAMPS/ FIXTURE	WATTS/ BULB	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCC. SENSOR	NO. OF SWITCHES	UNOCC LIGHTS ON
109	4	4			ON	Y	N	1	N
122	2	4			~~ON~~ OFF	Y	N	1	N
123	2	4			OFF	N ~~Y~~	N	0	N
120	2	4			ON	Y	N	1	N
119	4	4			ON	Y	N	1	N
118	20	4			ON	Y	N	2	N
113B	9	4			ON	Y	N	2	N
113A	6	4			ON	Y	N	1	N
114	9	4			ON	Y	N	2	N
116	8	4			ON	Y	N	2	N
117	12	4			ON	Y	N	~~1~~ 2	N
115	9	4			ON	Y	N	2	N
307	2	4			ON	Y	N	1	N
305	4	4			ON	Y	~~N~~ Y	1	Y
304	2	4			ON	Y	Y	1	Y
303	2	4			ON	Y	Y	1	N
302	2	2			ON	Y	Y	1	Y
301	6	4			ON	Y	N	1	~~N~~ ON

OF EXIT SIGNS – _____

COMMENTS:

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO. ____ OF ____
CALCULATED BY: CMO
CHECKED BY: ____
DATE: 12-18-91

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 181 BLDG NAME: Dorm JOB: 3105.000
PRIMARY FUNCTION: ____ GROSS SQ FT ____ NO OF FLRS 2
BUILDING MANAGER NAME: ____
PHONE: ____ OFFICE NO. ____
SPECIAL AREAS: COMPUTER FACILITY [ ] - ZONE NO'S. ____
AUDITORIUM [ ] - ZONE NO'S. ____
LABORATORIES [ ] - ZONE NO'S. ____
CAFETERIA [ ] - ZONE NO'S. ____
OTHER [ ] ____ - ZONE NO'S. ____

ZONE NO. 1 FUNCTION: ____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: 2nd Floor Main Area (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F 0 TO 2400, SAT 0 TO 0, SUN 0 TO 0
PRESENT TEMP: WINTER OCC 78.7 °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F
REQUIRE TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F

REMARKS: ____

ZONE NO. 2 FUNCTION: ____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: BASEMENT ROOM 6 (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F ____ TO ____, SAT ____ TO ____, SUN ____ TO ____
PRESENT TEMP: WINTER OCC 82.7 °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F
REQUIRE TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F

REMARKS: ____

ZONE NO. 3 FUNCTION: ____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: ROOM 7 (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F ____ TO ____, SAT ____ TO ____, SUN ____ TO ____
PRESENT TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F
REQUIRE TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F

REMARKS: ____

ZONE NO. 4 FUNCTION: ____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: ROOM 2 (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F ____ TO ____, SAT ____ TO ____, SUN ____ TO ____
PRESENT TEMP: WINTER OCC 75 °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F
REQUIRE TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F

REMARKS: ____

228 people

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

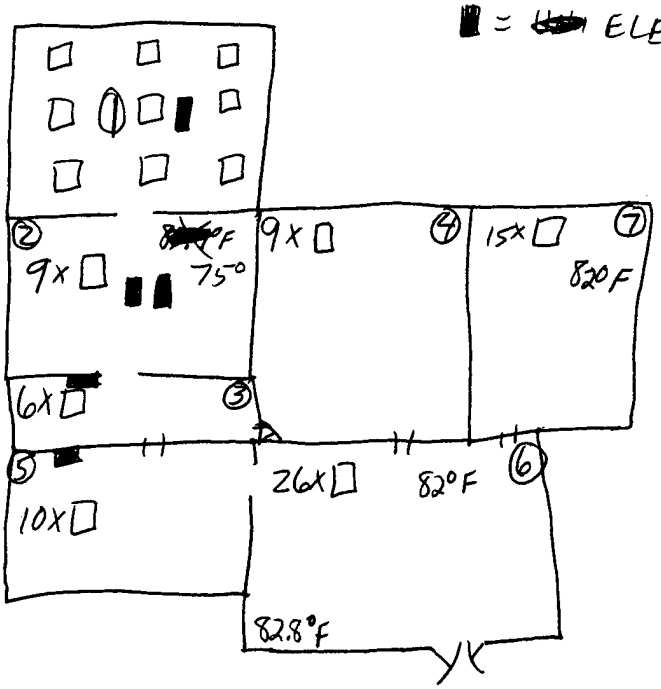
JOB
SHEET NO. OF
CALCULATED BY J W DATE
CHECKED BY DATE
SCALE

BLDG 181

N

RAY M. REESE
BASEMENT

□ = 4-34W
■ = ELECTRIC HEATERS



NOTE: ROOM #6 IS UNBEARABLY HOT IN THE WINTER & TOO COLD IN THE SUMMER. THERE IS A CONSENSUS FEELING OF BEING TEMPERATURE UNCOMFORTABLE.

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB

SHEET NO. OF

CALCULATED BY JW DATE

CHECKED BY DATE

SCALE

BLDG 181

LIGHT COUNT ⇒ ALL LIGHTS 4 BULB ~~34W~~ FL.

200 + 50 ≅ 250 + 20% MISSED ≅ 300 lights

~~+ Refrig~~

~~1 Coffee Pot~~

~~4 PC~~

~~4 Printer~~

~~10 Monitors~~

UPPER LEVEL ~~WEST~~ 80°F

NORTH WEST

PC's = ~~++++ ++++ ++++ ++++ ++++~~ 1

PRINTERS = ~~++++~~ 1111

MAIN FRAMES = 11

DUMB STATIONS = 11

REFRIGERATORS = 1

TYPEWRITERS = ~~++++~~ 1

COPY MACHINE = 1

JAM BOXES = ∞

UPPER N-E 79°F

UPPER ~~N~~ SOUTH 78°F

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB

SHEET NO. OF

CALCULATED BY J W DATE 12/20/91

CHECKED BY DATE

SCALE

BLDG 181

~~BLDG 101 ECO~~ 12 DUCT SIZES

AHU #1 ⇒ 18" X 24" ZONE #1
30" X 60" ZONE #2
18" X 24" ZONE #3

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

BLDG 181

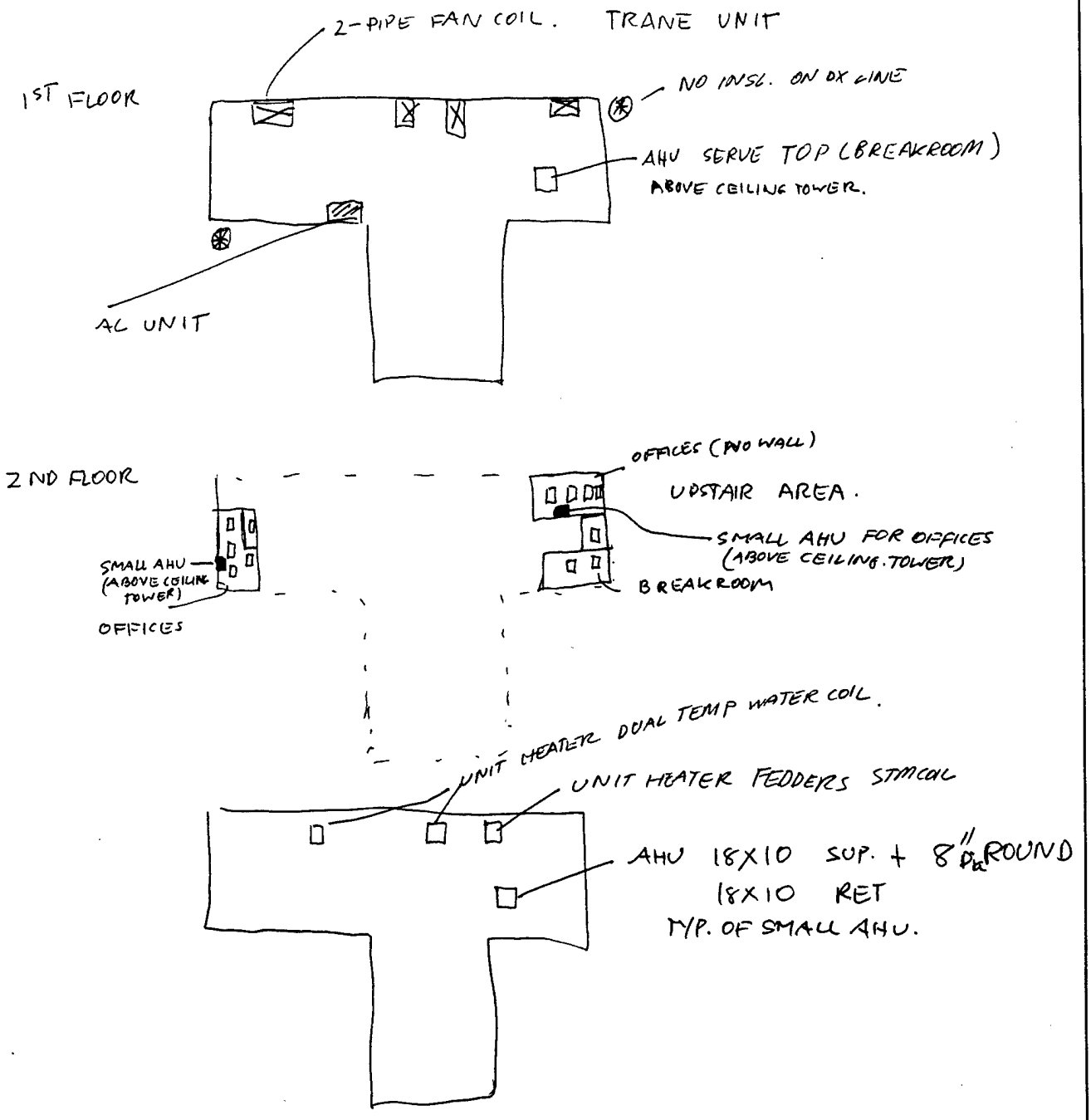
JOB _____

SHEET NO. _____ OF _____

CALCULATED BY KC DATE 12-19-91

CHECKED BY _____ DATE _____

SCALE _____



E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____
SHEET NO. _____ OF _____
CALCULATED BY CMD DATE 12-18-91
CHECKED BY _____ DATE _____
SCALE _____

Bldg 181

SOME ROOMS ARE HOT.

SOME ROOMS ARE COLD

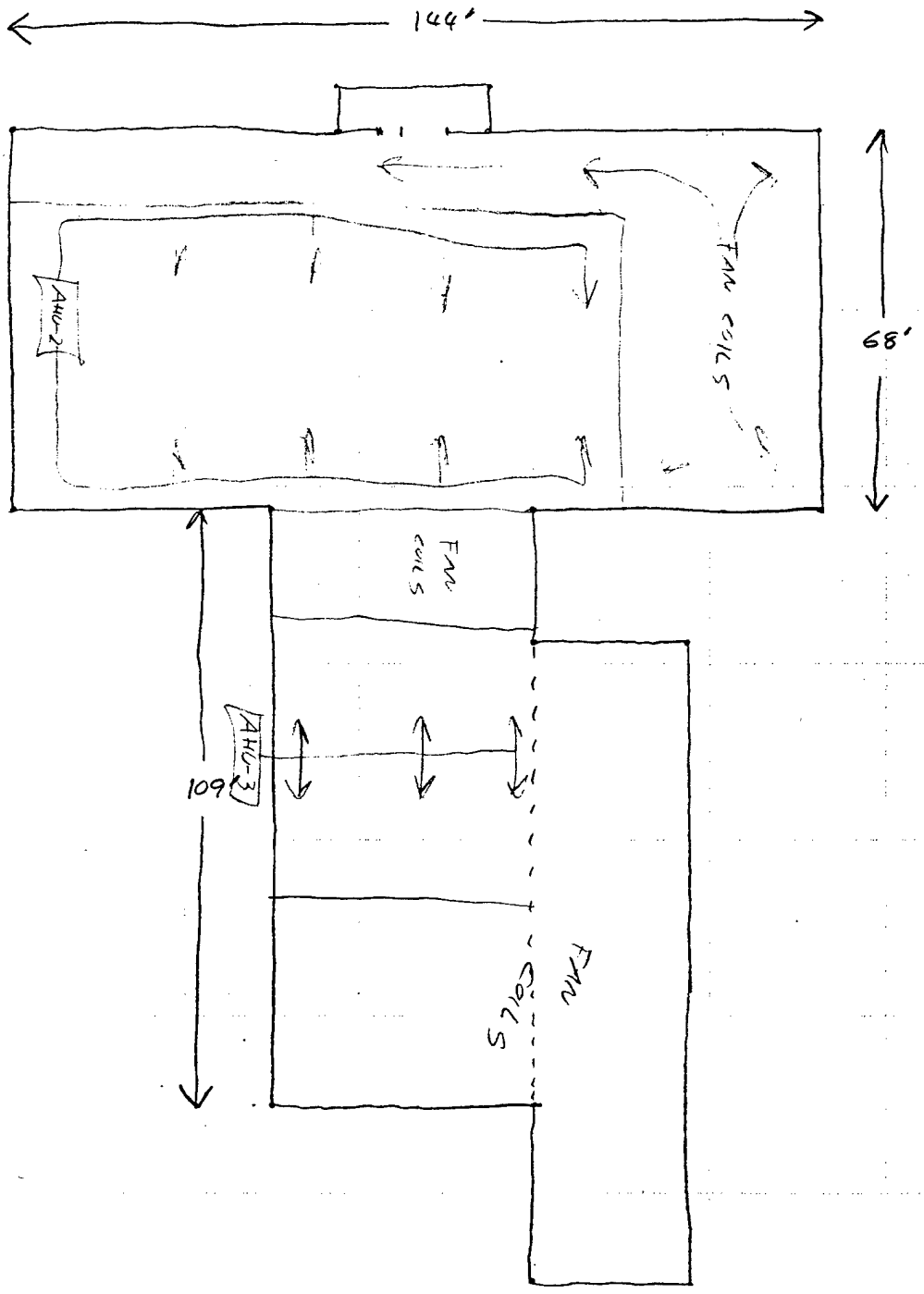
NO WINDOWS - NOT ENOUGH OUTSIDE AIR.

ROOM 6 SEVERAL COMPUTERS, HAS COMP. AC UNIT, BUT NOT FUNCTIONING.

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB 3105.000
SHEET NO. _____ OF _____
CALCULATED BY _____ DATE 2/28/92
CHECKED BY _____ DATE _____
SCALE 1" = 181

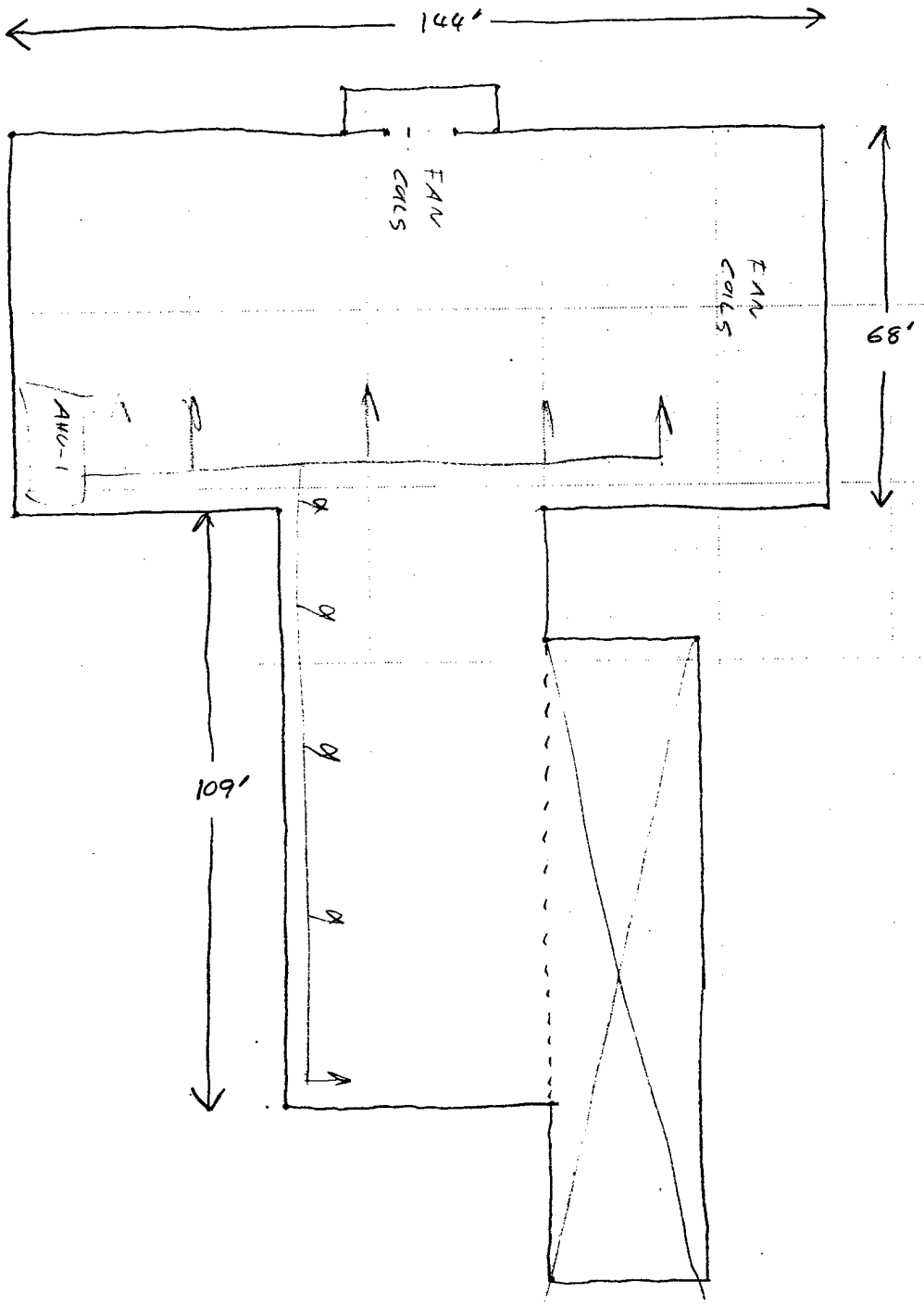
HVAC
LOWER FLOOR



E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB 3105.000
SHEET NO. _____ OF _____
CALCULATED BY _____ DATE 2/28/92
CHECKED BY _____ DATE _____
SCALE 1" = 181'

HVAC
UPPER FLOOR



E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

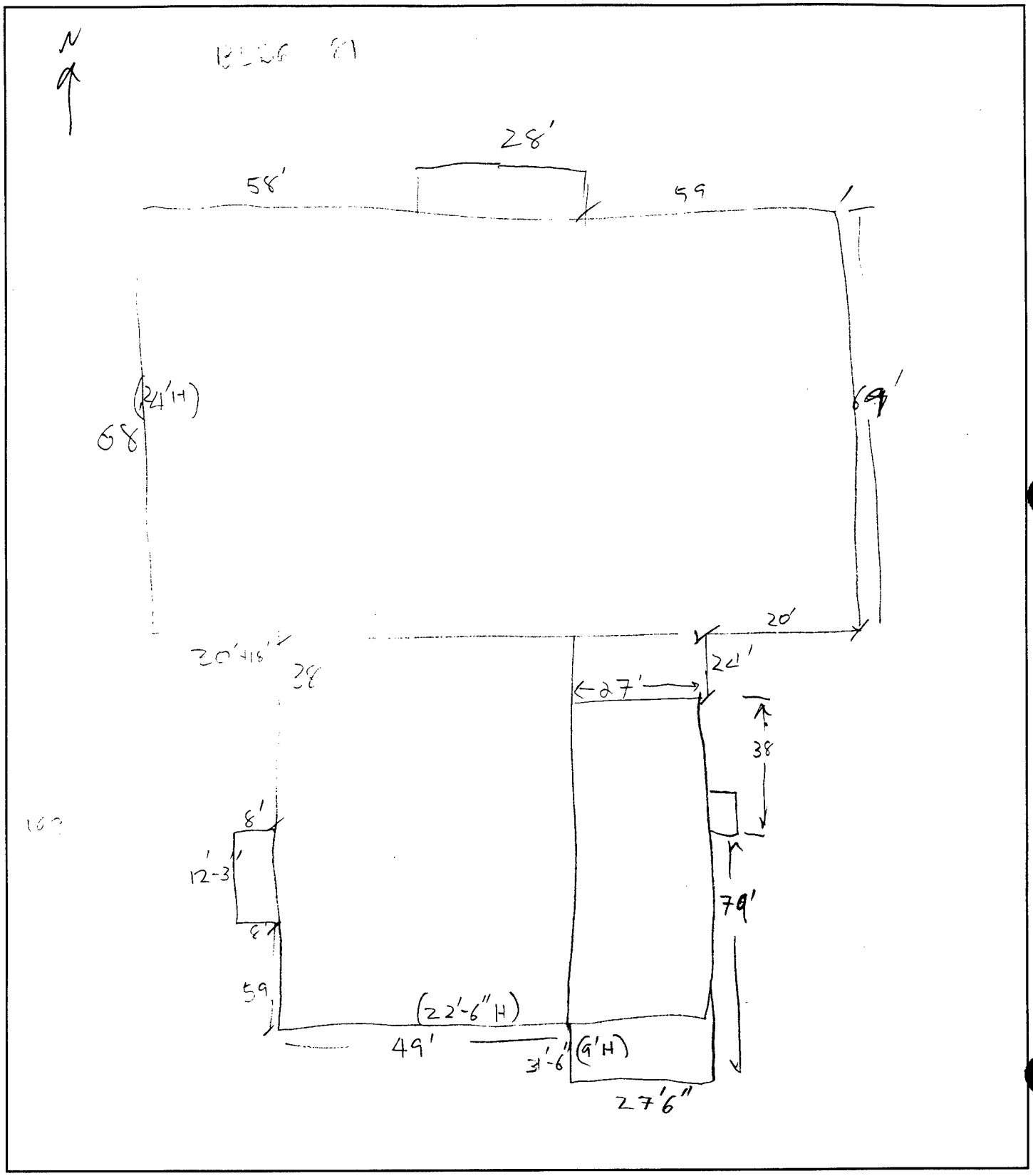
JOB _____

SHEET NO. _____ OF _____

CALCULATED BY KC DATE 12-18-91

CHECKED BY _____ DATE _____

SCALE _____



E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB
SHEET NO. OF
CALCULATED BY JW DATE
CHECKED BY DATE
SCALE

BLDG 181

THE OUTSIDE AIR DUCTS FOR THE AHU'S IN THIS BUILDING WERE CLOSED AT TIME OF SURVEY RESULTING IN "STUFFY" OFFICE CONDITIONS AND EMPLOYEE IRRITABILITY AND DISCOMFORT FROM EXCESSIVE HEAT.

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____
SHEET NO. _____ OF _____
CALCULATED BY CMD DATE 12-18-91
CHECKED BY _____ DATE _____
SCALE _____

SPACE HEATERS

DAYTON ELECTRIC MOD. 2E439 SER. 134624

208 V 3000 WATTS 10240 BTU

ROOM 1

8 DUMB TERMINALS
1 PC
1 ELEC. TYPEWRITER

ROOM 2

9 DUMB TERMINALS
3 PC's
1 PRINTER
1 ELECTRIC TYPEWRITER
1 COFFEEPOT

Room 3

3 PC's
1 COPY MACHINE
2 PRINTERS
1 MINI MAIN-FRAME

ROOM 4

1 MINI MAIN-FRAME
12 DUMB TERM.
2 PC's
1 LASER PRINTER
1 [illegible]

Room 5

8 PC's
2 ELECTRIC T-WRITERS
1 DOT MATRIX

ROOM 6

3 MINI MAINFRAMES
4 PCs
15 DUMB TERM,
2 ELECTRIC T-WRITERS
10 PRINTERS
1 COMPUTER AC UNIT- DOES NOT FUNCTION, SET UP TO SERVE ROOM 5.
1 FULL SIZE REFRIG.

Room 7

11 DUMB TERM
2 PRINTERS
2 PC's
1 ELEC T-WRITERS
1 COFFEE POT
1 COPY MACHINE

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

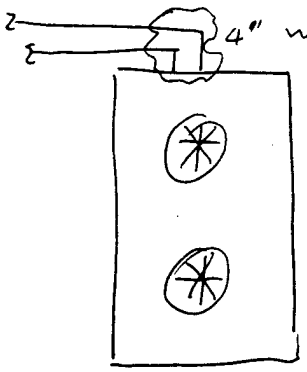
JOB _____
SHEET NO. _____ OF _____
CALCULATED BY _____ DATE _____
CHECKED BY _____ DATE _____
SCALE _____

181

MCQUARY + PERFEX INC.
ACCU AIRCON-AIR-CONDENSER
SER # 4-PD00164-04
MOD # APD-007C-V-99
208/230 V 3ϕ
0.33 HP. 2A
REF LINE NEED TO INSULATE 1/2" ~~3/4"~~
30' LONG.

CHILLER

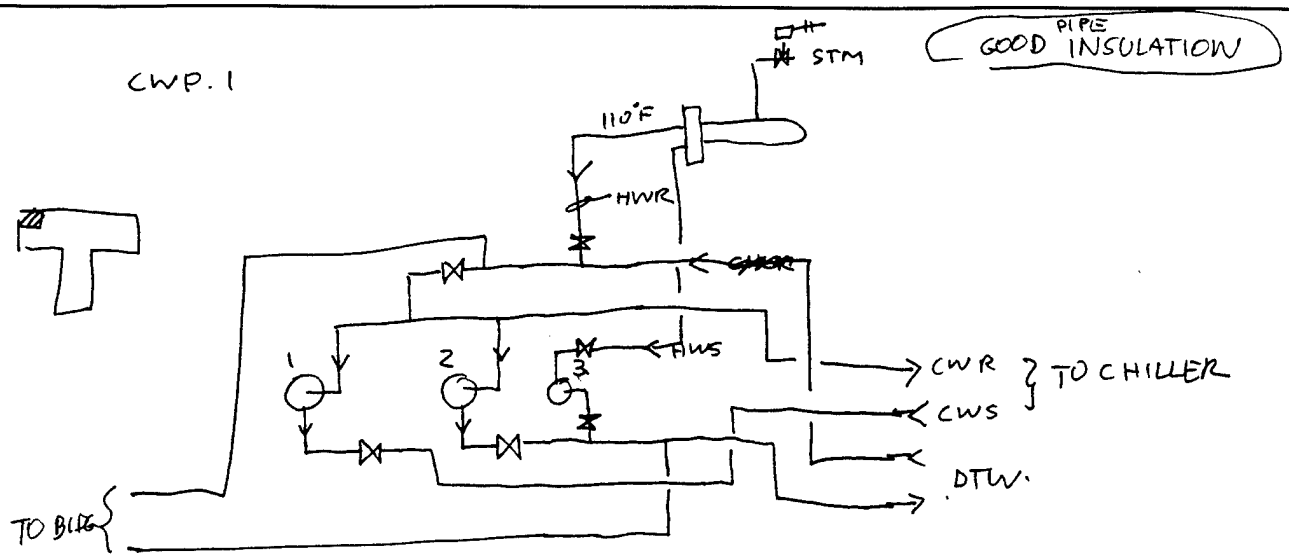
TRANE
MOD # CGAA0806RD61CC4C4C311CKAR
SER # L82L07755
COMP. MOTOR 2 - 3ϕ 168A
COND MOTOR 2 - 3ϕ 25.4A 7.5HP. } 200-208V



4" w/ 2" BLK FOAM INSULATION. BAD 15' ON ELBOW & VALVE

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____
SHEET NO. _____ OF _____
CALCULATED BY KC DATE 12-18-91
CHECKED BY _____ DATE _____
SCALE _____



CWP1 MARATHON ~~GENERAL~~ ELECTRIC
MOD # JN184TTDR7026BF W
FM 184T 5HP
TYPE TDR-B 3Ø 230V 13.2A 1740RPM
PUMP - FEDERAL PUMP
RECORD # B68296-P1 UNIT# 2CKB-5-4

CWP2 MARATHON ELEC. 7.5 HP 3Ø 3450 RPM
MOD.# SN184TTDR7001BCN 230V 18.8A
FM 184T
TYPE TDR-BE
PUMP FEDERAL PUMP
REC# B68296-P2 UNIT# 2CGB-7 1/2-2

HWP 3 MARATHON ELEC.
MOD # NVM145TTDR7663CH 3Ø 1745 RPM 1.5HP
FM 145JM 208V 1-15A
TYPE TDR 78.5% eff.

PUMP FEDERAL PUMP
REC# B68296-P3 UNIT# 1 1/2CG-1 1/2

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

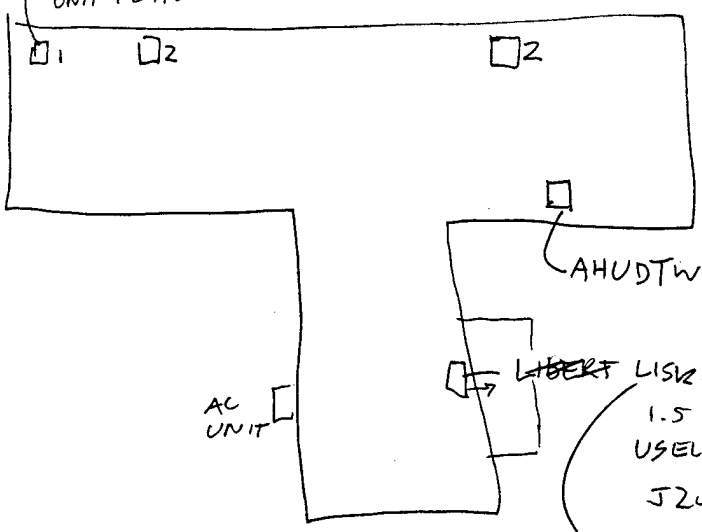
JOB _____

SHEET NO. _____ OF _____

CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____

SCALE _____



(1) STM COIL FAN FEDDERS UH - 17C220 MOD#
- 661402 SER#

(2) INTERNATIONAL DTW COIL.

AHUDTW COIL. SMALL NAMEPLATE NOT ACC.

~~LIBERT~~ LISKEY-AIRE
1.5 H.P. 3Ø 200V 5.4A.
USELECTRIC MOTOR 1740
J200R072 80Y.

MOD UAS
SER#. AE4-0413-3
DX COIL. ONLY

JOB

SHEET NO. OF

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

CALCULATED BY JW DATE

CHECKED BY DATE

SCALE

BLDG 181

#FAN COILS
CEILING HEIGHTS ⇒ 18' UPPER LEVEL 10' UC BACK (SOUTH)
8' LOWER " DROP
WALL CONSTRUCTIONS ✓
LIGHTING CONTROL 3rd floor X
ROOF Construction (R.I) = New) ~~[illegible]~~
✓ DUCT SIZE ✓
Chk cooling ONLY; Nameplate ✓X

DUCT SIZE FOR MAIN AHU

20X20 RETURN
12X24 OUTSIDE AIR
10X17 SUPPLY (ZONE#1)
12X12 " (ZONE#3)
~~[illegible]~~ 16X24 " (ZONE#2)

SMALL AHU (RM 11)
16X24 SUPPLY

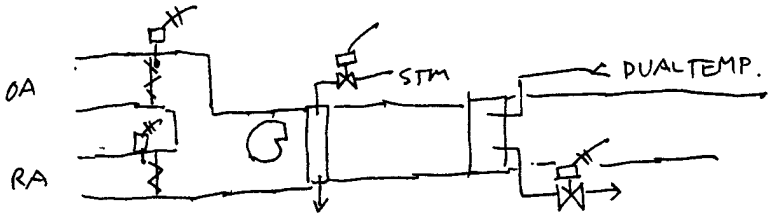
E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____
SHEET NO. _____ OF _____
CALCULATED BY KC DATE 12-18-91
CHECKED BY _____ DATE _____
SCALE _____

BLDG 181

- HEATING THROUGH STM FROM CENTRAL HEATING PLANT 160
- COOLING. CHILLER (AIR COOLED)
- 1 AHUS ON NORTH-WEST CORNER.

AHU-1



THIS A MULTI ZONE SYSTEM 2 ZONES (OPP?)

EXH. FAN US ELECTRIC 2HP 230V 6.6A
145T 80% 1735 RPM
F-86803-05-259

DUCT IN 8X8 BAD 1" FG. FOIL TEMP 60' CRAWSPACE
OVER HALF OF DUCT INSL. MISSING 60'.

FAN MOTOR BALDOR.
CAT # 143218T 5HP 1725RPM 3Ø
FRM. 124T 81.5% 14.2A 208V

CONTROL DOES NOT WORK – TOO COLD IN SUMMER
– TOO HOT IN WINTER

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____

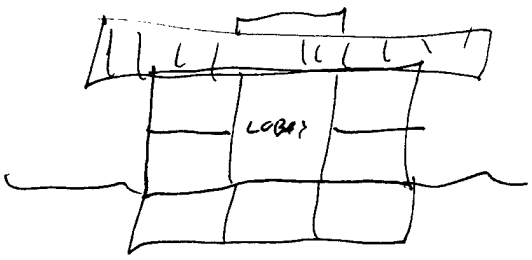
SHEET NO. _____ OF _____

CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____

SCALE _____

181



LOT'S OF PC'S

2' PLENUM ON 2nd FLOOR

NO WINDOWS

FANS EVERYWHERE

HOT

GETS VERY UNCOMFORTABLE

CHILLER

TRANE

C6AA086R051CC4C4C311 CKAR

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB _____

SHEET NO. _____ OF _____

CALCULATED BY CMD DATE 12-18-91

CHECKED BY _____ DATE _____

SCALE _____

1 MICROWAVE

1 CANDY MACHINE

2 COKE MACHINES

1 [illegible]

2 [illegible]

19 PCs

12 PRINTERS

1 COPY MACHINE

ELEC. TW

PC

COPY

MINI

11 PC [illegible]

17 DT

BASEMENT

10 PCs

9 PRINTERS

1 TW

1 COPY

2 MINI MAINFRAMES

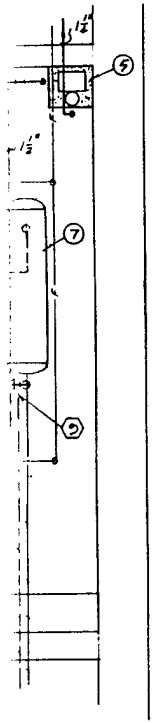
1 LARGE ENVELOPE MACHINE

1 REFRIG [illegible]

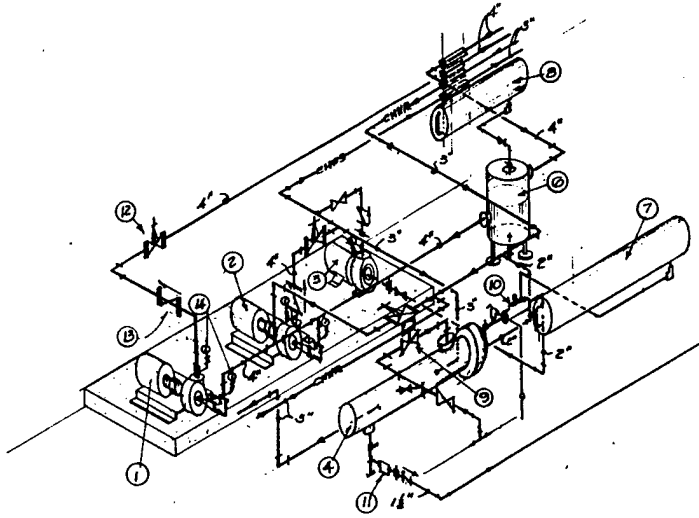
1 COFFEEPOT

10 DUMB TERMINALS

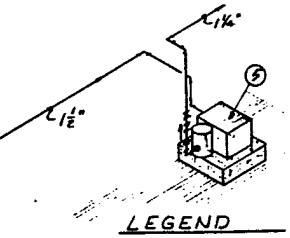
UPPER LEVEL N.E.



1 PLAN



2 PIPING DIAGRAM
M4 NO SCALE



LEGEND

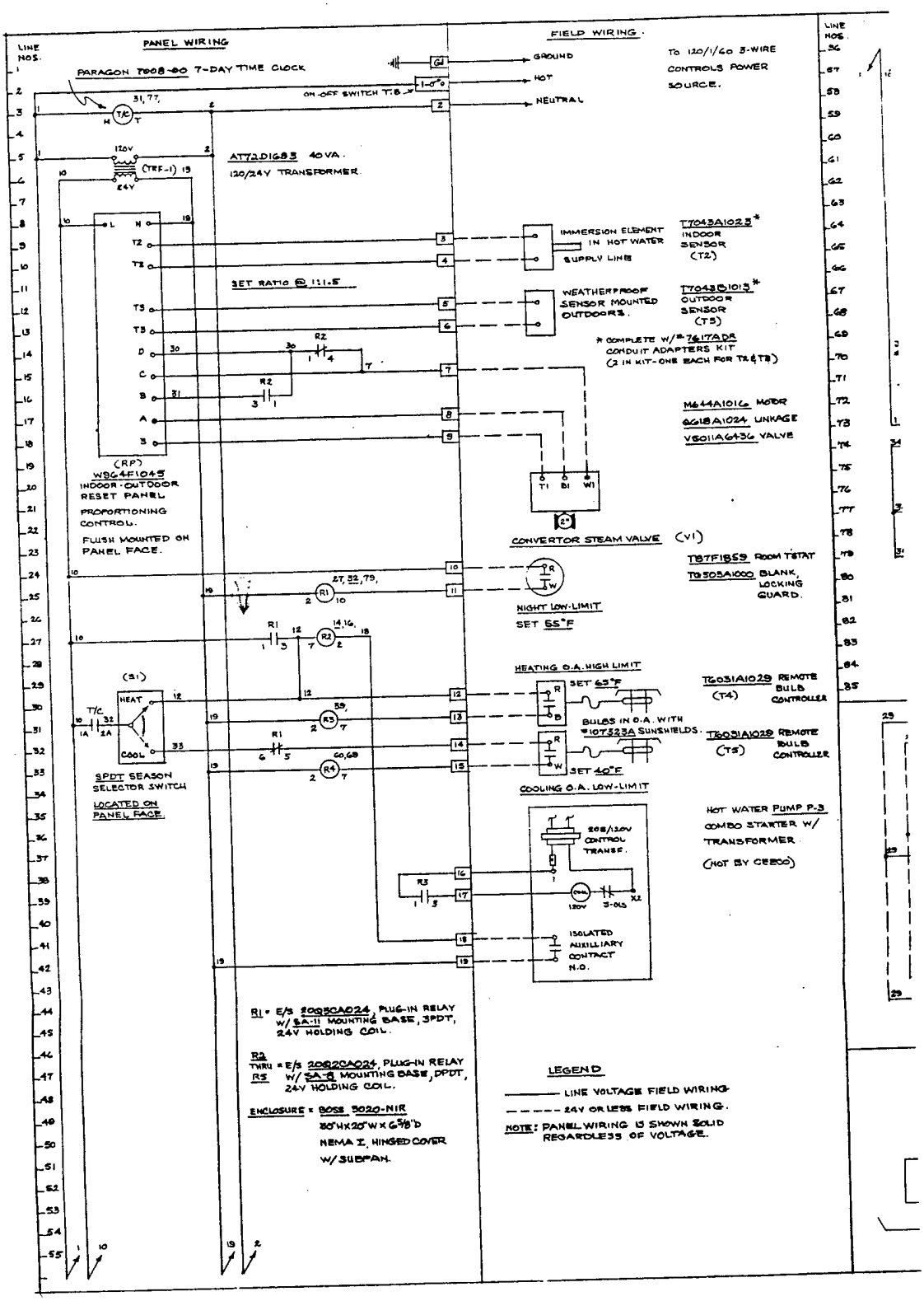
1. CHW. PUMP P1 - FEDERAL CORP MODEL 2CKB-5-4 200 GPM @ 52 FT-HD - 5 HP - @ 1750 RPM.
2. CH.W. PUMP P2 - FEDERAL CORP MODEL 2CG B-7½-2 223 GPM @ 72 FT-HD - 7½ HP - @ 3500 RPM
3. HW. PUMP P3 - FEDERAL CORP MODEL 1½CG-1½-4 43 GPM @ 40 FT-HD - 1½ HP - 1750 RPM.
4. H.E. TACO MODEL G4608-4PASS 45 GPM - 170°F IN → 194°F OUT.
5. CONDENSATE PUMP - FEDERAL VAC-620-2 9 GPM @ 20 FT HD ⅓ HP - 3450 RPM
6. AIR SEPARATOR TACO MODEL AC4 - 125 PSIG - RATED 200 GPM
7. EXP. TANK - TACO MODEL SD-400-1.3 125 PSIG - 40 GALS.
8. EXP. TANK - TACO MODEL SD-400-1.3 125 PSIG - 15 GALS.
9. STM. CONTROL VA. - HONEYWELL V5011AG4SG-2"
10. AIR SEPARATOR - TACO AIR-SCOOP 2"30-400-12
11. INVERTED BUCKET TRAP W/VENT. H&H/NR. @ 5 PSIG R.D.
12. GATE VALVE
13. CHECK VALVE
14. PRESSURE GAUGE W/ COCK

Valve Tag Schedule

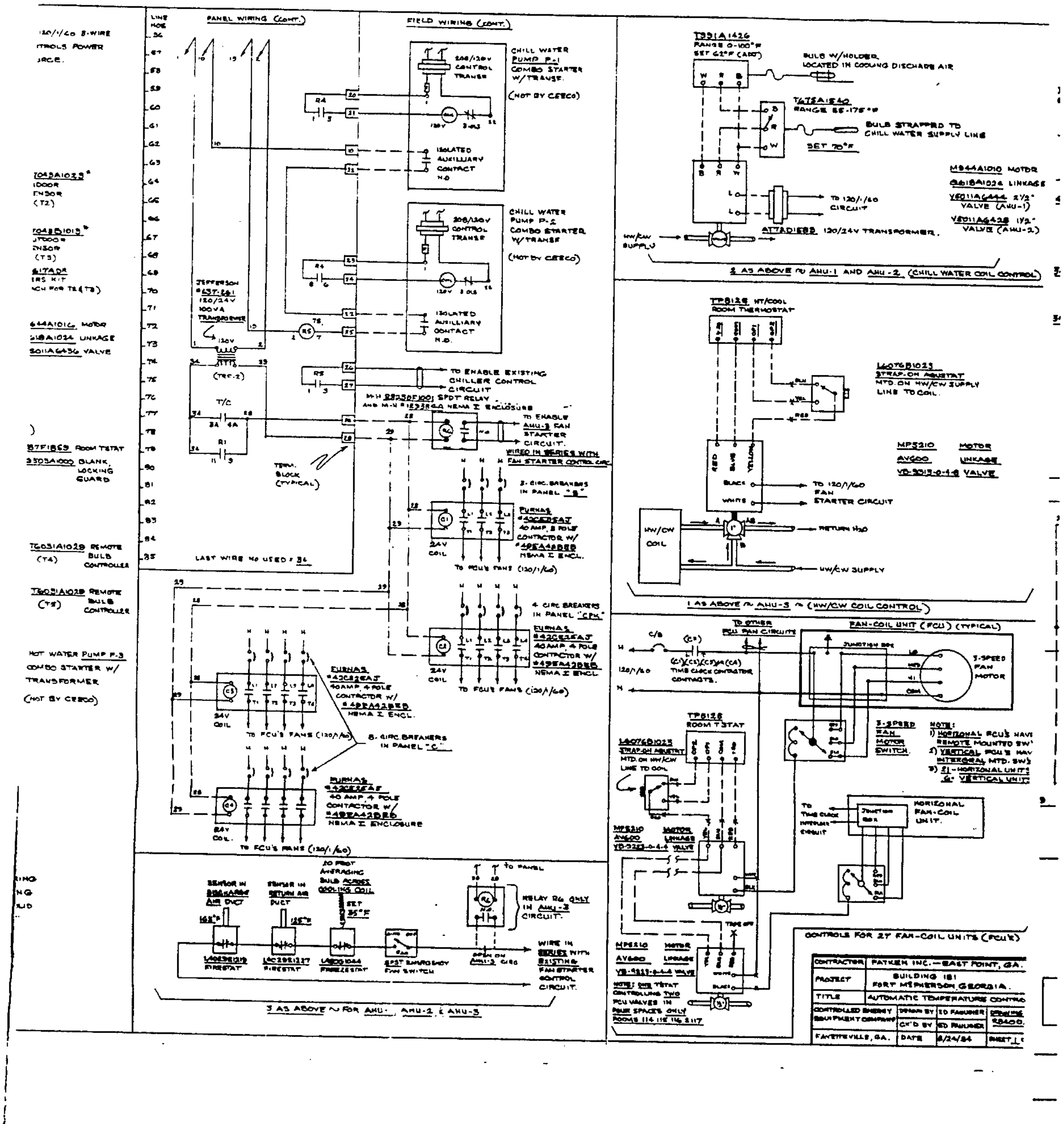
Tag Number	Size	System	Position for season
1	4"	C. H. W. S. from chiller	Close for Heat - Open for Cool
2	4"	C. H. W. R. to chiller	Close for Heat - Open for Cool
3	4"	Dual temperature	Open for Heat and Cool
4	4"	Dual temperature	Open for Heat and Cool
5	2"	Hot water supply to building	Open for Heat - Close for Cool
6	2"	Temperature supply from convector to pump thru building	Open for Heat - Close for Cool
7	2"	Temperature return from building	Open for Heat - Close for Cool
8	2"	Modulating steam control valve	Modulates during heating
9	2"	Steam supply shut off	Open for Heat - Close for Cool
10	3/4"	Make up water for system from expansion tank	Open at all times

BLDG 181

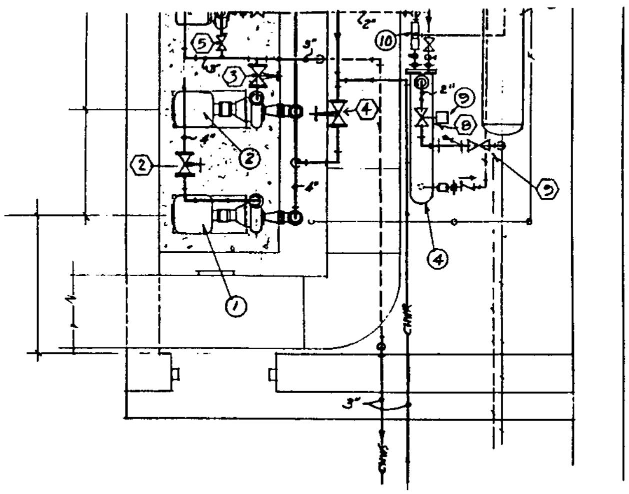
BLDG 181


PANEL WIRING
FIELD WIRING
PARAGON T998-80 7-DAY TIME CLOCK
ON-OFF SWITCH T.S.
GROUND
HOT
NEUTRAL
To 120/1/60 3-WIRE CONTROLS POWER SOURCE.
AT72D1683 40 VA. 120/24V TRANSFORMER.
SET RATIO @ 1:1.5
IMMERSION ELEMENT IN HOT WATER SUPPLY LINE
T7043A1023* INDOOR SENSOR (T2)
WEATHERPROOF SENSOR MOUNTED OUTDOORS.
T7043B1013* OUTDOOR SENSOR (T3)
* COMPLETE W/ 76I7ADR CONDUIT ADAPTERS KIT (2 IN KIT - ONE EACH FOR T2 & T3)
M644A1016 MOTOR
6G18A1024 LINKAGE
V5011A6436 VALVE
WSG44F1045 INDOOR-OUTDOOR RESET PANEL PROPORTIONING CONTROL. FLUSH MOUNTED ON PANEL FACE.
CONVERTOR STEAM VALVE (V1)
T87F1859 ROOM T'STAT
T9505A1000 BLANK, LOCKING GUARD.
NIGHT LOW-LIMIT SET 55°F
HEATING O.A. HIGH LIMIT
SET 65°F
BULBS IN O.A. WITH #107523A SUNSHIELDS.
T6031A1029 REMOTE BULB CONTROLLER (T4)
T6031A1029 REMOTE BULB CONTROLLER (T5)
SET 40°F
COOLING O.A. LOW-LIMIT
SPDT SEASON SELECTOR SWITCH LOCATED ON PANEL FACE.
HOT WATER PUMP P-3 COMBO STARTER W/ TRANSFORMER (NOT BY CEECO)
208/120V CONTROL TRANSF.
ISOLATED AUXILLIARY CONTACT N.O.
R1 = E/S 20930A024, PLUG-IN RELAY W/ SA-11 MOUNTING BASE, 3PDT, 24V HOLDING COIL.
R2 THRU R5 = E/S 20820A024, PLUG-IN RELAY W/ SA-8 MOUNTING BASE, DPDT, 24V HOLDING COIL.
ENCLOSURE = BOSS 3020-NIR 30"H x 20"W x 6 5/8"D NEMA 1, HINGED COVER W/ SUBPAN.
LEGEND
LINE VOLTAGE FIELD WIRING
24V OR LESS FIELD WIRING.
NOTE: PANEL WIRING IS SHOWN SOLID REGARDLESS OF VOLTAGE.

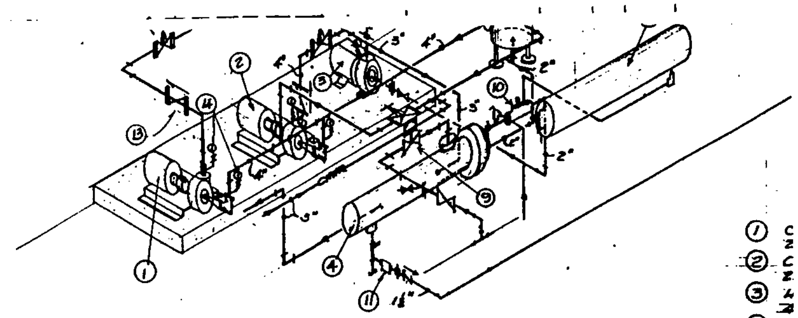
BLDG 181



CONTRACTOR	PATKEN INC.—EAST POINT, GA.				
PROJECT	BUILDING 181 FORT MCPHERSON, GEORGIA.				
TITLE	AUTOMATIC TEMPERATURE CONTRO				
CONTROLLED ENERGY EQUIPMENT COMPANY	DRAWN BY	ED FAULKNER	DRAWING		
	CH'D BY	ED FAULKNER	28400.		
FAYETTEVILLE, GA.	DATE	6/24/84	SHEET 1		



1/M4 MECHANICAL ROOM PLAN
SCALE 1/2" = 1'-0"



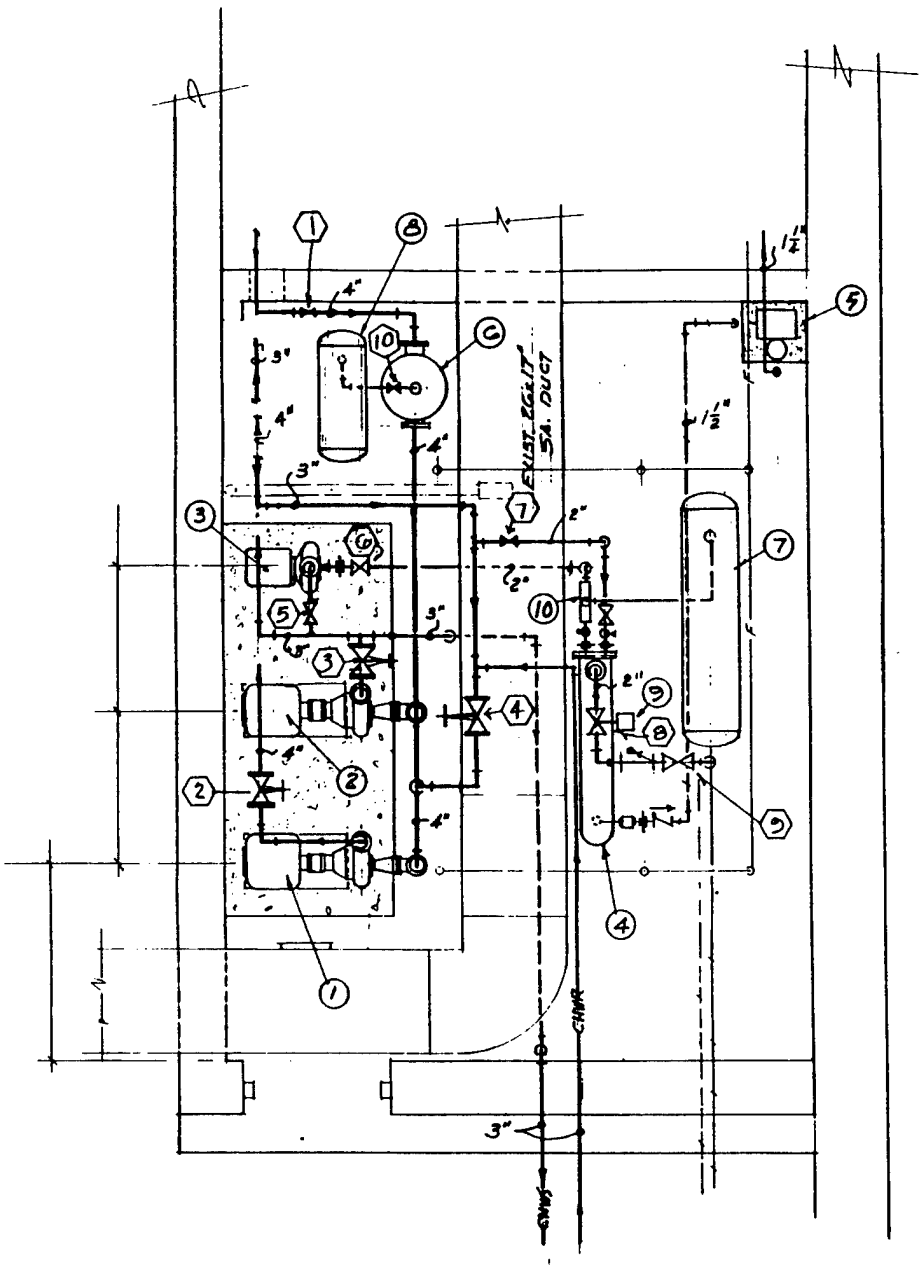
2/M4 PIPING DIAGRAM
NO SCALE

Valve Tag Schedule

Tag Number	Size	System	Position for season
1	4"	C. H. W. S. from chiller	Close for Heat - Open for Cool
2	4"	C. H. W. R. to chiller	Close for Heat - Open for Cool
3	4"	Dual temperature	Open for Heat and Cool
4	4"	Dual temperature	Open for Heat and Cool
5	2"	Hot water supply to building	Open for Heat - Close for Cool
6	2"	Temperature supply from convector to pump thru building	Open for Heat - Close for Cool
7	2"	Temperature return from building	Open for Heat - Close for Cool
8	2"	Modulating steam control valve	Modulates during heating
9	2"	Steam supply shut off	Open for Heat - Close for Cool
10	3/4"	Make up water for system from expansion tank	Open at all times

GENERAL NOTE: All valves rated for 125# steam pressure

BLDG 181



BLDG 181

(1/M1) MECHANICAL ROOM PLAN
SCALE 1/2" = 1'-0"

Tag Numb
1
2
3
4
5
6
8
9
10

GENE

BUILDING 184

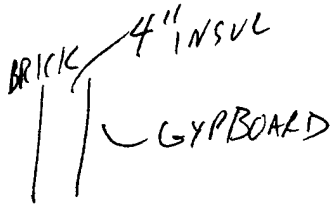
EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

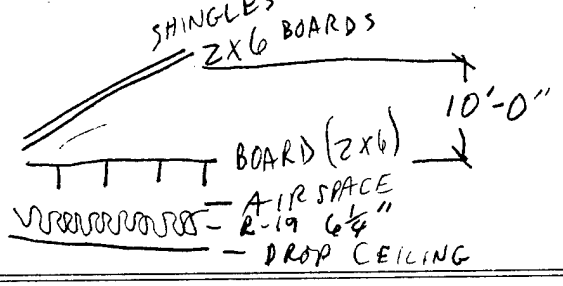
JOB	Ft. McPherson/Ft. Gillem Energy Study
PROJ.#	EMC # 3105.000
SHEET NO.	OF
CALCULATED BY:	JW
CHECKED BY:	
DATE:	12/19/91

BLDG.# 184
ECO 1

WALL & ROOF INSULATION

AREAS IN SQ. FEET	NORTH	SOUTH	EAST	WEST
WALLS				
WINDOWS				
OVERHEAD DOORS				
PERSONNEL DOORS				

SKETCH WALL CROSS–SECTION	COMPONENTS
	1. OUTSIDE AIR FILM 2. 3. 4. 5. 6. 7. INSIDE AIR FILM

SKETCH ROOF CROSS–SECTION	COMPONENTS
	1. OUTSIDE AIR FILM 2. 3. 4. 5. 6. 7. INSIDE AIR FILM
PERSONNEL DOOR TYPE _____ OVERHEAD DOOR TYPE _____	BASEMENT [ ] SLAB [ ] CRAWL SPACE [ ]

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: KK
CHECKED BY:
DATE: 12-19-91

BLDG.# 184
ECO 1

PIPE INSULATION

LOCATION	PIPE DIAMETER	PIPE LENGTH	FLUID TYPE	FLUID TEMP.	AIR TEMP.	INSULATION TYPE	INSULATION THICKNESS	INSULATION CONDITION
EAST MECH.	3 1/2"	100'	HW	NA	50°	FG. W/F	1"	GOOD
↓	3 1/2"	150'	CW	NA	50	↓	↓	GOOD

COMMENTS: UPPER LEVEL PIPE INSULATION IN GOOD CONDITION — ALL AHU ARE GOOD COND.

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB Ft. McPherson/Ft. Gillem Energy Study
PROJ.# EMC # 3105.000
SHEET NO. _____ OF
CALCULATED BY:
CHECKED BY:
DATE:

BLDG.# 184
ECO 1

DUCT INSULATION

LOCATION	DUCT CROSSECTION	SHAPE	DUCT TEMP. (°F)	SURROUND AIR TEMP. (°F)	INSULATION TYPE	INSULATION THICKNESS	INSULATION CONDITION
ATIC AHU 5	24 X 12	□	NA	65	FG W/F	1½" R3.8	GOOD
AHU 1-10	*						

COMMENTS: ALL IN GOOD CONDITION UNLESS SPECIFIED IN NOTE

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: JW
CHECKED BY:
DATE: 12/19/91

BLDG.# 184
ECO 2

WINDOWS SURVEY

ZONE	WINDOW NO.	SINGLE/DOUBLE PANE	TYPE–SLIDING FIXED, CASEMENT	FRAME MAT'L	ORIENTATION	GLASS SHADING	WINDOW COVER	DIMENSIONS (INCH)
3	14	SINGLE	SLIDING	WOOD	S	NONE	BLINDS	40 X 77
2	19	"	"	"	E	"	"	"
1	17				N	"		
4	18				W	"		
		INSIDE AREA						
3	4	"	"	"	N	"	"	"
1	4				S	"		
4	20				E	"		
2	6				W	"		

COMMENTS: WINDOWS ARE OLD & WOODEN BUT INFILTRATION IS LOW TO MEDIUM

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: J W
CHECKED BY:
DATE: 12/19/91

BLDG.# 184
ECO 3

WEATHERSTRIPING AND CAULKING

DOOR\ WINDOW	CONDITION OF W.S./CAULK	INFILTRATION	ORIENTATION	DIMENSIONS (INCH)	#
W	FAIR (OK)	LOW	N SEW	40x77	174
D	BAD	VERY HIGH	N (STAIRS)		1
D	BAD	VERY HIGH	E (PORCH) ADDITION		1

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO. _____ OF _____
CALCULATED BY: JW
CHECKED BY: _____
DATE: 12/19/91

BLDG.# 184
ECO 4

DOMESTIC HOT WATER

FAUCET LOCATION	WATER TEMPERATURE
1st FLOOR EAST WING MENS	122°F
2nd FLOOR WEST WING MENS	134°F
PROBLEMS:	

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: KC
CHECKED BY:
DATE: 12-18-91

BLDG.# 184
ECO 5

MOTORS

MOTOR #	1	HP	5	PH	3	RPM	1725
MODEL #	178101	VOLTS	200	AMPS	15.8		
SERIAL #		PRESENT HR.	0	TO	2400		
MFG	BELL & GOSSETT	REQUIRED HR.	7:30	TO	4:30		
FRAME	184JM	EFF.					
DESCRIPTION	DTW MOTOR	COMMENTS					

MOTOR #	2	HP	1/3	PH	1	RPM	1725
MODEL #	M90062	VOLTS	115	AMPS	6		
SERIAL #		PRESENT HR.	0	TO	2400		
MFG	BELL & GOSSETT	REQUIRED HR.		TO			
FRAME		EFF.					
DESCRIPTION	BOILER HW CIR. PUMP MTR.	COMMENTS					

MOTOR #	AHU-2	HP	1	PH	3	RPM	1725
MODEL #	M3116T	VOLTS	208	AMPS	3.6		
SERIAL #	3SB01-87	PRESENT HR.	0	TO	2400		
MFG	BALDOR	REQUIRED HR.		TO			
FRAME	145T	EFF.					
DESCRIPTION		COMMENTS	GOOD COND. 1ST FL CLASS ROOM				

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: KC
CHECKED BY:
DATE: 12/19/91

BLDG.# 184
ECO 5

MOTORS

MOTOR #	AHU 1	HP	1	PH	3	RPM	1740
MODEL #	3N2448	VOLTS	200	AMPS	4.2		
SERIAL #		PRESENT HR.	0	TO	2400		
MFG	DOERR ELEC.	REQUIRED HR.		TO			
FRAME	1H143T	EFF.					
DESCRIPTION		COMMENTS	1ST FL SEMINAR RM				

MOTOR #	AHU 6	HP	1.5	PH	3	RPM	1745
MODEL #	KVL145TTDR7926ACW	VOLTS	200	AMPS	5.5		
SERIAL #		PRESENT HR.	0	TO	2000		
MFG	MARATHON	REQUIRED HR.		TO			
FRAME	145T	EFF.	78.5				
DESCRIPTION		COMMENTS	2ND A N-E.				

MOTOR #	AHU-3	HP	2	PH	3	RPM	1740
MODEL #	WA145TTDR5331AA	VOLTS	208	AMPS	6.2		
SERIAL #		PRESENT HR.	0	TO	2400		
MFG	MARATHON	REQUIRED HR.		TO			
FRAME	145T-80	EFF.	81.5				
DESCRIPTION		COMMENTS					

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: ____ OF ____
CALCULATED BY: KC
CHECKED BY: ____
DATE: 12-18-91

BLDG.# 184
ECO 7

HW PUMPS

CIRCULATION PUMPS

RPM	FT HD	GPM	MODEL #	SERIAL #	MFG.	HOURS REQUIRED	HOURS PRESENT	PUMP #
1725	60	16.8	ZBB6BF		BELL & GOSSETT	7:30-4:30	0-2400	1 DTW
1750	15	42	11/2AA45/88F		" —— "	7:30-4:30	0-24	2 HW BLR CIR.

PUMP MOTORS

VOLTS	AMPS	PHASE	MODEL #	SERIAL #	MFG.	HOURS REQUIRED	HOURS PRESENT	FRAME	MOTOR#
208	15.8	3	178101—	5 HP	BELL & GOSSETT 1725	SAME AS ABOVE		184JM	1
115	6	1	M60062	1/3 HP	" —— " 1725	" —— "		—	2

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO. ____ OF ____
CALCULATED BY: JW
CHECKED BY: ____
DATE: 2/12/92

BLDG.# 184
EC0 15

LIGHTING

ROOM #	# OF FIXTURES	LAMPS/ FIXTURE	WATTS/ BULB	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCC. SENSOR	NO. OF SWITCHES	UNOCC LIGHTS ON
TOTAL BASEMENT	100	2	34	F	ON	N	N	20	N
1	2	4	34	F	ON	Y	N	1	N
2	3	4			ON	Y	ON	1	Y
3	4	4			ON	Y	N	2	Y
4	4	4			ON	Y	N	1	N
5	2	4			ON	Y	N	1	N
6	2	4			OFF	Y	Y	1	N
7	10	4			ON	Y	N	2	Y
8	4	4			OFF	Y	N	1	N
9	1	4			OFF	Y	Y	1	N
10	24	4			ON	Y	N	4	N
11	12	4			ON	Y	N	3	N
12	3/1	4/1	34/200	F/I	ON	Y	N	3	N
13	3	1	200	I	ON	Y	N	3	N
14	3	4	34	F	ON	Y	N	1	N
15	2	4			ON	Y	Y	1	Y
16	2	4			ON	Y	N	1	N
17	3	4			ON	Y	Y	1	N

OF EXIT SIGNS – ____

COMMENTS: FROM LIGHTING PLANS & SURVEY

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO. ____ OF ____
CALCULATED BY: JW
CHECKED BY: ____
DATE: 2/12/92

BLDG.# 184
EC0 15

LIGHTING

ROOM #	# OF FIXTURES	LAMPS/ FIXTURE	WATTS/ BULB	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCC. SENSOR	NO. OF SWITCHES	UNOCC LIGHTS ON
18	2	4	34	F	ON	Y	Y	1	Y
19	3	4	34	F	ON	Y	Y	1	N
20	3	4			ON	Y	N	1	N
21	2	4			ON	Y	Y	1	Y
22	3/1	~~4~~/1	34/200	F/I	ON	Y	N	3	N
23	3	1	200	I	OFF	Y	N	3	N
24	36	4	34	F	ON	Y	N	4	N
25	15	4			ON	Y	N	3	N
26	14	4			ON	Y	N	2	N
27	3/1	4/1	34/200	F/I	ON	Y	N	3	Y
~~28~~	~~2~~			~~F~~	ON	Y			
2nd FLOOR									
A	40	34		F	ON	Y	N		
B	40	34			ON	Y			
C	26	34			ON	Y			
D	3	200		I	OFF	Y			
E	42	34		F	ON	Y			
ATTIC	30	100		I	ON	Y			

OF EXIT SIGNS – ____

COMMENTS: FROM LIGHTING PLANS & SURVEY

JOB Ft. McPherson/Ft. Gillem Energy Study
PROJ.# EMC # 3105.000
SHEET NO. ______ OF ______
CALCULATED BY: JW
CHECKED BY: ______
DATE: 12/19/91

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 184 BLDG NAME: ______ JOB: 3105.000
PRIMARY FUNCTION: ______ GROSS SQ FT ______ NO OF FLRS ______
BUILDING MANAGER NAME: ______
PHONE: ______ OFFICE NO. ______
SPECIAL AREAS: COMPUTER FACILITY [ ] - ZONE NO'S. ______
AUDITORIUM [ ] - ZONE NO'S. ______
LABORATORIES [ ] - ZONE NO'S. ______
CAFETERIA [ ] - ZONE NO'S. ______
OTHER [ ] ______ - ZONE NO'S. ______

ZONE NO. ______ FUNCTION: ______ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: ______ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F 0700 TO 1630, SAT CLOSED, SUN CLOSED
PRESENT TEMP: WINTER OCC ______ °F UNOCC ______ °F, SUMMER OCC ______ °F UNOCC ______ °F
REQUIRE TEMP: WINTER OCC ______ °F UNOCC ______ °F, SUMMER OCC ______ °F UNOCC ______ °F

REMARKS: ______

ZONE NO. ______ FUNCTION: ______ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: ______ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F ______ TO ______, SAT ______ TO ______, SUN ______ TO ______
PRESENT TEMP: WINTER OCC ______ °F UNOCC ______ °F, SUMMER OCC ______ °F UNOCC ______ °F
REQUIRE TEMP: WINTER OCC ______ °F UNOCC ______ °F, SUMMER OCC ______ °F UNOCC ______ °F

REMARKS: ______

ZONE NO. ______ FUNCTION: ______ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: ______ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F ______ TO ______, SAT ______ TO ______, SUN ______ TO ______
PRESENT TEMP: WINTER OCC ______ °F UNOCC ______ °F, SUMMER OCC ______ °F UNOCC ______ °F
REQUIRE TEMP: WINTER OCC ______ °F UNOCC ______ °F, SUMMER OCC ______ °F UNOCC ______ °F

REMARKS: ______

ZONE NO. ______ FUNCTION: ______ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: ______ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F ______ TO ______, SAT ______ TO ______, SUN ______ TO ______
PRESENT TEMP: WINTER OCC ______ °F UNOCC ______ °F, SUMMER OCC ______ °F UNOCC ______ °F
REQUIRE TEMP: WINTER OCC ______ °F UNOCC ______ °F, SUMMER OCC ______ °F UNOCC ______ °F

REMARKS: ______

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB _____

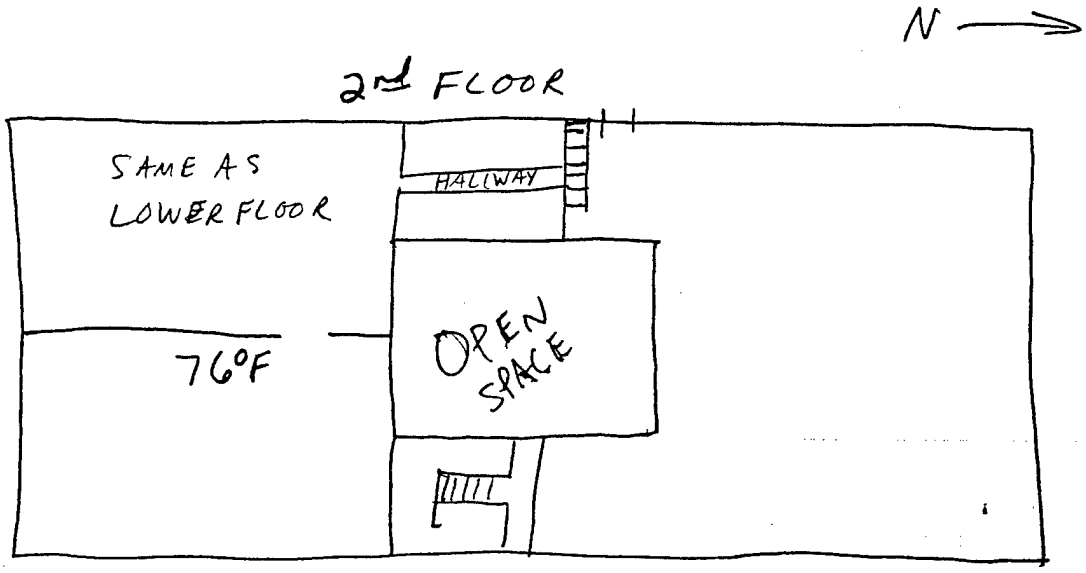
SHEET NO. _____ OF _____

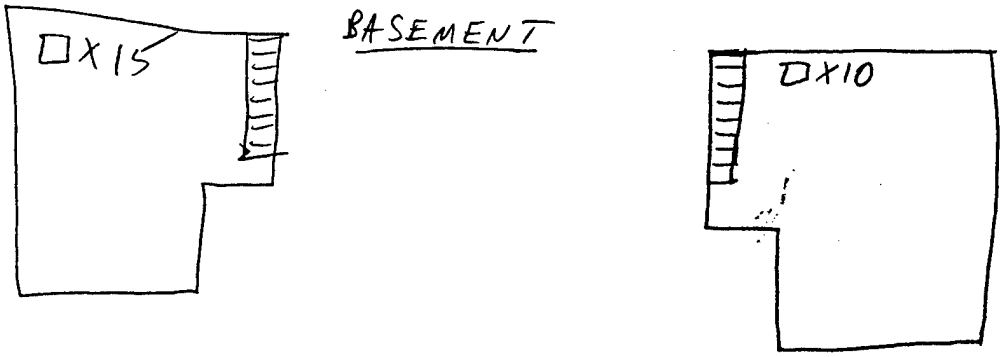
CALCULATED BY JW DATE _____

CHECKED BY _____ DATE _____

SCALE _____

BLDG 184





E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB _____

SHEET NO. _____ OF _____

CALCULATED BY JW DATE _____

CHECKED BY _____ DATE _____

SCALE _____

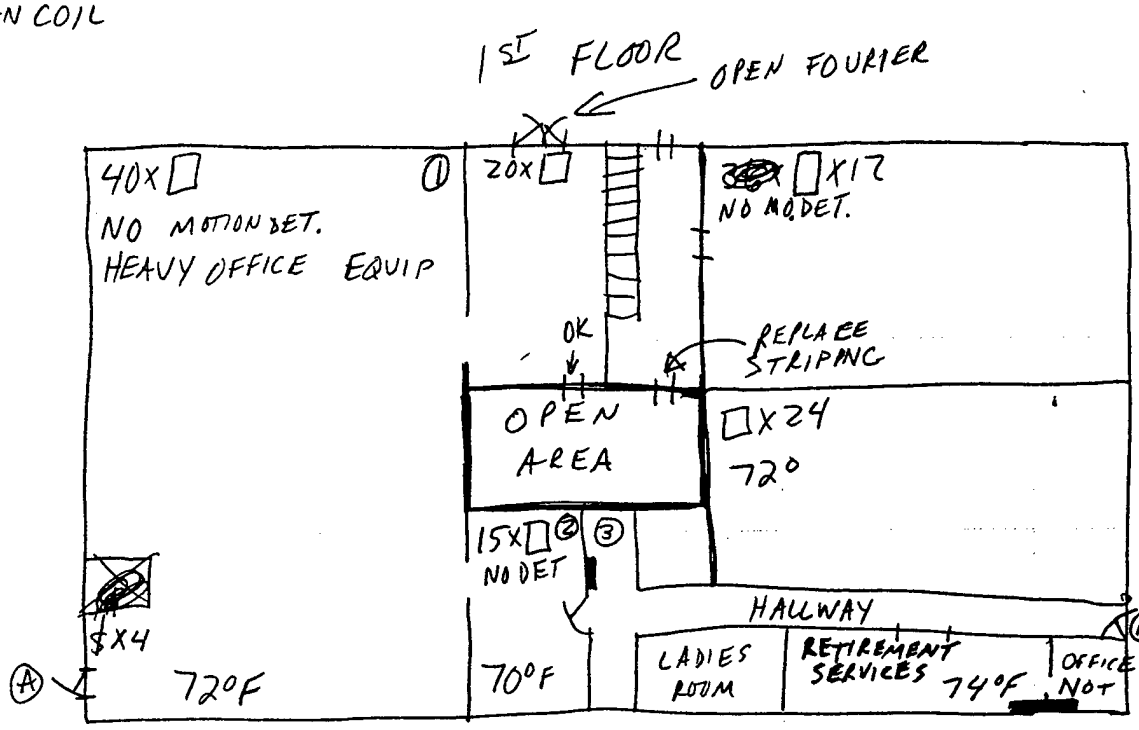
BLDG 184

LIGHTS

□ 4-34WF

▮ FAN COIL

N →



① APPLIANCE HEAT 1 COMPUTER & PRINTER / EVERY 15ft²

② THIS ROOM STAYS 70° DUE TO A COMPUTER ROOM AIR CONDITIONER

③ HALL WAY – BOTH EAST & WEST DOORS HAVE VERY LARGE AIR GAPS

Ⓐ NORTH & SOUTH EXIT DOORS HAVE A STAIRWELL. (OPEN AREA)

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

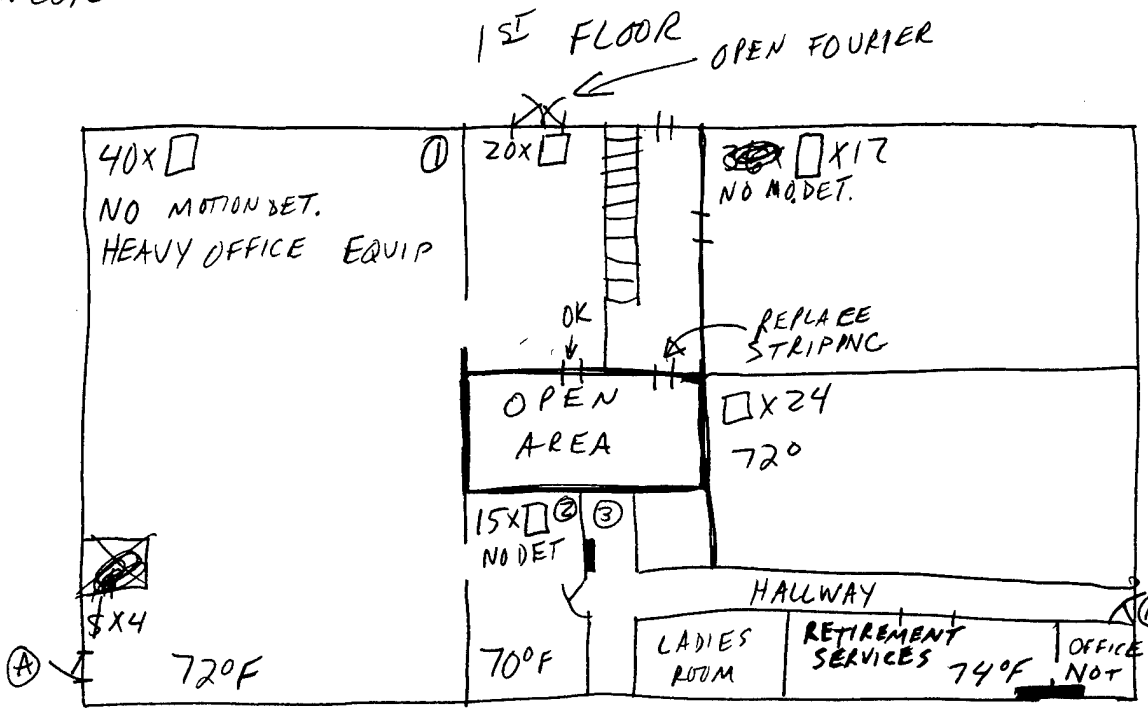
JOB _____
SHEET NO. _____ OF _____
CALCULATED BY JW DATE _____
CHECKED BY _____ DATE _____
SCALE _____

BLDG 184

LIGHTS

□ 4-34WF
■ FAN COIL

N →



① APPLIANCE HEAT 1 COMPUTER & PRINTER / EVERY 15ft²

② THIS ROOM STAYS 70° DUE TO A COMPUTER ROOM AIR CONDITIONER

③ HALL WAY – BOTH EAST & WEST DOORS HAVE VERY LARGE AIR GAPS

Ⓐ NORTH & SOUTH EXIT DOORS HAVE A STAIRWELL. (OPEN AREA)

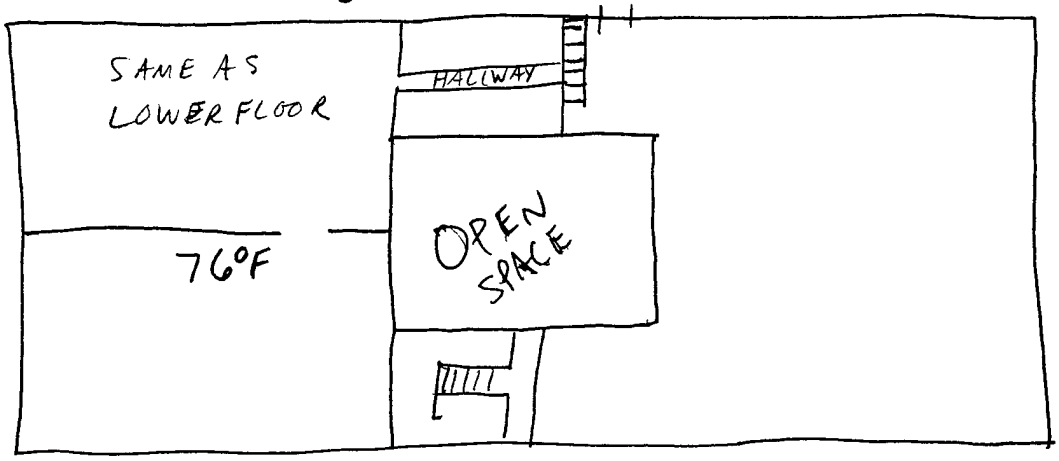
E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____
SHEET NO. _____ OF _____
CALCULATED BY JW DATE _____
CHECKED BY _____ DATE _____
SCALE _____

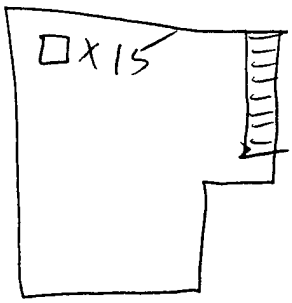
BLDG 184

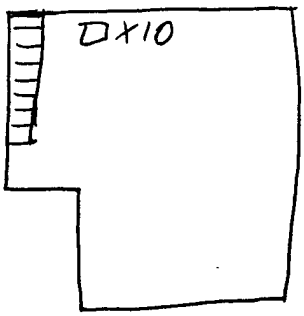
N →

2nd FLOOR



BASEMENT

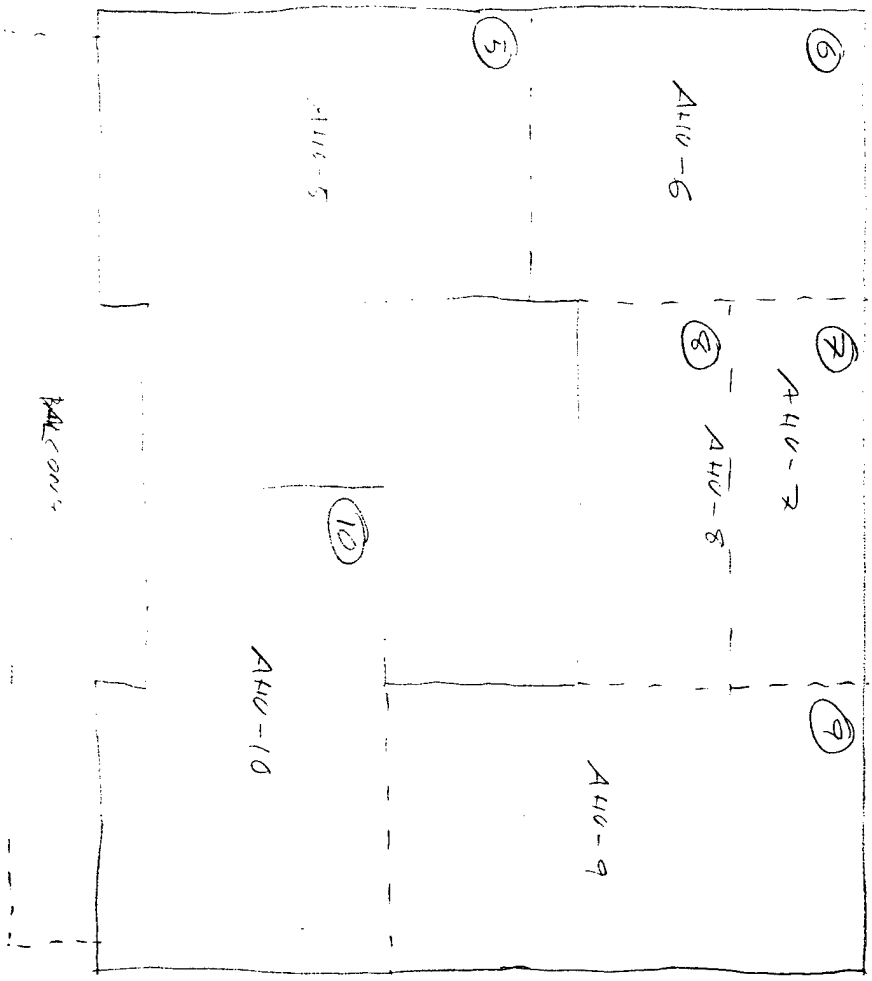




E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB 5105 - 00
SHEET NO. _____ OF _____
CALCULATED BY DS DATE 2/6/92
CHECKED BY _____ DATE _____
SCALE BC DS - 184

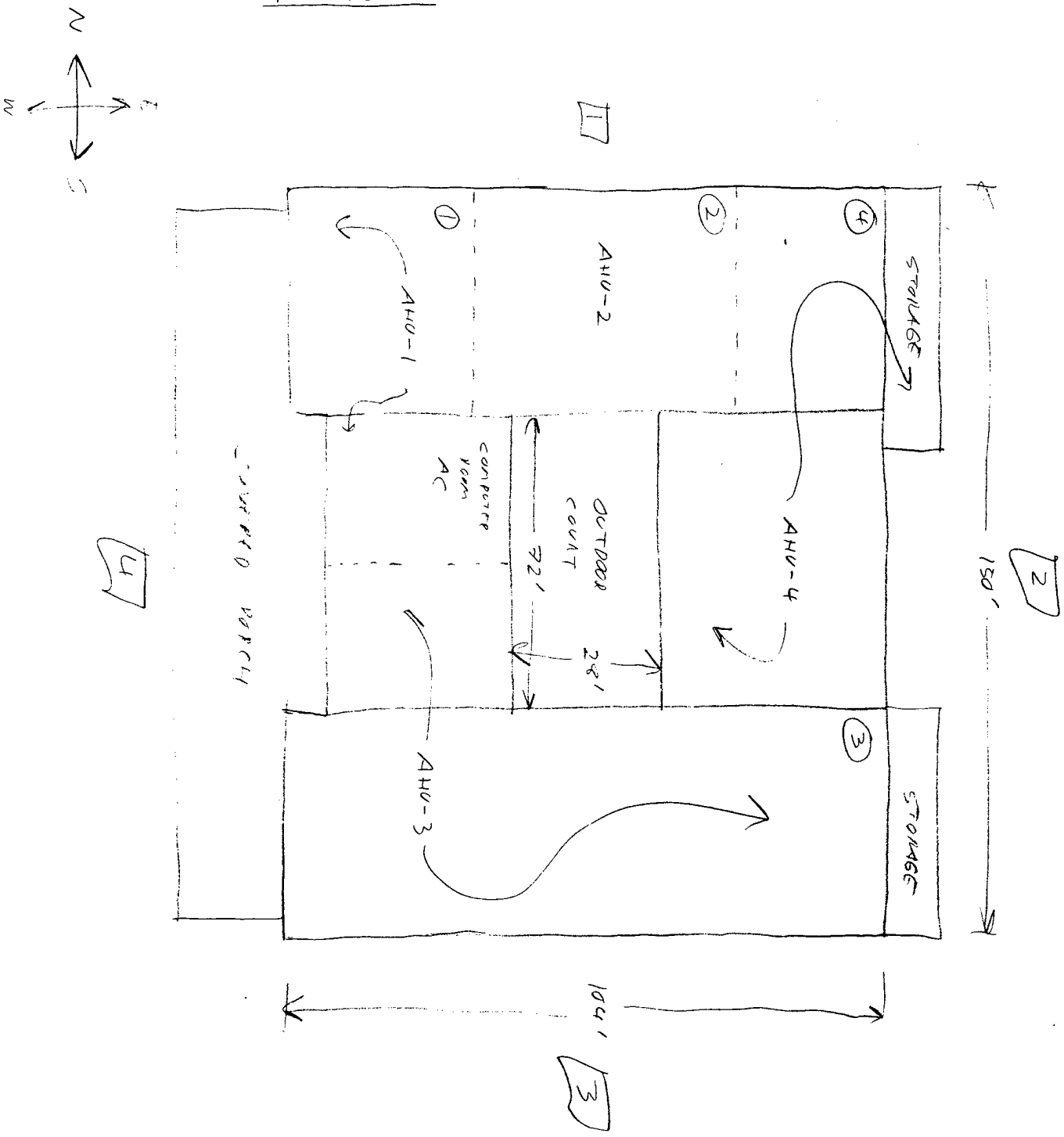
2nd FLOOR



E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB 3105.300
SHEET NO. _____ OF _____
CALCULATED BY DS DATE 2/6/92
CHECKED BY _____ DATE _____
SCALE BCDG - 184

1st FLOOR



E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB 3105.000

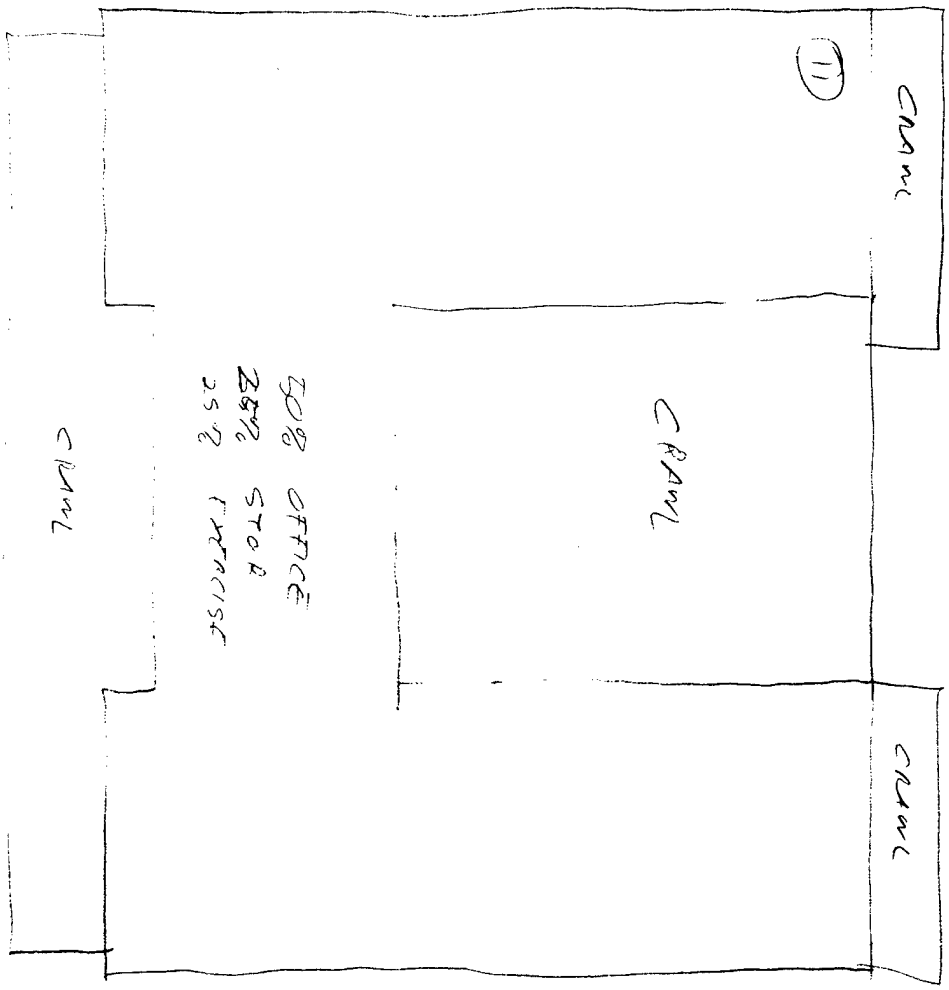
SHEET NO. _____ OF _____

CALCULATED BY DS DATE 2/6/92

CHECKED BY _____ DATE _____

SCALE BC DS-18

BASEMAP



E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB _____

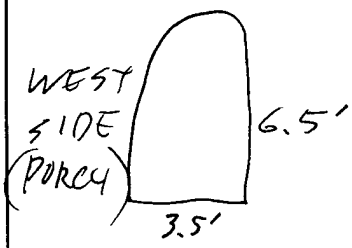
SHEET NO. _____ OF _____

CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____

SCALE _____

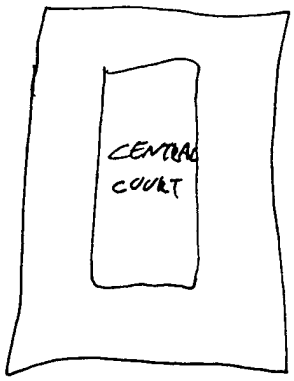
WINDOWS

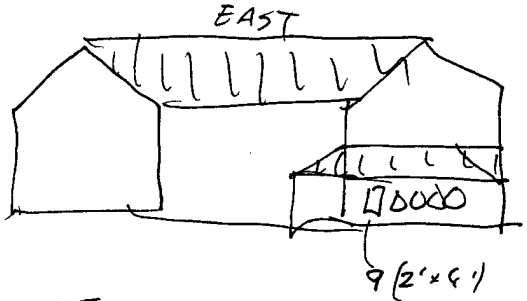


FLOOR TO FLOOR 12'

FEW PC2

SOME WOOD ACR





GET PICTURES

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO. ____ OF ____
CALCULATED BY: JW
CHECKED BY: ____
DATE: 12/18/91

BLDG.# 181
ECO 3

WEATHERSTRIPING AND CAULKING

DOOR\ WINDOW	CONDITION OF W.S./CAULK	INFILTRATION	ORIENTATION	DIMENSIONS (INCH)	#
FRONT 2 DOORS ① D	2 METAL DOOR UNITS	VERY HIGH	N	60 x 83	2
② ~~D~~	NONE	HIGH	E	34 x 80	1

COMMENTS: ① ½" AIR GAPS BETWEEN AND UNDER MAIN FRONT DOORS. WEATHER STRIPPING NEEDS REPLACING. THIS AREA WOULD SEEM TO BE A GOOD PLACE FOR AN AIR LOCK (FOURIER.)

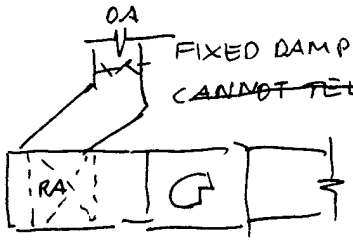
② THIS DOOR LEADS TO EAST SIDE PATIO AREA. IT HAS ½" AIR GAP AT BOTTOM.

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB
SHEET NO. OF
CALCULATED BY RC DATE 12-19-91
CHECKED BY DATE
SCALE

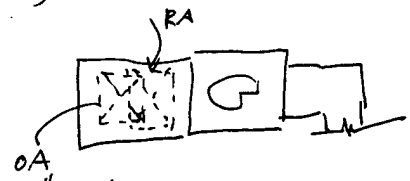
ECO-6 BLDG 184

AHU-1



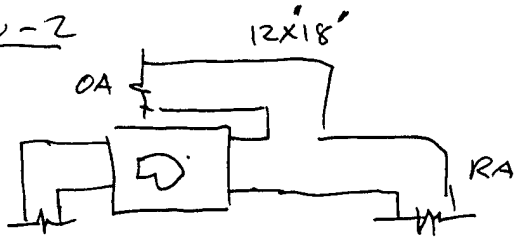
FIXED DAMPER 15"X15" WELL INSL DUCT
~~CANNOT TELL~~

AHU-5

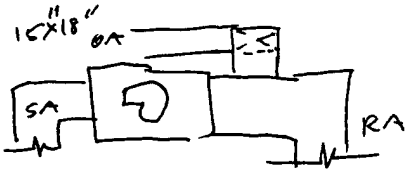


25"X15" WELL INSL 1½ FG W/I= R.3.8.

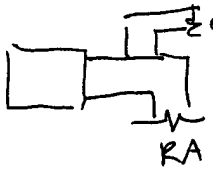
AHU-2



AHU-6



AHU-8 MARATHON . KVK145TTDR79 (SAME AS 9 OR 10)



AHU-4 CENTURY S-331262-03 FM N145T 3Ø 200V 1745 2HP 6.6A

OA 18"X16"

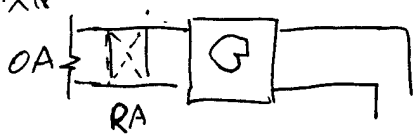
E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB
SHEET NO. OF
CALCULATED BY KC DATE 12-19-91
CHECKED BY DATE
SCALE

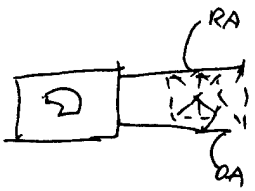
AHU-3

NEED INSL. REPAIR @ OA DAMPER, DAMPER REMOVED?

20"X18"



AHU-9 MARATHON KVK 145TTDR7926ACW
3ϕ 200V 1745; 1.5HP 5.5A
78.5%.



24"X18"

AHU-10

MARATHON KVK 145TTDR7926ACW
3ϕ 200V 1745 RPM 1.5HP 5.5A
SAME DUCT SIZE AS 9 78.5%.

AHU-7

OA DUCT 18"X18" MARATHON
SAME AS 10

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB _____

SHEET NO. _____ OF _____

CALCULATED BY KC DATE 12-19-91

CHECKED BY _____ DATE _____

SCALE _____

ANU-5 BALDOR CAT 3157T SPEC 35801-754
FM. 145T 2HP 208V 6.8A 3Ø 1725
78.5% eff. 2NP FL. N.W.

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____
SHEET NO. _____ OF _____
CALCULATED BY KC DATE 12-19-91
CHECKED BY _____ DATE _____
SCALE _____

BLDG 184

BELL & GOSSETT 5 HP

DUAL TEMP PUMP SEE BARBER COLMAN CONTROL DWG.

ACTUATOR FOR V-1 IS NOT CONNECTED. CLINCAGE)

" — " V-2 " _____ "

EQUIPMENT IN THIS MECH

1 - DTW P

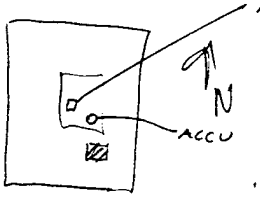
1 - HW BOILER

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____
SHEET NO. _____ OF _____
CALCULATED BY KC DATE 12-19-91
CHECKED BY _____ DATE _____
SCALE _____

BLDG 164

LISKEY-AIR
SERVE COMPUTER ROOM
5 HP 21.4A 208V 3Ø



- PERIMETER RADIATION ON EXTERIOR ZONES
- 2 PIPE FAN COIL AT ENTRANCE
-

BUILDING 187

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: JW
CHECKED BY:
DATE: 12/18/91

BLDG.# 187
ECO 4

DOMESTIC HOT WATER

FAUCET LOCATION	WATER TEMPERATURE
WASHROOM (NE CORNER)	133°F
PROBLEMS:	

COMMENTS:

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

BLDG 187

JOB
SHEET NO. OF
CALCULATED BY JW DATE
CHECKED BY DATE
SCALE 12/18/91

SOUTHEAST CORNER HEATER (GAS BLOW-THROUGH)

JANITROL UNIT HEATER - GAS FIRED (NATURAL)

MODEL SIZE UCS100-55
S# 055960979
INPUT - 100,000 BTU/HR
OUTPUT - 80,000 BTU/HR

AIR HANDLER FOR OFFICE & BREAKROOM

NORDYNE
10.3 AMP
1 ϕ
140,000 BTU/HR INPUT
NAT. GAS
MANUFACTURERS #3175208806
MOD # MFYHX140A21

(HEATING ONLY SYSTEM)

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB _____

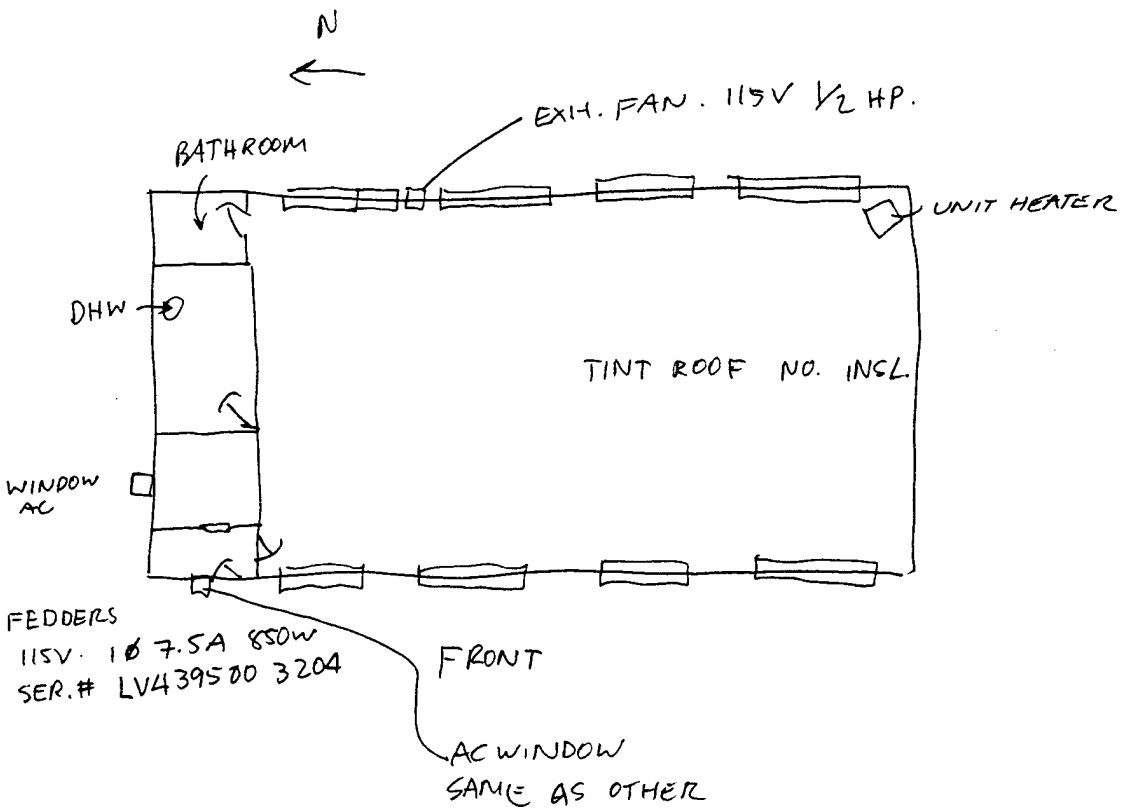
SHEET NO. _____ OF _____

CALCULATED BY K C DATE 12-18-91

CHECKED BY _____ DATE _____

SCALE _____

BLDG 187



BUILDING 200

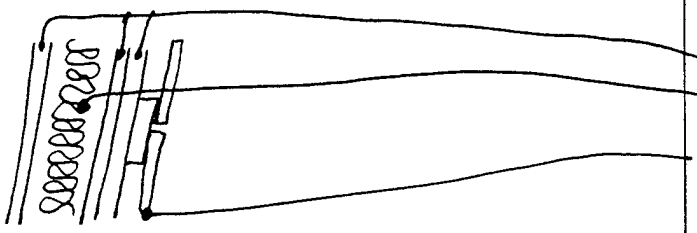
EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

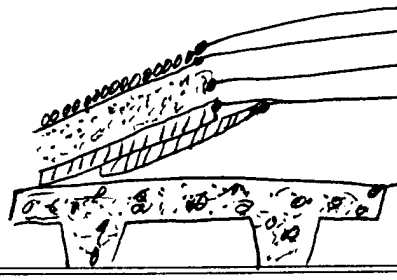
JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: JW
CHECKED BY:
DATE: 1/13/92

BLDG.# 200
ECO 1

WALL & ROOF INSULATION

AREAS IN SQ. FEET	NORTH	SOUTH	EAST	WEST
WALLS				
WINDOWS				
OVERHEAD DOORS				
PERSONNEL DOORS				

SKETCH WALL CROSS–SECTION	COMPONENTS
FROM PLATE A-28 	1. OUTSIDE AIR FILM 2. ● 3. GWB. WALL 4. R- 5. 6. WHITE OAK VENEER 7. INSIDE AIR FILM

SKETCH ROOF CROSS–SECTION	COMPONENTS
FROM PLATE A-43 	1. OUTSIDE AIR FILM 2. GRAVEL 3. BUILT UP ROOF 4. INSULATING C'CRETE 5. INSULATING BOARD 6. CONC. ROOF DECK STRUCTURE 7. INSIDE AIR FILM

PERSONNEL DOOR TYPE _____	BASEMENT [ ]
OVERHEAD DOOR TYPE _____	SLAB [ ]
	CRAWL SPACE [ ]

COMMENTS: ROOF AVERAGES U=.05, R≅20

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

BLDG 200

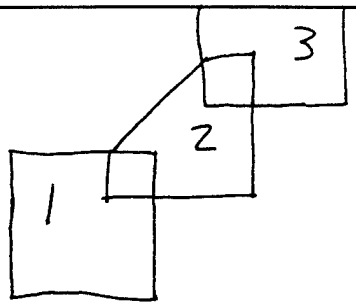
JOB _____

SHEET NO. _____ OF _____

CALCULATED BY JW DATE 1/13/92

CHECKED BY _____ DATE _____

SCALE _____



APPROX SQ. FOOT

LOCATE ANYTHING MISSING

SECTION	FLOOR	SQ.FT. (APPROX)
2	BASEMENT	15,516 ft²
1	BASEMENT	19,044 ft²
3	BASEMENT	19,044 ft²

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____
SHEET NO. _____ OF _____
CALCULATED BY _____ DATE _____
CHECKED BY _____ DATE _____
SCALE _____

BLDG 200

> CHECK CONTROL ON HW BOILER, HW SETPNT
> HOW MUCH IS HW BOILER OPERATING
> TAKE TEMP'S IN & OUT @ CHILLERS, BOILERS & HEAT PUMP
>
> TRY & GET IDEA IF AHU'S & PUMPS VARY W/ PRESSURE
> MEASURE OA CFM DOES MIN & MAX CFM WORK, HOW ARE THEY CONTROLLING?
> DISCHARGE TEMPS OFF OF COILS
> CHW SETPOINTS
> CW SETPOINTS
> S.O.P. ON CHILLERS
> FLOW METERS ON ~~CHILLERS~~? CHW & HW?
> BLDG KW? TOU METERS?
> LOG KW HOURLY (30 MINUTE) BLDG
> LOG KW " (") CHILLERS
>

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____

SHEET NO. _____ OF _____

CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____

SCALE _____

multiple domestic hot water heaters

MCC

- 13+16 100% OA

Additional ECO's Bldg 200

- Chiller optomization
- Run most efficient chiller

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO. OF
CALCULATED BY: JW 1/21/92
CHECKED BY:
DATE:

BLDG.# 200
ECO 4

DOMESTIC HOT WATER

FAUCET LOCATION	WATER TEMPERATURE
Basement (south) Men's Room	110°F
2nd Floor West Ctrl. Rm. Men's	113°F
1st Flr. N. Janitors	140°F
Basement N.	135°F
2nd Flr. N.	102°F
3rd Flr. N. Rm 313	104°F
3rd Flr. W. Rm 321	107.7°F
PROBLEMS:	

COMMENTS:

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB _____

SHEET NO. _____ OF _____

CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____

SCALE _____

BLDG 200

BALLAST

TYPICAL —

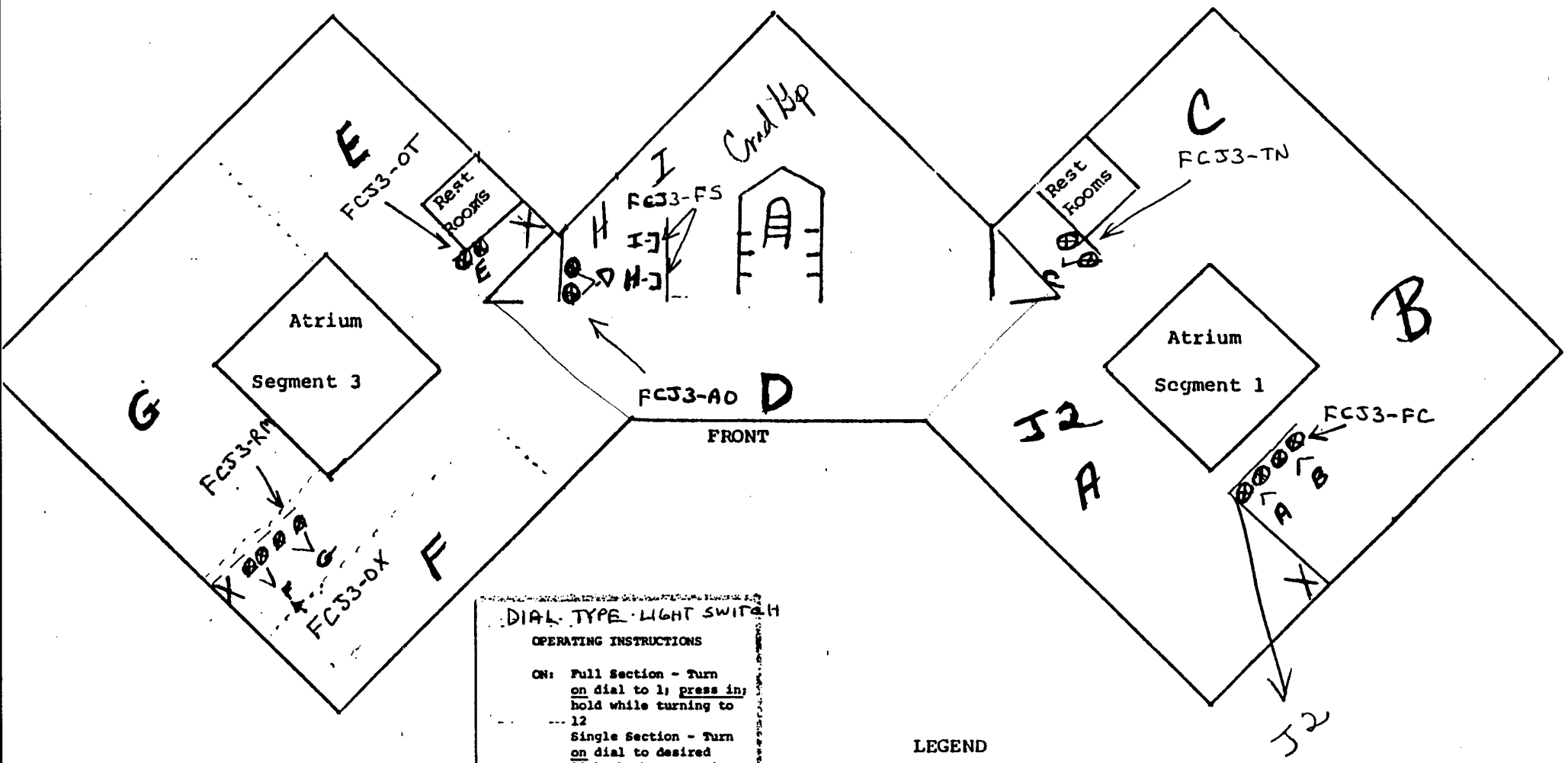
ADVANCE

CAT NO. VQM 2540-2-TP

277 VOLT

.35 AMPS Standard Lamps

.31 AMPS energy saving lamps



DIAL TYPE LIGHT SWITCH

OPERATING INSTRUCTIONS

ON: Full Section - Turn on dial to 1; press in; hold while turning to 12
Single Section - Turn on dial to desired light bank; press in

OFF: Follow directions as above using OFF dial

Bank 1 - Director
Bank 1 - Director
Bank 2 - FA
Bank 2 - FA/MRD
Bank 3 - PB/MRD
Bank 4 - PB
Bank 5 - PB
Bank 6 - FA
Bank 7 - MRD
Bank 8 -
Bank 9 -
Bank 10 -

SAMPLE

LEGEND

- ⊗ - Dial type light switch
- ⊔ - Flip type light switch
- ------ - Partition
- Door

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____
SHEET NO. _____ OF _____
CALCULATED BY _____ DATE _____
CHECKED BY _____ DATE _____
SCALE _____

BC06-200

VAV STATS AT 74°F INTERIOR
EXTERIOR HAS HEATING COILS ALSO

AHU 14615 REG AIR HANDLERS
13616 FRESH AIR

40 w TASK LIGHT 1 LAMP 2 PER CUBICAL

VAV (AS EXPLAINED BY DEH)
MAX COOL SA ONLY
SA + PLENUM
FAN + PLENUM
FAN + HEATING COIL } PERIMETER ONLY

T/STAT IS ASPIRATOR TYPE PNEUMATIC

VAV

TEMPMASTER CORP.
1222 OZARK ST.
N. KANSAS CITY, MO 64116
816/421-0723

FAN TERMS TYPES HFB, HFBE, HFBW

INTER TERMS AV, S, HSE, HSW, CO

BLDG #200

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

W #8 CUBICALS

JOB

SHEET NO. OF

CALCULATED BY JW DATE 1/30/92

CHECKED BY DATE

SCALE

BASEMENT MEZZANIE	40
1ST FLOOR SEG. 1	120
1ST FLOOR SEG. 2	110
1ST FLOOR SEG. 3	275
2ND FLOOR SEG. 1	200
2ND FLOOR SEG 2	175
2ND FLOOR SEG 3	260

505

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB _____

SHEET NO. _____ OF _____

CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____

SCALE _____

Bldg 800

Section		Cubicle count
BSMT	SEG 1	110
BSMT	SEG 2	103
BSMT	SEG 3	170
3rd	SEG 1	195
3rd	seg 2	104
3rd	Seg 3	244

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____

SHEET NO. _____ OF _____

CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____

SCALE _____

CH-1 Chiller

YORK

Chiller ~~Model #~~ YT L3 L3 E3 CW A 0.065 kW/ton

Compressor Model YTH126

Serial Y

Control 115/1Φ/60 15 A

oil pump 3/4 HP 460/3/60 1.69 FLA

oil heater 115/1/60 8 FLA

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY:
CHECKED BY:
DATE:

BLDG.# 200
ECO 5

MOTORS

MOTOR #	HWP-1 +2	HP	3	PH	3	RPM	1740
MODEL #	6-350324-11	VOLTS	200-230/460	AMPS	9.2-8.6/4.3		
SERIAL #		PRESENT HR.		TO			
MFG	Century	REQUIRED HR.		TO			
FRAME	S182JM	EFF.	—				
DESCRIPTION		COMMENTS	#2 operating inlet 10 psig outlet 27 psig				

MOTOR #	1,2,3	HP	15	PH	3	RPM	3440
MODEL #	6-350390-42	VOLTS	200-230/460	AMPS	42-38/19		
SERIAL #		PRESENT HR.		TO			
MFG	Century	REQUIRED HR.		TO			
FRAME	S215JM	EFF.					
DESCRIPTION	Domestic Cold water	COMMENTS	inlet 40 psi outlet 50 psig > for all 3 pumps in parallel #1 operational				

MOTOR #	HWP-~~2~~4	HP	5	PH	3	RPM	3480
MODEL #	6-350381-10	VOLTS	200-230/460	AMPS	15-13/6.5		
SERIAL #		PRESENT HR.		TO			
MFG	Century	REQUIRED HR.		TO			
FRAME	S182JM	EFF.	—				
DESCRIPTION		COMMENTS	in parallel w/ HWP-3 operating				

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY:
CHECKED BY:
DATE:

BLDG.# 200
ECO 5

MOTORS

MOTOR # HWP-3 HP 1.5 PH 3 RPM 1745
MODEL # 8-350320-01 VOLTS 200-230/460 AMPS 5.0-5.2/2.6
SERIAL # PRESENT HR. TO
MFG Century REQUIRED HR. TO
FRAME ? JM EFF.
DESCRIPTION COMMENTS not running

MOTOR # HWP-5 HP 5 PH 3 RPM 3480
MODEL # 6-350381-10 VOLTS 200-230/460 AMPS 15-13/6.5
SERIAL # PRESENT HR. TO
MFG Century REQUIRED HR. TO
FRAME 5182 JM EFF.
DESCRIPTION COMMENTS operating / ~~in parallel~~

MOTOR # HWP-6 HP 3 PH 3 RPM 1730
MODEL # 6-350324-10 VOLTS 200-230/460 AMPS 10-9/4.5
SERIAL # PRESENT HR. TO
MFG Century REQUIRED HR. TO
FRAME 5182JM EFF.
DESCRIPTION COMMENTS off

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY:
CHECKED BY:
DATE:

BLDG.# 200
ECO 5

MOTORS

MOTOR # HWP-7 HP 5 PH 3 RPM 3480
MODEL # 6-350381-10 VOLTS 200-230/460 AMPS 15-13/6.5
SERIAL # PRESENT HR. TO
MFG Century REQUIRED HR. TO
FRAME 5182JM EFF. —
DESCRIPTION COMMENTS operating

MOTOR # ~~8-35~~ HWP 8 HP 3 PH 3 RPM 3450
MODEL # 8-350378-01 VOLTS 200-230/460 AMPS 9-8.6/4.3
SERIAL # PRESENT HR. TO
MFG Century REQUIRED HR. TO
FRAME N145JM EFF. —
DESCRIPTION COMMENTS off

MOTOR # HWP-9 HP 7.5 PH 3 RPM 3460
MODEL # 6-350384-45 VOLTS 200-230/460 AMPS 21-18.6/9.3
SERIAL # PRESENT HR. TO
MFG Century REQUIRED HR. TO
FRAME 5184JM EFF. —
DESCRIPTION COMMENTS operating / same Room as 6

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY:
CHECKED BY:
DATE:

BLDG.# 200
ECO 5

MOTORS

MOTOR # HWP-10 HP 5 PH 3 RPM 3480
MODEL # 6-350381-10 VOLTS 200-230/460 AMPS 15-13/6.5
SERIAL # PRESENT HR. TO
MFG Century REQUIRED HR. TO
FRAME S182JM EFF.
DESCRIPTION COMMENTS off / same Runs #9

MOTOR # HP PH RPM
MODEL # VOLTS AMPS
SERIAL # PRESENT HR. TO
MFG REQUIRED HR. TO
FRAME EFF.
DESCRIPTION COMMENTS

MOTOR # HP PH RPM
MODEL # VOLTS AMPS
SERIAL # PRESENT HR. TO
MFG REQUIRED HR. TO
FRAME EFF.
DESCRIPTION COMMENTS

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY:
CHECKED BY:
DATE:

BLDG.# 760
ECO 5

MOTORS

MOTOR # CP-4 HP 7.5 PH 3 RPM 1740
MODEL # 6-350330-01 VOLTS 200-230/460 AMPS 22-21/10.5
SERIAL # PRESENT HR. TO
MFG Century REQUIRED HR. TO
FRAME 5213 JM EFF. —
DESCRIPTION COMMENTS

MOTOR # HP PH RPM
MODEL # VOLTS AMPS
SERIAL # PRESENT HR. TO
MFG REQUIRED HR. TO
FRAME EFF.
DESCRIPTION COMMENTS

MOTOR # HP PH RPM
MODEL # VOLTS AMPS
SERIAL # PRESENT HR. TO
MFG REQUIRED HR. TO
FRAME EFF.
DESCRIPTION COMMENTS

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY:
CHECKED BY:
DATE:

BLDG.# 200
ECO 5

10+ HP MOTORS

MEASURED

MOTOR# 1		PHASE A	PHASE B	PHASE C
DESCRIPTION AHU #1 SUPPLY	VOLTS	472	470	
MFG West.	AMPS	17.8	18.2	
MODEL # TBEC	KW	6.3	38.3 Hz	
SERIAL # PEJH008	KVAR	8.9		
FRAME 286T	KVA	10.9		
HP 30 RPM	PF	58.7		
VOLT 208	% MOTOR SPEED	%		
AMPS 25	PRESENT	TO		
EFF.	REQ HR.	TO		
COMMENTS				

MOTOR# 2		PHASE A	PHASE B	PHASE C
DESCRIPTION AHU #1 RETURN	VOLTS	469	473	
MFG G.E.	AMPS	7.4	7.6	
MODEL # 5K215BC205	KW	2.0		
SERIAL # PE JH013 ("6-pack")	KVAR	3.40	33.8 Hz	
FRAME 215T	KVA	3.9		
HP 10 RPM	PF	50		
VOLT 230	% MOTOR SPEED	%		
AMPS —	PRESENT	TO		
EFF.	REQ HR.	TO		
COMMENTS				

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY:
CHECKED BY:
DATE:

BLDG.# 200
ECO 5

10+ HP MOTORS

MEASURED

MOTOR# 3		PHASE A	PHASE B	PHASE C
DESCRIPTION AHU # 2 SUPPLY	VOLTS	225	225	
MFG Reliance	AMPS	14.4	14.3	
MODEL # P28G0311M-C10-UM/MW2836	KW	2.5		
SERIAL #	KVAR	2.6		
FRAME 284T	KVA	3.6		
HP 25 RPM 1765	PF	69		
VOLT 230/460	% MOTOR SPEED		%	
AMPS 64/32	PRESENT		TO	
EFF. 97.5	REQ HR.		TO	
COMMENTS				

MOTOR# 4		PHASE A	PHASE B	PHASE C
DESCRIPTION AHU # 2 RETURN	VOLTS	470	473	
MFG General Electric	AMPS	14	13.8	
MODEL # 5K 215 BC 205	KW	7.2		
SERIAL #	KVAR	4.8		
FRAME 215T	KVA	8.8		
HP 10 RPM 1740	PF	82.8		
VOLT 230/460	% MOTOR SPEED		%	
AMPS 24/12	PRESENT		TO	
EFF. 85.5	REQ HR.		TO	
COMMENTS				

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: CEL
CHECKED BY:
DATE: 1/21/92

BLDG.# 200
ECO 5

10+ HP MOTORS

MEASURED

MOTOR# 5		PHASE A	PHASE B	PHASE C
DESCRIPTION AHU #3 SUPPLY	VOLTS	468	471	
MFG Westinghouse	AMPS	16	20	
MODEL # TBFC	KW	5.5		
SERIAL # PE KA003	KVAR	9.6		
FRAME 286 T	KVA	11.2		
HP 30 RPM	PF	48		
VOLT 208	% MOTOR SPEED	35 ~~HZ~~		
AMPS 30	PRESENT	TO		
EFF.	REQ HR.	TO		
COMMENTS MAX OA ACTUATOR BROKEN				

MOTOR# 6		PHASE A	PHASE B	PHASE C
DESCRIPTION AHU #3 RETURN	VOLTS	468	471	
MFG G.E.	AMPS	8.8	9.1	
MODEL # 5K254B1205D2	KW	2.6		
SERIAL # PE AK012A	KVAR	4.4		
FRAME 254T	KVA	5.2		
HP 15 RPM	PF	51.8		
VOLT 230	% MOTOR SPEED	33.50 HZ		
AMPS 15	PRESENT	TO		
EFF.	REQ HR.	TO		
COMMENTS				

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: JW
CHECKED BY:
DATE: 1/21/91

BLDG.# 200
ECO 5

10+ HP MOTORS

MEASURED

MOTOR# 7		PHASE A	PHASE B	PHASE C
DESCRIPTION AHU #4 SUPPLY	VOLTS	460	472	
MFG West.	AMPS	17	16.4	
MODEL # TBFC	KW	4.3		
SERIAL # PE KB0051H	KVAR	8.5		
FRAME 286T	KVA	9.4	32.3Hz	
HP 30 RPM	PF	46		
VOLT 208	% MOTOR SPEED		%	
AMPS 30	PRESENT		TO	
EFF.	REQ HR.		TO	
COMMENTS				

MOTOR# 8		PHASE A	PHASE B	PHASE C
DESCRIPTION AHU #4 RETURN	VOLTS	468	470	
MFG G.E.	AMPS	12	12	
MODEL # 5K215BC205	KW	3.8		
SERIAL # PEJ14001A ("6-pk.")	KVAR	5.2	44.4Hz	
FRAME 215T	KVA	6.4		
HP 10 RPM	PF	57		
VOLT 230	% MOTOR SPEED		%	
AMPS 10A.	PRESENT		TO	
EFF.	REQ HR.		TO	
COMMENTS				

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: CEL
CHECKED BY:
DATE: 1/21/92

BLDG.# 200
ECO 5

10+ HP MOTORS

MEASURED

MOTOR# 9		PHASE A	PHASE B	PHASE C
DESCRIPTION AHU #5 SUPPLY	VOLTS	471	468	
MFG Westing.	AMPS	22.6	23.2	
MODEL # TBFC	KW	7.6		
SERIAL # PEJH006	KVAR	12.3		
FRAME 324T	KVA	14.4		
HP 40 RPM	PF	51.7		
VOLT 230	% MOTOR SPEED	34.7 %		
AMPS 30	PRESENT	TO		
EFF.	REQ HR.	TO		
COMMENTS				

MOTOR# 10		PHASE A	PHASE B	PHASE C
DESCRIPTION AHU #5 RETURN	VOLTS	466	470	
MFG G.E.	AMPS	10	10	
MODEL # 5K254BC206	KW	2.8		
SERIAL # PE KA005A	KVAR	4.9		
FRAME 254T	KVA	5.9		
HP 15 RPM	PF	50		
VOLT 230	% MOTOR SPEED	36 %		
AMPS 15	PRESENT	TO		
EFF.	REQ HR.	TO		
COMMENTS				

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: CEL
CHECKED BY:
DATE: 1/21/92

BLDG.# 200
ECO 5

10+ HP MOTORS

MEASURED

MOTOR# 11

DESCRIPTION: AHU # 6 Supply
MFG: Westinghouse
MODEL #: TBFC
SERIAL #: PE KB007m
FRAME: 324 T
HP: 40 RPM:
VOLT: 230
AMPS: 40
EFF.:
COMMENTS:

	PHASE A	PHASE B	PHASE C
VOLTS	469	472	
AMPS	19.8	19.3	
KW	14.8		
KVAR	2.4		
KVA	15.1		
PF	98.7		

% MOTOR SPEED: %
PRESENT: TO
REQ HR.: TO

MOTOR# 12

DESCRIPTION: AHU # 6 RETURN
MFG: G.E.
MODEL #: 5K254BC805
SERIAL #: PE KA009A
FRAME: 254 T
HP: 15 RPM:
VOLT: 230
AMPS: 15
EFF.:
COMMENTS:

	PHASE A	PHASE B	PHASE C
VOLTS	468	470	
AMPS	11.5	13.1	
KW	1.8		
KVAR	2.3		
KVA	3.0		
PF	64.3		

% MOTOR SPEED: 45.5 %
PRESENT: TO
REQ HR.: TO

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY:
CHECKED BY:
DATE:

BLDG.# 200
ECO 5

10+ HP MOTORS

MEASURED

MOTOR# 13
DESCRIPTION AHU #7 SUPPLY
MFG West.
MODEL # TBFC
SERIAL # PE KB006M
FRAME 286
HP 30 RPM
VOLT 208
AMPS 30
EFF.
COMMENTS

	PHASE A	PHASE B	PHASE C
VOLTS	473	476	
AMPS	18.4	18.7	
KW	5.7		
KVAR	9.7		
KVA	11.2	35.33 Hz	
PF	50.5		

% MOTOR SPEED %
PRESENT TO
REQ HR. TO

MOTOR# 14
DESCRIPTION AHU #7 RETURN
MFG G.E.
MODEL # 5K215BC205
SERIAL # PE JH013 ("6-pack")
FRAME 215T
HP 10 RPM
VOLT 230
AMPS —
EFF.
COMMENTS

	PHASE A	PHASE B	PHASE C
VOLTS	473	475	
AMPS	7.5	8.9	
KW	2.0		
KVAR	4.4	32.7 Hz	
KVA	4.7		
PF	47.9		

% MOTOR SPEED %
PRESENT TO
REQ HR. TO

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: JW
CHECKED BY:
DATE: 1/21/92

BLDG.# 200
ECO 5

10+ HP MOTORS

MEASURED

MOTOR# 15
DESCRIPTION AHU #8 SUPPLY
MFG Westing.
MODEL # TBFC
SERIAL # PE KB006K
FRAME 324T
HP 40 RPM
VOLT 230
AMPS 40
EFF.
COMMENTS

	PHASE A	PHASE B	PHASE C
VOLTS	472	474	
AMPS	11	11.2	
KW	7.6		
KVAR	2.0		
KVA	8.0		
PF	97.1		

% MOTOR SPEED %
PRESENT TO
REQ HR. TO

MOTOR# 16
DESCRIPTION AHU #8 RETURN
MFG G.E.
MODEL # 5K254BC205
SERIAL # PE KA006A
FRAME 215T
HP 10 RPM
VOLT 230
AMPS 10
EFF.
COMMENTS

	PHASE A	PHASE B	PHASE C
VOLTS	472	474	
AMPS	10.7	10.4	
KW	3.0		
KVAR	5.0		
KVA	6.2		
PF	52.4		

38.5 Hz

% MOTOR SPEED %
PRESENT TO
REQ HR. TO

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY:
CHECKED BY:
DATE:

BLDG.# 200
ECO 5

10+ HP MOTORS

MEASURED

MOTOR# 17		PHASE A	PHASE B	PHASE C
DESCRIPTION AHU #9 Supply	VOLTS	473	476	
MFG Westinghouse	AMPS	21	21.6	
MODEL # TBFC	KW	7.9		
SERIAL # PE JL007	KVAR	10.3		
FRAME 286 T	KVA	13.2		
HP 30 RPM	PF	60		
VOLT 208	% MOTOR SPEED	41.5 Hz		
AMPS 25	PRESENT	TO		
EFF.	REQ HR.	TO		
COMMENTS				

MOTOR# 18		PHASE A	PHASE B	PHASE C
DESCRIPTION AHU #9 RETURN	VOLTS	472	474	
MFG G.E.	AMPS	9.5	9.3	
MODEL # 5K215BC205	KW	3.1		
SERIAL # PE JL007	KVAR	4.2		
FRAME 215 T	KVA	5.2		
HP 10 RPM	PF	56.5		
VOLT 230	% MOTOR SPEED	41 %		
AMPS 10	PRESENT	TO		
EFF.	REQ HR.	TO		
COMMENTS				

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: JW
CHECKED BY:
DATE: 1/21/91

BLDG.# 200
ECO 5

10+ HP MOTORS

MEASURED

MOTOR# 19		PHASE A	PHASE B	PHASE C
DESCRIPTION AHU #10 SUPPLY	VOLTS	473	475	
MFG West.	AMPS	26	28	
MODEL # TBFC	KW	12.8		
SERIAL # PEKA004	KVAR	3	44.2 Hz	
FRAME 324	KVA	13		
HP 40 RPM	PF	97		
VOLT 230	% MOTOR SPEED		%	
AMPS 30	PRESENT		TO	
EFF.	REQ HR.		TO	
COMMENTS HAS A NEW YORK MODULATOR ON IT :. GOOD PF				

MOTOR# 20		PHASE A	PHASE B	PHASE C
DESCRIPTION AHU #10 RETURN	VOLTS	474	474	
MFG G.E.	AMPS	9.2	9.6	
MODEL # 5K254BC205	KW	2.7		
SERIAL # PE KA007A	KVAR	4.7	37.6 Hz	
FRAME 254T	KVA	5.4		
HP 15 RPM	PF	46		
VOLT 230	% MOTOR SPEED		%	
AMPS 15A	PRESENT		TO	
EFF.	REQ HR.		TO	
COMMENTS				

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: CBL
CHECKED BY:
DATE: 1/21/92

BLDG.# 200
ECO 5

10+ HP MOTORS

MEASURED

MOTOR# 21

		PHASE A	PHASE B	PHASE C
DESCRIPTION AHU #11 SUPPLY	VOLTS	473	470	
MFG Westing.	AMPS	22.2	22.6	
MODEL # TBFC	KW	8.6		
SERIAL # PE KB001M	KVAR	11.1		
FRAME 286T	KVA	14.1		
HP 30 RPM	PF	61.3		

VOLT 208
AMPS 30
EFF.

% MOTOR SPEED 43.25 %
PRESENT TO
REQ HR. TO

COMMENTS

MOTOR# 22

		PHASE A	PHASE B	PHASE C
DESCRIPTION AHU #11 RETURN	VOLTS	473	471	
MFG G.E.	AMPS	8.0	9.6	
MODEL # 5K254BC205	KW	2.6		
SERIAL # PE KA013A	KVAR	4.5		
FRAME 254T	KVA	5.2		
HP 15 RPM	PF	50.0		

VOLT 230
AMPS 15
EFF.

% MOTOR SPEED 35.56 %
PRESENT TO
REQ HR. TO

COMMENTS

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY:
CHECKED BY:
DATE:

BLDG.# 200
ECO 5

10+ HP MOTORS

MEASURED

MOTOR# 23		PHASE A	PHASE B	PHASE C
DESCRIPTION AHU #12 SUPPLY	VOLTS	472	474	
MFG Westinghouse	AMPS	25.8	23	
MODEL # ~~031-00798-000~~ TBFC	KW	18		
SERIAL # KC 0014	KVAR	3		
FRAME 324T	KVA	18		
HP 40 RPM	PF	98.7		
VOLT 230	% MOTOR SPEED	%		
AMPS 40	PRESENT	TO		
EFF.	REQ HR.	TO		
COMMENTS				

MOTOR# 24		PHASE A	PHASE B	PHASE C
DESCRIPTION AHU #12 RETURN	VOLTS	472	476	
MFG G.E.	AMPS	12.6	12.1	
MODEL # 5K254BC205 ~~031-00794-000~~	KW	4.5		
SERIAL # PE KA014A	KVAR	6.0		
FRAME 254T	KVA	8.0		
HP 15 RPM	PF	65.2		
VOLT 230	% MOTOR SPEED	44.5 #2		
AMPS 15	PRESENT	TO		
EFF.	REQ HR.	TO		
COMMENTS				

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: JW
CHECKED BY:
DATE: 1/21/92

BLDG.# 200
ECO 5

10+ HP MOTORS

MEASURED

MOTOR# 25
DESCRIPTION AHU # 14 SUPPLY
MFG West.
MODEL # TBFC
SERIAL # PE K B004
FRAME 364T
HP 60 RPM
VOLT 460
AMPS 50
EFF.
COMMENTS

	PHASE A	PHASE B	PHASE C
VOLTS	467	472	
AMPS	12.6	12.5	
KW	9.0		
KVAR	2.0		
KVA	9.2		
PF	97.8		

% MOTOR SPEED %
PRESENT TO
REQ HR. TO

MOTOR# 26
DESCRIPTION AHU # 14 RETURN
MFG G.E.
MODEL # 5K284BL205D
SERIAL # PE JL006
FRAME 284T
HP 25 RPM
VOLT 230
AMPS 25
EFF.
COMMENTS

	PHASE A	PHASE B	PHASE C
VOLTS	467	471	
AMPS	30.3	31.3	
KW	13.0		
KVAR	13.8		
KVA	18.5		
PF	66.5		

50.6 Hz

% MOTOR SPEED %
PRESENT TO
REQ HR. TO

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: JW
CHECKED BY:
DATE: 1/21/92

BLDG.# 200
ECO 5

10+ HP MOTORS

MEASURED

MOTOR# 33
DESCRIPTION AHU # 15 SUPPLY
MFG
MODEL #
SERIAL #
FRAME
HP RPM
VOLT
AMPS
EFF.
COMMENTS

	PHASE A	PHASE B	PHASE C
VOLTS	476	470	
AMPS	17.5	17.8	
KW	13.4		
KVAR	2.2		
KVA	13.7		
PF	98		

% MOTOR SPEED %
PRESENT TO
REQ HR. TO

MOTOR# 34
DESCRIPTION AHU # 15 RETURN
MFG
MODEL #
SERIAL #
FRAME
HP RPM
VOLT
AMPS
EFF.
COMMENTS

	PHASE A	PHASE B	PHASE C
VOLTS	473	478	
AMPS	19.0	19.8	
KW	7.0		
KVAR	8.0		
KVA	10.9		
PF	63		

48.6Hz

% MOTOR SPEED %
PRESENT TO
REQ HR. TO

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY:
CHECKED BY:
DATE:

BLDG.# 200
ECO 5

MOTORS

MOTOR # 27 HP 5 PH RPM
MODEL # VOLTS AMPS 7.6
SERIAL # PRESENT HR. TO
MFG REQUIRED HR. TO
FRAME EFF.
DESCRIPTION AHU #13 Supply COMMENTS

MOTOR # 28 HP 1 PH RPM
MODEL # VOLTS AMPS 1.8
SERIAL # PRESENT HR. TO
MFG REQUIRED HR. TO
FRAME EFF.
DESCRIPTION AHU #13 RETURN COMMENTS

MOTOR # 29 HP 5 PH RPM
MODEL # VOLTS AMPS 7.6
SERIAL # OK PRESENT HR. TO
MFG REQUIRED HR. TO
FRAME EFF.
DESCRIPTION AHU #16 Supply COMMENTS

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY:
CHECKED BY:
DATE:

BLDG.# 207
ECO 5

MOTORS

MOTOR # 30 HP 1 PH RPM
MODEL # VOLTS AMPS 1.8
SERIAL # PRESENT HR. TO
MFG REQUIRED HR. TO
FRAME EFF.
DESCRIPTION AHU # 16 RETURN COMMENTS

MOTOR # 31 HP 3 PH RPM
MODEL # VOLTS AMPS 4.8
SERIAL # PRESENT HR. TO
MFG REQUIRED HR. TO
FRAME EFF.
DESCRIPTION AHU # 17 SUPPLY COMMENTS 470V 2.6A 473V 2.5A 0.61kW 1.2kVAR 1.3kVA 41.3PF 26.3Hz

MOTOR # 32 HP PH RPM
MODEL # VOLTS AMPS
SERIAL # PRESENT HR. TO
MFG REQUIRED HR. TO
FRAME EFF.
DESCRIPTION AHU [illegible] RN COMMENTS

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY:
CHECKED BY:
DATE:

BLDG.# 200
ECO 5

10+ HP MOTORS

MEASURED

MOTOR# 35
DESCRIPTION CONDENSER PUMP#1
MFG Century
MODEL # 6-321179-07
SERIAL #
FRAME 365 TS
HP ~~100~~ 75 RPM 1770
VOLT ~~480~~ -3W 230/460
AMPS ~~124~~ 174/87
EFF. 88.7
COMMENTS off

VOLTS / AMPS / KVAR / KVA / KW / PF

PHASE A	PHASE B	PHASE C

PRESENT TO
REQ HR. TO

MOTOR# 36
DESCRIPTION CONDENSER PUMP #2
MFG Century
MODEL # 6-321179-07
SERIAL #
FRAME 365 TS
HP ~~100~~ 75 RPM 1770
VOLT ~~480~~ -3W 230/460
AMPS ~~124~~ 174/87
EFF. 88.7
COMMENTS off

VOLTS / AMPS / KVAR / KVA / KW / PF

PHASE A	PHASE B	PHASE C

PRESENT TO
REQ HR. TO

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY:
CHECKED BY:
DATE:

BLDG.# 200
ECO 5

10+ HP MOTORS

MEASURED

MOTOR# 37
DESCRIPTION CONDENSER Pump #3
MFG Century
MODEL # 6-321179-07
SERIAL #
FRAME 365 TS
HP ~~100~~ 75 RPM 1770
VOLT ~~480~~ -3W 230/460
AMPS ~~124~~ 174/87
EFF. 88.7

	PHASE A	PHASE B	PHASE C
VOLTS	472	469	
AMPS	77.3	76.0	
KVAR	33.2		
KVA	62.8		
KW	53.3		
PF	85.1		

PRESENT TO
REQ HR. TO

COMMENTS inlet 10 Psig outlet 53 Psig

MOTOR# 38
DESCRIPTION CONST. PRESS.
MFG
MODEL #
SERIAL #
FRAME
HP 25 RPM
VOLT 480 -3W
AMPS 34
EFF.

	PHASE A	PHASE B	PHASE C
VOLTS			
AMPS			
KVAR			
KVA			
KW			
PF			

PRESENT TO
REQ HR. TO

COMMENTS

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY:
CHECKED BY:
DATE: 1/21/92

BLDG.# 200
ECO 5

10+ HP MOTORS
MEASURED

MOTOR# 39		PHASE A	PHASE B	PHASE C
DESCRIPTION CHWP #1	VOLTS			
MFG Century	AMPS			
MODEL # 6-312794-01	KVAR			
SERIAL #	KVA			
FRAME 286T	KW			
HP 30 RPM 1750	PF			
VOLT 480 -3W / 230/460				
AMPS 40 / 74/37		PRESENT	TO	
EFF. 88.3		REQ HR.	TO	
COMMENTS Not Operating				

MOTOR# 40		PHASE A	PHASE B	PHASE C
DESCRIPTION CHWP #2	VOLTS			
MFG Century	AMPS			
MODEL # 6-312794-01	KVAR			
SERIAL #	KVA			
FRAME 286T	KW			
HP 30 RPM 1750	PF			
VOLT 480 -3W / 230/460				
AMPS 40 / 74/37		PRESENT	TO	
EFF. 88.3		REQ HR.	TO	
COMMENTS Not operating				

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY:
CHECKED BY:
DATE:

BLDG.# 200
ECO 5

10+ HP MOTORS

MEASURED

MOTOR# 41
DESCRIPTION CHWP #3
MFG Century
MODEL # 6-312794-01
SERIAL #
FRAME 286T
HP 30 RPM 1750
VOLT 480-3W / 230/460
AMPS 40 74/37
EFF. 88.3

	PHASE A	PHASE B	PHASE C
VOLTS	472	475	
AMPS	27.3	26.2	
KVAR	12.4		
KVA	22.3		
KW	18.5		
PF	83.1		

PRESENT TO
REQ HR. TO

COMMENTS inlet 27 psig outlet 59 psig

MOTOR# 42
DESCRIPTION CHWP #4
MFG CENTURY
PART ~~MODEL~~ # 6-321180-07
SERIAL # BB12
FRAME 364T
HP ~~30~~ 60 RPM 1770
VOLT 480-3W
AMPS ~~60~~ ~~74~~ 70
EFF. 1

	PHASE A	PHASE B	PHASE C
VOLTS			
AMPS			
KVAR			
KVA			
KW			
PF			

PRESENT TO
REQ HR. TO

COMMENTS off / 4A operating

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY:
CHECKED BY:
DATE:

BLDG.# 200
ECO 5

10+ HP MOTORS
MEASURED

MOTOR# 43
DESCRIPTION CHWP # 5
MFG Century
MODEL # 6-320318
SERIAL # ~~326T~~
FRAME 326TS
HP ~~60~~ 50 RPM 1765
VOLT ~~480 -3W~~ 230/460
AMPS ~~77~~ 120/60
EFF.
COMMENTS ~~not op~~ off / #6 operating in parallel

	PHASE A	PHASE B	PHASE C
VOLTS			
AMPS			
KVAR			
KVA			
KW			
PF			

PRESENT TO
REQ HR. TO

MOTOR# 44
DESCRIPTION CHWP #6
MFG Century
MODEL # 6-320318-01
SERIAL #
FRAME 326TS
HP ~~60~~ 50 RPM 1765
VOLT 480 -3W/ 230/460
AMPS 77 / 120/60
EFF. 90.3
COMMENTS inlet 25 psig outlet 52 psig

	PHASE A	PHASE B	PHASE C
VOLTS	456	453	
AMPS	46	46	
KVAR	29		
KVA	37		
KW	24.3		
PF	64		

PRESENT TO
REQ HR. TO

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY:
CHECKED BY:
DATE:

BLDG.# 200
ECO 5

10+ HP MOTORS

MEASURED

MOTOR# 45
DESCRIPTION C. TOWER #1
MFG
MODEL #
SERIAL #
FRAME
HP 50 RPM
VOLT 480 - 3W
AMPS 65
EFF.
COMMENTS

	PHASE A	PHASE B	PHASE C
VOLTS	472	471	
AMPS	36	34	
KVAR	17.3		
KVA	29.5		
KW	23.6		
PF	82%		

PRESENT TO
REQ HR. TO

MOTOR# 46
DESCRIPTION C. TOWER #2
MFG
MODEL #
SERIAL #
FRAME
HP 50 RPM
VOLT 480 - 3W
AMPS 65
EFF.
COMMENTS

	PHASE A	PHASE B	PHASE C
VOLTS			
AMPS			
KVAR			
KVA			
KW			
PF			

PRESENT TO
REQ HR. TO

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: ____ OF ____
CALCULATED BY:
CHECKED BY:
DATE:

BLDG.# 200
ECO 5

10+ HP MOTORS
MEASURED

MOTOR# 47
DESCRIPTION C. TOWER #3
MFG
MODEL #
SERIAL #
FRAME
HP 50 RPM
VOLT 480-3W
AMPS 65
EFF.
COMMENTS

	PHASE A	PHASE B	PHASE C
VOLTS			
AMPS			
KVAR			
KVA			
KW			
PF			

PRESENT TO
REQ HR. TO

MOTOR# 48
DESCRIPTION AIR ~~COMP~~ COMP. #2
MFG US Electrical motors
MODEL # ~~256~~ FL014R044
SERIAL #
FRAME 256T
HP ~~15~~ 20 RPM 1760
VOLT ~~480-3W~~ 230/460
AMPS ~~21~~ 54/27
EFF. 87.5
COMMENTS #2 Model # E660/R09R2000316F US Electrical Motor.

	PHASE A	PHASE B	PHASE C
VOLTS	471	474	
AMPS	22	22	
KVAR	11.6		
KVA	18.1		
KW	13.9		
PF	76.5		

PRESENT TO
REQ HR. TO

(cover)

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY:
CHECKED BY:
DATE:

BLDG.# 200
ECO 5

10+ HP MOTORS

MEASURED

MOTOR# 49
DESCRIPTION AIR COMP. #2
MFG
MODEL #
SERIAL #
FRAME
HP 15 RPM
VOLT 480-3W
AMPS 21
EFF.
COMMENTS

	PHASE A	PHASE B	PHASE C
VOLTS			
AMPS			
KW			
KVAR			
KVA			
PF			

% MOTOR SPEED %
PRESENT TO
REQ HR. TO

MOTOR# 50
DESCRIPTION HWP #1 (1ST FLOOR)
MFG
MODEL #
SERIAL #
FRAME
HP 10 RPM
VOLT 480-3W
AMPS 14
EFF.
COMMENTS

	PHASE A	PHASE B	PHASE C
VOLTS			
AMPS			
KW			
KVAR			
KVA			
PF			

% MOTOR SPEED %
PRESENT TO
REQ HR. TO

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY:
CHECKED BY:
DATE:

BLDG.# 200
ECO 5

10+ HP MOTORS

MEASURED

MOTOR#			PHASE A	PHASE B	PHASE C
DESCRIPTION Heat Pump		VOLTS	470	475	
MFG		AMPS	130	137	
MODEL #		KW	99		
SERIAL #		KVAR	49		
FRAME		KVA	109		
HP	RPM	PF	90		

VOLT
AMPS
EFF.

% MOTOR SPEED %
PRESENT TO
REQ HR. TO

COMMENTS HWR 121° HWS 133°

MOTOR#			PHASE A	PHASE B	PHASE C
DESCRIPTION		VOLTS			
MFG		AMPS			
MODEL #		KW			
SERIAL #		KVAR			
FRAME		KVA			
HP	RPM	PF			

VOLT
AMPS
EFF.

% MOTOR SPEED %
PRESENT TO
REQ HR. TO

COMMENTS

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____
SHEET NO. _____ OF _____
CALCULATED BY _____ DATE _____
CHECKED BY _____ DATE _____
SCALE _____

Elevator - Freight

Volts	475	478
Amps	40	42
Kw	32	
KVAR	11	
KVA	~~26~~ 35	
PF	94 %	

- Personel & Total

Volts	476	470
Amps	45	45.2
Kw	27	
KVAR	23	
KVA	31	
PF		

JOB
SHEET NO. OF
CALCULATED BY DATE
CHECKED BY DATE
SCALE

208

474 V 475 V
148 A 151 A
111 kW
54 kVAR
124 kVA
90% PF

HEAT PUMP

CONDENSER OFF CHILLERS
74° F RET
73° F SUP
HWR 116° F
HWS 133° F

AHU #1

472 V 470 V
17.8 A 18.2 A
6.3 kW
8.9 kVAR 38.3 Hz
10.9 kVA
58.3 PF

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB _____

SHEET NO. _____ OF _____

CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____

SCALE _____

BLDG 200

CHWP 4-A
MAGNATEK
PART #6-358659-02
FRAME # 5364T
HP - 60 60Hz 3φ
RPM 1765 460V 70A

MEASURED
332V 321V
25.5A 23.5A
4.7kW
3.9kVAR
6.2kVA
63.7% PF
AT 32Hz

Operating
Inlet 29 PSIG
outlet 49 PSIG

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____
SHEET NO. _____ OF _____
CALCULATED BY _____ DATE _____
CHECKED BY _____ DATE _____
SCALE _____

Electric ~~Heater~~ Boiler

CAM Industries Mod: 24CWB-2
BHP 486 Serial #: H221 D4
KW 486
Volts 480 3 Ph setpoint 110°F
Amps 585

HT WTR RET 122°F - False
HT WTR Supply from Heat Pump 134°F
into Heat Pump 122°F

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

200

JOB UPS CAPACITIES (INTERNL CAP)

SHEET NO. _____ OF _____

CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____

SCALE _____

UPS ~~BANK~~ "A" 500A
TOTAL 380kW
480V

UPS BANK "B" 480V
150A

BANK "D" 480V

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

Bldg 200

JOB _____

SHEET NO. _____ OF _____

CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____

SCALE _____

AHU-NUMBER	Economizer	Minimum OA.		[redacted] Comments
AHU 1	[redacted] Y	~~No Dimensions~~ 760 fpm (5x34)3	2692 cfm	~~One valve is open & the other is closed~~ ~~Both~~ 100% OPEN - MIN OA closed - MAX OA
AHU-2	[redacted] Y	760 fpm (5x34)3	2692 cfm	100% OPEN - MIN OA - Closed - MAX OA
AHU 3	Y	(5x34)3 75 fpm	265 cfm	~~One valve is~~ 50% OPEN - MAX OA 100% OPEN - MIN OA
AHU 4	Y	~~No Dimensions~~ Air circulating in & out through MAU OA louvers		EXHAUST PRESSURIZING [redacted] INTAKE PLENUM - Air flowing out MIN OA
AHU 6	Y	(34x5)3 730 fpm	2656 cfm	~~One valve is~~ 75% OPEN - MAX OA 100% OPEN - MIN OA
AHU 5	Y	(34x5)3 135 fpm	478 cfm	~~One valve is~~ 50% OPEN - MAX OA 100% OPEN - MIN OA
AHU 7	[redacted] Y	(34x5) 3 400 fpm	1417 cfm	100% OPEN - MIN OA closed - MAX OA
AHU 8	Y	(34x5) 3 230 fpm	814. [redacted] cfm	~~One~~ 50% OPEN - MAX OA 100% OPEN - MIN OA
AHU 9	Y	(34x5) 2 1/2 310 fpm	915.[redacted] cfm	"
AHU 10	Y	970 fpm (24x5) 3	3435 cfm	- SUBSTANTIAL OA - NEGATIVE PRESSURE PLENUM - ~~One~~ 50-75% OPEN - MAX OA 100% OPEN - MIN OA
AHU 11	Y	850 fpm (5x34)3	3010 cfm	~~One~~ 50% OPEN - MAX OA 100% OPEN - MIN OA
AHU 12	Y	820 fpm (5x34)3	2904 cfm	100% OPEN - MIN OA 50% OPEN - MAX OA
AHU 13	100% OA			100% OA OPEN
AHU 14	Y	(12x42) 3 330 fpm	3465 cfm	← MIN OA → ECON - Plenum being pressurized by too much exhaust air
AHU 15	Y	170 fpm (42x5)3	744 cfm	~~ONE~~ 50-75% OPEN - MAX OA 100% OPEN - MIN OA
AHU 16	100% OA			100% OA OPEN

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____

SHEET NO. _____ OF _____

CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____

SCALE _____

CONTROL SEQUENCE

AHU 2-12, 14, 15, 17

CHW COIL CONTROLED BY OA AT 57°F

AHU 13 & 16 ARE 100% OA UNITS

AIR HANDLING UNITS/~~RETURN~~ Supply AIR FANS

UNIT#	UNIT DESCRIPTION	BELTS/FILTERS	MOTOR/AIR MODULATOR
AHU1	York CS336FO 15,510 CFM S/N P3-816656AH1	B100 (4 EA) 24 x 24 x 2 (10 EA) 24 x 24 x 14 (10 EA)	Westinghouse TBFC 30 HP, 1755 RPM, 208-230/ 460 VAC, 3-Ph, Fr 286T, Air Mod Mdl: AM 25-46 P/N 031-00796-000 S/N PE JH008
AHU2	York CS270FO 13,525 CFM S/N 83816657AH1	B93 (4 EA) 24 x 24 x 2 (8 EA) 24 x 24 x 14 (8 EA)	Reliance 25 HP, 1765 RPM, 230/460 VAC, 3-Ph, Fr 284T, Air Mod Mdl: AM 25-46 P/N 031-00-796-000 S/N PE JH012
AHU3	York CS336FO 18,350 CFM S/N 83-816657BH2	B99 (4 EA) 24 x 24 x 2 (10 EA) 24 x 24 x 14 (10 EA)	Westinghouse TBFC 30 HP, 1755 RPM, 208-230/ 460 VAC, 3-Ph, Fr 286T, Air Mod Mdl: AM 30-46 P/N 031-0797-000 S/N PE KA003
AHU4	York CS270FO 13,710 CFM S/N 83816656BH2	B93 (4 EA) 24 x 24 x 2 (8 EA) 24 x 24 x 14 (8 EA)	Westinghouse TBFC 30 HP, 1755 RPM, 208-230/ 460 VAC, 3-Ph, Fr 286T Air Mod Mdl: AM 30-46 P/N 031-0797-000 S/N PE KB005 H
AHU5	York CS402FO 19,795 CFM S/N 83816657CH3	C105 (4 EA) 24 x 24 x 2 (10 EA) 12 x 24 x 2 (5 EA) 24 x 24 x 14 (10 EA) 12 x 24 x 14 (5 EA)	Westinghouse TBFC 40 HP, 1765 RPM, 230/460 VAC, 3-Ph, Fr 324T Air Mod Mdl: AM 30-46 P/N 031-0797-000 S/N PE JH006
AHU6	York CS402FO 20,590 CFM S/N 83816657C1B	C105 (4 EA) 24 x 24 x 2 (10 EA) 12 x 24 x 2 (5 EA) 24 x 24 x 14 (10 EA) 12 x 24 x 14 (5 EA)	Westinghouse TBFC 40 HP, 1765 RPM, 230/460 VAC, 3-Ph, Fr 324T Air Mod Mdl: AM 40-46 P/N 031-00798-000 S/N PE KB007 M
AHU7	York CS336FO 16,680 CFM S/N 83816659AH1	B99 (4 EA) 24 x 24 x 2 (10 EA) 24 x 24 x 14 (10 EA)	Westinghouse TBFC 30 HP, 1755 RPM, 208-230/ 460 VAC, 3-Ph, Fr 286T Air Mod Mdl: AM 30-46 P/N 031-0797-000 S/N PE KB006 M
AHU8	York CS402FO 19,750 CFM S/N 83816656CH3	C105 (4 EA) 24 x 24 x 2 (10 EA) 12 x 24 x 2 (5 EA) 24 x 24 x 14 (10 EA) 12 x 24 x 14 (5 EA)	Westinghouse TBFC 40 HP, 1765 RPM, 230/460 VAC, 3-Ph, Fr 324T Air Mod Mdl: AM 40-46 P/N 031-00798-000 S/N PE KB006K

AIR HANDLING UNITS/Supply AIR FANS

UNIT#	UNIT DESCRIPTION	BELTS/FILTERS	MOTOR/AIR MODULATOR
AHU9	York CS336FO 15,370 CFM S/N 83816656AH1	B100 (4 EA) 24 x 24 x 2 (10 EA) 24 x 24 x 14 (10 EA)	Westinghouse TBFC 30 HP, 1755 RPM, 208-230/460 VAC, 3-Ph, Fr 286T Air Mod Mdl: AM 25-46 P/N 031-00796-000 S/N PE JL007
AHU10	York CS336FO 18,010 CFM S/N 83816659BH2	C105 (4 EA) 24 x 24 x 2 (10 EA) 24 x 24 x 14 (10 EA)	Westinghouse TBFC 40 HP, 1765 RPM, 230/460 VAC, 3-Ph, Fr 324T Air Mod Mdl: AM 30-46 P/N 031-0797-000 S/N PE KA004
AHU11	York CS490FO 19,730 CFM S/N 83816656DHY	B112 (4 EA) 24 x 24 x 2 (15 EA) 24 x 24 x 14 (15 EA)	Westinghouse TBFC 30 HP, 1755 RPM, 208-230/460 VAC, 3-Ph, Fr 286T Air Mod Mdl: AM 30-46 P/N 031-0797-000 S/N PE KB001 M
AHU12	York CS490FO 22,240 CFM S/N 83816657DH4	C120 (4 EA) 24 x 24 x 2 (15 EA) 24 x 24 x 14 (15 EA)	Westinghouse TBFC 40 HP, 1765 RPM, 230/460 VAC, 3-Ph, Fr 324T Air Mod Mdl: AM 40-46 P/N 031-00798-000 S/N KC 001 U
AHU13	York CS50FO 2,040 CFM S/N 83816655AH1	B48 (2 EA) 24 x 24 x 2 (2 EA) 24 x 24 x 14 (2 EA)	Westinghouse 5BFC 5 HP, 1740 RPM, 230/460 VAC, 3-Ph, Fr 184T Air Mod Mdl: N/A (MCC)
AHU14	York CS666FO 33,465 CFM S/N 83816655CH3	C136 (4 EA) 24 x 24 x 2 (20 EA) 24 x 24 x 14 (20 EA)	Westinghouse TBFC 60 HP, 1775 RPM, 460 VAC 3-Ph, Fr 364T Air Mod Mdl: AM 50-46 P/N 031-00799-000 S/N PE KB004
AHU15	York CS490FO 24,075 CFM S/N 83816659DH4	C120 (4 EA) 24 x 24 x 2 (15 EA) 24 x 24 x 14 (15 EA)	Westinghouse TBFC 40 HP, 1765 RPM, 230/460 VAC, 3-Ph, Fr 324T Air Mod Mdl: AM 40-46 P/N 031-00798-000 S/N KC008 U
AHU16	York CS50FO 2,040 CFM S/N 83816655BH0	B48 (2 EA) 24 x 24 x 2 (2 EA) 24 x 24 x 14 (2 EA)	Westinghouse 5BFC 5 HP, 1740 RPM, 230/460 VAC, 3-Ph, Fr 184T Air Mod Mdl: N/A (MCC)

AIR HANDLING UNITS/~~RETURN~~ Supply AIR FANS

UNIT#	UNIT DESCRIPTION	BELTS/FILTERS	MOTOR/AIR MODULATOR
AHU17	York CS50FO 1,910 CFM S/N ?	B46 (2 EA) 12 x 24 x 2 (2 EA) 12 x 24 x 14 (2 EA)	Westinghouse 5BFC 3 HP, 1730 RPM, 230/460 VAC, 3-Ph, Fr 182T Air Mod Mdl: AM 5-46 P/N 031-00791-000 S/N PE KA011 A

AIR HANDLING UNITS/RETURN AIR FANS

UNIT#	UNIT DESCRIPTION	BELTS/FILTERS	MOTOR/AIR MODULATOR
RAF1	Aladdin BA365 14,780 CFM S/N 83346	B162 (2 EA)	G.E. 5K215BC205 10 HP, 1740 RPM, 230/460 VAC, 3-Ph, Fr 215T Air Mod Mdl: NOT MARKED P/N 808223 S/N PE JH013 ("6-pack")
RAF2	Aladdin BA300 12,875 CFM S/N 83347-1	BP140 (2 EA)	G.E. 5K215BC205 10 HP, 1740 RPM, 230/460 VAC, 3-Ph, Fr 215T Air Mod Mdl: NOT MARKED P/N 808223 000 S/N PE JH017 Rev. A ("6-pack")
RAF3	Aladdin BA365 17,445 CFM S/N 83348-1	BX158 (3 EA)	G.E. 5K254B1205D2 15 HP, 1760 RPM, 230/460 VAC, 3-Ph, Fr 254T Air Mod Mdl: AM 15A-46 P/N 031-00794-000 S/N PE AK012 A
RAF4	Aladdin BA300 12,200 CFM S/N 83347-2	BX136 (2 EA)	G.E. 5K215BC205 10 HP, 1740 RPM, 230/460 VAC, 3-Ph, Fr 215T Air Mod Mdl: AM 10A-46 P/N 031-00793-000 S/N PE JH001 A ("6-pack")
RAF5	Aladdin BA365 18,105 CFM S/N 83348-2	B162 (2 EA)	G.E. 5K254BC206 15 HP, 1760 RPM, 230/460 VAC, 3-Ph, Fr 254T Air Mod Mdl: AM 15A-46 P/N: 031-00794-000 S/N: PE KA005 A
RAF6	Aladdin BA365 18,920 CFM S/N 83348-3	B162 (2 EA)	G.E. 5K254BC205 15 HP, 1760 RPM, 230/460 VAC, 3-Ph, Fr 254T Air Mod Mdl: AM 15A-46 P/N: 031-000794-000 S/N: PE KA009A
RAF7	Aladdin BA365 15,060 CFM S/N 83348-4	BX162 (2 EA)	G.E. 5K254BC205 15 HP, 1760 RPM, 230/460 VAC, 3-Ph, Fr 254T Air Mod Mdl: AM 15A-46 P/N: 031-00794-000 S/N: PE KA010 A

AIR HANDLING UNITS/RETURN AIR FANS

UNIT#	UNIT DESCRIPTION	BELTS/FILTERS	MOTOR/AIR MODULATOR
RAF8	Aladdin BA365 17,920 CFM S/N 83348-5	B173 (2 EA)	G.E. 5K254BC205 15 HP, 1760 RPM, 230/460 VAC, 3-Ph, Fr 254T Air Mod Mdl: AM 15A-46 P/N: 031-00794-000 S/N: PE KA006 A
RAF9	Aladdin BA300 13,690 CFM S/N: 83347-3	BX150 (2 EA)	G.E. 5K215BC205 10 HP, 1740 RPM, 230/460 VAC, 3-Ph, Fr 215T Air Mod Mdl: AM 10A-46 P/N: 031-00796-000 S/N: PE JL007
RAF10	Aladdin BA365 17,025 CFM S/N: 83348-6	B162 (2 EA)	G.E. 5K254BC205 15 HP, 1760 RPM, 230/460 VAC, 3-Ph, Fr 254T Air Mod Mdl: AM 15A-46 P/N: 031-00794-000 S/N: PE KA007 A
RAF11	Aladdin BA365 18,670 CFM S/N: 83348-7	B180 (2 EA)	G.E. 5K254BC205 15 HP, 1760 RPM, 230/460 VAC, 3-Ph, Fr 254T Air Mod Mdl: AM 15A-46 P/N: 031-00794-000 S/N: PE KA013A
RAF12	Aladdin BA402 21,215 CFM S/N: 83349	B180 (2 EA)	G.E. 5K254BC205 15 HP, 1760 RPM, 230/460 VAC, 3-Ph, Fr 254T Air Mod Mdl: AM 15A-46 P/N: 031-00794-000 S/N: PE KA014 A
RAF13	ILG Industries, Inc Mdl SQLB 425 CFM	AX46 (1 EA).	Westinghouse Series CH82 Type ES 1 HP, 1725 RPM, 230/460 VAC, 3-Ph, Fr 66 Conventional Starter MCC
RAF14	Aladdin BA445 29,850 CFM S/N: 83350	B173 (4 EA)	G.E. 5K284BL205D 25 HP, 1765 RPM, 230/460 VAC, 3-Ph, Fr 284T Air Mod Mdl: AM 25-46 P/N: 031-00796-000 S/N: PE JL006
RAF15	Aladdin BA402 23,245 CFM S/N 83351	B162 (4 EA)	G.E. 5K256BC205 20 HP, 1755 RPM, 230/460 VAC, 3-Ph, Fr 256T Air Mod Mdl: AM 20A-46 P/N: 031-00795-000 S/N: PE JM004 C

AIR HANDLING UNITS/RETURN AIR FANS

UNIT#	UNIT DESCRIPTION	BELTS/FILTERS	MOTOR/AIR MODULATOR
RAF 16	ILG Industries, Inc Mdl SQLB 1856 CFM		

Ft. McPherson/ Ft. Gillem Energy Study
EMC # 3105.000

DATE:_____
BY:_____

I. AIR HANDLING UNIT SURVEY OBSERVATIONS

BLDG NO: 200 BLDG NAME: ADMIN JOB: 3105
AHU NO: 1 LOCATION: R-119 SEC. 1 1ST FLOOR NORTH
ZONE NO. SERVED:_____ REF. SYS. SERVING AHU:_____
([ ] VERIFIED ZONE OCCUPANCY AND TEMP. REQUIREMENTS ON SURVEY FORM VI.)
UNIT TYPE: SINGLE ZONE [ ] MULTIZONE [ ] DOUBLE DT [ ] REHEAT [ ]
HEAT & VENT [ ] 2-PIPE FC [ ] 4-PIPE FC [ ] UNIT HT [ ]
OTHER [X] VAV
MFG:_____ MODEL:_____
SUPPLY FAN: FAN HP:_____ MFG:_____ MODEL:_____
CFM: SA 15510 RA 14780 OA 1915 (MEASURED [ ] ESTIMATED [ ])
PRESENT DAILY STARTUP: M-F_____TO_____, SAT_____TO_____, SUN_____TO_____
STARTUP METHOD: MANUAL [ ] TIMECLOCK [ ] (WORKING, YES [ ] NO [ ])
SEASONAL SWITCHOVER: SUM_____TO_____, WIN_____TO_____
REQUIRED DAILY STARTUP:M-F_____TO_____, SAT_____TO_____, SUN_____TO_____

COILS: PREHEAT: NONE [ ] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
HEATING: NONE [ ] STM [ ] HW [X] ELEC [ ] MOD VLV [ ]
REHEAT: NONE [ ] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
HUMID: NONE [ ] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
COOLING: NONE [ ] CW [X] DX [ ] SPRAY[ ] OTHER [ ]

REMARK:_____
DAMPERS: OUTSIDE AIR: MAX %_____, MIN %_____, DAMPER MTR YES [ ] NO [ ]
RETURN AIR: MAX %_____, MIN %_____, DAMPER MTR YES [ ] NO [ ]
RELIEF AIR: MAX %_____, MIN %_____, DAMPER MTR YES [ ] NO [ ]
MIXED AIR CONTROL [ ], ECONOMIZER (DB [ ] OR ENTH [ ]) NONE [ ]

REMARKS:_____
SUPPORT FANS: UNIT_____ RETURN FAN [X] EXHAUST FAN [ ] OTHER [ ]
FAN HP:_____ MFG:_____ MODEL:_____
THERMOSTAT TYPE: SINGLE SETPOINT [ ] DUAL SETPOINT [ ] SETBACK [ ]
PNEUMATIC [ ] ELECTRIC/ELECTRONIC [ ] NO. OF ZONES_____
SETPOINT:OCC HEAT_____°F UNOCC HEAT_____°F OCC COOL_____°F UNOCC COOL_____°F
RESET CONTROLS: YES [ ] NO [ ], DECK SETPOINT HOT_____°F COLD_____°F
DEMAND LIMITING, DUTY CYCLING YES [ ] NO [ ]
REMARKS:

Ft. McPherson/ Ft. Gillem Energy Study
EMC # 3105.000

DATE:_____
BY:_____

I. AIR HANDLING UNIT SURVEY OBSERVATIONS

BLDG NO: 200 BLDG NAME: ADMIN JOB: 3105
AHU NO: 2 LOCATION: R-218 SEC. 1 2ND FLR NORTH
ZONE NO. SERVED:_____ REF. SYS. SERVING AHU:_____
([ ] VERIFIED ZONE OCCUPANCY AND TEMP. REQUIREMENTS ON SURVEY FORM VI.)
UNIT TYPE: SINGLE ZONE [ ] MULTIZONE [ ] DOUBLE DT [ ] REHEAT [ ]
HEAT & VENT [ ] 2-PIPE FC [ ] 4-PIPE FC [ ] UNIT HT [ ]
OTHER [X] VAV
MFG:_____ MODEL:_____
SUPPLY FAN: FAN HP:_____ MFG:_____ MODEL:_____
CFM: SA 13525 RA 12875 OA 1410 (MEASURED [ ] ESTIMATED [ ])
PRESENT DAILY STARTUP: M-F_____TO_____, SAT_____TO_____, SUN_____TO_____
STARTUP METHOD: MANUAL [ ] TIMECLOCK [ ] (WORKING, YES [ ] NO [ ])
SEASONAL SWITCHOVER: SUM_____TO_____, WIN_____TO_____
REQUIRED DAILY STARTUP:M-F_____TO_____, SAT_____TO_____, SUN_____TO_____

COILS:
PREHEAT: NONE [ ] STM [ ] HW [X] ELEC [ ] MOD VLV [ ]
HEATING: NONE [ ] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ] 74.5°
REHEAT: NONE [ ] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
HUMID: NONE [ ] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
COOLING: NONE [ ] CW [X] DX [ ] SPRAY[ ] OTHER [ ]

REMARK:_____

DAMPERS: OUTSIDE AIR: MAX %_____, MIN %_____, DAMPER MTR YES [ ] NO [ ]
RETURN AIR: MAX %_____, MIN %_____, DAMPER MTR YES [ ] NO [ ]
RELIEF AIR: MAX %_____, MIN %_____, DAMPER MTR YES [ ] NO [ ]
MIXED AIR CONTROL [ ], ECONOMIZER (DB [ ] OR ENTH [ ]) NONE [ ]

REMARKS:_____
SUPPORT FANS: UNIT_____ RETURN FAN [X] EXHAUST FAN [ ] OTHER [ ]
FAN HP:_____ MFG:_____ MODEL:_____
THERMOSTAT TYPE: SINGLE SETPOINT [ ] DUAL SETPOINT [ ] SETBACK [ ]
PNEUMATIC [ ] ELECTRIC/ELECTRONIC [ ] NO. OF ZONES_____
SETPOINT:OCC HEAT_____°F UNOCC HEAT_____°F OCC COOL_____°F UNOCC COOL_____°F
RESET CONTROLS: YES [ ] NO [ ], DECK SETPOINT HOT_____°F COLD_____°F
DEMAND LIMITING, DUTY CYCLING YES [ ] NO [ ]
REMARKS:

Return fan pressurizing intake Plenum, forcing air out the OA louvers; Overridden + made operational ↑ economizer

$T_{RA} = 75.2$
$T_{HD} = 74.5$
$T_{SA} = 57.2$

Ft. McPherson/ Ft. Gillem Energy Study
EMC # 3105.000

DATE:_____
BY:_____

I. AIR HANDLING UNIT SURVEY OBSERVATIONS

BLDG NO: 200 BLDG NAME: ADMIN JOB: 3105
AHU NO: 3 LOCATION: R-317 SEC. 1 NORTH
ZONE NO. SERVED:_____ REF. SYS. SERVING AHU:_____
([ ] VERIFIED ZONE OCCUPANCY AND TEMP. REQUIREMENTS ON SURVEY FORM VI.)
UNIT TYPE: SINGLE ZONE [ ] MULTIZONE [ ] DOUBLE DT [ ] REHEAT [ ]
HEAT & VENT [ ] 2-PIPE FC [ ] 4-PIPE FC [ ] UNIT HT [ ]
OTHER [ ] VAV
MFG:_____ MODEL:_____
SUPPLY FAN: FAN HP:_____ MFG:_____ MODEL:_____
CFM: SA 18350 RA 17445 OA 2200 (MEASURED [ ] ESTIMATED [ ])
PRESENT DAILY STARTUP: M-F_____TO_____, SAT_____TO_____, SUN_____TO_____
STARTUP METHOD: MANUAL [ ] TIMECLOCK [ ] (WORKING, YES [ ] NO [ ])
SEASONAL SWITCHOVER: SUM_____TO_____, WIN_____TO_____
REQUIRED DAILY STARTUP:M-F_____TO_____, SAT_____TO_____, SUN_____TO_____

COILS:
PREHEAT: NONE [ ] STM [ ] HW [X] ELEC [ ] MOD VLV [ ]
HEATING: NONE [ ] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
REHEAT: NONE [ ] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
HUMID: NONE [ ] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
COOLING: NONE [ ] CW [X] DX [ ] SPRAY[ ] OTHER [ ]

REMARK:_____
DAMPERS: OUTSIDE AIR: MAX %_____, MIN %_____, DAMPER MTR YES [ ] NO [ ]
RETURN AIR: MAX %_____, MIN %_____, DAMPER MTR YES [ ] NO [ ]
RELIEF AIR: MAX %_____, MIN %_____, DAMPER MTR YES [ ] NO [ ]
MIXED AIR CONTROL [ ], ECONOMIZER (DB [ ] OR ENTH [ ]) NONE [ ]

REMARKS:_____
SUPPORT FANS: UNIT_____ RETURN FAN [X] EXHAUST FAN [ ] OTHER [ ]
FAN HP:_____ MFG:_____ MODEL:_____
THERMOSTAT TYPE: SINGLE SETPOINT [ ] DUAL SETPOINT [ ] SETBACK [ ]
PNEUMATIC [ ] ELECTRIC/ELECTRONIC [ ] NO. OF ZONES_____
SETPOINT:OCC HEAT_____°F UNOCC HEAT_____°F OCC COOL_____°F UNOCC COOL_____°F
RESET CONTROLS: YES [ ] NO [ ], DECK SETPOINT HOT_____°F COLD_____°F
DEMAND LIMITING, DUTY CYCLING YES [ ] NO [ ]
REMARKS:

Ft. McPherson/ Ft. Gillem Energy Study
EMC # 3105.000

DATE:_____
BY:_____

I. AIR HANDLING UNIT SURVEY OBSERVATIONS

BLDG NO: 200 BLDG NAME: ADMIN JOB: 3105
AHU NO: 4 LOCATION: R-118 SEC. 1 @ 1ST FLOOR SOUTH
ZONE NO. SERVED:_____ REF. SYS. SERVING AHU:_____
([ ] VERIFIED ZONE OCCUPANCY AND TEMP. REQUIREMENTS ON SURVEY FORM VI.)
UNIT TYPE: SINGLE ZONE [X] MULTIZONE [ ] DOUBLE DT [ ] REHEAT [ ]
HEAT & VENT [ ] 2-PIPE FC [ ] 4-PIPE FC [ ] UNIT HT [ ]
OTHER [X] VAV
MFG:_____ MODEL:_____
SUPPLY FAN: FAN HP:_____ MFG:_____ MODEL:_____
CFM: SA 13716 RA 12200 OA 1090 (MEASURED [ ] ESTIMATED [ ])
PRESENT DAILY STARTUP: M-F_____TO_____, SAT_____TO_____, SUN_____TO_____
STARTUP METHOD: MANUAL [ ] TIMECLOCK [ ] (WORKING, YES [ ] NO [ ])
SEASONAL SWITCHOVER: SUM_____TO_____, WIN_____TO_____
REQUIRED DAILY STARTUP: M-F_____TO_____, SAT_____TO_____, SUN_____TO_____

COILS:
PREHEAT: NONE [ ] STM [ ] HW [X] ELEC [ ] MOD VLV [ ]
HEATING: NONE [ ] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
REHEAT: NONE [ ] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
HUMID: NONE [ ] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
COOLING: NONE [ ] CW [X] DX [ ] SPRAY[ ] OTHER [ ]

REMARK:_____
DAMPERS: OUTSIDE AIR: MAX %_____, MIN %_____, DAMPER MTR YES [ ] NO [ ]
RETURN AIR: MAX %_____, MIN %_____, DAMPER MTR YES [ ] NO [ ]
RELIEF AIR: MAX %_____, MIN %_____, DAMPER MTR YES [ ] NO [ ]
MIXED AIR CONTROL [ ], ECONOMIZER (DB [ ] OR ENTH [ ]) NONE [ ]

REMARKS:_____
SUPPORT FANS: UNIT_____ RETURN FAN [X] EXHAUST FAN [ ] OTHER [ ]
FAN HP:_____ MFG:_____ MODEL:_____
THERMOSTAT TYPE: SINGLE SETPOINT [ ] DUAL SETPOINT [ ] SETBACK [ ]
PNEUMATIC [ ] ELECTRIC/ELECTRONIC [ ] NO. OF ZONES_____
SETPOINT: OCC HEAT_____°F UNOCC HEAT_____°F OCC COOL_____°F UNOCC COOL_____°F
RESET CONTROLS: YES [ ] NO [ ], DECK SETPOINT HOT_____°F COLD_____°F
DEMAND LIMITING, DUTY CYCLING YES [ ] NO [ ]
REMARKS:

Ft. McPherson/ Ft. Gillem Energy Study
EMC # 3105.000

DATE:_____
BY:_____

I. AIR HANDLING UNIT SURVEY OBSERVATIONS

BLDG NO: 200 BLDG NAME: ADMIN JOB: 3105
AHU NO: 5 LOCATION: R-217 SEC. 1 2nd FLOOR SOUTH
ZONE NO. SERVED:_____ REF. SYS. SERVING AHU:_____
([ ] VERIFIED ZONE OCCUPANCY AND TEMP. REQUIREMENTS ON SURVEY FORM VI.)
UNIT TYPE: SINGLE ZONE [ ] MULTIZONE [ ] DOUBLE DT [ ] REHEAT [ ]
HEAT & VENT [ ] 2-PIPE FC [ ] 4-PIPE FC [ ] UNIT HT [ ]
OTHER [∝] VAV
MFG:_____ MODEL:_____
SUPPLY FAN: FAN HP:_____ MFG:_____ MODEL:_____
CFM: SA 19795 RA 18105 OA 1945 (MEASURED [ ] ESTIMATED [ ])
PRESENT DAILY STARTUP: M-F_____TO_____, SAT_____TO_____, SUN_____TO_____
STARTUP METHOD: MANUAL [ ] TIMECLOCK [ ] (WORKING, YES [ ] NO [ ])
SEASONAL SWITCHOVER: SUM_____TO_____, WIN_____TO_____
REQUIRED DAILY STARTUP:M-F_____TO_____, SAT_____TO_____, SUN_____TO_____

COILS:
PREHEAT:	NONE [ ]	STM [ ]	HW [ ]	ELEC [ ]	MOD VLV [ ]	
HEATING:	NONE [ ]	STM [ ]	HW [X]	ELEC [ ]	MOD VLV [ ]	
REHEAT:	NONE [ ]	STM [ ]	HW [ ]	ELEC [ ]	MOD VLV [ ]	
HUMID:	NONE [ ]	STM [ ]	HW [ ]	ELEC [ ]	MOD VLV [ ]	
COOLING:	NONE [ ]	CW [X]	DX [ ]	SPRAY [ ]	OTHER [ ]	

REMARK:_____
DAMPERS: OUTSIDE AIR: MAX %_____, MIN %_____, DAMPER MTR YES [ ] NO [ ]
RETURN AIR: MAX %_____, MIN %_____, DAMPER MTR YES [ ] NO [ ]
RELIEF AIR: MAX %_____, MIN %_____, DAMPER MTR YES [ ] NO [ ]
MIXED AIR CONTROL [ ], ECONOMIZER (DB [ ] OR ENTH [ ]) NONE [ ]

REMARKS:_____
SUPPORT FANS: UNIT_____ RETURN FAN [X] EXHAUST FAN [ ] OTHER [ ]
FAN HP:_____ MFG:_____ MODEL:_____
THERMOSTAT TYPE: SINGLE SETPOINT [ ] DUAL SETPOINT [ ] SETBACK [ ]
PNEUMATIC [ ] ELECTRIC/ELECTRONIC [ ] NO. OF ZONES_____
SETPOINT:OCC HEAT_____°F UNOCC HEAT_____°F OCC COOL_____°F UNOCC COOL_____°F
RESET CONTROLS: YES [ ] NO [ ], DECK SETPOINT HOT_____°F COLD_____°F
DEMAND LIMITING, DUTY CYCLING YES [ ] NO [ ]
REMARKS:

Ft. McPherson/ Ft. Gillem Energy Study
EMC # 3105.000

DATE:_____
BY:_____

I. AIR HANDLING UNIT SURVEY OBSERVATIONS

BLDG NO: 200 BLDG NAME: ADMIN JOB: 3105
AHU NO: 6 LOCATION: R-316 SEC. 1 SOUTH
ZONE NO. SERVED:_____ REF. SYS. SERVING AHU:_____
([ ] VERIFIED ZONE OCCUPANCY AND TEMP. REQUIREMENTS ON SURVEY FORM VI.)
UNIT TYPE: SINGLE ZONE [ ] MULTIZONE [ ] DOUBLE DT [ ] REHEAT [ ]
HEAT & VENT [ ] 2-PIPE FC [ ] 4-PIPE FC [ ] UNIT HT [ ]
OTHER [✓] VAV
MFG:_____ MODEL:_____
SUPPLY FAN: FAN HP:_____ MFG:_____ MODEL:_____
CFM: SA 20590 RA 18920 OA 2575 (MEASURED [ ] ESTIMATED [ ])
PRESENT DAILY STARTUP: M-F_____TO_____, SAT_____TO_____, SUN_____TO_____
STARTUP METHOD: MANUAL [ ] TIMECLOCK [ ] (WORKING, YES [ ] NO [ ])
SEASONAL SWITCHOVER: SUM_____TO_____, WIN_____TO_____
REQUIRED DAILY STARTUP:M-F_____TO_____, SAT_____TO_____, SUN_____TO_____

COILS:
PREHEAT:	NONE	[ ]	STM	[ ]	HW	[X]	ELEC	[ ]	MOD VLV	[ ]
HEATING:	NONE	[ ]	STM	[ ]	HW	[ ]	ELEC	[ ]	MOD VLV	[ ]
REHEAT:	NONE	[ ]	STM	[ ]	HW	[ ]	ELEC	[ ]	MOD VLV	[ ]
HUMID:	NONE	[ ]	STM	[ ]	HW	[ ]	ELEC	[ ]	MOD VLV	[ ]
COOLING:	NONE	[ ]	CW	[X]	DX	[ ]	SPRAY	[ ]	OTHER	[ ]

REMARK:_____

DAMPERS: OUTSIDE AIR: MAX %_____, MIN %_____, DAMPER MTR YES [ ] NO [ ]
RETURN AIR: MAX %_____, MIN %_____, DAMPER MTR YES [ ] NO [ ]
RELIEF AIR: MAX %_____, MIN %_____, DAMPER MTR YES [ ] NO [ ]
MIXED AIR CONTROL [ ], ECONOMIZER (DB [ ] OR ENTH [ ]) NONE [ ]

REMARKS:_____
SUPPORT FANS: UNIT_____ RETURN FAN [X] EXHAUST FAN [ ] OTHER [ ]
FAN HP:_____ MFG:_____ MODEL:_____
THERMOSTAT TYPE: SINGLE SETPOINT [ ] DUAL SETPOINT [ ] SETBACK [ ]
PNEUMATIC [ ] ELECTRIC/ELECTRONIC [ ] NO. OF ZONES_____
SETPOINT:OCC HEAT_____°F UNOCC HEAT_____°F OCC COOL_____°F UNOCC COOL_____°F
RESET CONTROLS: YES [ ] NO [ ], DECK SETPOINT HOT_____°F COLD_____°F
DEMAND LIMITING, DUTY CYCLING YES [ ] NO [ ]
REMARKS:

Ft. McPherson/ Ft. Gillem Energy Study
EMC # 3105.000

DATE:_____
BY:_____

I. AIR HANDLING UNIT SURVEY OBSERVATIONS

BLDG NO: 200 BLDG NAME: ADMIN JOB: 3105
AHU NO: 7 LOCATION: R-131 WEST 1ST FLOOR SEC. 3
ZONE NO. SERVED:_____ REF. SYS. SERVING AHU:_____
([ ] VERIFIED ZONE OCCUPANCY AND TEMP. REQUIREMENTS ON SURVEY FORM VI.)
UNIT TYPE: SINGLE ZONE [ ] MULTIZONE [ ] DOUBLE DT [ ] REHEAT [ ]
HEAT & VENT [ ] 2-PIPE FC [ ] 4-PIPE FC [ ] UNIT HT [ ]
OTHER [∝] VAV
MFG:_____ MODEL:_____
SUPPLY FAN: FAN HP:_____ MFG:_____ MODEL:_____
CFM: SA 16680 RA 15060 OA 2150 (MEASURED [ ] ESTIMATED [ ])
PRESENT DAILY STARTUP: M-F_____TO_____, SAT_____TO_____, SUN_____TO_____
STARTUP METHOD: MANUAL [ ] TIMECLOCK [ ] (WORKING, YES [ ] NO [ ])
SEASONAL SWITCHOVER: SUM_____TO_____, WIN_____TO_____
REQUIRED DAILY STARTUP: M-F_____TO_____, SAT_____TO_____, SUN_____TO_____

COILS:
PREHEAT: NONE [ ] STM [ ] HW [X] ELEC [ ] MOD VLV [ ]
HEATING: NONE [ ] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
REHEAT: NONE [ ] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
HUMID: NONE [ ] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
COOLING: NONE [ ] CW [X] DX [ ] SPRAY[ ] OTHER [ ]

REMARK:_____

DAMPERS: OUTSIDE AIR: MAX %_____, MIN %_____, DAMPER MTR YES [ ] NO [ ]
RETURN AIR: MAX %_____, MIN %_____, DAMPER MTR YES [ ] NO [ ]
RELIEF AIR: MAX %_____, MIN %_____, DAMPER MTR YES [ ] NO [ ]
MIXED AIR CONTROL [ ], ECONOMIZER (DB [ ] OR ENTH [ ]) NONE [ ]

REMARKS:_____
SUPPORT FANS: UNIT_____ RETURN FAN [X] EXHAUST FAN [ ] OTHER [ ]
FAN HP:_____ MFG:_____ MODEL:_____
THERMOSTAT TYPE: SINGLE SETPOINT [ ] DUAL SETPOINT [ ] SETBACK [ ]
PNEUMATIC [ ] ELECTRIC/ELECTRONIC [ ] NO. OF ZONES_____
SETPOINT: OCC HEAT_____°F UNOCC HEAT_____°F OCC COOL_____°F UNOCC COOL_____°F
RESET CONTROLS: YES [ ] NO [ ], DECK SETPOINT HOT_____°F COLD_____°F
DEMAND LIMITING, DUTY CYCLING YES [ ] NO [ ]
REMARKS:

Ft. McPherson/ Ft. Gillem Energy Study
EMC # 3105.000

DATE:_____
BY:_____

I. AIR HANDLING UNIT SURVEY OBSERVATIONS

BLDG NO: 200 BLDG NAME: ADMIN JOB: 3105
AHU NO: 18 LOCATION: R-230 SEC, 3 WEST
ZONE NO. SERVED:_____ REF. SYS. SERVING AHU:_____
([ ] VERIFIED ZONE OCCUPANCY AND TEMP. REQUIREMENTS ON SURVEY FORM VI.)
UNIT TYPE: SINGLE ZONE [ ] MULTIZONE [ ] DOUBLE DT [ ] REHEAT [ ]
HEAT & VENT [ ] 2-PIPE FC [ ] 4-PIPE FC [ ] UNIT HT [ ]
OTHER [X] VAV
MFG:_____ MODEL:_____
SUPPLY FAN: FAN HP:_____ MFG:_____ MODEL:_____
CFM: SA 19750 RA 17920 OA 2200 (MEASURED [ ] ESTIMATED [ ])
PRESENT DAILY STARTUP: M-F_____TO_____, SAT_____TO_____, SUN_____TO_____
STARTUP METHOD: MANUAL [ ] TIMECLOCK [ ] (WORKING, YES [ ] NO [ ])
SEASONAL SWITCHOVER: SUM_____TO_____, WIN_____TO_____
REQUIRED DAILY STARTUP:M-F_____TO_____, SAT_____TO_____, SUN_____TO_____

COILS: PREHEAT: NONE [ ] STM [ ] HW [X] ELEC [ ] MOD VLV [ ]
HEATING: NONE [ ] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
REHEAT: NONE [ ] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
HUMID: NONE [ ] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
COOLING: NONE [ ] CW [X] DX [ ] SPRAY[ ] OTHER [ ]

REMARK:_____
DAMPERS: OUTSIDE AIR: MAX %_____, MIN %_____, DAMPER MTR YES [ ] NO [ ]
RETURN AIR: MAX %_____, MIN %_____, DAMPER MTR YES [ ] NO [ ]
RELIEF AIR: MAX %_____, MIN %_____, DAMPER MTR YES [ ] NO [ ]
MIXED AIR CONTROL [ ], ECONOMIZER (DB [ ] OR ENTH [ ]) NONE [ ]

REMARKS:_____
SUPPORT FANS: UNIT_____ RETURN FAN [X] EXHAUST FAN [ ] OTHER [ ]
FAN HP:_____ MFG:_____ MODEL:_____
THERMOSTAT TYPE: SINGLE SETPOINT [ ] DUAL SETPOINT [ ] SETBACK [ ]
PNEUMATIC [ ] ELECTRIC/ELECTRONIC [ ] NO. OF ZONES_____
SETPOINT:OCC HEAT_____°F UNOCC HEAT_____°F OCC COOL_____°F UNOCC COOL_____°F
RESET CONTROLS: YES [ ] NO [ ], DECK SETPOINT HOT_____°F COLD_____°F
DEMAND LIMITING, DUTY CYCLING YES [ ] NO [ ]
REMARKS:

Ft. McPherson/ Ft. Gillem Energy Study
EMC # 3105.000

DATE:_____
BY:_____

I. AIR HANDLING UNIT SURVEY OBSERVATIONS

BLDG NO: 200 BLDG NAME: ADMIN JOB:_____
AHU NO: 9 LOCATION: R-323 SEC. 3 @WEST
ZONE NO. SERVED:_____ REF. SYS. SERVING AHU:_____
([ ] VERIFIED ZONE OCCUPANCY AND TEMP. REQUIREMENTS ON SURVEY FORM VI.)
UNIT TYPE: SINGLE ZONE [ ] MULTIZONE [ ] DOUBLE DT [ ] REHEAT [ ]
HEAT & VENT [ ] 2-PIPE FC [ ] 4-PIPE FC [ ] UNIT HT [ ]
OTHER [X] VAV
MFG:_____ MODEL:_____
SUPPLY FAN: FAN HP:_____ MFG:_____ MODEL:_____
CFM: SA 15370 RA 13690 OA 2220 (MEASURED [ ] ESTIMATED [ ])
PRESENT DAILY STARTUP: M-F_____TO_____, SAT_____TO_____, SUN_____TO_____
STARTUP METHOD: MANUAL [ ] TIMECLOCK [ ] (WORKING, YES [ ] NO [ ])
SEASONAL SWITCHOVER: SUM_____TO_____, WIN_____TO_____
REQUIRED DAILY STARTUP: M-F_____TO_____, SAT_____TO_____, SUN_____TO_____

COILS:
PREHEAT: NONE [ ] STM [ ] HW [X] ELEC [ ] MOD VLV [ ]
HEATING: NONE [ ] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
REHEAT: NONE [ ] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
HUMID: NONE [ ] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
COOLING: NONE [ ] CW [X] DX [ ] SPRAY[ ] OTHER [ ]

REMARK:_____
DAMPERS: OUTSIDE AIR: MAX %_____, MIN %_____, DAMPER MTR YES [ ] NO [ ]
RETURN AIR: MAX %_____, MIN %_____, DAMPER MTR YES [ ] NO [ ]
RELIEF AIR: MAX %_____, MIN %_____, DAMPER MTR YES [ ] NO [ ]
MIXED AIR CONTROL [ ], ECONOMIZER (DB [ ] OR ENTH [ ]) NONE [ ]

REMARKS:_____
SUPPORT FANS: UNIT_____ RETURN FAN [X] EXHAUST FAN [ ] OTHER [ ]
FAN HP:_____ MFG:_____ MODEL:_____
THERMOSTAT TYPE: SINGLE SETPOINT [ ] DUAL SETPOINT [ ] SETBACK [ ]
PNEUMATIC [ ] ELECTRIC/ELECTRONIC [ ] NO. OF ZONES_____
SETPOINT: OCC HEAT_____°F UNOCC HEAT_____°F OCC COOL_____°F UNOCC COOL_____°F
RESET CONTROLS: YES [ ] NO [ ], DECK SETPOINT HOT_____°F COLD_____°F
DEMAND LIMITING, DUTY CYCLING YES [ ] NO [ ]
REMARKS:

Ft. McPherson/ Ft. Gillem Energy Study
EMC # 3105.000

DATE:_____
BY:_____

I. AIR HANDLING UNIT SURVEY OBSERVATIONS

BLDG NO: 200 BLDG NAME: ADMIN JOB: 3105
AHU NO: 10 LOCATION: R-132 SEC. 3 EAST 1ST floor
ZONE NO. SERVED:_____ REF. SYS. SERVING AHU:_____
([ ] VERIFIED ZONE OCCUPANCY AND TEMP. REQUIREMENTS ON SURVEY FORM VI.)
UNIT TYPE: SINGLE ZONE [X] MULTIZONE [ ] DOUBLE DT [ ] REHEAT [ ]
HEAT & VENT [ ] 2-PIPE FC [ ] 4-PIPE FC [ ] UNIT HT [ ]
OTHER [X] VAV
MFG:_____ MODEL:_____
SUPPLY FAN: FAN HP:_____ MFG:_____ MODEL:_____
CFM: SA 18010 RA 17025 OA 2440 (MEASURED [ ] ESTIMATED [ ])
PRESENT DAILY STARTUP: M-F_____TO_____, SAT_____TO_____, SUN_____TO_____
STARTUP METHOD: MANUAL [ ] TIMECLOCK [ ] (WORKING, YES [ ] NO [ ])
SEASONAL SWITCHOVER: SUM_____TO_____, WIN_____TO_____
REQUIRED DAILY STARTUP: M-F_____TO_____, SAT_____TO_____, SUN_____TO_____

COILS:
PREHEAT: NONE [ ] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
HEATING: NONE [ ] STM [ ] HW [X] ELEC [ ] MOD VLV [ ]
REHEAT: NONE [ ] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
HUMID: NONE [ ] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
COOLING: NONE [ ] CW [X] DX [ ] SPRAY[ ] OTHER [ ]

REMARK:_____

DAMPERS: OUTSIDE AIR: MAX %_____, MIN %_____, DAMPER MTR YES [ ] NO [ ]
RETURN AIR: MAX %_____, MIN %_____, DAMPER MTR YES [ ] NO [ ]
RELIEF AIR: MAX %_____, MIN %_____, DAMPER MTR YES [ ] NO [ ]
MIXED AIR CONTROL [ ], ECONOMIZER (DB [ ] OR ENTH [ ]) NONE [ ]

REMARKS:_____
SUPPORT FANS: UNIT_____ RETURN FAN [X] EXHAUST FAN [ ] OTHER [ ]
FAN HP:_____ MFG:_____ MODEL:_____
THERMOSTAT TYPE: SINGLE SETPOINT [ ] DUAL SETPOINT [ ] SETBACK [ ]
PNEUMATIC [ ] ELECTRIC/ELECTRONIC [ ] NO. OF ZONES_____
SETPOINT: OCC HEAT_____°F UNOCC HEAT_____°F OCC COOL_____°F UNOCC COOL_____°F
RESET CONTROLS: YES [ ] NO [ ], DECK SETPOINT HOT_____°F COLD_____°F
DEMAND LIMITING, DUTY CYCLING YES [ ] NO [ ]
REMARKS:

Ft. McPherson/ Ft. Gillem Energy Study
EMC # 3105.000

DATE:_____
BY:_____

I. AIR HANDLING UNIT SURVEY OBSERVATIONS

BLDG NO: 200 BLDG NAME: ADMIN JOB: 3105
AHU NO: 11 LOCATION: R-231 SEC.3 EAST
ZONE NO. SERVED:_____ REF. SYS. SERVING AHU:_____
([ ] VERIFIED ZONE OCCUPANCY AND TEMP. REQUIREMENTS ON SURVEY FORM VI.)
UNIT TYPE: SINGLE ZONE [ ] MULTIZONE [ ] DOUBLE DT [ ] REHEAT [ ]
HEAT & VENT [ ] 2-PIPE FC [ ] 4-PIPE FC [ ] UNIT HT [ ]
OTHER [X] VAV
MFG:_____ MODEL:_____
SUPPLY FAN: FAN HP:_____ MFG:_____ MODEL:_____
CFM: SA 19730 RA 18670 OA 2095 (MEASURED [ ] ESTIMATED [ ])
PRESENT DAILY STARTUP: M-F_____TO_____, SAT_____TO_____, SUN_____TO_____
STARTUP METHOD: MANUAL [ ] TIMECLOCK [ ] (WORKING, YES [ ] NO [ ])
SEASONAL SWITCHOVER: SUM_____TO_____, WIN_____TO_____
REQUIRED DAILY STARTUP:M-F_____TO_____, SAT_____TO_____, SUN_____TO_____

COILS:
PREHEAT: NONE [ ] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
HEATING: NONE [ ] STM [ ] HW [X] ELEC [ ] MOD VLV [ ]
REHEAT: NONE [ ] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
HUMID: NONE [ ] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
COOLING: NONE [ ] CW [X] DX [ ] SPRAY[ ] OTHER [ ]

REMARK:_____
DAMPERS: OUTSIDE AIR: MAX %_____, MIN %_____, DAMPER MTR YES [ ] NO [ ]
RETURN AIR: MAX %_____, MIN %_____, DAMPER MTR YES [ ] NO [ ]
RELIEF AIR: MAX %_____, MIN %_____, DAMPER MTR YES [ ] NO [ ]
MIXED AIR CONTROL [ ], ECONOMIZER (DB [ ] OR ENTH [ ]) NONE [ ]

REMARKS:_____
SUPPORT FANS: UNIT_____ RETURN FAN [X] EXHAUST FAN [ ] OTHER [ ]
FAN HP:_____ MFG:_____ MODEL:_____
THERMOSTAT TYPE: SINGLE SETPOINT [ ] DUAL SETPOINT [ ] SETBACK [ ]
PNEUMATIC [ ] ELECTRIC/ELECTRONIC [ ] NO. OF ZONES_____
SETPOINT:OCC HEAT_____°F UNOCC HEAT_____°F OCC COOL_____°F UNOCC COOL_____°F
RESET CONTROLS: YES [ ] NO [ ], DECK SETPOINT HOT_____°F COLD_____°F
DEMAND LIMITING, DUTY CYCLING YES [ ] NO [ ]
REMARKS:

Ft. McPherson/ Ft. Gillem Energy Study
EMC # 3105.000

DATE:_____
BY:_____

I. AIR HANDLING UNIT SURVEY OBSERVATIONS

BLDG NO: 200 BLDG NAME: ADMIN JOB:_____
AHU NO: 12 LOCATION: R-324 SEC. 3 EAST
ZONE NO. SERVED:_____ REF. SYS. SERVING AHU:_____
([ ] VERIFIED ZONE OCCUPANCY AND TEMP. REQUIREMENTS ON SURVEY FORM VI.)
UNIT TYPE: SINGLE ZONE [ ] MULTIZONE [ ] DOUBLE DT [ ] REHEAT [ ]
HEAT & VENT [ ] 2-PIPE FC [ ] 4-PIPE FC [ ] UNIT HT [ ]
OTHER [x] VAV
MFG:_____ MODEL:_____
SUPPLY FAN: FAN HP:_____ MFG:_____ MODEL:_____
CFM: SA 22240 RA 21215 OA 2200 (MEASURED [ ] ESTIMATED [ ])
PRESENT DAILY STARTUP: M-F_____TO_____, SAT_____TO_____, SUN_____TO_____
STARTUP METHOD: MANUAL [ ] TIMECLOCK [ ] (WORKING, YES [ ] NO [ ])
SEASONAL SWITCHOVER: SUM_____TO_____, WIN_____TO_____
REQUIRED DAILY STARTUP:M-F_____TO_____, SAT_____TO_____, SUN_____TO_____

COILS:
PREHEAT: NONE [ ] STM [ ] HW [X] ELEC [ ] MOD VLV [ ]
HEATING: NONE [ ] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
REHEAT: NONE [ ] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
HUMID: NONE [ ] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
COOLING: NONE [ ] CW [X] DX [ ] SPRAY[ ] OTHER [ ]

REMARK:_____
DAMPERS: OUTSIDE AIR: MAX %_____, MIN %_____, DAMPER MTR YES [ ] NO [ ]
RETURN AIR: MAX %_____, MIN %_____, DAMPER MTR YES [ ] NO [ ]
RELIEF AIR: MAX %_____, MIN %_____, DAMPER MTR YES [ ] NO [ ]
MIXED AIR CONTROL [ ], ECONOMIZER (DB [ ] OR ENTH [ ]) NONE [ ]

REMARKS:_____
SUPPORT FANS: UNIT_____ RETURN FAN [X] EXHAUST FAN [ ] OTHER [ ]
FAN HP:_____ MFG:_____ MODEL:_____
THERMOSTAT TYPE: SINGLE SETPOINT [ ] DUAL SETPOINT [ ] SETBACK [ ]
PNEUMATIC [ ] ELECTRIC/ELECTRONIC [ ] NO. OF ZONES_____
SETPOINT:OCC HEAT_____°F UNOCC HEAT_____°F OCC COOL_____°F UNOCC COOL_____°F
RESET CONTROLS: YES [ ] NO [ ], DECK SETPOINT HOT_____°F COLD_____°F
DEMAND LIMITING, DUTY CYCLING YES [ ] NO [ ]
REMARKS:

Ft. McPherson/ Ft. Gillem Energy Study
EMC # 3105.000

DATE: _____
BY: JW

I. AIR HANDLING UNIT SURVEY OBSERVATIONS

BLDG NO: 200 BLDG NAME: ADMIN JOB: 3105.000
AHU NO: AHU-13 LOCATION: R-011 NORTH BASEMENT
ZONE NO. SERVED: _____ REF. SYS. SERVING AHU: _____
([ ] VERIFIED ZONE OCCUPANCY AND TEMP. REQUIREMENTS ON SURVEY FORM VI.)
UNIT TYPE: SINGLE ZONE [X] MULTIZONE [ ] DOUBLE DT [ ] REHEAT [ ]
HEAT & VENT [ ] 2-PIPE FC [ ] 4-PIPE FC [ ] UNIT HT [ ]
OTHER [X] VAV
MFG: _____ MODEL: _____
SUPPLY FAN: FAN HP: _____ MFG: _____ MODEL: _____
CFM: SA 2040 RA 245 OA 2040 (MEASURED [ ] ESTIMATED [ ])
PRESENT DAILY STARTUP: M-F _____ TO _____, SAT _____ TO _____, SUN _____ TO _____
STARTUP METHOD: MANUAL [ ] TIMECLOCK [ ] (WORKING, YES [ ] NO [ ])
SEASONAL SWITCHOVER: SUM _____ TO _____, WIN _____ TO _____
REQUIRED DAILY STARTUP: M-F _____ TO _____, SAT _____ TO _____, SUN _____ TO _____

COILS:
PREHEAT: NONE [ ] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
HEATING: NONE [ ] STM [ ] HW [X] ELEC [ ] MOD VLV [ ]
REHEAT: NONE [ ] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
HUMID: NONE [ ] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
COOLING: NONE [ ] CW [X] DX [ ] SPRAY [ ] OTHER [ ]

REMARK: _____

DAMPERS:
OUTSIDE AIR: MAX %_____, MIN %_____, DAMPER MTR YES [ ] NO [ ]
RETURN AIR: MAX %_____, MIN %_____, DAMPER MTR YES [ ] NO [ ]
RELIEF AIR: MAX %_____, MIN %_____, DAMPER MTR YES [ ] NO [ ]
MIXED AIR CONTROL [ ], ECONOMIZER (DB [ ] OR ENTH [ ]) NONE [ ]

REMARKS: _____

SUPPORT FANS: UNIT _____ RETURN FAN [X] EXHAUST FAN [ ] OTHER [ ]
FAN HP: _____ MFG: _____ MODEL: _____
THERMOSTAT TYPE: SINGLE SETPOINT [ ] DUAL SETPOINT [ ] SETBACK [ ]
PNEUMATIC [ ] ELECTRIC/ELECTRONIC [ ] NO. OF ZONES _____
SETPOINT: OCC HEAT _____ °F UNOCC HEAT _____ °F OCC COOL _____ °F UNOCC COOL _____ °F
RESET CONTROLS: YES [ ] NO [ ], DECK SETPOINT HOT _____ °F COLD _____ °F
DEMAND LIMITING, DUTY CYCLING YES [ ] NO [ ]
REMARKS:
100% OA UNIT (SAME AS 16)

Ft. McPherson/ Ft. Gillem Energy Study
EMC # 3105.000

DATE: 1/13/92
BY: JW

I. AIR HANDLING UNIT SURVEY OBSERVATIONS

BLDG NO: 200 BLDG NAME: ADMIN JOB: 3105
AHU NO: 14 LOCATION: R-010 BASEMENT SEC / SOUTH
ZONE NO. SERVED: _____ REF. SYS. SERVING AHU: _____
([ ] VERIFIED ZONE OCCUPANCY AND TEMP. REQUIREMENTS ON SURVEY FORM VI.)
UNIT TYPE: SINGLE ZONE [ ] MULTIZONE [ ] DOUBLE DT [ ] REHEAT [ ]
HEAT & VENT [ ] 2-PIPE FC [ ] 4-PIPE FC [ ] UNIT HT [ ]
OTHER [X] VAV
MFG: _____ MODEL: _____
SUPPLY FAN: FAN HP: _____ MFG: _____ MODEL: _____
CFM: SA 33465 RA 29850 OA 5570 (MEASURED [ ] ESTIMATED [ ])
PRESENT DAILY STARTUP: M-F _____ TO _____, SAT _____ TO _____, SUN _____ TO _____
STARTUP METHOD: MANUAL [ ] TIMECLOCK [ ] (WORKING, YES [ ] NO [ ])
SEASONAL SWITCHOVER: SUM _____ TO _____, WIN _____ TO _____
REQUIRED DAILY STARTUP: M-F _____ TO _____, SAT _____ TO _____, SUN _____ TO _____

COILS:
PREHEAT: NONE [ ] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
HEATING: NONE [ ] STM [ ] HW [X] ELEC [ ] MOD VLV [ ]
REHEAT: NONE [ ] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
HUMID: NONE [ ] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
COOLING: NONE [ ] CW [X] DX [ ] SPRAY [ ] OTHER [ ]

REMARK: _____

DAMPERS:
OUTSIDE AIR: MAX %_____, MIN %_____, DAMPER MTR YES [ ] NO [ ]
RETURN AIR: MAX %_____, MIN %_____, DAMPER MTR YES [ ] NO [ ]
RELIEF AIR: MAX %_____, MIN %_____, DAMPER MTR YES [ ] NO [ ]
MIXED AIR CONTROL [ ], ECONOMIZER (DB [ ] OR ENTH [ ]) NONE [ ]

REMARKS: _____

SUPPORT FANS: UNIT _____ RETURN FAN [X] EXHAUST FAN [ ] OTHER [ ]
FAN HP: _____ MFG: _____ MODEL: _____
THERMOSTAT TYPE: SINGLE SETPOINT [ ] DUAL SETPOINT [ ] SETBACK [ ]
PNEUMATIC [ ] ELECTRIC/ELECTRONIC [ ] NO. OF ZONES _____
SETPOINT: OCC HEAT _____ °F UNOCC HEAT _____ °F OCC COOL _____ °F UNOCC COOL _____ °F
RESET CONTROLS: YES [ ] NO [ ], DECK SETPOINT HOT _____ °F COLD _____ °F
DEMAND LIMITING, DUTY CYCLING YES [ ] NO [ ]
REMARKS:

Ft. McPherson/ Ft. Gillem Energy Study
EMC # 3105.000

DATE:_____
BY:_____

I. AIR HANDLING UNIT SURVEY OBSERVATIONS

BLDG NO: 200 BLDG NAME: ADMIN JOB: 3105
AHU NO: 15 LOCATION: R-019 WEST BASEMENT SEC. 3
ZONE NO. SERVED:_____ REF. SYS. SERVING AHU:_____
([ ] VERIFIED ZONE OCCUPANCY AND TEMP. REQUIREMENTS ON SURVEY FORM VI.)
UNIT TYPE: SINGLE ZONE [ ] MULTIZONE [ ] DOUBLE DT [ ] REHEAT [ ]
HEAT & VENT [ ] 2-PIPE FC [ ] 4-PIPE FC [ ] UNIT HT [ ]
OTHER [X] VAV
MFG:_____ MODEL:_____
SUPPLY FAN: FAN HP:_____ MFG:_____ MODEL:_____
CFM: SA 24075 RA 23245 OA 3546 (MEASURED [ ] ESTIMATED [ ])
PRESENT DAILY STARTUP: M-F_____TO_____, SAT_____TO_____, SUN_____TO_____
STARTUP METHOD: MANUAL [ ] TIMECLOCK [ ] (WORKING, YES [ ] NO [ ])
SEASONAL SWITCHOVER: SUM_____TO_____, WIN_____TO_____
REQUIRED DAILY STARTUP:M-F_____TO_____, SAT_____TO_____, SUN_____TO_____

COILS:
PREHEAT: NONE [ ] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
HEATING: NONE [ ] STM [ ] HW [X] ELEC [ ] MOD VLV [ ]
REHEAT: NONE [ ] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
HUMID: NONE [ ] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
COOLING: NONE [ ] CW [X] DX [ ] SPRAY[ ] OTHER [ ]

REMARK:_____

DAMPERS:
OUTSIDE AIR: MAX %_____, MIN %_____, DAMPER MTR YES [ ] NO [ ]
RETURN AIR: MAX %_____, MIN %_____, DAMPER MTR YES [ ] NO [ ]
RELIEF AIR: MAX %_____, MIN %_____, DAMPER MTR YES [ ] NO [ ]
MIXED AIR CONTROL [ ], ECONOMIZER (DB [ ] OR ENTH [ ]) NONE [ ]

REMARKS:_____
SUPPORT FANS: UNIT_____ RETURN FAN [X] EXHAUST FAN [ ] OTHER [ ]
FAN HP:_____ MFG:_____ MODEL:_____
THERMOSTAT TYPE: SINGLE SETPOINT [ ] DUAL SETPOINT [ ] SETBACK [ ]
PNEUMATIC [ ] ELECTRIC/ELECTRONIC [ ] NO. OF ZONES_____
SETPOINT:OCC HEAT_____°F UNOCC HEAT_____°F OCC COOL_____°F UNOCC COOL_____°F
RESET CONTROLS: YES [ ] NO [ ], DECK SETPOINT HOT_____°F COLD_____°F
DEMAND LIMITING, DUTY CYCLING YES [ ] NO [ ]
REMARKS:

Ft. McPherson/ Ft. Gillem Energy Study
EMC # 3105.000

DATE:_____
BY:_____

I. AIR HANDLING UNIT SURVEY OBSERVATIONS

BLDG NO: 200 BLDG NAME: ADMIN JOB: 3105
AHU NO: 16 LOCATION: R-020 EAST SEC. 3 BASEMENT
ZONE NO. SERVED: 6 REF. SYS. SERVING AHU:_____
([ ] VERIFIED ZONE OCCUPANCY AND TEMP. REQUIREMENTS ON SURVEY FORM VI.)
UNIT TYPE: SINGLE ZONE [ ] MULTIZONE [ ] DOUBLE DT [ ] REHEAT [ ]
HEAT & VENT [ ] 2-PIPE FC [ ] 4-PIPE FC [ ] UNIT HT [ ]
OTHER [X] VAV
MFG:_____ MODEL:_____
SUPPLY FAN: FAN HP:_____ MFG:_____ MODEL:_____
CFM: SA 2640 RA 1856 OA 2040 (MEASURED [ ] ESTIMATED [ ])
PRESENT DAILY STARTUP: M-F_____TO_____, SAT_____TO_____, SUN_____TO_____
STARTUP METHOD: MANUAL [ ] TIMECLOCK [ ] (WORKING, YES [ ] NO [ ])
SEASONAL SWITCHOVER: SUM_____TO_____, WIN_____TO_____
REQUIRED DAILY STARTUP:M-F_____TO_____, SAT_____TO_____, SUN_____TO_____

COILS:
PREHEAT: NONE [ ] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
HEATING: NONE [ ] STM [ ] HW [X] ELEC [ ] MOD VLV [ ]
REHEAT: NONE [ ] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
HUMID: NONE [ ] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
COOLING: NONE [ ] CW [X] DX [ ] SPRAY[ ] OTHER [ ]

REMARK:_____
DAMPERS: OUTSIDE AIR: MAX %_____, MIN %_____, DAMPER MTR YES [ ] NO [ ]
RETURN AIR: MAX %_____, MIN %_____, DAMPER MTR YES [ ] NO [ ]
RELIEF AIR: MAX %_____, MIN %_____, DAMPER MTR YES [ ] NO [ ]
MIXED AIR CONTROL [ ], ECONOMIZER (DB [ ] OR ENTH [ ]) NONE [ ]

REMARKS:_____
SUPPORT FANS: UNIT_____ RETURN FAN [X] EXHAUST FAN [ ] OTHER [ ]
FAN HP:_____ MFG:_____ MODEL:_____
THERMOSTAT TYPE: SINGLE SETPOINT [ ] DUAL SETPOINT [ ] SETBACK [ ]
PNEUMATIC [ ] ELECTRIC/ELECTRONIC [ ] NO. OF ZONES_____
SETPOINT:OCC HEAT_____°F UNOCC HEAT_____°F OCC COOL_____°F UNOCC COOL_____°F
RESET CONTROLS: YES [ ] NO [ ], DECK SETPOINT HOT_____°F COLD_____°F
DEMAND LIMITING, DUTY CYCLING YES [ ] NO [ ]
REMARKS:
100% OA UNIT (SAME AS 13)

Ft. McPherson/ Ft. Gillem Energy Study
EMC # 3105.000

DATE:_____
BY:_____

I. AIR HANDLING UNIT SURVEY OBSERVATIONS

BLDG NO: 200 BLDG NAME: ADMIN JOB:_____
AHU NO: 17 LOCATION: R-136 1st Floor Lobby
ZONE NO. SERVED:_____ REF. SYS. SERVING AHU:_____
([ ] VERIFIED ZONE OCCUPANCY AND TEMP. REQUIREMENTS ON SURVEY FORM VI.)
UNIT TYPE: SINGLE ZONE [ ] MULTIZONE [ ] DOUBLE DT [ ] REHEAT [ ]
HEAT & VENT [ ] 2-PIPE FC [ ] 4-PIPE FC [ ] UNIT HT [ ]
OTHER [X] VAV
MFG:_____ MODEL:_____
SUPPLY FAN: FAN HP:_____ MFG:_____ MODEL:_____
CFM: SA 1910 RA 1590 OA 125 (MEASURED [ ] ESTIMATED [ ])
PRESENT DAILY STARTUP: M-F_____TO_____, SAT_____TO_____, SUN_____TO_____
STARTUP METHOD: MANUAL [ ] TIMECLOCK [ ] (WORKING, YES [ ] NO [ ])
SEASONAL SWITCHOVER: SUM_____TO_____, WIN_____TO_____
REQUIRED DAILY STARTUP:M-F_____TO_____, SAT_____TO_____, SUN_____TO_____

COILS:
PREHEAT: NONE [ ] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
HEATING: NONE [ ] STM [ ] HW [X] ELEC [ ] MOD VLV [ ]
REHEAT: NONE [ ] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
HUMID: NONE [ ] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
COOLING: NONE [ ] CW [X] DX [ ] SPRAY[ ] OTHER [ ]

REMARK:_____

DAMPERS: OUTSIDE AIR: MAX %_____, MIN %_____, DAMPER MTR YES [ ] NO [ ]
RETURN AIR: MAX %_____, MIN %_____, DAMPER MTR YES [ ] NO [ ]
RELIEF AIR: MAX %_____, MIN %_____, DAMPER MTR YES [ ] NO [ ]
MIXED AIR CONTROL [ ], ECONOMIZER (DB [ ] OR ENTH [ ]) NONE [ ]

REMARKS:_____
SUPPORT FANS: UNIT_____ RETURN FAN [X] EXHAUST FAN [ ] OTHER [ ]
FAN HP:_____ MFG:_____ MODEL:_____
THERMOSTAT TYPE: SINGLE SETPOINT [ ] DUAL SETPOINT [ ] SETBACK [ ]
PNEUMATIC [ ] ELECTRIC/ELECTRONIC [ ] NO. OF ZONES_____
SETPOINT:OCC HEAT_____°F UNOCC HEAT_____°F OCC COOL_____°F UNOCC COOL_____°F
RESET CONTROLS: YES [ ] NO [ ], DECK SETPOINT HOT_____°F COLD_____°F
DEMAND LIMITING, DUTY CYCLING YES [ ] NO [ ]
REMARKS:

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____

SHEET NO. _____ OF _____

CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____

SCALE _____

3rd floor

Bldg 200

3rd floor
2nd Section

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY:
CHECKED BY:
DATE:

BLDG.# 306
ECO 15

LIGHTING

ROOM #	# OF FIXTURES	LAMPS/ FIXTURE	WATTS/ BULB	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCC. SENSOR	NO. OF SWITCHES	UNOCC LIGHTS ON
300									
301	28	1	175	MH	•				
302	15	2	34	F warm light	ON	Y	Y	4	Y
303	1	2	34	F	ON	Y	Y	1	Y
304	1	2	34	F	OFF	Y	N	1	N
305	2	2	34	F	OFF	Y	N	1	N
306	1	2	34	F	ON	Y	Y	1	Y
307	1	2	34	F	ON	Y	Y	1	Y
308	1	2	34	F	OFF	Y	N	1	N
309	2	2	34	F	OFF	Y	N	1	N
310	1	2	34	F	ON	Y	Y	1	Y
326	27	3	34	F	ON	Y	N	(1 3way) 3	N
Good	10	1	100	I		Y			
327	2		34	F		Y		2	
328	8	2	34	F		Y		(2 3way) 6	
	24	1	200	I		Y		See E-18 Drwg. 329	
329	5	3	34	F	ON	Y	Y	2	N
330	3	3	34	F	OFF	Y	N	1	N
325	9	2	34	F	3ON	Y	N	1	N
326A	16	3	34	F	ON	Y	N		N
310A	6	2	34	F	2ON	Y	N	1	N

OF EXIT SIGNS – 3

COMMENTS:

3rd floor
2nd section

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO. ____ OF ____
CALCULATED BY:
CHECKED BY:
DATE:

BLDG.# 200
EC0 15

LIGHTING

ROOM #	# OF FIXTURES	LAMPS/ FIXTURE	WATTS/ BULB	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCC. SENSOR	NO. OF SWITCHES	UNOCC LIGHTS ON
331	1	3	34	F		Y		1	
332	1	2	34	F		Y		1	
333	5	1	200	I	OFF	Y	Y	1	N
	4	1	300	I	OFF	Y	Y	1	N
334	1	2	34	F		Y		1	
335	1	2	34	F		Y		1	
336	5	1	200	I		Y		1	
	4	1	300	I		Y		1	
337	1	2	34	F		Y		1	
339	6	1	300	I		Y		1	
	6	1	200	I		Y		1	
	4	1	200	I		Y		1	
338									
340	4	3	34	F	OFF	Y	Y	2	N
341	10	1	150	I	OFF	Y	N	1	N
dont work	~~4~~	~~1~~	~~200~~	~~I~~	~~OFF~~	~~Y~~	~~N~~	~~1~~	~~N~~
342									
343	1	2	34	F	OFF	Y	Y	1	N

OF EXIT SIGNS – ____

COMMENTS:

3rd floor
2nd Section

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO. _____ OF _____
CALCULATED BY: _____
CHECKED BY: _____
DATE: _____

BLDG.# 200
EC0 15

LIGHTING

ROOM #	# OF FIXTURES	LAMPS/ FIXTURE	WATTS/ BULB	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCC. SENSOR	NO. OF SWITCHES	UNOCC LIGHTS ON
344	1	3	34	F	ON	Y	Y	1	Y
345									
346	~~25~~	3	34	F	ON	Y	N	4	N
347	4	3	34	F		Y		2	
348	84	3	34	F	ON	Y	N	M.S. 1A (1)	N
349	28	3	34	F	ON	Y	N	4	N
346A	4	3	34	F	OFF	Y	Y	2	N
~~346~~									

OF EXIT SIGNS – _____

COMMENTS: _____

3rd floor
1st Section

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY:
CHECKED BY:
DATE:

BLDG.# 200
EC0 15

LIGHTING

ROOM #	# OF FIXTURES	LAMPS/ FIXTURE	WATTS/ BULB	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCC. SENSOR	NO. OF SWITCHES	UNOCC LIGHTS ON
301A	23	1	175	MH					
311	4	2	34	F	ON	Y	N	1	N
312	2	2	34	F	OFF	Y	N	1	N
313	1	2	34	F	ON	Y	Y	1	N
314	5	2	34	F	ON	Y	N	1	N
315	2	2	34	F	OFF	Y	N	1	N
316	5	2	34	F		Y		1	
317	5	2	34	F		Y		1	
350	131	3	34	F	ON	Y	N	M.S. A (1)	N
351 ~~350A~~	6	3	34	F	ON	Y	Y	2	Y
352 ~~350B~~	4	3	34	F	ON	Y	Y	2	N
~~351~~	~~4~~		~~34~~	~~F~~		~~Y~~		~~2~~	
352	22		34	F		Y		~~M.S. B~~ (1)	
353	~~16~~	3	34	F	ON	Y	N	M.S. B (1)	N
354	6		34	F		Y		2	
355	~~27~~	3	34	F	ON	Y	N	M.S. B (1)	N
~~356~~	~~4~~		~~34~~	~~F~~		~~Y~~		~~2~~	
357	~~54~~	3	34	F	ON	Y	N	M.S. B (1)	N
316A	6	2	34	F	2ON	Y	N	1	N
350A	24	3	34	F	ON	Y	N	1	N

OF EXIT SIGNS –

COMMENTS:

3rd floor
1st Section

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO. _____ OF _____
CALCULATED BY: _____
CHECKED BY: _____
DATE: _____

BLDG.# 200
EC0 15

LIGHTING

ROOM #	# OF FIXTURES	LAMPS/ FIXTURE	WATTS/ BULB	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCC. SENSOR	NO. OF SWITCHES	UNOCC LIGHTS ON
358	4	3	34	F	~~OFF~~	Y	can't enter	2	
359	2~~3~~1	3	34	F	ON	Y	N	M.S.C (1)	N
360	54	3	34	F	ON	Y	N	M.S.C (1)	N
361	6	3	34	F	~~OFF~~	Y	can't enter Y	2	N
362	2	3	34	F	ON	Y	Y	1	N
318	2	2	34	F	OFF	Y	N	1	N
363	Storage	2 lights	probably		ON		plans		
301AA	6	3	34	F	ON	Y	N	1	N

07-A7
D6-A6

07-A7
D9-A9
12
21

front of 363

OF EXIT SIGNS – _____

COMMENTS: _____

3rd floor
3rd Section

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY:
CHECKED BY:
DATE:

BLDG.# 200
EC0 15

LIGHTING

ROOM #	# OF FIXTURES	LAMPS/ FIXTURE	WATTS/ BULB	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCC. SENSOR	NO. OF SWITCHES	UNOCC LIGHTS ON
301B	24	1	175	MH					
319	4	2	34	F	ON	Y	N	1	N
320	2	2	34	F	OFF	Y	N	1	N
321	1	2	34	F	ON	Y	Y	1	Y
322	5	2	34	F	ON	Y	N	1	N
323	5	2	34	F		Y		1	
324	5	2	34	F		Y		1	
325	2	2	34	F	OFF	Y	N	1	N
364	14	3	34	F	ON	Y	N	M.S. A (1)	N
365	6	3	34	F	OFF	Y	Y	2	Y
366	6	4	34	F	OFF	Y	Y	2	Y
367	6	3	34	F	ON	Y	Y	2	N
368	6	3	34	F	ON	Y	Y	2	N
369	24	3	34	F	ON	Y	N	M.S. C (1)	N
370	216	3	34	F	ON	Y	N	M.S. B&C (2)	N
368B	3	3	34	F	OFF	Y	Y	2	N
371	9	3	34	F	ON	Y	N	1	N
372	9	3	34	F	ON	Y	Y	2	N
206A	5	2	34	F	ON	Y	N	1	Y

OF EXIT SIGNS – _____

COMMENTS:

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____

SHEET NO. _____ OF _____

CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____

SCALE _____

1st floor Lighting

Bldg 200

1st Floor Section 3

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO. ____ OF ____
CALCULATED BY:
CHECKED BY:
DATE:

BLDG.# 200
EC0 15

LIGHTING

ROOM #	# OF FIXTURES	LAMPS/ FIXTURE	WATTS/ BULB	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCC. SENSOR	NO. OF SWITCHES	UNOCC LIGHTS ON
127	4	2	34	F	ON	Y	N	1	N
128	2	2	34	F	OFF	Y	N	1	N
130	5	2	34	F	ON	Y	N	1	N
129	1	2	34	F	OFF	Y	N	1	N
131	7	2	34	F		Y		1	
132	6	2	34	F		Y		1	
Atrium 133	4	spots 1							
134	2	2	32	F	OFF	Y	N	1	N
160	147	3	34	F	ON	Y	N	master switch (A) (1)	N
~~161~~	~~4~~		~~34~~	~~F~~		~~Y~~		~~2~~	
162	35	3	34	F	ON	Y	N	master switch (C) (1)	N
163	115	3	34	F	ON	Y	N	M.S. B (1)	N
164	121	3	34	F	ON	Y	N	M.S. C (1)	N
134A	5	2	34	F	2 ON	Y	N	1	Y

[illegible] way 101E
[illegible] lts. from west end of bldg.

OF EXIT SIGNS – ____

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB Ft. McPherson/Ft. Gillem Energy Study
PROJ.# EMC # 3105.000
SHEET NO. _____ OF _____
CALCULATED BY: _____
CHECKED BY: _____
DATE: _____

BLDG.# _____
EC0 15

LIGHTING

ROOM #	# OF FIXTURES	LAMPS/ FIXTURE	WATTS/ BULB	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCC. SENSOR	NO. OF SWITCHES	UNOCC LIGHTS ON
1					OFF		N	1	N
10									
101	6			HID	ON all time	Y	N	1	N
102	2	1		HID	ON "	Y	N	1	N
	4	2	34	F	ON	Y	N	1	N
113	2	2	34	F	OFF	Y	N	1	N
114	1	2	34	F	OFF	Y	N	1	N
115	5	2	34	F	ON	Y	N	1	N
116	2	2	34	F	ON	Y	Y	1	Y
117	@ 4 18	spotslts 3	34	F	OFF ON	Y	N	1	~~Y~~ N
						Y		1	

OF EXIT SIGNS – _____

COMMENTS: _____

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB Ft. McPherson/Ft. Gillem Energy Study
PROJ.# EMC # 3105.000
SHEET NO. OF
CALCULATED BY:
CHECKED BY:
DATE:

BLDG.# 200
EC0 15

LIGHTING

ROOM #	# OF FIXTURES	LAMPS/ FIXTURE	WATTS/ BULB	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCC. SENSOR	NO. OF SWITCHES	UNOCC LIGHTS ON
151	4	3		F	ON	/	Y	2	Y
151		3	34		ON	Y	N		N
152		3	34	F	OFF	/	N	2	N
153	69	3		F	ON	Y	N		N
154	34	3			ON	Y	N	1	N
155		3			ON		N		N
156				F		Y		1	
157		3	34	F	ON	Y	N	2	N
158	3	3			ON	/	N		N
			40	F	ON	/	N		N
160	40	3		/	ON	/	N	2	N
111	7	2	34	F	4 OFF 3 ON	Y	N	1	N
120S	6	2	34	F	2 ON 4 OFF	Y	N	1	Y
159A	4	3	34	F	ON	Y	Y	2	Y

32
34
69

GH 5,6, Extra copiers + printers -12

OF EXIT SIGNS – 111

COMMENTS: 158 + 160 are divided by fixtures from North end. 9

1st floor ... 2

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB Ft. McPherson/Ft. Gillem Energy Study
PROJ.# EMC # 3105.000
SHEET NO. ____ OF ____
CALCULATED BY: ____
CHECKED BY: ____
DATE: ____

BLDG.# 200
EC0 15

LIGHTING

ROOM #	# OF FIXTURES	LAMPS/ FIXTURE	WATTS/ BULB	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCC. SENSOR	NO. OF SWITCHES	UNOCC LIGHTS ON	
✓ 101	1	2	34	F		Y		1		
✓ 110	2	2	34	F		Y		1		
111	1	2'U	40	F	ON	Y	N	1	N	
	1	3	34	F	ON	Y	N		N	
	1	2	34	F	ON	Y	N		N	
138		2	34	F	ON	Y	Y	1	Y	
138A	3				OFF	Y	Y	2	N	
139	7	3	34	F	ON	Y	N	2	Y	
✓ 137	6		34	F		Y		4		may be 2 (3cm)
✓ 137	10		34	F		Y		2		
✓ 101	30		175	HID	ON					
101A	2	1	175	HID						
101 L	2	1	175	HID						
✓ 102	4	1	175	HID	ON					
103										
104	1	2	34	F	ON	Y	Y	1	X	
105	1	2	34	F		Y		1		
106	2	2	34	F		Y		1		
107	1	2	34	F	ON	Y	Y	1	N	
✓ 101E	14	1	175	HID		Y				
✓ 100	12	1	175	HID						

OF EXIT SIGNS – ____

COMMENTS: ____

1st floor sector 2

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO. _____ OF _____
CALCULATED BY: _____
CHECKED BY: _____
DATE: _____

BLDG.# 200
EC0 15

LIGHTING

ROOM #	# OF FIXTURES	LAMPS/ FIXTURE	WATTS/ BULB	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCC. SENSOR	NO. OF SWITCHES	UNOCC LIGHTS ON
135	4	3	34	F	ON	Y	Y	2	N
136	23	3	34	F	ON	Y	N	3	N
140	1		34	F					
141	65	3	34	F	ON	Y	N	4	N
142	4	3	34	F	ON	Y	Y	2	Y
143	66	3	34	F	ON	Y	N	4	N
144	4	3	34	F	ON	Y	Y	4	N
145	4	3	34	F	ON	Y	Y	2	N
146	6	3	34	F	OFF	Y	Y	2	N
147	6	3	34	F	ON	Y	N	2	N
148	6	3	34	F	OFF	Y	N	2	N
149	4	3	34	F	1/2 ON	Y	Y	2	1/2
150	7	3	34	F	ON	Y	N	2	N
100C	1		34	F		Y		2	
100B	3	3	34	F	ON	Y	N	0	N
A5	1 spot	2	34	F	ON	Y	N	1	N
144A	3	3	34	F	ON	Y		2	N
101A	6	2	34	F	1/3 ON	Y	N	1	Y

OF EXIT SIGNS – _____

COMMENTS: 101B lighting is controlled in room 101C

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB 3105CCC G+M

SHEET NO. _____ OF _____

CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____

SCALE _____

* None of the stairs are numbered, so I have not included them in the lighting charts. We need to count them when surveying.

LIGHTING CONTROL

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____

SHEET NO. _____ OF _____

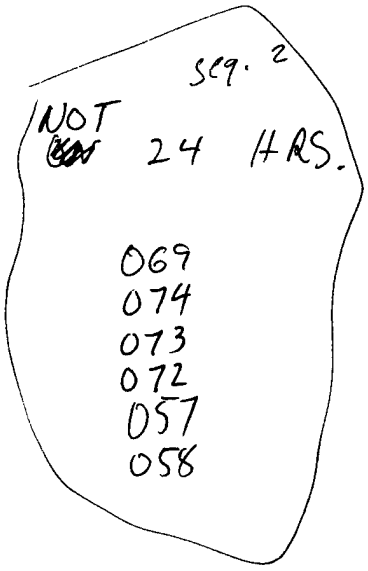
CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____

SCALE _____

Basement

Bldg. 200



Basement
Section 1.

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO. ____ OF ____
CALCULATED BY: ____
CHECKED BY: ____
DATE: ____

BLDG.# 200
EC0 15

LIGHTING

ROOM #	# OF FIXTURES	LAMPS/ FIXTURE	WATTS/ BULB	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCC. SENSOR	NO. OF SWITCHES	UNOCC LIGHTS ON
2	24	2	34	F	~~X~~ ON	Y	N	1	N
5	4	2	34	F		Y		1	
6	2	2	34	F		Y		1	
7	1	2	34	F		Y		1	
8	5	2	34	F		Y		1	
9	1	2	34	F		Y		1	
10	7	2	34	F		Y		2	
11	4	2	34	F		Y		1	
12	2	2	34	F		Y		1	
12A	2	2	34	F		Y		1	
13	22	2	34	F	1/2 ON	Y	N	2	Y
14	27	2	34	F	1/2 ON	Y	N	2	Y
29	6	4	34	F		Y		2	
30	9	4	34	F		Y		2	
31	6	3	34	F	ON	Y	Y	2	Y
13A	5	2	34	F		Y		1	
32	156	3	34	F	ON	Y	N	M.S. A (1)	N
33	87	3	34	F		Y		4	

OF EXIT SIGNS – ____

COMMENTS: ____

Basement
Section 1

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO. _____ OF _____
CALCULATED BY: _____
CHECKED BY: _____
DATE: _____

BLDG.# _____
EC0 15

LIGHTING

ROOM #	# OF FIXTURES	LAMPS/ FIXTURE	WATTS/ BULB	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCC. SENSOR	NO. OF SWITCHES	UNOCC LIGHTS ON
33A	2	4	34	F		Y		2	
33B	3	2	34	F	.ON	Y	Y	2	Y
33C	9	3	34	F		Y		2	
34	4	4	34	F		Y		2	
35	12	2	34	F		Y		2	
36	6	3	34	F		Y		2	
37	6	3	34	F		Y		2	
38	3	4	34	F		Y		2	
39	5	3	34	F		Y		2	
28	12	3	34	F		Y		2	
40	12	3	34	F		Y		2	
41	23	3	34	F		Y		2	
12B	6	2	34	F	2 ON	Y	N	1	Y

OF EXIT SIGNS – _____

COMMENTS: _____

Basement
Section 2

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB Ft. McPherson/Ft. Gillem Energy Study
PROJ.# EMC # 3105.000
SHEET NO. ____ OF ____
CALCULATED BY: ____
CHECKED BY: ____
DATE: ____

BLDG.# 200
EC0 15

LIGHTING

ROOM #	# OF FIXTURES	LAMPS/ FIXTURE	WATTS/ BULB	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCC. SENSOR	NO. OF SWITCHES	UNOCC LIGHTS ON
2A	2	2	34	F					
3	3	2	34	F		Y		1	
4	2	2	34	F		Y		1	
22	8	4	34	F		Y		2	
23	12	3	34	F		Y		2	
23A	1	2 (U)	40	F		Y		1	
24	8	4	34	F		Y		2	
VAULT	1	1	100	I		Y		1	
25	1	2	34	F					
26 (1 bulb out ←)	16	3	34	F		Y		10	
	~~3~~	~~1~~	~~?~~	~~I~~		~~Y~~			
	4	1	250	I		Y			
✓	6	1	200	I		Y			
✓	102	1	[illegible]	I		Y			
26 A,B,C,D									
27	6	2	34	F	ON	Y	Y	1	Y
42	3	2	34	F					
2C	31	2	34	F					
	3	1	175	MH					

OF EXIT SIGNS – ____

COMMENTS: ____

Basement
Section 2

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB Ft. McPherson/Ft. Gillem Energy Study
PROJ.# EMC # 3105.000
SHEET NO. OF
CALCULATED BY:
CHECKED BY:
DATE:

BLDG.# 200
EC0 15

LIGHTING

ROOM #	# OF FIXTURES	LAMPS/ FIXTURE	WATTS/ BULB	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCC. SENSOR	NO. OF SWITCHES	UNOCC LIGHTS ON
~~2C~~	~~1~~	~~2~~	~~34~~	~~F~~					
2D	1	2	34	F					
UPPER F.O.C.	36	3	34	F					
UPPER AUDIO VISUAL	9	3	34	F					

OF EXIT SIGNS – _____

COMMENTS: _____

Basement
Section 2

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB Ft. McPherson/Ft. Gillem Energy Study
PROJ.# EMC # 3105.000
SHEET NO. _____ OF _____
CALCULATED BY: _____
CHECKED BY: _____
DATE: _____

BLDG.# 200
EC0 15

LIGHTING

ROOM #	# OF FIXTURES	LAMPS/ FIXTURE	WATTS/ BULB	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCC. SENSOR	NO. OF SWITCHES	UNOCC LIGHTS ON
43	50	3	34	F		Y		2	
44	16	3	34	F		Y		2	
45	13	4	34	F		Y		2	
46	1	4	34	F					
47	8	3	34	F		Y		2	
48	4	3	34	F		Y		2	
49	8	3	34	F		Y		2	
50	6	3	34	F		Y		2	
M1	2	1	175	MH					
M2A	2	2	34	F					
M3	5	3	34	F		Y		2	
M4	16	3	34	F		Y		2	
M2	4	2	34	F					
M5	4	2	34	F					
M6	8	3	34	F					
M7	4	3	34	F		Y		2	
M8	19	3	34	F		Y		2	
M9	7	3	34	F		Y		2	

elevator lobby

OF EXIT SIGNS – _____

COMMENTS: _____

Basement
Section 3

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO. ____ OF ____
CALCULATED BY: ____
CHECKED BY: ____
DATE: ____

BLDG.# 200
EC0 15

LIGHTING

ROOM #	# OF FIXTURES	LAMPS/ FIXTURE	WATTS/ BULB	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCC. SENSOR	NO. OF SWITCHES	UNOCC LIGHTS ON
15	4	2	34	F		Y		1	
16	2	2	34	F		Y		1	
17	1	2	34	F		Y		1	
18	5	2	34	F		Y		1	
19	5	2	34	F		Y		1	
20	4	2	34	F		Y		1	
21	2	2	34	F		Y		1	
21A	2	2	34	F		Y		1	
60	9	3	34	F		Y		2	
	1	2	34	F		Y			
61	6	3	34	F		Y		2	
62	6	3	34	F		Y		2	
63	6	4	34	F		Y		2	
64	4	3	34	F		Y		2	
65	4	4	34	F		Y		2	
66	2	4	34	F		Y		2	
67	8	3	34	F		Y		2	
68	6	4	34	F		Y		2	

OF EXIT SIGNS – ____

COMMENTS: ____

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB Ft. McPherson/Ft. Gillem Energy Study
PROJ.# EMC # 3105.000
SHEET NO. _____ OF _____
CALCULATED BY: _____
CHECKED BY: _____
DATE: _____

BLDG.# _____
EC0 15

LIGHTING

ROOM #	# OF FIXTURES	LAMPS/ FIXTURE	WATTS/ BULB	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCC. SENSOR	NO. OF SWITCHES	UNOCC LIGHTS ON
69	64	3	34	F		Y		4	
70	2	4	34	F		Y		2	
	4	3	34	F		Y			
71	54	3	34	F		Y		2	
72	38	3	34	F		Y		2	
73	21	3	34	F		Y		2	
74	28	3	34	F		Y		2	
76	16	3	34	F		Y		2	
75									
78A	4	3	34	F		Y		2	
77	46	3	34	F		Y		6	
77A	10	3	34	F		Y		2	
78	3	4	34	F		Y		2	
79	8	3	34	F		Y		2	

OF EXIT SIGNS – _____

COMMENTS: _____

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB _____

SHEET NO. _____ OF _____

CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____

SCALE _____

3rd floor lighting

Bldg. 200

144
-156

2nd floor
Sect. 1

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO. ____ OF ____
CALCULATED BY:
CHECKED BY:
DATE:

BLDG.# 3003
EC0 15

LIGHTING

ROOM #	# OF FIXTURES	LAMPS/ FIXTURE	WATTS/ BULB	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCC. SENSOR	NO. OF SWITCHES	UNOCC LIGHTS ON
201A	12	1	175	HIC					
212	4	2	34	F	ON	Y	N	1	N
213	2	2	34	F	OFF	Y	N	1	N
214	1	2	34	F	OFF	Y	N	1	N
215	5	2	34	F	ON	Y	N	1	N
216	2	2	34	F	OFF	Y	N	1	N
217	5	2	34	F		Y		1	
218	5	2	34	F	OFF	Y	N	1	Y
219	2	2	34	F	OFF	Y	N	1	N
220	18	2	34	F					
221	27	2	34	F	ON	Y	N	1	N
222	4	2	34	F	ON	Y	N	1	Y
223	6	3	34	F	ON	Y	N	2	N
224	1	3	34	F	OFF	Y	N	1	N
225	2	2	34	F	OFF	Y	Y	1	N
	1	1	60	HID		Y		1	
236A	129	3	34	F	ON	Y	N	M.S. A (1)	N
237	27	3	34	F	ON	Y	N	1	N
236	6	3	34	F	ON	Y	Y	1	N
# OF EXIT SIGNS – 212A	7	2	34	F	2ON	Y	N	1	X

COMMENTS:

2nd Floor
Sect 1

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO. ____ OF ____
CALCULATED BY:
CHECKED BY:
DATE:

BLDG.# 200
EC0 15

LIGHTING

ROOM #	# OF FIXTURES	LAMPS/ FIXTURE	WATTS/ BULB	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCC. SENSOR	NO. OF SWITCHES	UNOCC LIGHTS ON
238	15	3	34	F	ON	Y	N	M.S. B (1)	N
counting 201A WEST OF OPENING AS 239									
239	112	3	34	F	ON	Y	N	M.S. B (1)	N
219A	5	2	34	F	ON	Y	N	1	Y
AT	4 spots 1								
248A	24	3	34	F	ON	Y	N	1	N
AT	4 spots 1								

3 24 9 216

12 9 108

OF EXIT SIGNS – ____

COMMENTS:

241 +100
Sect. 2

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO. ____ OF ____
CALCULATED BY: ____
CHECKED BY: ____
DATE: ____

BLDG.# 200
EC0 15

LIGHTING

ROOM #	# OF FIXTURES	LAMPS/ FIXTURE	WATTS/ BULB	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCC. SENSOR	NO. OF SWITCHES	UNOCC LIGHTS ON
201	28	1	175	HID	ON	Y	N	1	N
203	1	2	34	F	ON	Y	Y	1	Y
204	1	2	34	F	OFF	Y	N	1	N
205	2	2	34	F		Y		1	
206	01	2	34	F	ON	Y	Y	1	Y
207	202 SAME ↓ 6	2	34	F	ON	Y	Y	2	N
208	1	2	34	F	ON	Y	Y	1	Y
209	1	2	34	F		Y		1	
210	2	2	34	F		Y		1	
211	1	2	34	F	ON	Y	Y	1	Y
202	6	2	34	F		Y		2	
233	12 4	3	34	F	ON	Y	N	M.S. B+C (2)	N
234	6	3	34	F	ON	Y	Y	2	N
235	6	3	34	F	ON	Y	Y	2	N
240	36	3	34	F	ON	Y	N	M.S. A 1	N
241	4	3	34	F	~~OFF~~ ON	Y	Y	2	N
242	6	3	34	F	ON	Y	Y	2	N
243	40	3	34	F	ON	Y	N	M.S. A (1)	N
206A	7	2	34	F	3 ON	Y	N	1	Y

OF EXIT SIGNS – ____

COMMENTS: ____

2nd floor

Sect. 3

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB Ft. McPherson/Ft. Gillem Energy Study
PROJ.# EMC # 3105.000
SHEET NO. OF
CALCULATED BY:
CHECKED BY:
DATE:

BLDG.# 200
EC0 15

LIGHTING

ROOM #	# OF FIXTURES	LAMPS/ FIXTURE	WATTS/ BULB	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCC. SENSOR	NO. OF SWITCHES	UNOCC LIGHTS ON
201B	16	1	175	MH					
226	4	2	34	F	ON	Y	N	1	N
227	2	2	34	F	OFF	Y	N	1	N
228	1	2	34	F	ON	Y	N	1	Y
229	5	2	34	F	ON	Y	N	1	N
230	5	2	34	F		Y		1	
231	5	2	34	F		Y		1	
232	2	2	34	F	OFF	Y	N	1	N
244	129	3	34	F	ON	Y	N	M.S. A (1)	N
245	6	3	34	F	ON	Y	Y	2	Y
246	6	3	34	F	ON	Y	Y	2	Y
247	24		34	F		Y		M.S. C	
248	~~7~~ 16 ~~14~~	3	34	F	ON	Y	N	M.S. C (1)	N
249	~~9~~ 18 ~~9~~ 1	3 2'U	34 40	F F	ON ON	Y Y	N N	M.S. B (1)	N N
200	~~4~~ 4	1		MH	ON	Y	N	1	N
233A	7	3	34	F	ON	Y	Y	2	N
252	6	3	34	F	ON	Y	Y	2	~~N~~ Y
250	6	3	34	F	~~OFF~~ ON	Y	Y	2	N
251	6	3	34	F	ON	Y	Y	2	N
232 ~~201A~~ A	6	3	34	F	~~3~~ ON	Y	N	1	Y

13
24
20
72
129

144
96
240

OF EXIT SIGNS –

COMMENTS:

BUILDING 206

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

BLDG 206

JOB
SHEET NO. OF
CALCULATED BY JW DATE 12/19/91
CHECKED BY DATE
SCALE

NAMEPLATES

EAST SIDE AC UNIT:
BOHN A/C & R DIVISION
MODEL# DVS0272A002
S# BKK8124
206V 3φ 60Hz (2)-1.5Hp MOTORS
7.2 AMP each

SOUTH AC PACKAGE UNIT:
MC QUAY
2 COMPRESSOR (RECIPROCATING) 50HP each 165 RLA
~~208~~ 208V/60/3 1070 LRA each
R-22

DOMESTIC HW TEMP.
SOUTHWEST MEN'S ROOM = 132°F

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____

SHEET NO. _____ OF _____

CALCULATED BY VEC DATE 12-19-91

CHECKED BY _____ DATE _____

SCALE _____

BLDG 206 MAKE-UP WATER PUMP.

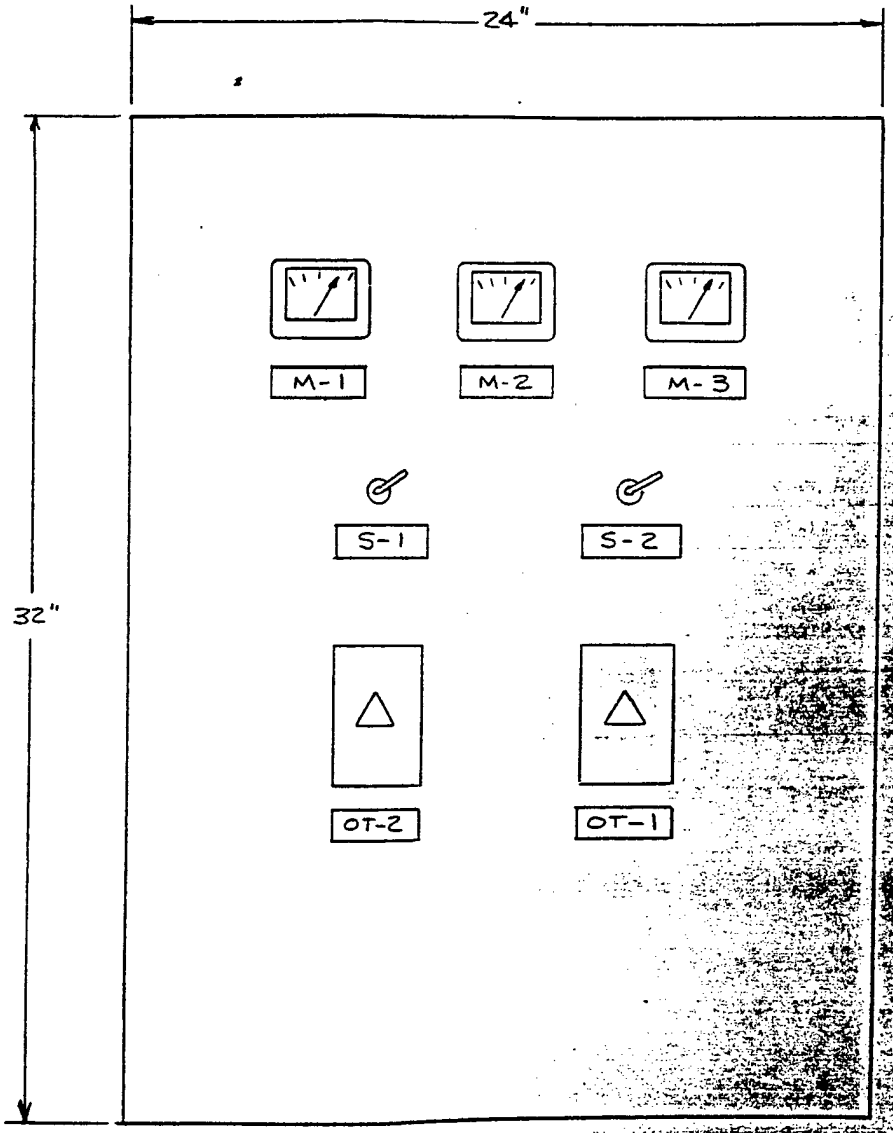
ARMSTRONG. PUMP

UQC485|7D105|HP 60 HZ 1Ø 115V 1725
TYPE-55 3.5 A 1/6 HP

DOMESTIC HW PUMP

FRANKLIN ELECTRIC
MOD 1103175400 3/4 HP 1Ø 3450
FM 56 115V 11.2A.
TURN ON WITH CONTROL RELAY.

DUAL TEMP. PUMP -1, 2 MARATHON
VVD 213TTDR7026GPL FM. 213T
3Ø 7½ HP 208V 24A 1750 RPM 84%.



DEVICE	NAMEPLATE
M-1	SUPPLY WATER TEMPERATURE
M-2	RETURN WATER TEMPERATURE
M-3	OUTSIDE AIR TEMPERATURE
S-1	SUMMER WINTER CHANGEOVER SWITCH
S-2	P-1 P-2 PUMP SELECTOR SWITCH
OT-1	TIME CLOCK OVERRIDE SWITCH ZONES 3 & 4
OT-2	TIME CLOCK OVERRIDE SWITCH ZONES 1 & 2

CONTROL PANEL CP-1

SEE SHEET 1 FOR INTERNAL WIRING

Ergon Systems
5500 Oakbrook Pky., Suite 210
Norcross, GA 30093

JOB NAME
ALTERATIONS TO BUILDINGS 205, 206 & 207
FORT McPHERSON, GEORGIA

JOB #	TITLE	REV.
1789-9	PANEL FACE	

DATE	SALESMAN	ENGINEER	SHEET	OF
9-13-89	FOS		P-1	1

BILL OF MATERIAL

INST ID	LIT REF	QTY	CODE NO.	DESCRIPTION
DP	JOHNSON	3	P74FA-5	DIFF. PRESS. SWITCH
HS	TRIAD	2	HD-1-3	HUMIDITY TRANSMITTER 0-100 % R.H.
TS-1	TRIAD	4	100TX-RA-C	TEMP. TRANSMITTER 50-85 F.
TS-2	TRIAD	2	100TX-P1-B-25-W	TEMP. TRANSMITTER 40-190 F.

ALTERATIONS TO BUILDINGS
205, 206, 207
FT. McPHERSON, GA.
SHEET 4 OF 4

DESCRIPTION OF OPERATION

Note: See sheet 1 for panel mounted devices

FAN COIL UNITS Time clock TC-1 starts and stops the units according to a preset schedule. An interval timer for each building overrides the respective time clock circuits to restore day operation. A night low limit thermostat in each building cycles its respective units to prevent building space temperature from falling below the night minimum setting. The outdoor air dampers for the non-process units will remain closed when the unit are operating on the night cycle.

Heating-Cooling Units (non-process) Space thermostat furnished with the units positions the 2 position dual temperature water valve to maintain space temperature at the heating or cooling setpoint. Control valve action is changed over from cooling to heating operation by a change over thermostat sensing the entering water temperature. Outdoor air damper opens when the unit is operating in the day cycle or when the respective override timer is activated. The damper will remain closed when the unit is operating in the night cycle. A high temperature detector located in the unit air inlet will prevent unit operation if its setpoint is exceeded. A low temperature detector located in the unit discharge will stop the unit and close the outdoor air damper if the discharge air temperature falls below its setpoint.

Heating-Cooling Units (process) Units operate as described above with the following exceptions: The outdoor air damper is interlocked with an associated exhaust fan and fully opens wheen that fan runs. The Fan Coil unit operates on 100% return air when the associated exhaust fan is off.

Heating Only units Space thermostat cycles the 2 position water valve to maintain space temperature. The valve will be closed when the system is operating in the "Summer" mode.

BILL OF MATERIAL

INST ID	LIT REF	QTY	CODE NO.	DESCRIPTION
HTD-1-4	DYNACON	104	FS-200	MAN. RESET FIRESTAT
LTD-1.2	BC	83	TA-3441	MAN. RESET FREEZESTAT
R-1-5	DYNACON	104 104	RH1B-UAC120 SH1B-05	SPDT RELAY 120VAC RELAY SOCKET
R-6	DYNACON	10 10	RH2B-UAC120 SH2B-05	DPDT RELAY 120VAC RELAY SOCKET

ALTERATIONS TO BUILDINGS
205, 206, 207
FT. McPHERSON, GA.
SHEET 3 OF 4

DESCRIPTION OF OPERATION

Note: See sheet 1 for panel mounted devices

Dual Temperature Pumps (P-1 or P-2 as selected by switch S-2) are started and stopped by any circuit of time clock TC-1, any override timer, or any night set-back thermostat.

Summer-Winter changeover switch S-1 positions 2 position changeover valves V-2 & V-3 for chilled water flow when in "Summer" position and for hot water flow when in the "Winter" position. Time delay relays TD-1 & TD-2 delay the valve changeover for a preset time (adjustable). When S-2 is in the "Summer" position and flow is proven by the chiller flow switch, chiller C-1 is allowed to start and runs under control of its internal control system. Valve V-1 prevents flow through C-1 until the Dual temperature return water temperature is below the setpoint (adjustable) of thermostat T-1. When S-2 is in the "Winter" position and flow is proven by boiler flow switch FS-1, boiler B-1 is allowed to start and runs under control of its internal control system. See manufacturer's literature for complete description of operation.

BILL OF MATERIAL

INST ID	LIT REF	QTY	CODE NO.	DESCRIPTION
FS-1,2	M-M	2	FS4-3D	DPDT FLOW SWITCH
T-1	BC	1	TC-4111	RMT. BULB T'STAT
TS-1,2	BC	2 2	TS-8201 AT-215	TEMP. TRANSMITTER BULB WELL
TS-3	BC	1 1	TS-8501 AT-211	O.A. TEMP. T'MITTER OUTDOOR BULB SHIELD
V-1,2	BC	1	VC-9313 *	3-WAY MIXING VALVE
V-3	BC	1	VC-9223 *	3-WAY DIVERTING VALVE

* SEE VALVE SCHEDULE FOR COMPLETE VALVE INFORMATION

ALTERATIONS TO BUILDINGS
205, 206, 207
FT. McPHERSON, GA.
SHEET 2 OF 4 SHEETS

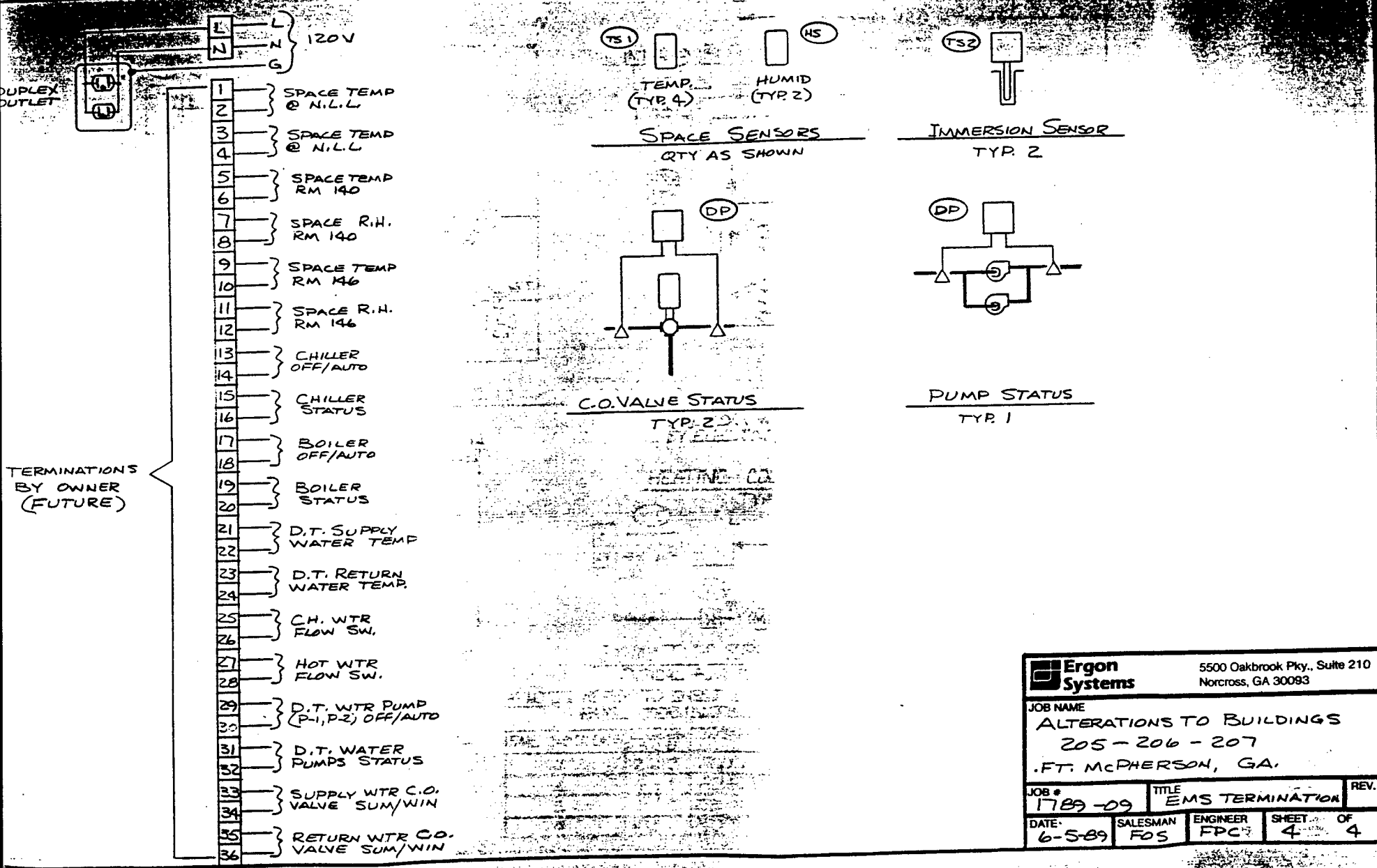
BILL OF MATERIAL

INST ID	LIT REF	QTY	CODE NO.	DESCRIPTION
CP-1	BC	1	AE-631	CONTROL PANEL
ES-1	ELLENCO	1	55E	EMERG. BREAKGLASS
M-1,2	BC	2	ASP-563	METER 40-240
		2	TSP-8111	TEMP. TRANSMITTER
M-3	BC	1	ASP-561	METER -40-160
		1	TSP-8111	TEMP. TRANSMITTER
OT-1,2	RHODES	2	90017	OVERRIDE TIMER
R-1-4,6,8	DYNACON	6	RH3B-VAC120	3PDT RELAY 120VAC
		6	SH3B-05	RELAY SOCKET
R-5,7,11, & 12	DYNACON	4	RH2B-VAC120	DPDT RELAY 120VAC
		4	SH2B-05	RELAY SOCKET
R-9,10	DYNACON	2	RH1B-VAC120	SPDT RELAY 120VAC
		2	SH1B-05	RELAY SOCKET
S-1	CARLINGSWITCH	1	1L254-73	4PDT TOGGLE SWITCH
S-2	CARLINGSWITCH	1	2FB54-73	SPDT TOGGLE SWITCH
TC-1	GRASSLIN	1	DIGI 127-9R	9 CIRCUIT TIME CLOCK
TD-1	GRAINGER	1	6X602	TIME DELAY RELAY
TD-2	GRAINGER	1	6X601	TIME DELAY RELAY
TF-1	GRAINGER	1	3A357	T'FORMER,120/24V,40VA

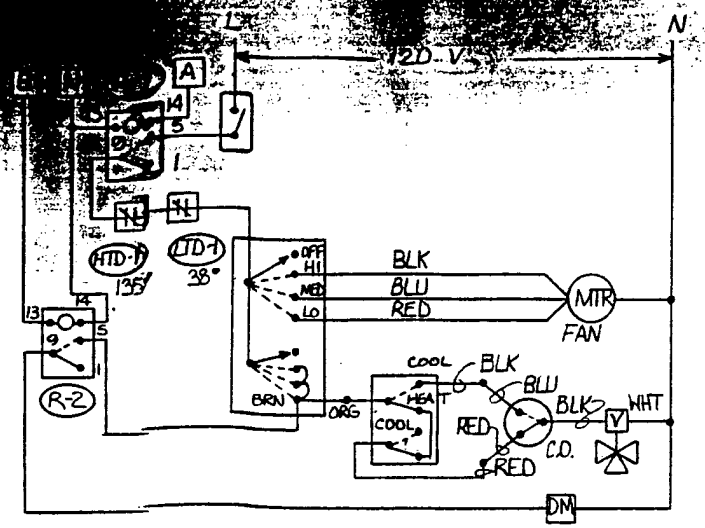
DESCRIPTION OF OPERATION

See sheets 2 & 3 for description of operation

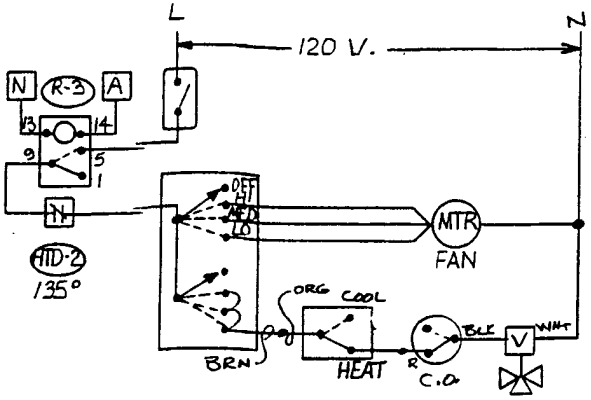
ALTERATIONS TO BUILDINGS
205, 206, 207
FT. McPHERSON, GA.
SHEET 1 OF 4



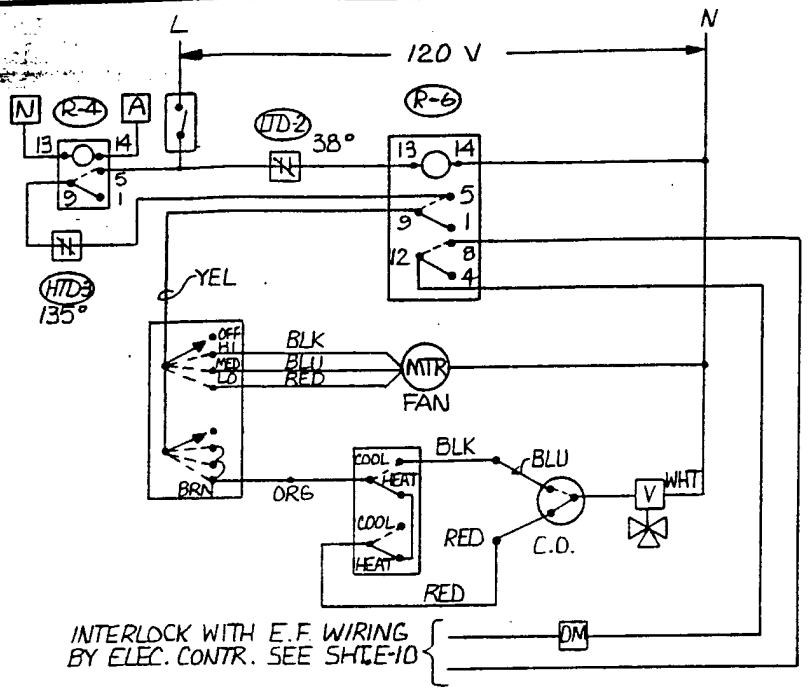
Ergon Systems	5500 Oakbrook Pky., Suite 210 Norcross, GA 30093		
JOB NAME: ALTERATIONS TO BUILDINGS 205 – 206 – 207 .FT. McPHERSON, GA.			
JOB # 1789-09	TITLE: EMS TERMINATION		REV.
DATE: 6-5-89	SALESMAN: FOS	ENGINEER: FPC	SHEET 4 OF 4



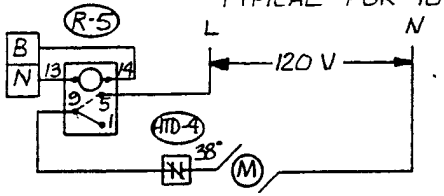
HEATING-COOLING FAN COIL UNITS (MIN. O.A.)
TYPICAL FOR 73 SETS



HEATING ONLY FAN COIL UNIT
TYPICAL FOR 11 SETS



HEATING-COOLING FAN COIL UNITS (100% O.A.)
TYPICAL FOR 10 SETS



EXHAUST OR SUPPLY FAN
TYPICAL FOR 10 SETS

* NOTE: REFER TO SHEET 1 FOR PANEL TERMINATIONS

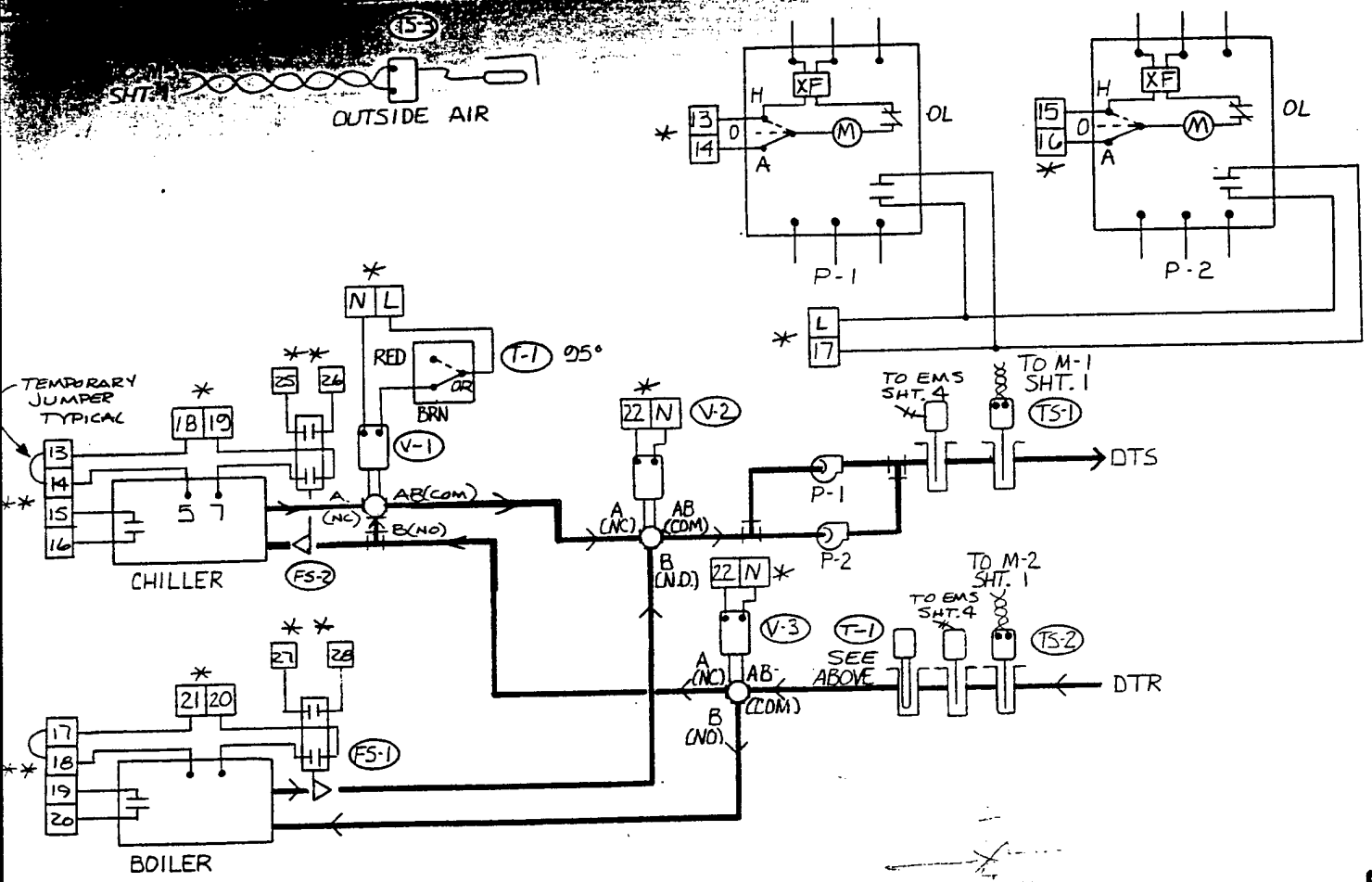
TIME CLOCK CIR.	TERMINALS A	TERMINALS B	INTERLOCKED EQUIPMENT A	INTERLOCKED EQUIPMENT B
1	2	3	FCU 1-15, 39-41	SF-2, EF-1
2	4	5	FCU 16-20, 22-38, 42, 43	SF-1, EF-2, 3
3	8	9	FCU-44-76, 88, 91-95	SF-3, EF-14, 15
4	10	11	FCU 77-87, 89, 90	SF-5, EF-16

Ergon Systems
5500 Oakbrook Pky., Suite 210
Norcross, GA 30093

JOB NAME: ALTERATIONS TO: BLDGS 205, 206, 207 FT. MCPHERSON, GA.

JOB # 1789-09	TITLE: FAN COIL UNITS	REV.

DATE: 5-30-89	SALESMAN: FOS	ENGINEER: FPC	SHEET 3 OF 4

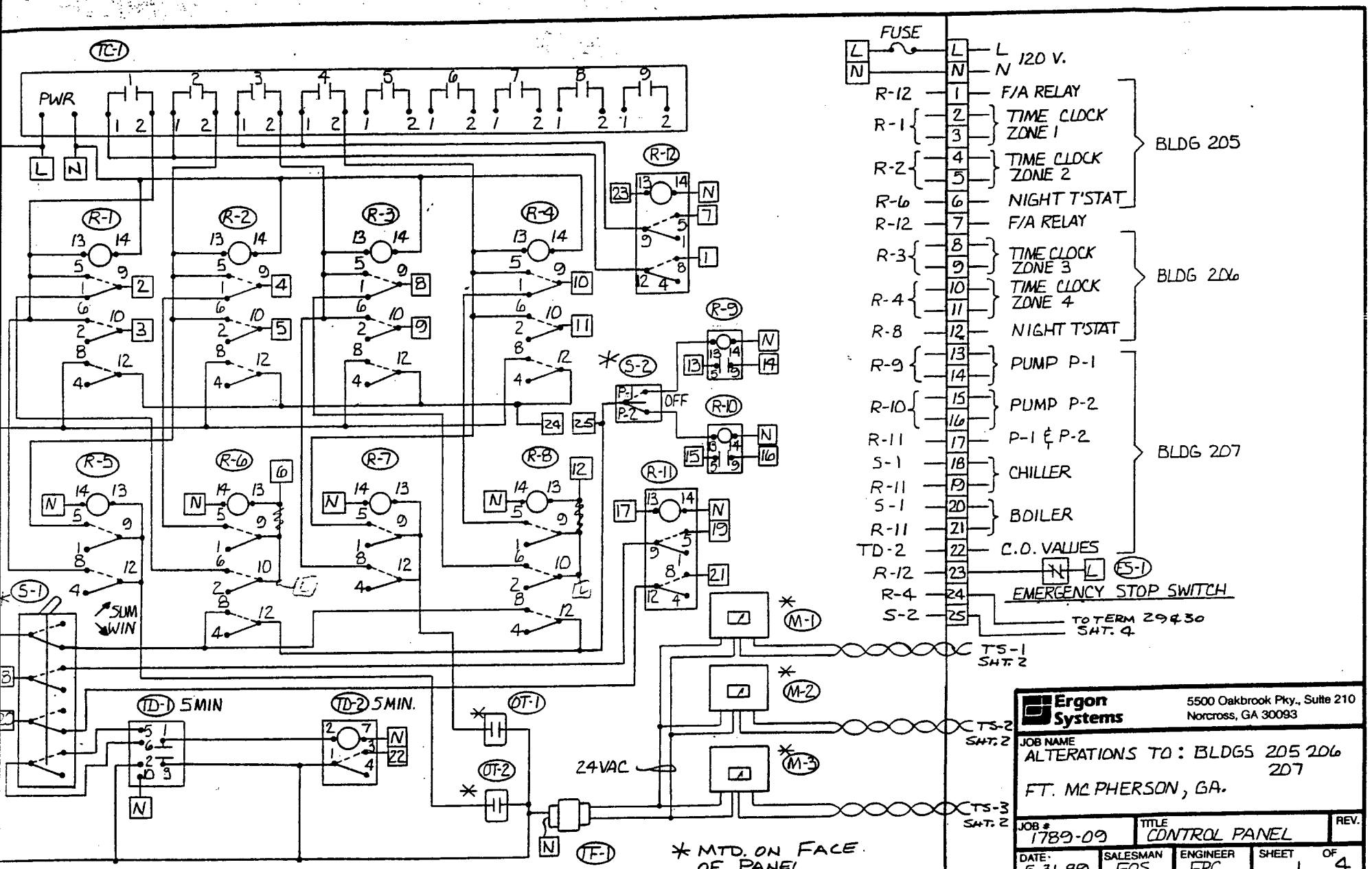


DUAL TEMPERATURE WATER

* WIRE TO TERMINALS LOCATED IN CONTROL PANEL CP-1 (SHT. 1)

** WIRE TO TERMINALS IN EMS TERMINATION CABINET. (SHT. 4)

Ergon Systems	5500 Oakbrook Pky., Suite 210 Norcross, GA 30093
JOB NAME	ALTERATIONS TO: BLDGS 205, 206, 207 FT. MCPHERSON, GA.
JOB #	1989-09
TITLE	BLDG 207
REV.	
DATE	5-30-89
SALESMAN	FDS
ENGINEER	FPC
SHEET	2 OF 4



Ergon Systems
5500 Oakbrook Pky., Suite 210
Norcross, GA 30093

JOB NAME
ALTERATIONS TO: BLDGS 205 206 207
FT. MC PHERSON, GA.

JOB #	TITLE	REV.
1789-09	CONTROL PANEL	

DATE	SALESMAN	ENGINEER	SHEET	OF
5-31-89	FOS	FPC	1	4

BUILDING 246

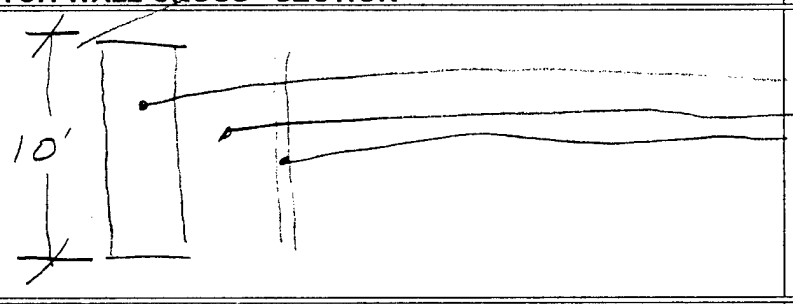
EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

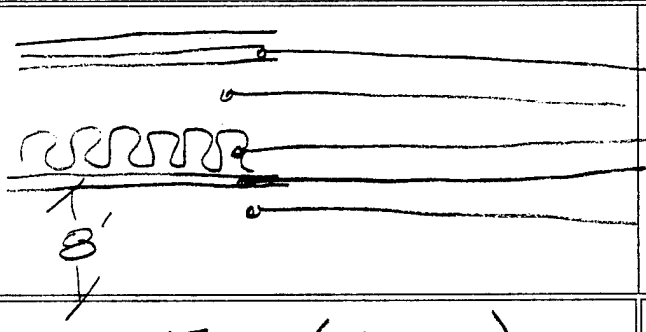
JOB	Ft. McPherson/Ft. Gillem Energy Study
PROJ.#	EMC # 3105.000
SHEET NO.	OF
CALCULATED BY:	CEL
CHECKED BY:	
DATE:	12/31/91

BLDG.# 246
ECO 1

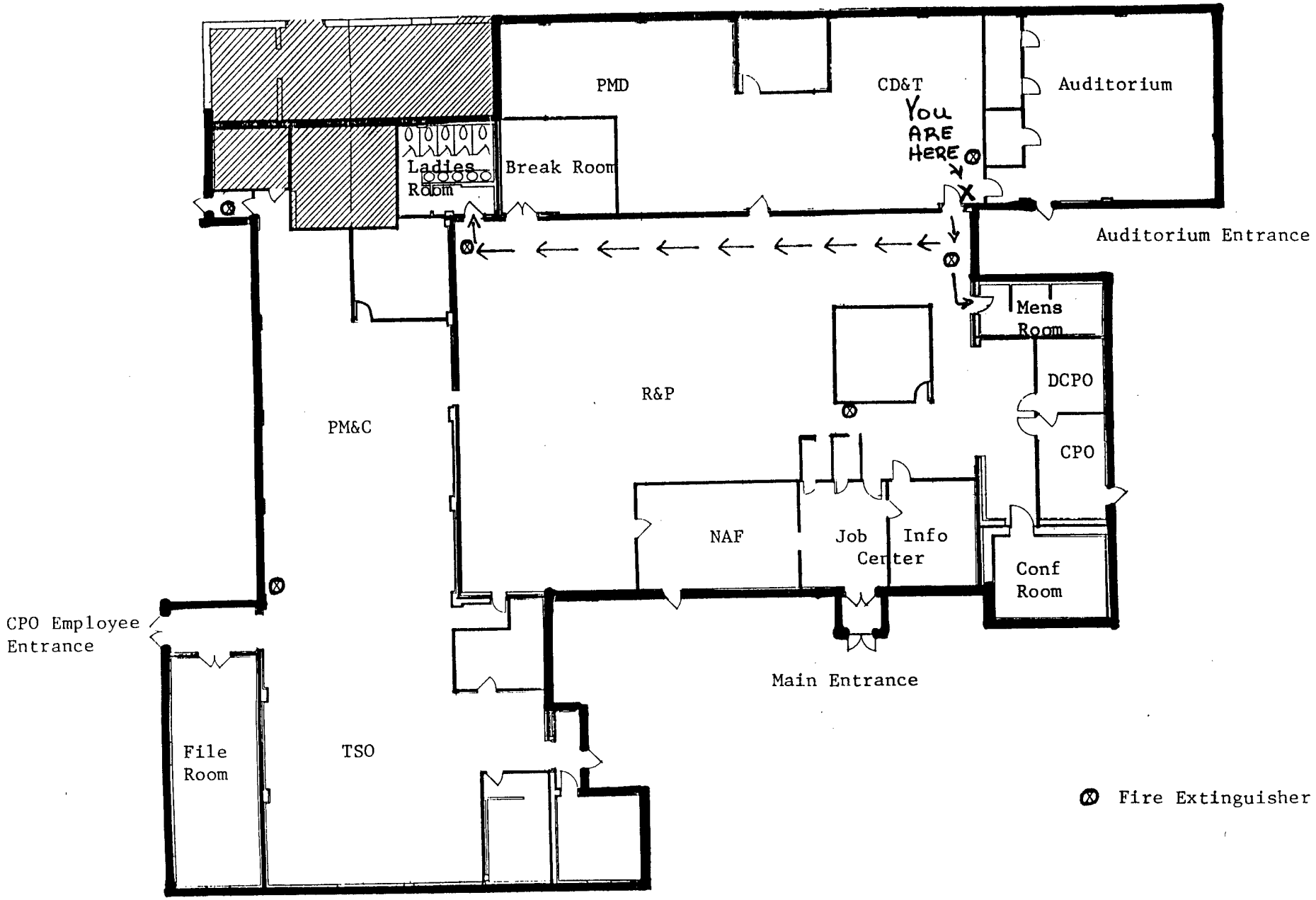
WALL & ROOF INSULATION

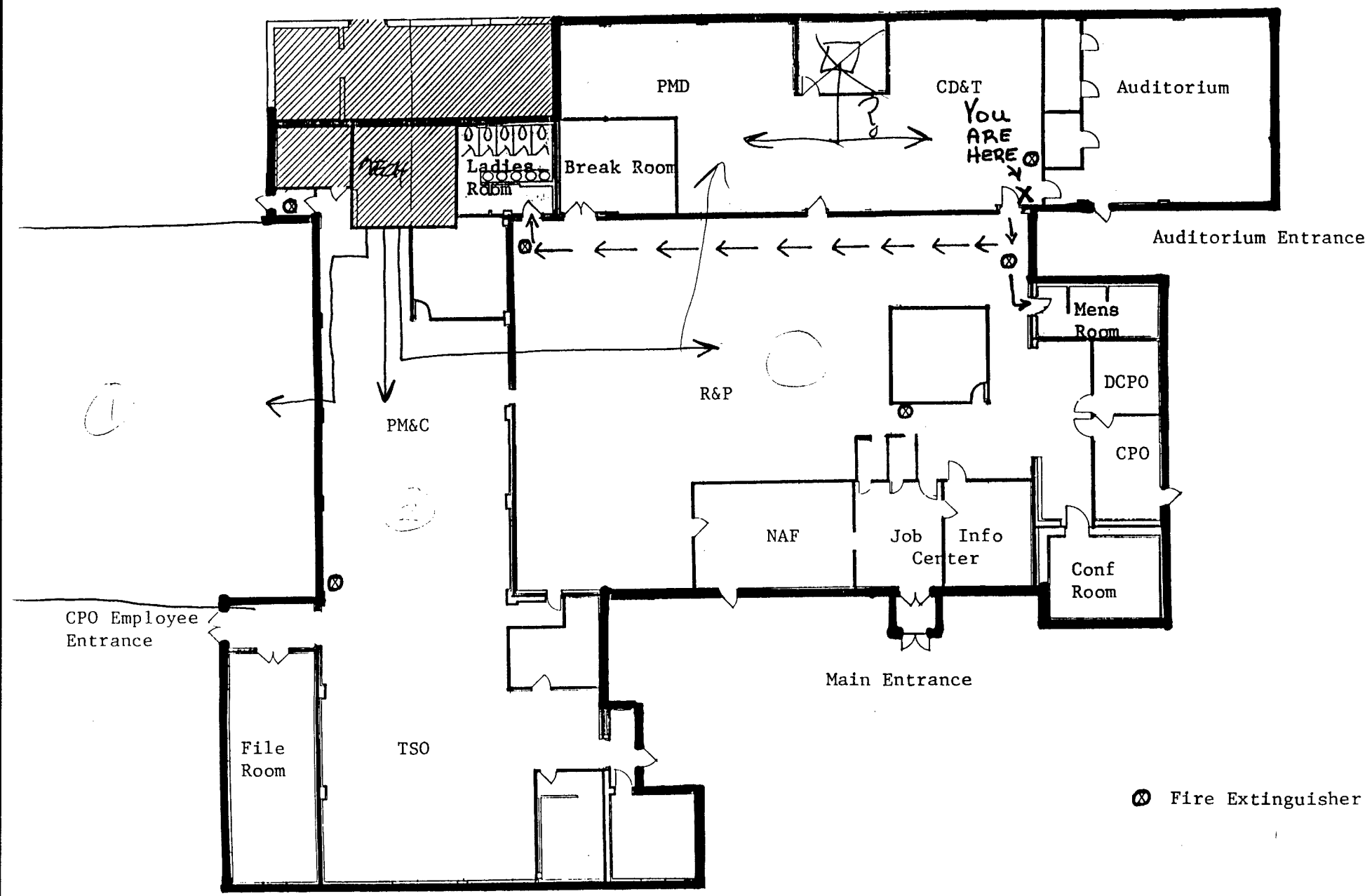
AREAS IN SQ. FEET	NORTH	SOUTH	EAST	WEST
WALLS		see floor plan		
WINDOWS				
OVERHEAD DOORS				
PERSONNEL DOORS				

SKETCH WALL CROSS–SECTION	COMPONENTS
	1. OUTSIDE AIR FILM 2. CONCRETE 3. FRAME WALL 4. GYP BRD 5. 6. 7. INSIDE AIR FILM

SKETCH ROOF CROSS–SECTION	COMPONENTS
	1. OUTSIDE AIR FILM 2. ROOF DECK 3. AIR SPACE 4. 6" FIBERGLASS NS 5. DROP CEILING 6. 7. INSIDE AIR FILM
PERSONNEL DOOR TYPE: METAL (HOLLOW) OVERHEAD DOOR TYPE: NONE	BASEMENT [ ] SLAB [ ] CRAWL SPACE [ ]

COMMENTS:


PMD
CD&T
Auditorium
You ARE HERE
Ladies Room
Break Room
Auditorium Entrance
Mens Room
DCPO
CPO
R&P
PM&C
NAF
Job Info Center
Conf Room
CPO Employee Entrance
Main Entrance
File Room
TSO
Fire Extinguisher


PMD
CD&T
Auditorium
You ARE HERE
Ladies Room
Break Room
Auditorium Entrance
Mens Room
DCPO
CPO
R&P
PM&C
NAF
Job Center
Info
Conf Room
CPO Employee Entrance
Main Entrance
File Room
TSO
Fire Extinguisher

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: KC
CHECKED BY:
DATE: 12-31-91

BLDG.# 246
ECO 1

DUCT INSULATION

LOCATION	DUCT CROSSECTION	SHAPE	DUCT TEMP. (°F)	SURROUND AIR TEMP. (°F)	INSULATION TYPE	INSULATION THICKNESS	INSULATION CONDITION
AHU ROOM	23X28 RA	□		64	FIBERGLASS	1"	GOOD
↓	23X29 OA	□		↓	↓	↓	↓
↓	29X40 RA	□		↓	↓	↓	↓
	30"X 8'-6" SA	□				↓	↓

COMMENTS: SUPPLY AIR – 30" X 8'-6" WITH 4 ZONES

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: KC
CHECKED BY:
DATE: 12-31-91

BLDG.# 246
ECO 1

PIPE INSULATION

LOCATION	PIPE DIAMETER	PIPE LENGTH	FLUID TYPE	FLUID TEMP.	AIR TEMP.	INSULATION TYPE	INSULATION THICKNESS	INSULATION CONDITION
AHU ROOM	1½"	10'	HW	150°F	64°F	FIBERGLASS	3/4"	*
↓	2"	20'	CW	—	64°F	↓	1"	GOOD
OUTSIDE TO CHILLER	2"	24'	CW	—	52°F	FIBERGLASS	1/2" WITH ALUMINUM WRAP	FAIR
BOIER ROOM	2"	100'	CW		60°F	↓	1"	GOOD
↓	1½	15'	HW		60 F	↓	3/4"	GOOD
↓	4	25'	STM		60 F	↓	1"	GOOD

COMMENTS: NEW PIPE WORK WAS DONE TO HW, NO INSULATION.

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: CEL
CHECKED BY:
DATE: 12/31/91

BLDG.# 246
ECO 2

WINDOWS SURVEY

WINDOW NO.	SINGLE/DOUBLE PANE	TYPE–SLIDING FIXED, CASEMENT	FRAME MAT'L	ORIENTATION	GLASS SHADING	WINDOW COVER	DIMENSIONS (INCH)
TYPICAL	DOUBLE PANE (NEW WINDOWS)	SLIDING	METAL	ALL	NONE	CURTAINS (OPEN)	45" x 50"

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: 1 OF
CALCULATED BY: KC
CHECKED BY:
DATE: 12-19-91

BLDG.# 246
ECO 5

MOTORS

MOTOR #	1	HP 1/3	PH 1	RPM 1725	
MODEL #	MOT 323-6-EP	VOLTS 115	AMPS 6.1		
SERIAL #		PRESENT HR.		TO	
MFG	BELL & GOSSETT	REQUIRED HR.		TO	
FRAME		EFF.			
DESCRIPTION	HW (SEC.) PUMP MOTOR	COMMENTS	CONTROLLED BY ON-OFF SW.		

MOTOR #	2	HP 5	PH 3	RPM 1745	
MODEL #	2547	VOLTS 200	AMPS 15.6		
SERIAL #	954719.	PRESENT HR.	SUMMER	TO	
MFG	LINCOLN	REQUIRED HR.		TO	
FRAME	184T	EFF.			
DESCRIPTION	CW PUMP MOTOR	COMMENTS	NOT RUNNING. OPERATE WHEN CHILLER RUNS		

MOTOR #	3	HP ~~more than 10 HP.?~~ 15	PH 3	RPM	
MODEL #		VOLTS 208	AMPS		
SERIAL #		PRESENT HR.		TO	
MFG	US ELECTRIC MOTORS	REQUIRED HR.		TO	
FRAME		EFF.			
DESCRIPTION	AHU FAN MOTOR	COMMENTS	* ~~NO NAME PLATE~~.		

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY:
CHECKED BY: KC
DATE: 12/31/91

BLDG.# 246
ECO 5

10+ HP MOTORS

MEASURED

		PHASE A	PHASE B	PHASE C
MOTOR# AHU				
LOCATION MECH	KVAR	9.8		
MFG US ELECTRIC	KVA	~~9.8~~ 12.0		
MODEL # R-8905-00-938	KW	8.1	~~[illegible]~~	
SERIAL # —	PF	65.5		
FRAME 254T	HP			
HP 15	VOLTS	206	207	
RPM 1765	AMPS	31.0	35.0	
PRESENT 0 TO	PH	3		
REQ HR. TO	3ϕ 60 HZ. 200V 43A 1765			

		PHASE A	PHASE B	PHASE C
MOTOR #				
LOCATION	KVAR			
MFG	KVA			
MODEL #	KW			
SERIAL #	PF			
FRAME	HP			
HP	VOLTS			
RPM	AMPS			
PRESENT TO	PH			
REQ HR. TO				

COMMENTS

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: JW
CHECKED BY:
DATE: 12/20/91

BLDG.# 246
ECO 4

DOMESTIC HOT WATER

FAUCET LOCATION	WATER TEMPERATURE
NORTH WEST MEN'S	135°F
PROBLEMS:	

COMMENTS:

Ft. McPherson/ Ft. Gillem Energy Study
EMC # 3105.000

DATE: 12-19-91
BY: KC

I. AIR HANDLING UNIT SURVEY OBSERVATIONS

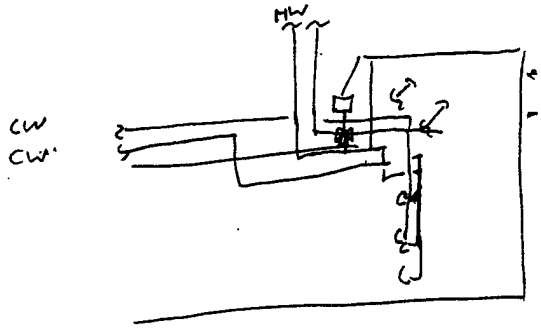
BLDG NO: 246 BLDG NAME: ADMIN JOB: 3105.000
AHU NO: _____ LOCATION: _____
ZONE NO. SERVED: 4 ZONES REF. SYS. SERVING AHU: _____
([ ] VERIFIED ZONE OCCUPANCY AND TEMP. REQUIREMENTS ON SURVEY FORM VI.)
UNIT TYPE: SINGLE ZONE [ ] MULTIZONE [✓] DOUBLE DT [ ] REHEAT [ ]
HEAT & VENT [ ] 2-PIPE FC [ ] 4-PIPE FC [ ] UNIT HT [ ]
OTHER [ ] _____
MFG: _____ MODEL: _____
SUPPLY FAN: FAN HP: 15 MFG: US ELECTRIC MOTOR MODEL: _____
CFM: SA _____ RA _____ OA _____ (MEASURED [ ] ESTIMATED [ ])
PRESENT DAILY STARTUP: M-F _____ TO _____, SAT _____ TO _____, SUN _____ TO _____
STARTUP METHOD: MANUAL [ ] TIMECLOCK [ ] (WORKING, YES [ ] NO [ ])
SEASONAL SWITCHOVER: SUM _____ TO _____, WIN _____ TO _____
REQUIRED DAILY STARTUP: M-F _____ TO _____, SAT _____ TO _____, SUN _____ TO _____

COILS:
PREHEAT: NONE [ ] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
HEATING: NONE [ ] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
REHEAT: NONE [ ] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
HUMID: NONE [ ] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
COOLING: NONE [ ] CW [ ] DX [ ] SPRAY [ ] OTHER [ ]

REMARK: SETUP LIKE A SZ WITH BYPASS AIR - DECK ACTUATOR WORKING.

DAMPERS:
OUTSIDE AIR: MAX % _____, MIN % _____, DAMPER MTR YES [ ] NO [ ]
RETURN AIR: MAX % _____, MIN % _____, DAMPER MTR YES [ ] NO [ ]
RELIEF AIR: MAX % _____, MIN % _____, DAMPER MTR YES [ ] NO [ ]
MIXED AIR CONTROL [ ], ECONOMIZER (DB [ ] OR ENTH [ ]) NONE [ ]

REMARKS: _____
SUPPORT FANS: UNIT _____ RETURN FAN [ ] EXHAUST FAN [ ] OTHER [ ]
FAN HP: _____ MFG: _____ MODEL: _____
THERMOSTAT TYPE: SINGLE SETPOINT [ ] DUAL SETPOINT [ ] SETBACK [ ]
PNEUMATIC [ ] ELECTRIC/ELECTRONIC [ ] NO. OF ZONES _____
SETPOINT: OCC HEAT _____ °F UNOCC HEAT _____ °F OCC COOL _____ °F UNOCC COOL _____ °F
RESET CONTROLS: YES [ ] NO [ ], DECK SETPOINT HOT _____ °F COLD _____ °F
DEMAND LIMITING, DUTY CYCLING YES [ ] NO [ ]
REMARKS:



- HD REMOVED - HW TIES IN WITH CW TO CD
- HW 3 WAY VALVE MODULATE BY ~~DECK TEMP.~~ RA TEMP.

- HAVE PROBLEM WITH ZON CONTROL
- TOO HOT TOO COLD IN DIFF. ZONE

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB Ft. McPherson / Ft. Gillem Energy Study

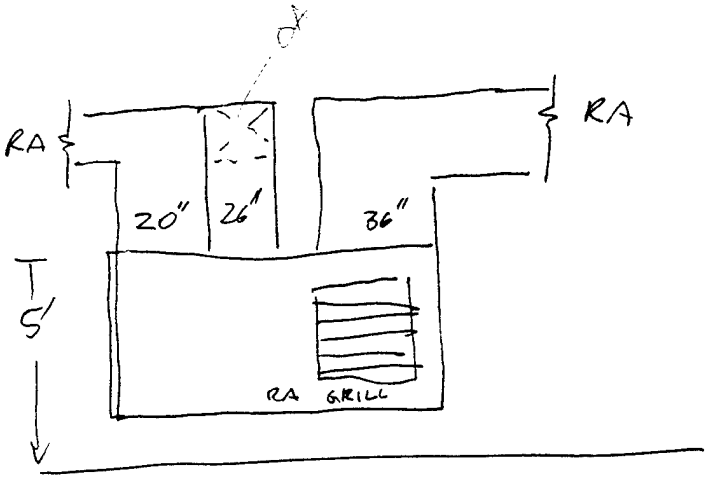
SHEET NO. _____ OF _____

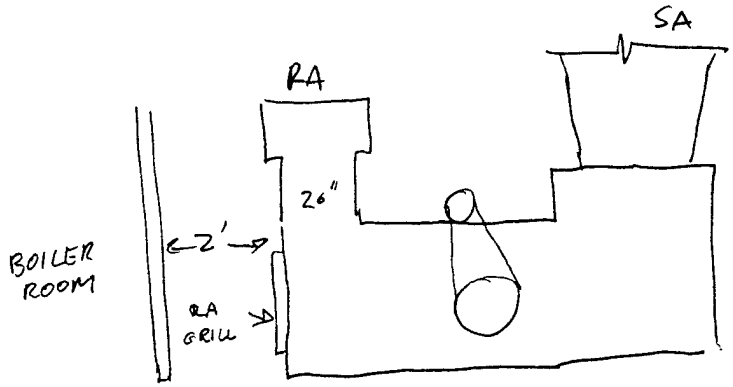
CALCULATED BY KC DATE 12-19-91

CHECKED BY _____ DATE _____

SCALE NTS

ECONOMIZER DATA:
Sketch AHU, Ductwork
Note Dampers, Actuators, Dimensions





JOB Ft. McPherson/Ft. Gillem Energy Study
PROJ # EMC # 3105.000
SHEET NO. ____ OF ____
CALCULATED BY: JW
CHECKED BY:
DATE: 12/31/91

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 246 BLDG NAME: ____ JOB: 3105.000
PRIMARY FUNCTION: ____ GROSS SQ FT ____ NO OF FLRS ____
BUILDING MANAGER NAME: ____
PHONE: ____ OFFICE NO. ____
SPECIAL AREAS: COMPUTER FACILITY [ ] - ZONE NO'S. ____
AUDITORIUM [ ] - ZONE NO'S. ____
LABORATORIES [ ] - ZONE NO'S. ____
CAFETERIA [ ] - ZONE NO'S. ____
OTHER [ ] ____ - ZONE NO'S. ____

ZONE NO. ____ FUNCTION: ____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: CHAPEL 6:00 (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F ~~7:00~~ TO 5:30, SAT ____ TO ____, SUN ____ TO ____
PRESENT TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F
REQUIRE TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F

REMARKS: ____

ZONE NO. ____ FUNCTION: ____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: ____ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F ____ TO ____, SAT ____ TO ____, SUN ____ TO ____
PRESENT TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F
REQUIRE TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F

REMARKS: ____

ZONE NO. ____ FUNCTION: ____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: ____ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F ____ TO ____, SAT ____ TO ____, SUN ____ TO ____
PRESENT TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F
REQUIRE TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F

REMARKS: ____

ZONE NO. ____ FUNCTION: ____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: ____ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F ____ TO ____, SAT ____ TO ____, SUN ____ TO ____
PRESENT TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F
REQUIRE TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F

REMARKS: ____

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

BLDG 246

JOB

SHEET NO. OF

CALCULATED BY JW DATE 12/31/91

CHECKED BY DATE

SCALE

(1) REFRIG (FULLSIZE), TV, COFFEE POT (STANDARD OFFICE EQUIP)

(2) SMALL REFRIG, MICROWAVE

(3) STANDARD

EXIT SIGNS: TTHL TTHL II

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB

SHEET NO. OF

CALCULATED BY KC DATE 12-31-91

CHECKED BY DATE

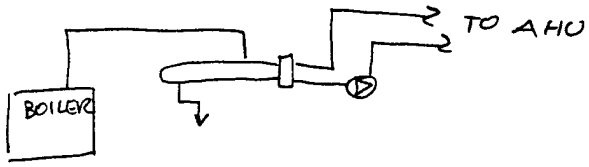
SCALE

BLDG. 246

TRANE CHILLER

MOD CGAC65E
SER LZH660217
COMP. MOTOR 208/220 V 3Ø 264 FLA 10.5 LRA
COND MOTOR 208/220 V 3Ø 23 FLA 7.5 LRA

N.GAS BOILER YORK SHIPLEY, INC.
STEAMPAK GENERATOR STM
MOD SPHV-50-N2 93948
SER 78-11923 H-71341
CAP 1,675,000 BTU
STEAM 150



E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____

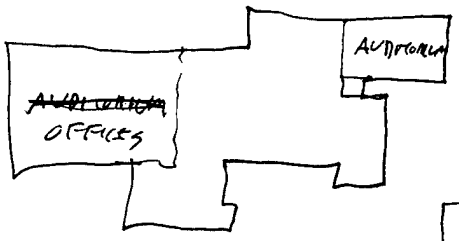
SHEET NO. _____ OF _____

CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____

SCALE _____

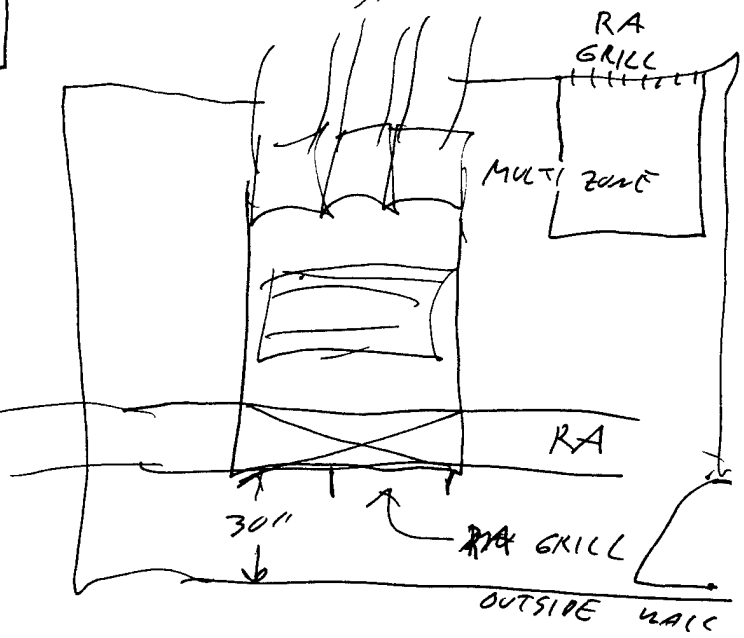
246



MU DUCT ON ROOF

B SET TO BYPASS

4 ZONE SA



BEW PC 2

T/STAT SETPOINT		BYPASS ↑	COIL ↑
~~68°F~~ 70 °F	HEATING	80°F	
84 °F	COOLING	84°F	

NITE SETBACK 55°F
TIMER NOT PROGRAMMED

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

BLDG 246

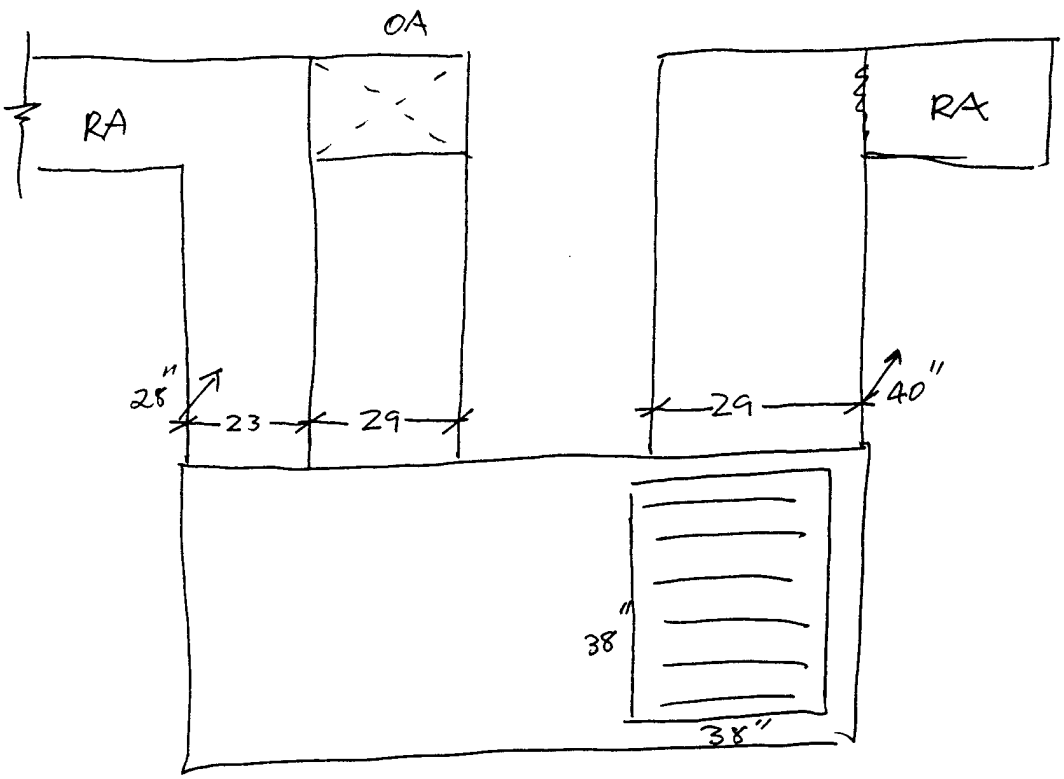
JOB _____

SHEET NO. _____ OF _____

CALCULATED BY KC DATE 12-31-91

CHECKED BY _____ DATE _____

SCALE _____



E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

BLDG 246

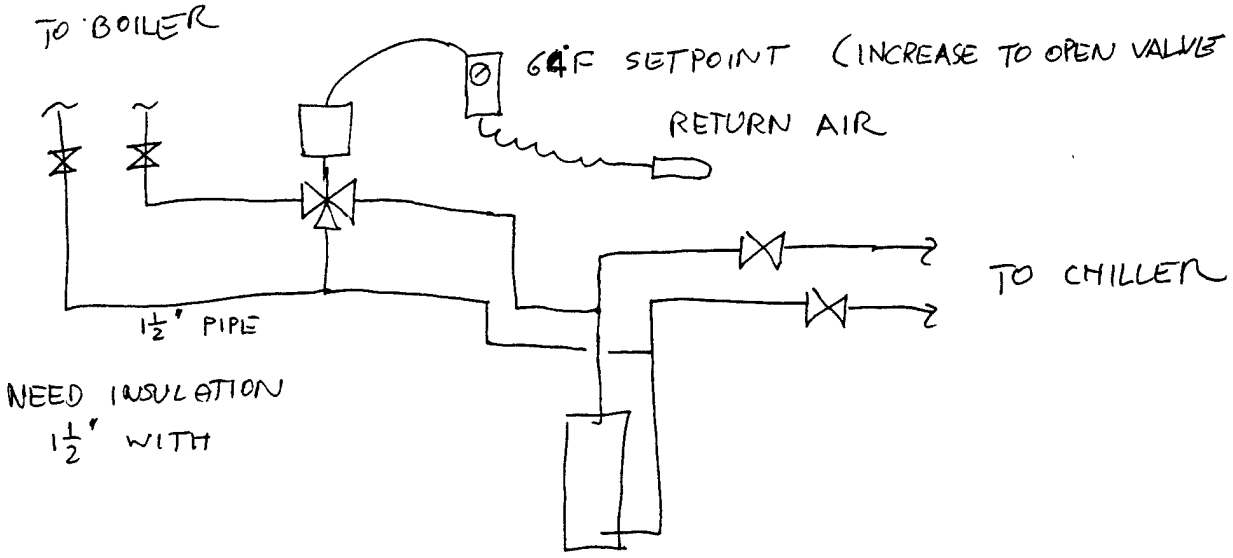
JOB _____

SHEET NO. _____ OF _____

CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____

SCALE _____



- OA T'STAT FOR HEATING "BT-1" ORIGINAL SETPOINT 55°F
  NOW SET AT 80°F

- TIMECLOCK DOES NOT FUNCTION

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB _____

SHEET NO. _____ OF _____

CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____

SCALE _____

~~#~~246

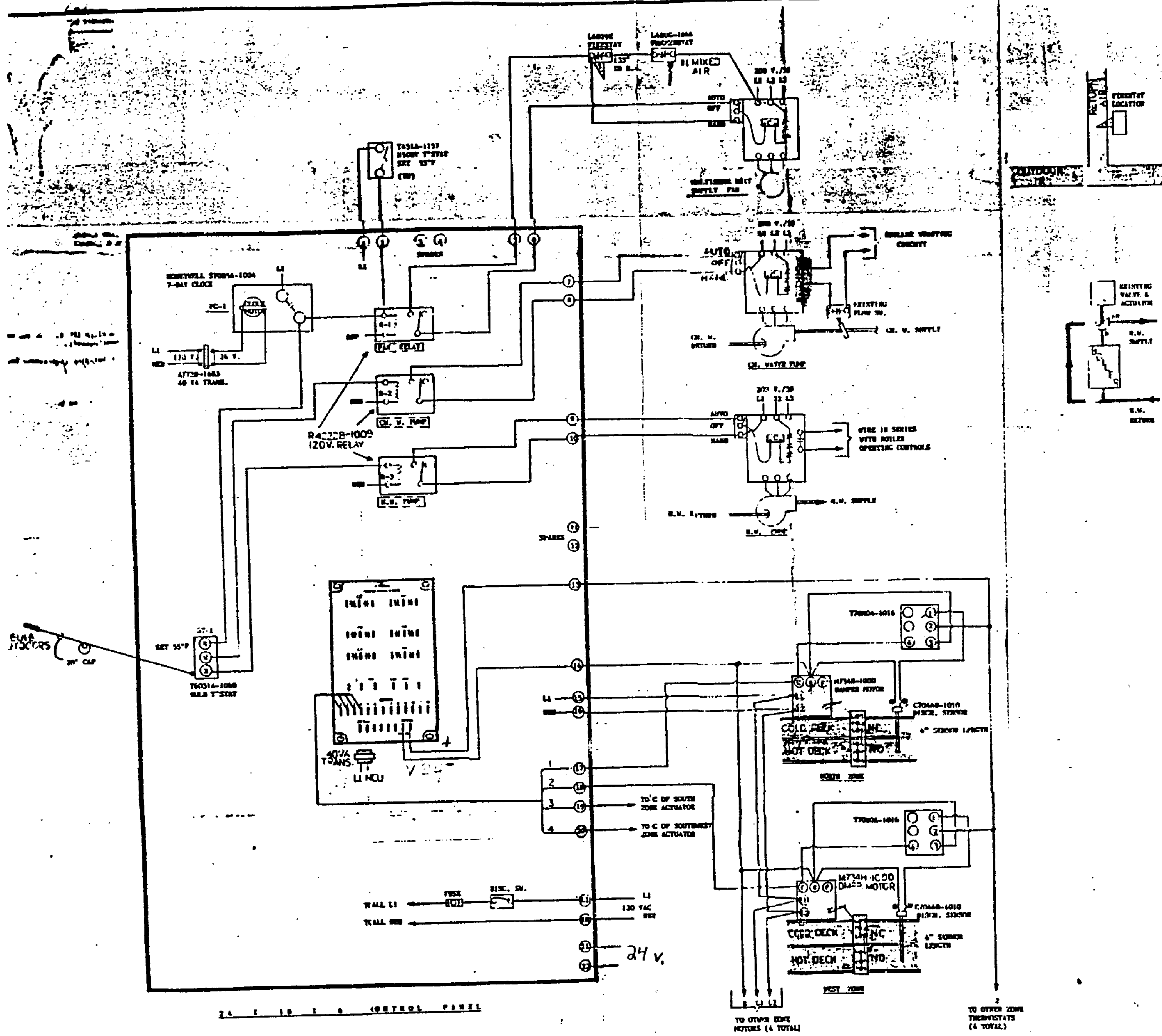
B	R	Coil	Midway	Bypass
H	H			X O
H	L		X O	
L	L	X O		

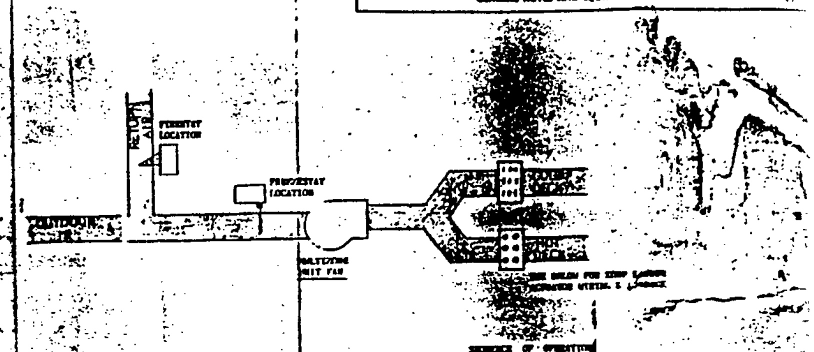
HEAT X OA / 70°F

COOL O 50°F

BOILER ON

USE ELECTRIC HEATER IN FRONT OFFICE





GENERAL NOTES AND EQUIPMENT SCHEDULE

SEQUENCE OF OPERATION

Program Occupancy

System is placed into operation by panel mounted program clock (PC-1). During occupied schedule, multizone unit supply fan will run continuously.

A night low limit thermostat (TN) is provided to prevent building temperature from dropping below 55°F (adjustable).

Heat/Cool Indexing

Bulb thermostat (BT-1) will automatically index heating or cooling by sensing outdoor air temperature. Chill water pump will be energized when outdoor air temperature is above 55°F. Hot water pump will be energized when outdoor air temperature is below 55°F.

Heating

With system indexed to heating and on a fall in space temperature below room thermostat setpoint, respective face and bypass damper will modulate open to the heating coil (bypassing cooling coil) to satisfy heating demand. On a space temperature rise, face and bypass damper will modulate closed to the heating coil and modulate open to the bypass duct or cooling coil. (Cooling is OFF below 55°F outdoor air temperature).

Cooling

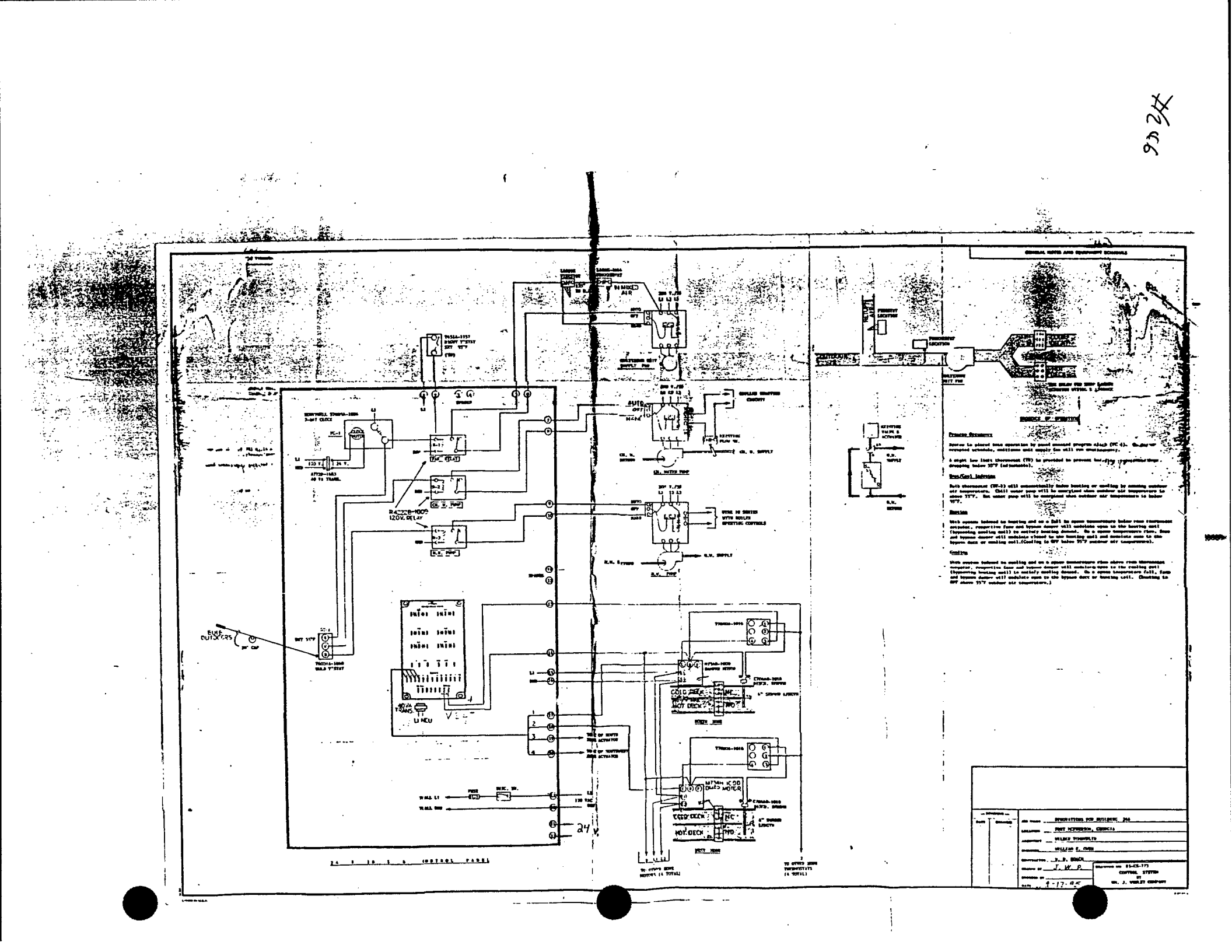
With system indexed to cooling and on a space temperature rise above room thermostat setpoint, respective face and bypass damper will modulate open to the cooling coil (bypassing heating coil) to satisfy cooling demand. On a space temperature fall, face and bypass damper will modulate open to the bypass duct or heating coil. (Heating is OFF above 55°F outdoor air temperature.)

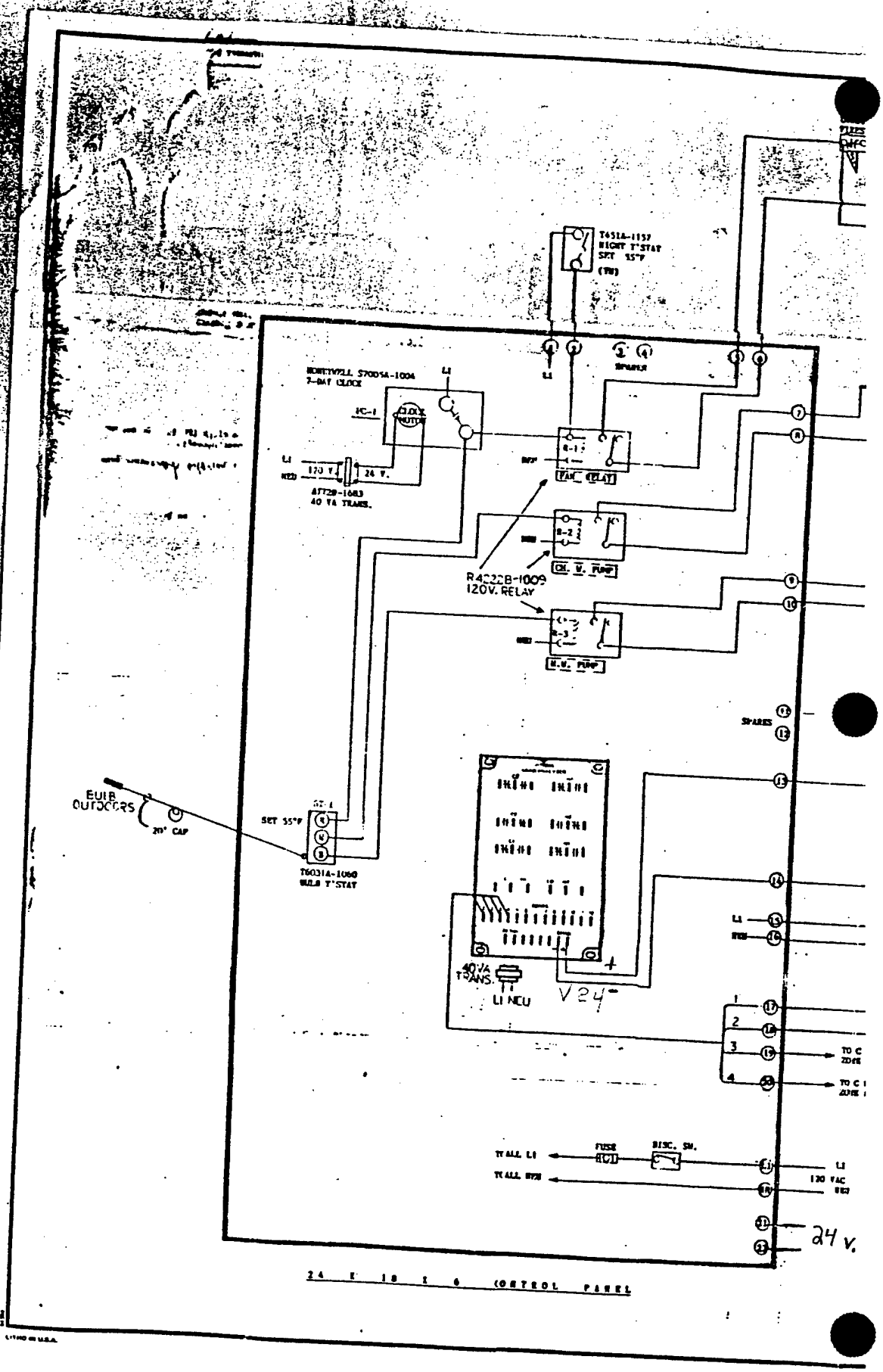
246

JOB NAME	RENOVATIONS FOR BUILDING 246
LOCATION	FORT MCPHERSON, GEORGIA
ARCHITECT	WILBUR TOMBERLIN
ENGINEER	WILLIAM F. OWEN
CONTRACTOR	W. B. ROACH
DRAWN BY	J. W. P.
CHECKED BY	
DATE	1-17-95

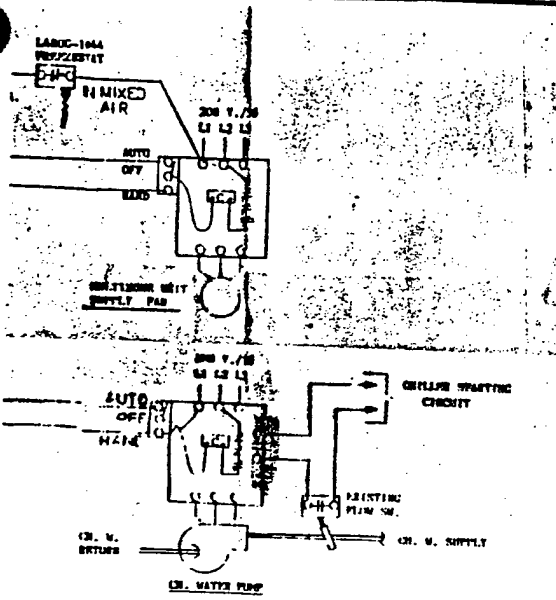
REVISIONS — DATE | CHANGES

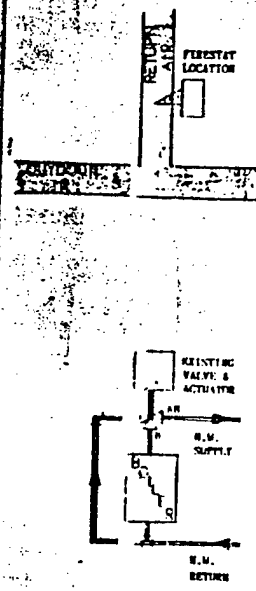
DRAWING NO. 85-CS-773
CONTROL SYSTEM
BY
WM. J. WESLEY COMPANY

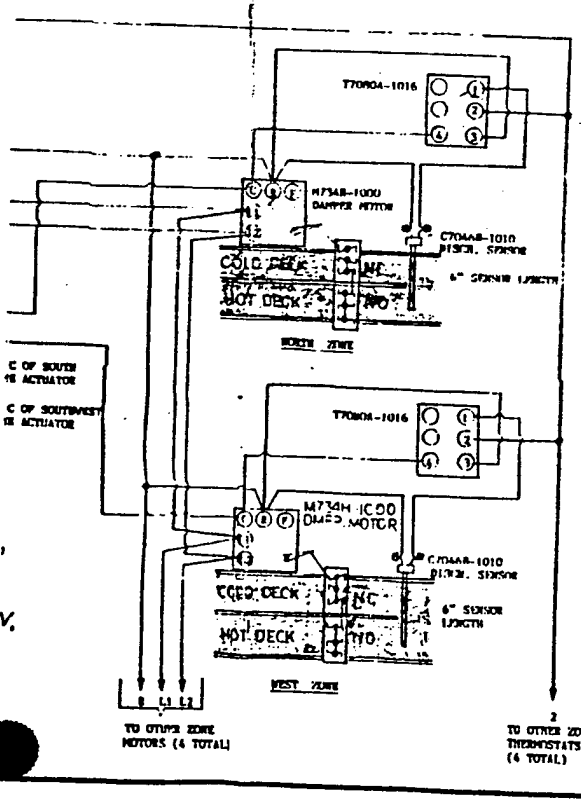

GENERAL NOTES AND EQUIPMENT SCHEDULE
SEQUENCE OF OPERATION
Primary Equipment
Control Sequence
Heat/Cool Selection
Heating
Cooling
OUTDOORS
R4222B-1000
120V. RELAY
COLD DECK
HOT DECK
24 V.
INSTALLATION OF CONTROL SYSTEM
BY
GEO. J. WESLEY COMPANY



24 F 18 I 6 CONTROL PANEL







GENERAL NOTES AND EQUIPMENT SCHEDULE

SEQUENCE OF OPERATION

Program Occupancy

System is placed into operation by panel mounted program clock (PC-1). The duct w occupied schedule, multizone unit supply fan will run continuously.

A night low limit thermostat (TH) is provided to prevent bui dropping below 55°F (adjustable).

Heat/Cool Indexing

Bulb thermostat (BT-1) will automatically index heating or cooling by sensing out air temperature. Chill water pump will be energized when outdoor air temperature above 55°F. Hot water pump will be energized when outdoor air temperature is bel 55°F.

Heating

With system indexed to heating and on a fall in space temperature below room ther setpoint, respective face and bypass damper will modulate open to the heating coi (bypassing cooling coil) to satisfy heating demand. On a space temperature rise, and bypass damper will modulate closed to the heating coil and modulate open to t bypass duct or cooling coil.(Cooling is OFF below 55°F outdoor air temperature).

Cooling

With system indexed to cooling and on a space temperature rise above room thermos setpoint, respective face and bypass damper will modulate open to the cooling coi (bypassing heating coil) to satisfy cooling demand. On a space temperature fall, and bypass damper will modulate open to the bypass duct or heating coil. (Heatin OFF above 55°F outdoor air temperature.)

246

REVISIONS		
DATE	CHANGES	

JOB NAME RENOVATIONS FOR BUILDING 246
LOCATION FORT MCPHERSON, GEORGIA
ARCHITECT WILBUR TOMBERLIN
ENGINEER WILLIAM E. OWEN
CONTRACTOR W. B. ROACH
DRAWN BY J. W. P.
CHECKED BY
DATE 4-17-95
DRAWING NO. 85-CS-773
CONTROL SYSTEM
BY
WM. J. WESLEY COMPANY

BUILDING 250

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: JW
CHECKED BY:
DATE: 12/31/91

BLDG.# 250
ECO 2

WINDOWS SURVEY

WINDOW NO.	SINGLE/DOUBLE PANE	TYPE–SLIDING FIXED, CASEMENT	FRAME MAT'L	ORIENTATION	GLASS SHADING	WINDOW COVER	DIMENSIONS (INCH)
1	SINGLE	FIXED	METAL	N/W	GRAY	VERT BLINDS	22'7" x 7'
1	"	"	"	N	"	"	32" x 7'6"
1	"	"	"	W	"	"	"

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB Ft. McPherson/Ft. Gillem Energy Study
PROJ.# EMC # 3105.000
SHEET NO. OF
CALCULATED BY: JW
CHECKED BY:
DATE:

BLDG.# 250
ECO 3

WEATHERSTRIPING AND CAULKING

DOOR\ WINDOW	CONDITION OF W.S./CAULK	INFILTRATION	ORIENTATION	DIMENSIONS (INCH)	#
D	EXCEL		E	40x80	1
D	"		N	"	1
D	"		S	"	1

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO. OF
CALCULATED BY: JW
CHECKED BY:
DATE: 1/6/92

BLDG.# 250
ECO 4

DOMESTIC HOT WATER

FAUCET LOCATION	WATER TEMPERATURE
TECHNICAL SERVICES OFFICE	84°F
PROBLEMS:	

COMMENTS:
THE HOT WATER IN THIS BUILDING IS HEATED BY USE OF TWO INSTANT HW HEATERS LOCATED UNDER THE SINKS. THE MEN'S & WOMEN'S ROOM ARE HEATED BY THE SAME UNIT, HOWEVER, IT IS NOT WORKING AT PRESENT TIME.

HEATER NAMEPLATE: INSTANT-FLOW WATER HEATER
M# S-30L S# 95075
120V 3000W 27A

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO. ____ OF ____
CALCULATED BY: CS
CHECKED BY: ____
DATE: Jan 6, 1992

BLDG.# 250
EC0 15

LIGHTING

ROOM #	# OF FIXTURES	LAMPS/ FIXTURE	WATTS/ BULB	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCC. SENSOR	NO. OF SWITCHES	UNOCC LIGHTS ON
Main Room	106	4	34	F	ON	Y	N	Dial controls sects. of lights	N
SW Storage	3	4	34	F	ON	Y	Y	1	Y
SW Office	2	4	34	F	ON	Y	Y	1	N
Tech. Services	4	4	34	F	ON	Y	N	1	N
Tech Services	4	4	34	F	ON	Y	N	1	N
Docu. Section	6	4	34	F	ON	Y	N	2	N

OF EXIT SIGNS – ____

COMMENTS: ____

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB Ft. McPherson/Ft. Gillem Energy Study
SHEET NO. EMC # 3105.000 OF
CALCULATED BY CS DATE 1/6/92
CHECKED BY DATE
SCALE

BLDG 250

In the middle of the Library there is a approx. 26 x 26 fixture. There are lights above plastic panneling and they can not be counted. the lights are four foot F. lights.

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

BLDG 250

JOB

SHEET NO. OF

CALCULATED BY JW DATE 1/6/92

CHECKED BY DATE

SCALE

INSIDE AIR TEMP. ⇒ 73.3°F

OA TEMP AT 10:30AM ⇒ 60°F

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

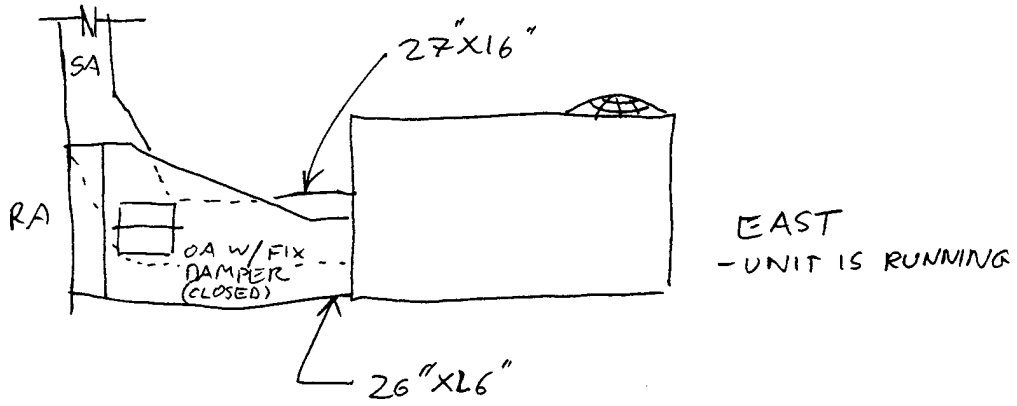
JOB _____
SHEET NO. _____ OF _____
CALCULATED BY _____ DATE _____
CHECKED BY _____ DATE _____
SCALE _____

BLDG. 250 CARRIER

MOD 50QH008530DA
SER. 1289G35061

COMP.	2 -	208V	3Ø 60 HZ	16.5A	
COND. FAN	2 -	208V	1Ø 60 HZ	2.9A	0.5 HP, 0.37 KW
EVAP FAN	1 -	208V	3Ø 60 HZ	5.7A	1.5 HP 1.12 KW

SINGLE ZON PACKAGE UNIT WITH OA DUCT 12"X12"



* SHOULD INSULATE SA DUCT ≃ 15' LONG.

THIS IS TYPICAL OF 3 UNIT

M 10-5
T

JOB Ft. McPherson/Ft. Gillem Energy Study
PROJ.# EMC # 3105.000
SHEET NO. ______ OF ______
CALCULATED BY: JW
CHECKED BY: ______
DATE: 12/31/91

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 250 BLDG NAME: LIBRARY JOB: 3105.000
PRIMARY FUNCTION: ______ GROSS SQ FT ______ NO OF FLRS ______
BUILDING MANAGER NAME: ______
PHONE: ______ OFFICE NO. ______
SPECIAL AREAS: COMPUTER FACILITY [ ] - ZONE NO'S. ______
AUDITORIUM [ ] - ZONE NO'S. ______
LABORATORIES [ ] - ZONE NO'S. ______
CAFETERIA [ ] - ZONE NO'S. ______
OTHER [ ] ______ - ZONE NO'S. ______

ZONE NO. ______ FUNCTION: ______ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: ______ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F 10:00 TO 5:00 , SAT 12:00 TO 5:00 , SUN Closed TO ______
T-TH 10 - 7pm
PRESENT TEMP: WINTER OCC ______ °F UNOCC ______ °F, SUMMER OCC ______ °F UNOCC ______ °F
REQUIRE TEMP: WINTER OCC ______ °F UNOCC ______ °F, SUMMER OCC ______ °F UNOCC ______ °F

REMARKS: ______

ZONE NO. ______ FUNCTION: ______ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: ______ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F ______ TO ______ , SAT ______ TO ______ , SUN ______ TO ______
PRESENT TEMP: WINTER OCC ______ °F UNOCC ______ °F, SUMMER OCC ______ °F UNOCC ______ °F
REQUIRE TEMP: WINTER OCC ______ °F UNOCC ______ °F, SUMMER OCC ______ °F UNOCC ______ °F

REMARKS: ______

ZONE NO. ______ FUNCTION: ______ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: ______ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F ______ TO ______ , SAT ______ TO ______ , SUN ______ TO ______
PRESENT TEMP: WINTER OCC ______ °F UNOCC ______ °F, SUMMER OCC ______ °F UNOCC ______ °F
REQUIRE TEMP: WINTER OCC ______ °F UNOCC ______ °F, SUMMER OCC ______ °F UNOCC ______ °F

REMARKS: ______

ZONE NO. ______ FUNCTION: ______ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: ______ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F ______ TO ______ , SAT ______ TO ______ , SUN ______ TO ______
PRESENT TEMP: WINTER OCC ______ °F UNOCC ______ °F, SUMMER OCC ______ °F UNOCC ______ °F
REQUIRE TEMP: WINTER OCC ______ °F UNOCC ______ °F, SUMMER OCC ______ °F UNOCC ______ °F

REMARKS: ______

BUILDING 358

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

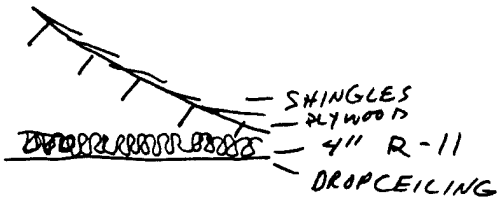
JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: J W
CHECKED BY:
DATE: 12/20/91

BLDG.# 358
ECO 1

WALL & ROOF INSULATION

AREAS IN SQ. FEET	NORTH	SOUTH	EAST	WEST
WALLS				
WINDOWS				
OVERHEAD DOORS				
PERSONNEL DOORS				

SKETCH WALL CROSS–SECTION	COMPONENTS
	1. OUTSIDE AIR FILM 2. _____ 3. _____ 4. _____ 5. _____ 6. _____ 7. INSIDE AIR FILM

SKETCH ROOF CROSS–SECTION	COMPONENTS
	1. OUTSIDE AIR FILM 2. _____ 3. _____ 4. _____ 5. _____ 6. _____ 7. INSIDE AIR FILM

PERSONNEL DOOR TYPE _____	BASEMENT [ ]
OVERHEAD DOOR TYPE _____	SLAB [ ] CRAWL SPACE [ ]

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: KC
CHECKED BY:
DATE: 12-9-91

BLDG.# 358
ECO 1

PIPE INSULATION

LOCATION	PIPE DIAMETER	PIPE LENGTH	FLUID TYPE	FLUID TEMP.	AIR TEMP.	INSULATION TYPE	INSULATION THICKNESS	INSULATION CONDITION
MECH 1	3"	40'	HW	120°F	55°F	HARD BLK FOAM	1 3/4"	FAIR
MECH 1	1 1/2"	40'	HW	120°F	55°F	BLK RUBBER	3/4"	GOOD
AHU-1,2,3	1 1/2" HW & 3" CW	200'				FG. W/PAINT	2"	GOOD
AHU 5	NO PIPE							
AHU 6	1 1/2"	25'	HW			RUBBER	3/4	GOOD
MECH 2	3"	10'	CW	NOT RUN	50°F	FG	1 1/2	*
AHU 4	1 1/4"	30'	CW & HW	—		RUBBER	1"	**

COMMENTS: * MISSING INSL TO & FROM PUMP (CW)

* NEED INSL. 10'

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB	Ft. McPherson/Ft. Gillem Energy Study
PROJ.#	EMC # 3105.000
SHEET NO.	OF
CALCULATED BY:	KC
CHECKED BY:	
DATE:	12-19-91

BLDG.# 358
ECO 1

DUCT INSULATION

LOCATION	DUCT CROSSECTION	SHAPE	DUCT TEMP. (°F)	SURROUND AIR TEMP. (°F)	INSULATION TYPE	INSULATION THICKNESS	INSULATION CONDITION
AHU-1							
AHU-2							
AHU-3	36"X15"	□	NOT RUNNING	50°	FG W/F	2"	*
AHU5		□	↓	50	↓	↓	GOOD
AHU6	16"X38"	□	68°F	50	↓	↓	~~GOOD~~ **
AHU 4	36"X24" SA DUCT	□	NOT RUNNING	60°	NONE		NONE
↓	18"X80 RA DUCT	□	↓	↓	↓		↓

COMMENTS: * INSL. WAS CUT OUT ON ONE SIDE 36"X24"

** SECTION OF INSL WAS REMOVED 4' long

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

BLDG.# 358
ECO 2

JOB Ft. McPherson/Ft. Gillem Energy Study
PROJ.# EMC # 3105.000
SHEET NO. OF
CALCULATED BY: JW
CHECKED BY:
DATE: 12/20/91

WINDOWS SURVEY

WINDOW NO.	SINGLE/DOUBLE PANE	TYPE–SLIDING FIXED, CASEMENT	FRAME MAT'L	ORIENTATION	GLASS SHADING	WINDOW COVER	DIMENSIONS (INCH)
~~25~~ 33	SINGLE	SLIDING	WOOD	E	NONE	BLINDS & CURTAINS	30X53
(1) ~~26~~ 45	SINGLE	"	"	N	NONE	BLINDS	"
~~29~~ 50	"	"	"	S	"	"	"
13	"	"	"	W	"	"	"
NOTE: MANY OF THE STORM WINDOWS ARE PARTIALLY OR FULLY OPEN WITH WOOD WINDOWS							
CLOSED. THIS PRACTICE, IF OVERLOOKED, WILL DEFEAT THE ENERGY SAVING CAPABILITIES							
OF THE STORM WINDOWS. OPEN ONLY IF NECESSARY FOR VENTILATION & CLOSE BACK.							

COMMENTS:
ALL WINDOWS HAVE STORM WINDOWS WITH MED/LOW INFILTRATION. TOTAL WINDOW HAS LOW INFILTRATION. THERE ARE ALSO SEVERAL STORM WINDOWS MISSING.

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: JW
CHECKED BY:
DATE: 12/20/91

BLDG.# 358
ECO 3

WEATHERSTRIPING AND CAULKING

	DOOR\ WINDOW	CONDITION OF W.S./CAULK	INFILTRATION	ORIENTATION	DIMENSIONS (INCH)	~~#~~
(1)	W	NONE	LOW	E	30X53	~~25~~ 33
	STORM WINDOW	FAIR/POOR	MED/HIGH	E	30X53	~~25~~ 33
	D	GOOD	LOW	CENTER EAST	34X80	1
(2)	D	POOR	MED	SOUTH EAST	"	1
	D	EXCEL	NONE	NORTH EAST	"	1
	D	FAIR	LOW	SOUTH WEST	"	1
(2)	D	POOR	MED	N	"	1

COMMENTS:
(1) INFILTRATION LOW BECAUSE STORM WINDOWS INSTALLED. (2) DOOR IS WARPED CAUSING ¼" AIR GAP AT TOP CORNER.

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: JW
CHECKED BY:
DATE: 12/20/91

BLDG.# 358
ECO 4

DOMESTIC HOT WATER

FAUCET LOCATION	WATER TEMPERATURE
NORTH ~~WEST~~ WEST MEN'S ROOM	134°F
SOUTH EAST MEN'S ROOM	139°F
PROBLEMS:	

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: KC
CHECKED BY:
DATE: 12-19-91

BLDG.# 358
ECO 5

MOTORS

MOTOR #	7	HP	3	PH	3	RPM	
MODEL #	6-357330-40	VOLTS	200	AMPS	21		
SERIAL #		PRESENT HR.	SUMMER	TO			
MFG	CENTURY	REQUIRED HR.		TO			
FRAME	M184TCZ	EFF.	85.5				
DESCRIPTION	CWP MOTOR.	COMMENTS					

MOTOR #	8	HP	2	PH	3	RPM	1725
MODEL #	5K49UG6001	VOLTS	208	AMPS	6.8		
SERIAL #		PRESENT HR.	0	TO	2400		
MFG	GE	REQUIRED HR.		TO			
FRAME	145T	EFF.					
DESCRIPTION	AHU-4	COMMENTS	T'STAT				

MOTOR #		HP		PH		RPM	
MODEL #		VOLTS		AMPS			
SERIAL #		PRESENT HR.		TO			
MFG		REQUIRED HR.		TO			
FRAME		EFF.					
DESCRIPTION		COMMENTS					

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: KL
CHECKED BY:
DATE: 12-19-91

BLDG.# 358
ECO 5

MOTORS

MOTOR # 1 HP 2 PH 3 RPM 1735
MODEL # 2G2-4 VOLTS 200 AMPS 7.8
SERIAL # PRESENT HR. 0 TO 2400
MFG ~~WESTINGHOUSE~~ US. ELEC. MOTOR. REQUIRED HR. TO
FRAME 145JP EFF.
DESCRIPTION HW CIR. COMMENTS ONLY IN WINTER
BOILER TEMP. SETTING 120°F

MOTOR # 2 HP 5 PH 3 RPM 1730
MODEL # F-3465-00291 VOLTS 200 AMPS 16.6
SERIAL # PRESENT HR. TO
MFG US ELEC. MOTORS REQUIRED HR. TO
FRAME 184T EFF.
DESCRIPTION AHU-1 COMMENTS T'STAT CONTROL

MOTOR # 3 HP 1/2 PH 1 RPM
MODEL # 5KBL026D VOLTS 115 AMPS 7.8
SERIAL # PRESENT HR. 0 TO 2400
MFG GE REQUIRED HR. TO
FRAME EFF.
DESCRIPTION AHU-2 COMMENTS T'STAT CONTROL

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: KL
CHECKED BY:
DATE: 12-19-91

BLDG.# 358
ECO 5

MOTORS

MOTOR #	4	HP	1	PH	3	RPM	1725
MODEL #	5K43MG8046X	VOLTS	230	AMPS	3.8		
SERIAL #		PRESENT HR.	0	TO	2400		
MFG	GE	REQUIRED HR.	7:00	TO	400 PM		
FRAME		EFF.					
DESCRIPTION	AHU-3	COMMENTS	T'STAT CONTROL				

MOTOR #	5	HP	1/2	PH	1	RPM	
MODEL #		VOLTS	115V	AMPS	9 MAX		
SERIAL #		PRESENT HR.		TO			
MFG		REQUIRED HR.		TO			
FRAME		EFF.					
DESCRIPTION	AHU-5	COMMENTS	T'STAT CONTROL				

MOTOR #	6	HP	3	PH	3	RPM	1725
MODEL #	5K49 768010	VOLTS	230	AMPS	9.2		
SERIAL #		PRESENT HR.		TO			
MFG	GE	REQUIRED HR.		TO			
FRAME		EFF.					
DESCRIPTION	AHU-6	COMMENTS	T'STAT CONTROL				

Ft. McPherson/ Ft. Gillem Energy Study
EMC # 3105.000

DATE: 12-19-91
BY: KC

I. AIR HANDLING UNIT SURVEY OBSERVATIONS

BLDG NO: 358 BLDG NAME: OEH JOB: 3105.000
AHU NO: 1 LOCATION: NW
ZONE NO. SERVED: _____ REF. SYS. SERVING AHU: _____
([ ] VERIFIED ZONE OCCUPANCY AND TEMP. REQUIREMENTS ON SURVEY FORM VI.)
UNIT TYPE: SINGLE ZONE [✓] MULTIZONE [ ] DOUBLE DT [ ] REHEAT [ ]
HEAT & VENT [ ] 2-PIPE FC [ ] 4-PIPE FC [ ] UNIT HT [ ]
OTHER [ ] _____
MFG: TRANE MODEL: _____
SUPPLY FAN: FAN HP: 5 MFG: US ELEC MODEL: _____
CFM: SA _____ RA _____ OA _____ (MEASURED [ ] ESTIMATED [✓])
PRESENT DAILY STARTUP: M-F _____ TO _____, SAT _____ TO _____, SUN _____ TO _____
STARTUP METHOD: MANUAL [ ] TIMECLOCK [ ] (WORKING, YES [ ] NO [ ])
SEASONAL SWITCHOVER: SUM _____ TO _____, WIN _____ TO _____
REQUIRED DAILY STARTUP: M-F _____ TO _____, SAT _____ TO _____, SUN _____ TO _____

COILS:
PREHEAT: NONE [✓] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
HEATING: NONE [ ] STM [ ] HW [✓] ELEC [ ] MOD VLV [ ]
REHEAT: NONE [✓] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
HUMID: NONE [✓] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
COOLING: NONE [ ] CW [✓] DX [ ] SPRAY [ ] OTHER [ ]

REMARK: MODULATING ELEC. ACTUATOR

DAMPERS:
OUTSIDE AIR: MAX % _____, MIN % _____, DAMPER MTR YES [ ] NO [ ]
RETURN AIR: MAX % _____, MIN % _____, DAMPER MTR YES [ ] NO [ ]
RELIEF AIR: MAX % _____, MIN % _____, DAMPER MTR YES [ ] NO [ ]
MIXED AIR CONTROL [ ], ECONOMIZER (DB [ ] OR ENTH [ ]) NONE [ ]

REMARKS: RETURN AIR PULL THROUGH WALL (NEAR COFFE POTS)

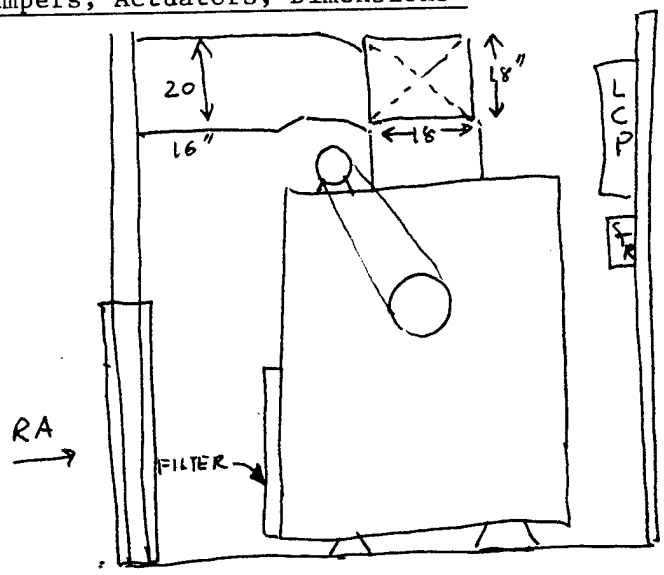
SUPPORT FANS: UNIT — RETURN FAN [ ] EXHAUST FAN [ ] OTHER [ ]
FAN HP: _____ MFG: _____ MODEL: _____
THERMOSTAT TYPE: SINGLE SETPOINT [ ] DUAL SETPOINT [ ] SETBACK [ ]
PNEUMATIC [ ] ELECTRIC/ELECTRONIC [ ] NO. OF ZONES _____
SETPOINT: OCC HEAT _____ °F UNOCC HEAT _____ °F OCC COOL _____ °F UNOCC COOL _____ °F
RESET CONTROLS: YES [ ] NO [ ], DECK SETPOINT HOT _____ °F COLD _____ °F
DEMAND LIMITING, DUTY CYCLING YES [ ] NO [ ]
REMARKS:

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB Ft. McPherson / Ft. Gillem Energy Study
SHEET NO. _____ OF _____
CALCULATED BY KL DATE 12-19-91
CHECKED BY _____ DATE _____
SCALE NTS

ECONOMIZER DATA:
Sketch AHU, Ductwork
Note Dampers, Actuators, Dimensions

AHU-1
SZ UNIT



- RETURN AIR FROM HALLWAY
- CAN NOT DUCT IN OA, PHYSICAL RESTRICTION & LOCATION
- AHU - CONTROL BY T'STAT - CYCLE FAN ON/OFF
- THE CLOSET IS A RETURN AIR PLENUM
- SA DUCTS ARE NOT INSULATED IN THE CLOSET

Ft. McPherson/ Ft. Gillem Energy Study
EMC # 3105.000

DATE: 12-19-91
BY: KC

I. AIR HANDLING UNIT SURVEY OBSERVATIONS

BLDG NO: 358 BLDG NAME: _____ JOB: _____
AHU NO: 2 LOCATION: _____
ZONE NO. SERVED: _____ REF. SYS. SERVING AHU: _____
([ ] VERIFIED ZONE OCCUPANCY AND TEMP. REQUIREMENTS ON SURVEY FORM VI.)
UNIT TYPE: SINGLE ZONE [ ] MULTIZONE [ ] DOUBLE DT [ ] REHEAT [ ]
HEAT & VENT [ ] 2-PIPE FC [ ] 4-PIPE FC [ ] UNIT HT [ ]
OTHER [ ] _____
MFG: MAGIC AIRE MODEL: MAVBC/AAVBC-5
SUPPLY FAN: FAN HP: 1/2 MFG: GE MODEL: _____
CFM: SA _____ RA _____ OA _____ (MEASURED [ ] ESTIMATED [✓])
PRESENT DAILY STARTUP: M-F 0 TO 2400, SAT 0 TO 2400, SUN 0 TO 2400
STARTUP METHOD: MANUAL [ ] TIMECLOCK [ ] (WORKING, YES [ ] NO [ ])
SEASONAL SWITCHOVER: SUM _____ TO _____, WIN _____ TO _____
REQUIRED DAILY STARTUP: M-F _____ TO _____, SAT _____ TO _____, SUN _____ TO _____

COILS:
PREHEAT: NONE [✓] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
HEATING: NONE [ ] STM [ ] HW [✓] ELEC [ ] MOD VLV [ ]
REHEAT: NONE [✓] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
HUMID: NONE [✓] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
COOLING: NONE [ ] CW [✓] DX [ ] SPRAY [ ] OTHER [ ]

REMARK: PIPE HAS GOOD INSULATION

DAMPERS:
OUTSIDE AIR: MAX % _____, MIN % _____, DAMPER MTR YES [ ] NO [ ]
RETURN AIR: MAX % _____, MIN % _____, DAMPER MTR YES [ ] NO [ ]
RELIEF AIR: MAX % _____, MIN % _____, DAMPER MTR YES [ ] NO [ ]
MIXED AIR CONTROL [ ], ECONOMIZER (DB [ ] OR ENTH [ ]) NONE [ ]

REMARKS: _____
SUPPORT FANS: UNIT _____ RETURN FAN [ ] EXHAUST FAN [ ] OTHER [ ]
FAN HP: — MFG: _____ MODEL: _____
THERMOSTAT TYPE: SINGLE SETPOINT [ ] DUAL SETPOINT [ ] SETBACK [ ]
PNEUMATIC [ ] ELECTRIC/ELECTRONIC [ ] NO. OF ZONES _____
SETPOINT: OCC HEAT _____ °F UNOCC HEAT _____ °F OCC COOL _____ °F UNOCC COOL _____ °F
RESET CONTROLS: YES [ ] NO [ ], DECK SETPOINT HOT _____ °F COLD _____ °F
DEMAND LIMITING, DUTY CYCLING YES [ ] NO [ ]
REMARKS:

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB Ft. McPherson / Ft. Gillem Energy Study

SHEET NO. _____ OF _____

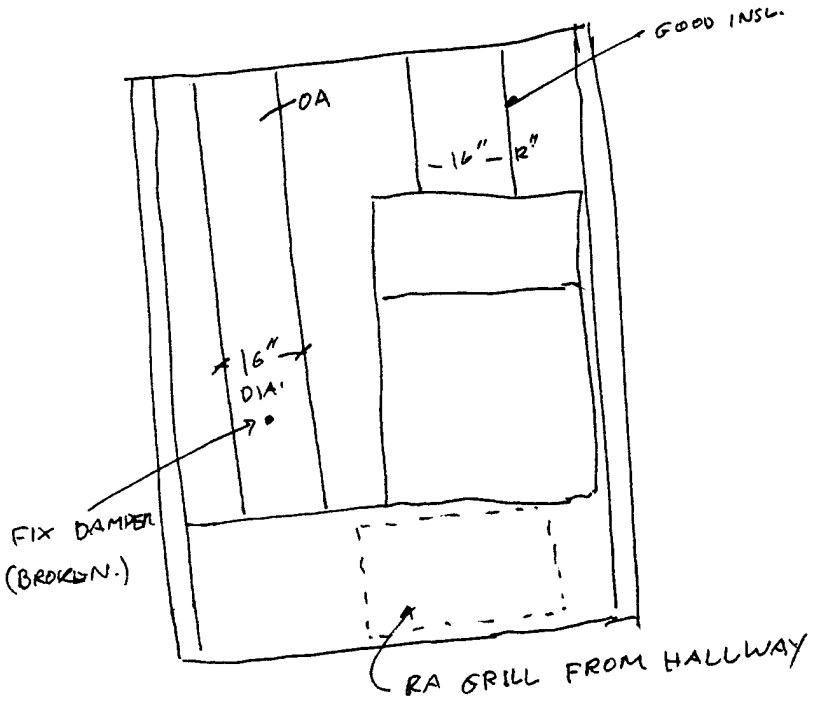
CALCULATED BY K— DATE 12-19-91

CHECKED BY _____ DATE _____

SCALE NTS

ECONOMIZER DATA:
Sketch AHU, Ductwork
Note Dampers, Actuators, Dimensions

AHU-2



Ft. McPherson/ Ft. Gillem Energy Study
EMC # 3105.000

DATE: 12-19-91
BY: KC

I. AIR HANDLING UNIT SURVEY OBSERVATIONS

BLDG NO: 358 BLDG NAME: DEH JOB: _____
AHU NO: 3 LOCATION: _____
ZONE NO. SERVED: _____ REF. SYS. SERVING AHU: _____
([ ] VERIFIED ZONE OCCUPANCY AND TEMP. REQUIREMENTS ON SURVEY FORM VI.)
UNIT TYPE: SINGLE ZONE [✓] MULTIZONE [ ] DOUBLE DT [ ] REHEAT [ ]
HEAT & VENT [ ] 2-PIPE FC [ ] 4-PIPE FC [ ] UNIT HT [ ]
OTHER [ ] _____
MFG: CARRIER MODEL: A0B5-008-540
SUPPLY FAN: FAN HP: 1 MFG: GE MODEL: 5K43M6804GX
CFM: SA _____ RA _____ OA _____ (MEASURED [ ] ESTIMATED [ ])
PRESENT DAILY STARTUP: M-F _____ TO _____, SAT _____ TO _____, SUN _____ TO _____
STARTUP METHOD: MANUAL [ ] TIMECLOCK [ ] (WORKING, YES [ ] NO [ ])
SEASONAL SWITCHOVER: SUM _____ TO _____, WIN _____ TO _____
REQUIRED DAILY STARTUP: M-F _____ TO _____, SAT _____ TO _____, SUN _____ TO _____

COILS:
PREHEAT: NONE [✓] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
HEATING: NONE [ ] STM [ ] HW [✓] ELEC [ ] MOD VLV [ ]
REHEAT: NONE [✓] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
HUMID: NONE [✓] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
COOLING: NONE [ ] CW [✓] DX [ ] SPRAY [ ] OTHER [ ]

REMARK: _____

DAMPERS:
OUTSIDE AIR: MAX %_____, MIN %_____, DAMPER MTR YES [ ] NO [ ]
RETURN AIR: MAX %_____, MIN %_____, DAMPER MTR YES [ ] NO [ ]
RELIEF AIR: MAX %_____, MIN %_____, DAMPER MTR YES [ ] NO [ ]
MIXED AIR CONTROL [ ], ECONOMIZER (DB [ ] OR ENTH [ ]) NONE [ ]

REMARKS: NO OA. DUCT

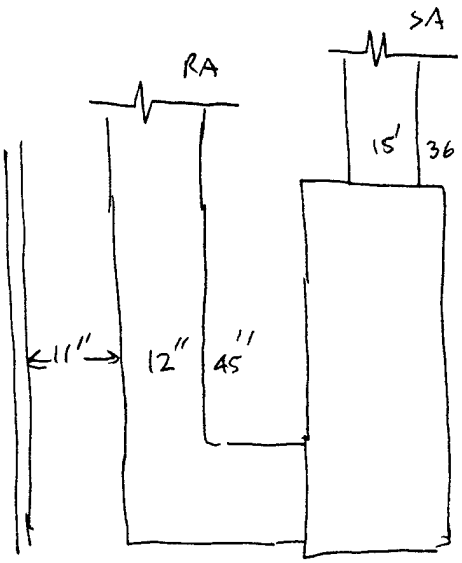
SUPPORT FANS: UNIT _____ RETURN FAN [ ] EXHAUST FAN [ ] OTHER [ ]
FAN HP: _____ MFG: _____ MODEL: _____
THERMOSTAT TYPE: SINGLE SETPOINT [ ] DUAL SETPOINT [ ] SETBACK [ ]
PNEUMATIC [ ] ELECTRIC/ELECTRONIC [ ] NO. OF ZONES _____
SETPOINT: OCC HEAT _____ °F UNOCC HEAT _____ °F OCC COOL _____ °F UNOCC COOL _____ °F
RESET CONTROLS: YES [ ] NO [ ], DECK SETPOINT HOT _____ °F COLD _____ °F
DEMAND LIMITING, DUTY CYCLING YES [ ] NO [ ]
REMARKS:

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB Ft. McPherson / Ft. Gillem Energy Study
SHEET NO. _____ OF _____
CALCULATED BY KC DATE 12-19-91
CHECKED BY _____ DATE _____
SCALE NTS

ECONOMIZER DATA:
Sketch AHU, Ductwork
Note Dampers, Actuators, Dimensions

AHU-3



6' CEILING

- COULD TAP TO SIDE OF RA DUCT & UP TO ROOF FOR OA

Ft. McPherson/ Ft. Gillem Energy Study
EMC # 3105.000

DATE: 12-19-91
BY: _____

I. AIR HANDLING UNIT SURVEY OBSERVATIONS

BLDG NO: 358 BLDG NAME: DEH JOB: _____
AHU NO: 4 LOCATION: _____
ZONE NO. SERVED: _____ REF. SYS. SERVING AHU: _____
([ ] VERIFIED ZONE OCCUPANCY AND TEMP. REQUIREMENTS ON SURVEY FORM VI.)
UNIT TYPE: SINGLE ZONE [✓] MULTIZONE [ ] DOUBLE DT [ ] REHEAT [ ]
HEAT & VENT [ ] 2-PIPE FC [ ] 4-PIPE FC [ ] UNIT HT [ ]
OTHER [ ] _____
MFG: _____ MODEL: _____
SUPPLY FAN: FAN HP: _____ MFG: _____ MODEL: _____
CFM: SA _____ RA _____ OA _____ (MEASURED [ ] ESTIMATED [ ])
PRESENT DAILY STARTUP: M-F _____ TO _____, SAT _____ TO _____, SUN _____ TO _____
STARTUP METHOD: MANUAL [ ] TIMECLOCK [ ] (WORKING, YES [ ] NO [ ])
SEASONAL SWITCHOVER: SUM _____ TO _____, WIN _____ TO _____
REQUIRED DAILY STARTUP: M-F _____ TO _____, SAT _____ TO _____, SUN _____ TO _____

COILS:
PREHEAT: NONE [✓] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
HEATING: NONE [ ] STM [ ] HW [✓] ELEC [ ] MOD VLV [ ]
REHEAT: NONE [✓] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
HUMID: NONE [✓] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
COOLING: NONE [ ] CW [✓] DX [ ] SPRAY [ ] OTHER [ ]

REMARK: _____

DAMPERS:
OUTSIDE AIR: MAX %_____, MIN %_____, DAMPER MTR YES [ ] NO [ ]
RETURN AIR: MAX %_____, MIN %_____, DAMPER MTR YES [ ] NO [ ]
RELIEF AIR: MAX %_____, MIN %_____, DAMPER MTR YES [ ] NO [ ]
MIXED AIR CONTROL [ ], ECONOMIZER (DB [ ] OR ENTH [ ]) NONE [ ]

REMARKS: _____

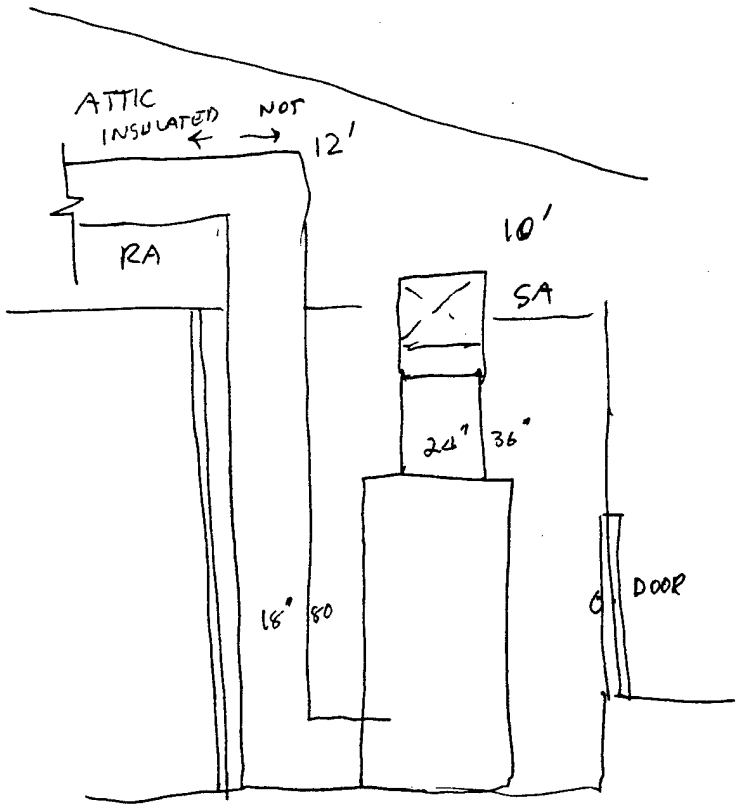
SUPPORT FANS: UNIT _____ RETURN FAN [ ] EXHAUST FAN [ ] OTHER [ ]
FAN HP: _____ MFG: _____ MODEL: _____
THERMOSTAT TYPE: SINGLE SETPOINT [ ] DUAL SETPOINT [ ] SETBACK [ ]
PNEUMATIC [ ] ELECTRIC/ELECTRONIC [ ] NO. OF ZONES _____
SETPOINT: OCC HEAT _____ °F UNOCC HEAT _____ °F OCC COOL _____ °F UNOCC COOL _____ °F
RESET CONTROLS: YES [ ] NO [ ], DECK SETPOINT HOT _____ °F COLD _____ °F
DEMAND LIMITING, DUTY CYCLING YES [ ] NO [ ]
REMARKS:

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB Ft. McPherson / Ft. Gillem Energy Study
SHEET NO. _____ OF _____
CALCULATED BY KC DATE 12-19-91
CHECKED BY _____ DATE _____
SCALE NTS

ECONOMIZER DATA:
Sketch AHU, Ductwork
Note Dampers, Actuators, Dimensions

AHU-4



Ft. McPherson/ Ft. Gillem Energy Study
EMC # 3105.000

DATE: 12-19-91
BY: KC

I. AIR HANDLING UNIT SURVEY OBSERVATIONS

BLDG NO: 358 BLDG NAME: DEIT JOB: 3105.000
AHU NO: 5 LOCATION: _____
ZONE NO. SERVED: _____ REF. SYS. SERVING AHU: _____
([ ] VERIFIED ZONE OCCUPANCY AND TEMP. REQUIREMENTS ON SURVEY FORM VI.)
UNIT TYPE: SINGLE ZONE [ ] MULTIZONE [ ] DOUBLE DT [ ] REHEAT [ ]
HEAT & VENT [ ] 2-PIPE FC [ ] 4-PIPE FC [ ] UNIT HT [ ]
OTHER [ ] _____
MFG: CARRIER MODEL: 58SS100-CC
SUPPLY FAN: FAN HP: 1/2 MFG: - MODEL: _____
CFM: SA _____ RA _____ OA _____ (MEASURED [ ] ESTIMATED [ ])
PRESENT DAILY STARTUP: M-F _____ TO _____, SAT _____ TO _____, SUN _____ TO _____
STARTUP METHOD: MANUAL [ ] TIMECLOCK [ ] (WORKING, YES [ ] NO [ ])
SEASONAL SWITCHOVER: SUM _____ TO _____, WIN _____ TO _____
REQUIRED DAILY STARTUP: M-F _____ TO _____, SAT _____ TO _____, SUN _____ TO _____

COILS:
PREHEAT: NONE [ ] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
HEATING: NONE [ ] STM [ ] HW [ ] ELEC [ ] ~~MOD VLV~~ [✓] FURANCE
REHEAT: NONE [ ] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
HUMID: NONE [ ] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
COOLING: NONE [ ] CW [ ] DX [✓] SPRAY [ ] OTHER [ ]

REMARK: SMALL HOME TYPE UNIT

DAMPERS:
OUTSIDE AIR: MAX % _____, MIN % _____, DAMPER MTR YES [ ] NO [ ]
RETURN AIR: MAX % _____, MIN % _____, DAMPER MTR YES [ ] NO [ ]
RELIEF AIR: MAX % _____, MIN % _____, DAMPER MTR YES [ ] NO [ ]
MIXED AIR CONTROL [ ], ECONOMIZER (DB [ ] OR ENTH [ ]) NONE [ ]

REMARKS: _____
SUPPORT FANS: UNIT _____ RETURN FAN [ ] EXHAUST FAN [ ] OTHER [ ]
FAN HP: _____ MFG: _____ MODEL: _____
THERMOSTAT TYPE: SINGLE SETPOINT [ ] DUAL SETPOINT [ ] SETBACK [ ]
PNEUMATIC [ ] ELECTRIC/ELECTRONIC [ ] NO. OF ZONES _____
SETPOINT: OCC HEAT _____ °F UNOCC HEAT _____ °F OCC COOL _____ °F UNOCC COOL _____ °F
RESET CONTROLS: YES [ ] NO [ ], DECK SETPOINT HOT _____ °F COLD _____ °F
DEMAND LIMITING, DUTY CYCLING YES [ ] NO [ ]
REMARKS:

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB Ft. McPherson / Ft. Gillem Energy Study

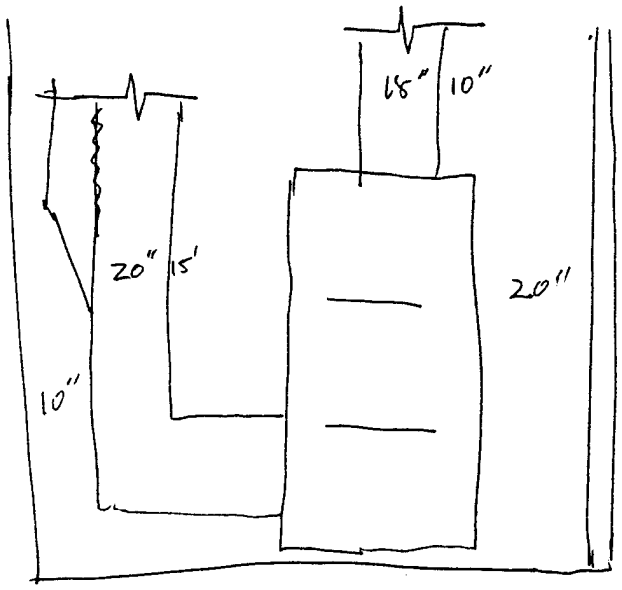
SHEET NO. _____ OF _____

CALCULATED BY KC DATE 12-19-91

CHECKED BY _____ DATE _____

SCALE NTS

ECONOMIZER DATA:
Sketch AHU, Ductwork
Note Dampers, Actuators, Dimensions



Ft. McPherson/ Ft. Gillem Energy Study
EMC # 3105.000

DATE: 12-19-91
BY: LEC

I. AIR HANDLING UNIT SURVEY OBSERVATIONS

BLDG NO: 358 BLDG NAME: DEH JOB: _____
AHU NO: 6 LOCATION: _____
ZONE NO. SERVED: _____ REF. SYS. SERVING AHU: _____
([ ] VERIFIED ZONE OCCUPANCY AND TEMP. REQUIREMENTS ON SURVEY FORM VI.)
UNIT TYPE: SINGLE ZONE [ ] MULTIZONE [ ] DOUBLE DT [ ] REHEAT [ ]
HEAT & VENT [ ] 2-PIPE FC [ ] 4-PIPE FC [ ] UNIT HT [ ]
OTHER [ ] _____
MFG: CARRIER (40RS-024-010) MODEL: _____
SUPPLY FAN: FAN HP: _____ MFG: _____ MODEL: _____
CFM: SA _____ RA _____ OA _____ (MEASURED [ ] ESTIMATED [ ])
PRESENT DAILY STARTUP: M-F _____ TO _____, SAT _____ TO _____, SUN _____ TO _____
STARTUP METHOD: MANUAL [ ] TIMECLOCK [ ] (WORKING, YES [ ] NO [ ])
SEASONAL SWITCHOVER: SUM _____ TO _____, WIN _____ TO _____
REQUIRED DAILY STARTUP: M-F _____ TO _____, SAT _____ TO _____, SUN _____ TO _____

COILS:
PREHEAT: NONE [✓] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
HEATING: NONE [ ] STM [ ] HW [✓] ELEC [ ] MOD VLV [ ]
REHEAT: NONE [✓] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
HUMID: NONE [✓] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
COOLING: NONE [ ] CW [✓] DX [ ] SPRAY [ ] OTHER [ ]

REMARK: _____

DAMPERS:
OUTSIDE AIR: MAX % _____, MIN % _____, DAMPER MTR YES [ ] NO [ ]
RETURN AIR: MAX % _____, MIN % _____, DAMPER MTR YES [ ] NO [ ]
RELIEF AIR: MAX % _____, MIN % _____, DAMPER MTR YES [ ] NO [ ]
MIXED AIR CONTROL [ ], ECONOMIZER (DB [ ] OR ENTH [ ]) NONE [ ]

REMARKS: _____

SUPPORT FANS: UNIT _____ RETURN FAN [ ] EXHAUST FAN [ ] OTHER [ ]
FAN HP: _____ MFG: _____ MODEL: _____
THERMOSTAT TYPE: SINGLE SETPOINT [ ] DUAL SETPOINT [ ] SETBACK [ ]
PNEUMATIC [ ] ELECTRIC/ELECTRONIC [ ] NO. OF ZONES _____
SETPOINT: OCC HEAT _____ °F UNOCC HEAT _____ °F OCC COOL _____ °F UNOCC COOL _____ °F
RESET CONTROLS: YES [ ] NO [ ], DECK SETPOINT HOT _____ °F COLD _____ °F
DEMAND LIMITING, DUTY CYCLING YES [ ] NO [ ]
REMARKS:

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB Ft. McPherson / Ft. Gillem Energy Study

SHEET NO. _____ OF _____

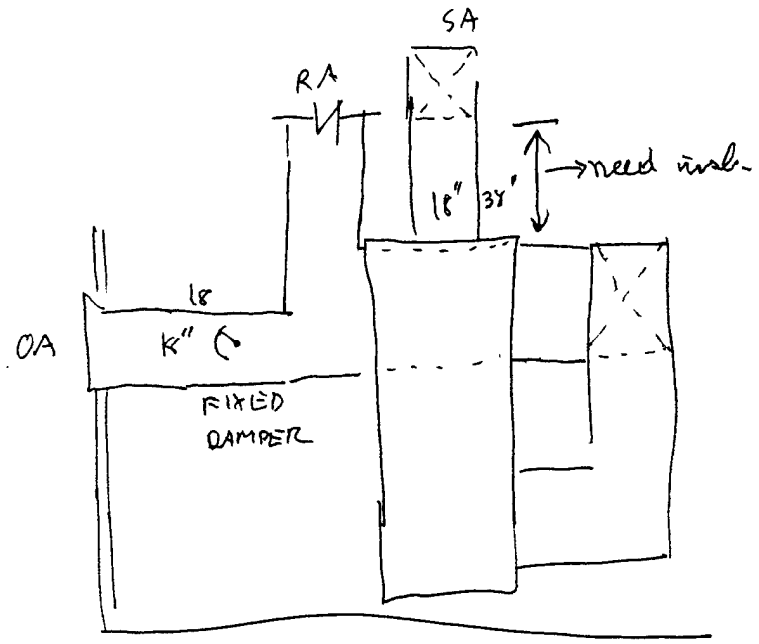
CALCULATED BY KC DATE 12-19-91

CHECKED BY _____ DATE _____

SCALE NTS

ECONOMIZER DATA:
Sketch AHU, Ductwork
Note Dampers, Actuators, Dimensions

AHU-6



JOB Ft. McPherson/Ft. Gillem Energy Study
PROJ.# EMC # 3105.000
SHEET NO. ____ OF ____
CALCULATED BY: JW
CHECKED BY: ____
DATE: 12/20/91

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 358 BLDG NAME: DEH JOB: 3105.000
PRIMARY FUNCTION: ____ GROSS SQ FT ____ NO OF FLRS ____
BUILDING MANAGER NAME: ____
PHONE: ____ OFFICE NO. ____
SPECIAL AREAS: COMPUTER FACILITY [ ] - ZONE NO'S. ____
AUDITORIUM [ ] - ZONE NO'S. ____
LABORATORIES [ ] - ZONE NO'S. ____
CAFETERIA [ ] - ZONE NO'S. ____
OTHER [ ] ____ - ZONE NO'S. ____

ZONE NO. ____ FUNCTION: ____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: ____ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F 0630 TO 1700, SAT ____ TO ____, SUN ____ TO ____
PRESENT TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F
REQUIRE TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F

REMARKS: ____

ZONE NO. ____ FUNCTION: ____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: ____ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F ____ TO ____, SAT ____ TO ____, SUN ____ TO ____
PRESENT TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F
REQUIRE TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F

REMARKS: ____

ZONE NO. ____ FUNCTION: ____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: ____ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F ____ TO ____, SAT ____ TO ____, SUN ____ TO ____
PRESENT TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F
REQUIRE TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F

REMARKS: ____

ZONE NO. ____ FUNCTION: ____ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: ____ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F ____ TO ____, SAT ____ TO ____, SUN ____ TO ____
PRESENT TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F
REQUIRE TEMP: WINTER OCC ____ °F UNOCC ____ °F, SUMMER OCC ____ °F UNOCC ____ °F

REMARKS: ____

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

BLDG 358

JOB
SHEET NO. OF
CALCULATED BY JW DATE 12/20/91
CHECKED BY DATE
SCALE

SPACE TEMPERATURES
OA TEMP AT 12:20pm = 52°F

MAIN LOBBY (EAST) = 67°F

SOUTH HALLWAY = 67.8°F

CENTER ENGINEERING ROOMS = 71.0°F

NORTH WEST CORNER = 71°F

BLUE PRINT ROOM (NORTH) = 74°F

NORTH EAST CORNER = 72.5°F

BUILDING 360

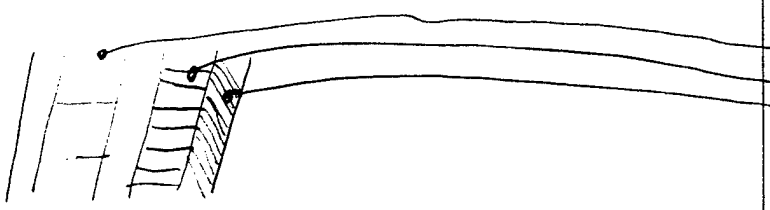
EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

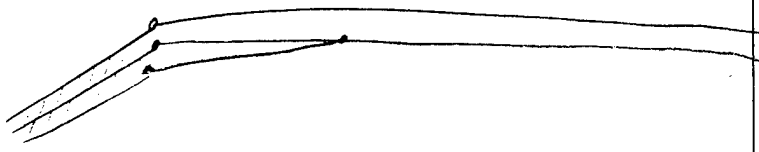
JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: JW
CHECKED BY:
DATE: 2/6/92

BLDG.# 360
ECO 1

WALL & ROOF INSULATION

AREAS IN SQ. FEET	NORTH	SOUTH	EAST	WEST
WALLS				
WINDOWS				
OVERHEAD DOORS				
PERSONNEL DOORS				

SKETCH WALL CROSS–SECTION	COMPONENTS	
	1. OUTSIDE AIR FILM	.17
	2. 8" CMU	1.24
	3. BRICK	1.24
	4. EXT. INSUL 3"	11
	5.	
	6.	
	7. INSIDE AIR FILM	.68
		14.33

SKETCH ROOF CROSS–SECTION	COMPONENTS	
	1. OUTSIDE AIR FILM	.17
	2. ROOF MEMBRANE	1.25
	3. (2) 1.5 RIGID INSUL	22
	4.	
	5.	
	6.	
	7. INSIDE AIR FILM	.68
		24.1

PERSONNEL DOOR TYPE _____	BASEMENT [ ]
OVERHEAD DOOR TYPE _____	SLAB [ ]
	CRAWL SPACE [ ]

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB	Ft. McPhereson/Ft. Gillem Energy Study
PROJ.#	EMC # 3105.000
SHEET NO.	OF
CALCULATED BY:	
CHECKED BY:	
DATE:	[illegible]

BLDG.# [illegible]

DOMESTIC HOT WATER

FAUCET LOCATION	WATER TEMPERATURE
[illegible]	165 °F
[illegible]	[illegible] °F
PROBLEMS:	

COMMENTS: [illegible] temp. reached [illegible] sink [illegible]

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPhereson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY:
CHECKED BY:
DATE:

BLDG.# 360

MOTORS

MOTOR #	FAN MOTOR	HP	7½	PH	3Ø	RPM	1725
MODEL #	CAT M3311T	VOLTS	208V	AMPS	23		
SERIAL #	F1189	PRESENT HR.		TO			
MFG	BALDOR	REQUIRED HR.		TO			
FRAME	213T	EFF.	85.5				
DESCRIPTION	AHU	COMMENTS	NEW MOTOR PF 0.75				

MOTOR #	HW PUMP FOR AHU.	HP	1/10	PH	1Ø	RPM	
MODEL #		VOLTS	115V	AMPS			
SERIAL #		PRESENT HR.		TO			
MFG		REQUIRED HR.		TO			
FRAME		EFF.					
DESCRIPTION	HW RECIR. PUMP	COMMENTS					

MOTOR #		HP		PH		RPM	
MODEL #		VOLTS		AMPS			
SERIAL #		PRESENT HR.		TO			
MFG		REQUIRED HR.		TO			
FRAME		EFF.					
DESCRIPTION		COMMENTS					

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: _____ OF _____
CALCULATED BY: CMD
CHECKED BY: _____
DATE: 12-10-91

BLDG.# 360
ECO 1

PIPE INSULATION

LOCATION	PIPE DIAMETER	PIPE LENGTH	FLUID TYPE	FLUID TEMP.	AIR TEMP.	INSULATION TYPE	INSULATION THICKNESS	INSULATION CONDITION
mech rm (ENTRANCE HALL)	2"	50'	HW			—	0	

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: CWP
CHECKED BY:
DATE: 12-10 91

BLDG.# 360
ECO 1

DUCT INSULATION

LOCATION	DUCT CROSSECTION	SHAPE	DUCT TEMP. (°F)	SURROUND AIR TEMP. (°F)	INSULATION TYPE	INSULATION THICKNESS	INSULATION CONDITION

COMMENTS: Ducts NOT ACCESSIBLE

Ft. Story EMCS Feasibility Study
EMC# 3104.000

DATE: 12-10-91
BY: KC

II. PERIMETER RADIATION SURVEY OBSERVATIONS

BLDG NO: 360 BLDG NAME: COMMISARY JOB: 3105.000

PER. RAD. NO. 1, 2, 3, 4 LOCATION : LOADING DOCK

AREA SERVED _____

PERIMETER RADIATION TYPE: STEAM [ ] HOT WATER [ ] ELECTRIC [ ]
OTHER [√] GAS FURNACE

SOURCE OF HEATING MEDIUM: _____

ZONE HW PUMPS: NO. OF PUMPS _____ PUMP 1 HP _____ ZONE NO. _____
PUMP 2 HP _____ ZONE NO. _____
PUMP 3 HP _____ ZONE NO. _____
PUMP 4 HP _____ ZONE NO. _____

PRESENT DAILY STARTUP: M-F _____ TO _____, SAT _____ TO _____, SUN _____ TO _____

STARTUP METHOD: MANUAL [ ] TIMECLOCK [ ] (WORKING YES [ ] NO [ ])

SEASONAL SWITCHOVER: SUM _____ TO _____, WIN _____ TO _____

REQUIRED DAILY STARTUP: M-F _____ TO _____, SAT _____ TO _____, SUN _____ TO _____

T-S 3:00 AM - 7:00 PM
M 8:00AM - 5:00 PM.

TEMPERATURE CONTROL MFG. AND TYPE: ROOM THERMOSTAT [✓] ZONE THERMOSTAT [ ]
OUTSIDE AIR RESET [ ] SET POINT _____ °F
2-WAY VALVE [ ] 3-WAY VALVE [ ]
ZONE PUMP CONTROL [ ]
OTHER [ ]

REMARKS:

T'STAT SETAT 60°F WITH SWITCH OFF
FAN MOTOR WESTING HOUSE SER EA85 TYPE FH
3/4 HP RPM 1725 115V 1Ø 11A
CAT # 15001 (GOOD CONDITION)

ITT GRINNELL MODEL# BLO-250 SERIAL # C8546028
INPUT 250,000 BTUH OUTPUT 192,500 BTUH NAT GAS
THERMAL EFF 77% POWERCONSUMPTION 650W
FOR OPERATION AT TEMP. RISE FROM 50 TO 80°F
ELEC RATING 115V 1Ø 13.8A.

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB 3105.000

SHEET NO. _____ OF _____

CALCULATED BY KC DATE 12-10-91

CHECKED BY _____ DATE _____

SCALE _____

BLDG. 360

- SHOULD INSULATE HW PIPE
- AHU SINGLE ZONE HW & DX COILS
- HW BOILER GAS FIRE BURNHAM

HW PUMP SMALL

			COMPRESSOR				FANS	
	COMPRESSORS	MODEL						
11	WITT	WS075HZ	208V	30.2 A	3 PH	60 Hz	2 ea	208V, 3A, 3 PH, ½ HP
12	G & W Bohn Heat Transfer	RCD-21S	208	80 A	3 PH	60 Hz	2 ea	" 4.6A, 3 PH, 1 HP

A
B
C
D
E
} Room locked, looks identical to cond. unit 3

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB 3105
SHEET NO. ____ OF ____
CALCULATED BY CE DATE 12/10/91
CHECKED BY ____ DATE ____
SCALE ____

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB 3105

SHEET NO. ______ OF ______

CALCULATED BY ORL DATE 12/10/0

CHECKED BY ______ DATE ______

SCALE ______

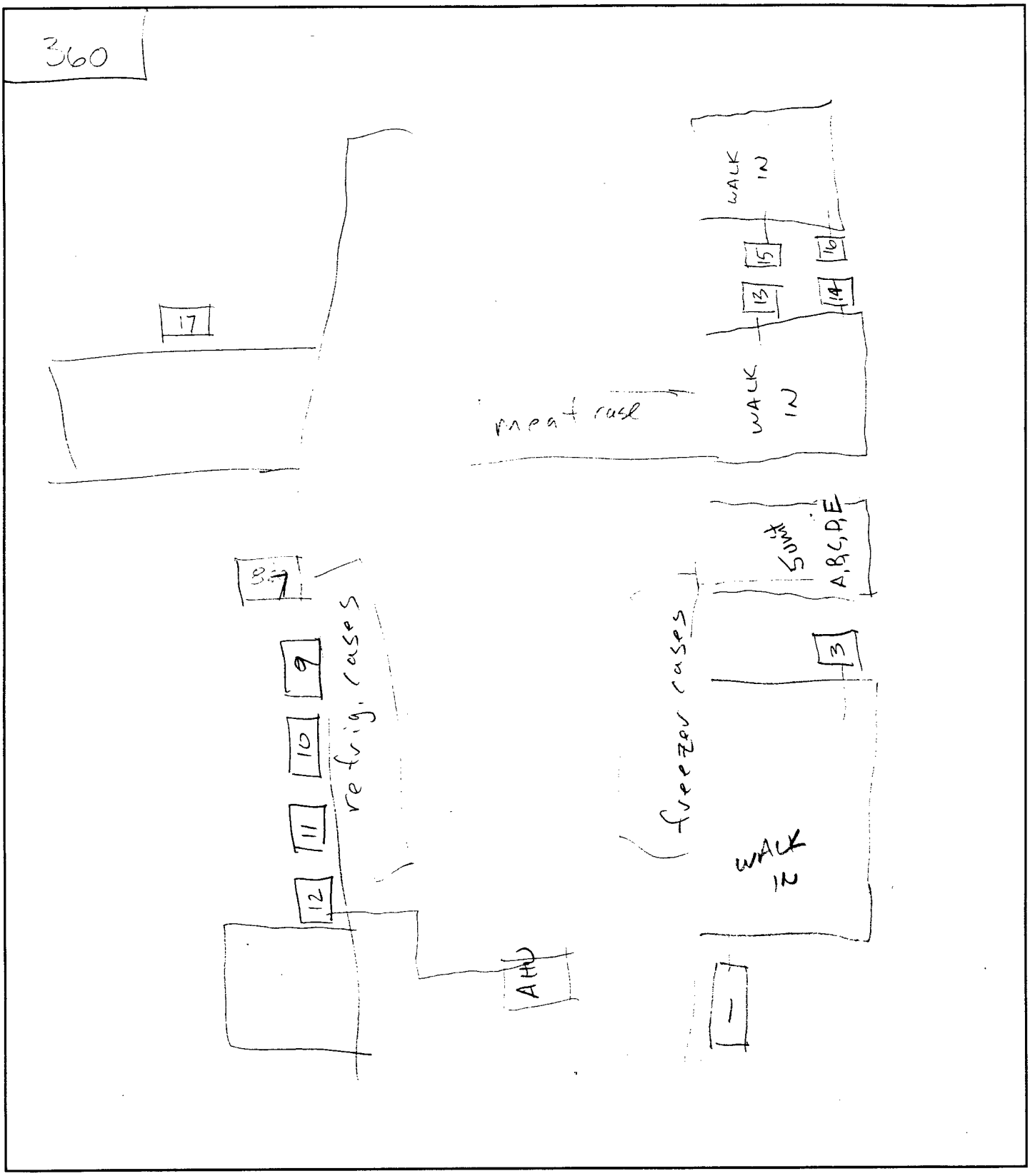
360

COOLERS

	MANUF.	MODEL	COMPRESSOR	FANS	
1.	COPELAND	H7DB-1000-TFC-001	208 V, 42A, 3 PH, 60HZ	2 ea, 208 V, 4.1A, 1/2 HP	ON
3.	"	9RS3-0765-TFC	208V, 29.4A, 3PH, 60	2 ea, ~~208~~ 208V, 1.7A 1/4 HP	OFF CYCLING
~~14~~	HUSSMAN	H760FSK2110663 SER NO. 6507150	208V, 29.4A, 3PH, 60	2 ea, 208, 1.7A, 1/5 HP	
13	GW Bohn Heat Transfer Division	B8H2HB SER NO. B9364 [illegible]	208V, 31.[illegible]A, [illegible], 60	[illegible] ea, [illegible]V, [illegible]A TOTAL, 1/[illegible] HP [illegible] 1 PH	
15	WARREN	5AHU 7550L	220V, 22 A, 3 PH, 60 HZ	1 ea, 220V, 2.3A, 33 HP	
14		B3H2HC	208V, 12.7 A, 3 PH, 60 Hz	2 ea, 208V, 4.0A, 1 PH, 1/7 HP ea	
17	COPELAND	9RS3-0765-TFC	208, 29.4A, 3PH, 60 HZ	1 ea 208, 4.1A, 1/2 HP	
8	KYSOR	5AHU-~~70~~-FC	230V, 5.4A, 1 PH,	1 PH	
7	"	5AHU-150-FC	208V, 5.0A 3PH	1 ea 208V, [illegible]A, [illegible] HP	
				1 ea 208V, [illegible]A, 1/4 HP	
9	NO NAMEPLATE				
16	WITT	WS050HZ	208V, 19.2A, 3PH	1 ea 208V, 3 A 1/2 HP	

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB 3105
SHEET NO. _____ OF _____
CALCULATED BY _____ DATE 12/10/91
CHECKED BY _____ DATE _____
SCALE _____



E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____

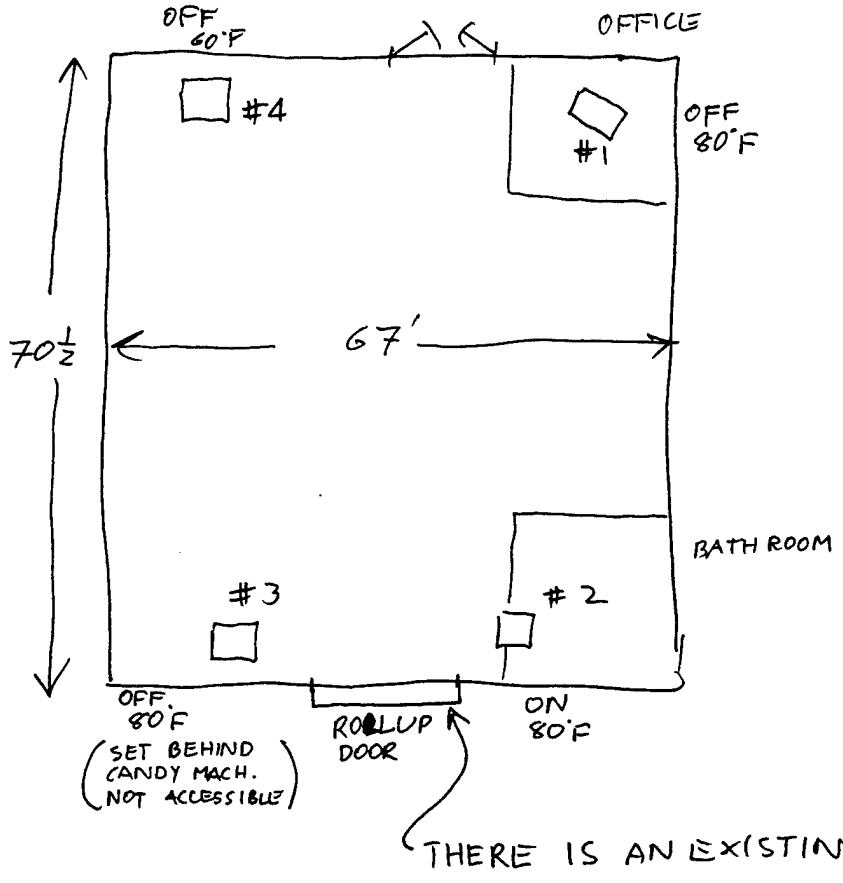
SHEET NO. _____ OF _____

CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____

SCALE _____

LOADING DOCK



22½' CEILING HIGHT

THERE IS AN EXISTING AIR CIRTAIN.

COMMISSARY HR.

SUN, MON	CLOSED
TUE-FRI	1000-1800
SAT	0930-1730

BUILDING 363

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY:
CHECKED BY:
DATE:

BLDG.# 363
ECO 4

DOMESTIC HOT WATER

FAUCET LOCATION	WATER TEMPERATURE
Bath Room 17 D 2	101
Janitor Cl. 14 F 1	122
Janitor C 11 F 1	124.8
BR 8 F 2	128
BR 1 C 2	111
BR 2.4 G 1	134

PROBLEMS:	

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY:
CHECKED BY:
DATE:

BLDG.# 363
ECO 5

10+ HP MOTORS

MEASURED

MOTOR# HWP-1
DESCRIPTION Hot Water Supply
MFG US Electrical Motor
MODEL # N03N03105 4E
SERIAL #
FRAME 215 JM
HP 10 RPM 3500
VOLT 230/460
AMPS 24.4/12.2
EFF. 88.5

	PHASE A	PHASE B	PHASE C
VOLTS	477	475	
AMPS	7.5	8.7	
KW	6.2		
KVAR	3.00		
KVA	7.2		
PF	85.2		

% MOTOR SPEED ____ %
PRESENT ____ TO
REQ HR. ____ TO

COMMENTS

MOTOR#
DESCRIPTION Standby Condenser Pump
MFG Baldor
MODEL # JMM2515T
SERIAL #
FRAME 256 JM
HP 20 RPM 1760
VOLT 230/460
AMPS 50/25
EFF. 86

	PHASE A	PHASE B	PHASE C
VOLTS			
AMPS			
KW			
KVAR			
KVA			
PF			

% MOTOR SPEED ____ %
PRESENT ____ TO
REQ HR. ____ TO

COMMENTS

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY:
CHECKED BY:
DATE:

BLDG.# 363
ECO 5

10+ HP MOTORS

MEASURED

MOTOR#

		PHASE A	PHASE B	PHASE C
DESCRIPTION	Standby Chill Water (2)	VOLTS			
MFG	Baldor	AMPS			
MODEL #	JMM 35131	KW			
SERIAL #		KVAR			
FRAME	215 JM	KVA			
HP	10 RPM 1725	PF			
VOLT	208-230/460	% MOTOR SPEED		%	
AMPS	30-28/14	PRESENT		TO	
EFF.	85	REQ HR.		TO	

COMMENTS

MOTOR# 5A

		PHASE A	PHASE B	PHASE C
DESCRIPTION	AHU-5A Rm 13F2	VOLTS			
MFG	Carrier (Baldor	AMPS			
MODEL #	39EW08 | M3211T	KW			
SERIAL #		KVAR			
FRAME	182T	KVA			
HP	3 RPM 1725	PF	75 - nameplate		
VOLT	208-230/460	% MOTOR SPEED		%	
AMPS	9.8-8.6/4.3	PRESENT		TO	
EFF.	82	REQ HR.		TO	

COMMENTS

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY:
CHECKED BY:
DATE:

BLDG.# 363
ECO 5

MOTORS

MOTOR # 1 HP 10 PH 3 RPM 1750
MODEL # ~~Century~~ 6-357722-01 VOLTS 460 AMPS ~~12.5~~ 12.5
SERIAL # PRESENT HR. TO
MFG Century REQUIRED HR. TO
FRAME S215T EFF. 85.6
DESCRIPTION AHU #1 COMMENTS 477 12.3 8kW 5.8kVAR 477 11.6 7.0kVA 87.9%PF

MOTOR # 2 HP PH RPM
MODEL # OTHER VOLTS AMPS
SERIAL # FORM PRESENT HR. TO
MFG REQUIRED HR. TO
FRAME EFF.
DESCRIPTION AHU #2 COMMENTS

MOTOR # 3 HP 5 PH 60 RPM 1740
MODEL # Unreadable VOLTS AMPS
SERIAL # Cat No H124 PRESENT HR. TO
MFG Marathon REQUIRED HR. TO
FRAME 184T EFF. 81
DESCRIPTION AHU #3 COMMENTS

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY:
CHECKED BY:
DATE:

BLDG.# 363
ECO 5

10+ HP MOTORS

MEASURED

MOTOR#

DESCRIPTION Condenser Pump
MFG Southeast Pump & Equip Co
MODEL # UVH 254TTDR5044AA L
SERIAL #
FRAME 254JM
HP 15 RPM 1460
VOLT 230/460
AMPS 39/19.5
EFF. 88.5

	PHASE A	PHASE B	PHASE C
VOLTS	475 ~~480~~	477 ~~483~~	
AMPS	9.9	13.4	
KW	7.9		
KVAR	6.2		
KVA	10		
PF	78.89		

% MOTOR SPEED ____ %
PRESENT ____ TO
REQ HR. ____ TO

COMMENTS

MOTOR#

DESCRIPTION Chill Water Return Pump
MFG US Electrical Motors
MODEL # 65-0956-116 K 210656
SERIAL #
FRAME 215JM
HP 15 RPM 3400
VOLT 230/460
AMPS 36.6/18.7
EFF. 85.5

	PHASE A	PHASE B	PHASE C
VOLTS	482	481	
AMPS	12.8	10	
KW	~~8.8~~ 9.3		
KVAR	~~6~~ 4		
KVA	10.1		
PF	91.0		

% MOTOR SPEED ____ %
PRESENT ____ TO
REQ HR. ____ TO

COMMENTS

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY:
CHECKED BY:
DATE:

BLDG.# 363
ECO 5

MOTORS

MOTOR # 16 HP 1/8 PH 1 RPM
MODEL # VOLTS 115 AMPS
SERIAL # PRESENT HR. TO
MFG REQUIRED HR. TO
FRAME EFF.
DESCRIPTION EF-1 COMMENTS

MOTOR # HP PH RPM
MODEL # VOLTS AMPS
SERIAL # PRESENT HR. TO
MFG REQUIRED HR. TO
FRAME EFF.
DESCRIPTION COMMENTS

MOTOR # HP PH RPM
MODEL # VOLTS AMPS
SERIAL # PRESENT HR. TO
MFG REQUIRED HR. TO
FRAME EFF.
DESCRIPTION COMMENTS

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: ____ OF ____
CALCULATED BY: JW
CHECKED BY: ____
DATE: ____

BLDG.# 363
ECO 5

MOTORS

MOTOR # ____ HP 7.5 PH ____ RPM 1750
CAT
~~MODEL~~ # H12B VOLTS 230/460 AMPS 23/10.8
MODEL XOVAZ13TTOR702 6GPL
SERIAL # ____ PRESENT HR. ____ TO ____
MFG MARATHON REQUIRED HR. ____ TO ____
FRAME ____ EFF. ____
DESCRIPTION AHU#2 COMMENTS NEW

MOTOR # ____ HP ____ PH ____ RPM ____
MODEL # ____ VOLTS ____ AMPS ____
SERIAL # ____ PRESENT HR. ____ TO ____
MFG ____ REQUIRED HR. ____ TO ____
FRAME ____ EFF. ____
DESCRIPTION ____ COMMENTS ____

MOTOR # ____ HP ____ PH ____ RPM ____
MODEL # ____ VOLTS ____ AMPS ____
SERIAL # ____ PRESENT HR. ____ TO ____
MFG ____ REQUIRED HR. ____ TO ____
FRAME ____ EFF. ____
DESCRIPTION ____ COMMENTS ____

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY:
CHECKED BY:
DATE:

BLDG.# 363
ECO 5

MOTORS

MOTOR # 13 HP PH RPM
MODEL # VOLTS AMPS
SERIAL # PRESENT HR. TO
MFG REQUIRED HR. TO
FRAME EFF.
DESCRIPTION CP-1 COMMENTS

MOTOR # 14 HP PH RPM
MODEL # VOLTS AMPS
SERIAL # PRESENT HR. TO
MFG REQUIRED HR. TO
FRAME EFF.
DESCRIPTION CWP-1 COMMENTS

MOTOR # 15 HP PH RPM
MODEL # VOLTS AMPS
SERIAL # PRESENT HR. TO
MFG REQUIRED HR. TO
FRAME EFF.
DESCRIPTION HWP-1 COMMENTS

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY:
CHECKED BY:
DATE:

BLDG.# 363
ECO 5

MOTORS

MOTOR # 10 HP 20 PH 3 RPM 1755
MODEL # MARATHON XB256TVR7329FNW VOLTS 200 AMPS 59
SERIAL # PRESENT HR. TO
MFG MARATHON REQUIRED HR. TO
FRAME 256T EFF. 87.5 84% PF
DESCRIPTION AHU 10 COMMENTS
J 200 203
4 30 30
KW 5.5
KVAR 8.9
KW 10.7
PF 52%

MOTOR # 11 HP PH RPM
MODEL # VOLTS AMPS
SERIAL # PRESENT HR. TO
MFG REQUIRED HR. TO
FRAME EFF.
DESCRIPTION AHU 11 COMMENTS Inaccessible (above high ceiling

MOTOR # 12 HP 3 PH 3 RPM 1730
MODEL # WVC182TTOR7627AD VOLTS 200 AMPS 10.4
SERIAL # PRESENT HR. TO
MFG Marathon REQUIRED HR. TO
FRAME 182T EFF. 81.5 77.7 PF
DESCRIPTION AHU 12 COMMENTS

AHU - 13 above ceiling 2nd floor

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY:
CHECKED BY:
DATE:

BLDG.# 363
ECO 5

MOTORS

MOTOR # 7 HP 7.5 PH 60 RPM 1750
MODEL # H-125 VOLTS 208-230/460 AMPS 24-21.6/10.8
SERIAL # PRESENT HR. TO
MFG Marathon REQUIRED HR. TO
FRAME 213T EFF. 84 PF 76.6
DESCRIPTION AHU 7 COMMENTS

MOTOR # 8 HP 7.5 PH 60 RPM 1750
MODEL # H-125 VOLTS 208-230/460 AMPS 24-21.6/10.8
SERIAL # PRESENT HR. TO
MFG Marathon REQUIRED HR. TO
FRAME 213T EFF. 84 76.6
DESCRIPTION AHU 8 COMMENTS

MOTOR # 9 HP 15 PH 3 RPM 1745
MODEL # VOLTS 230/460 AMPS 39/19.5
SERIAL # PRESENT HR. TO
MFG MARATHON REQUIRED HR. TO
FRAME 254 EFF. 88.5 ~~88.1~~ 87.6 PF
DESCRIPTION AHU 9 COMMENTS 81.7% PF
V.lt 465 463

Amp 9.9 8.8
Kw 3.6
6.6
7.6
45%

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY:
CHECKED BY:
DATE:

BLDG.# 363
ECO 5

MOTORS

MOTOR # 4 HP 5 PH 3 RPM 1740
CAT
~~MODEL~~ # H124 VOLTS 208-230/460 AMPS 13.8-13.2/6.6
SERIAL # PRESENT HR. TO
MFG Marathon REQUIRED HR. TO
FRAME 184T EFF. 85.5 81 PF
DESCRIPTION AHU 4 COMMENTS

MOTOR # 5 HP 3 PH 3 RPM 1730
MODEL # ~~Marathon~~ VOLTS 208-230/460 AMPS 9.4-9/4.5
Model
~~SERIAL #~~ XVA182TTDR7026WG PRESENT HR. TO
MFG Marathon REQUIRED HR. TO
FRAME 182T EFF. 81.5
DESCRIPTION AHU 5 COMMENTS Economizer

MOTOR # 6 HP 5 PH 3 RPM 1740
Cat
~~MODEL~~ # H124 VOLTS 208-230/460 AMPS 13.8-13.2/6.6
SERIAL # PRESENT HR. TO
MFG Marathon REQUIRED HR. TO
FRAME 184T EFF. 85.5
DESCRIPTION AHU 6 COMMENTS

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB Ft. McPherson/Ft. Gillem Energy Study
PROJ.# EMC # 3105.000
SHEET NO. _____ OF _____
CALCULATED BY: _____
CHECKED BY: _____
DATE: _____

BLDG.# 363
EC0 15

LIGHTING

ROOM #	# OF FIXTURES	LAMPS/ FIXTURE	WATTS/ BULB	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCC. SENSOR	NO. OF SWITCHES	UNOCC LIGHTS ON
1	10	2 8'		F	ON	Y	N	1	Y
	6	1		MH	ON	Y	N	1	Y
2	2	4	34	F	ON	Y	Y	1	Y
3	2	4	34	F	ON	Y	Y	1	Y
4	9	2 8'	?	F	6 ON	Y	N	1	Y
5	2	2 8'		F	ON	Y	N	1	Y
6	6	4	34	F	ON	Y	Y	1	Y
7	7	2 8'		F	4 ON	Y	N	1	Y
8	5	2 8'		F	ON	Y	N	1	N
9	17	2 8'		F	ON	Y	N	1	Y
	2	1		MH	ON	Y	N	1	Y
10	8	2 8'		F	ON	Y	N	1	N
11	19								
12	5	2 8'		F	ON	Y	N	1	Y
	6	1	200	I	ON	Y	N	1	Y
A	4	1	54	I	OFF	N	N	1	N
C	1	2 8'		F	OFF	Y	N	1	N
B	1	1	54	I	OFF	Y	N	1	N

OF EXIT SIGNS – _____

COMMENTS: _____

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB Ft. McPherson/Ft. Gillem Energy Study
PROJ.# EMC # 3105.000
SHEET NO. _____ OF _____
CALCULATED BY: _____
CHECKED BY: _____
DATE: _____

BLDG.# 365
EC0 15

LIGHTING

ROOM #	# OF FIXTURES	LAMPS/ FIXTURE	WATTS/ BULB	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCC. SENSOR	NO. OF SWITCHES	UNOCC LIGHTS ON
22	2	4	34	F	OFF	Y	Y	1	N
23	2	"	"	"	ON	Y	Y	1	Y
24	10	"	"	"	OFF	Y	Y	2	N
25	4	"	"	"	OFF	Y	Y	1	N
26	2	"	"	"	OFF	Y	Y	1	N
27	"	"	"	"	"	"	"	"	"
28	DITTO								
29	1	"	"	"	"	"	"	"	"
30	1	"	"	"	"	"	N	1	N
	1	2'	?	F	OFF	Y	N	1	N
31	29	2 8'		F	OFF	Y	N	1	N
	4	1		MH	OFF	Y	N	1	N
32	2	4	34	F	OFF	Y	N	1	N
33	3	2 8'		F	ON	Y	N	1	Y
34	13	2 8'		F	OFF	Y	N	1	N
36	1	2 8'		F	ON	Y	N	1	Y
	3		100	I	OFF	Y	N	1	N
35	30	2 8'		F	ON	Y	N	1	Y

OF EXIT SIGNS – _____

COMMENTS: _____

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB Ft. McPherson/Ft. Gillem Energy Study
PROJ.# EMC # 3105.000
SHEET NO. _____ OF _____
CALCULATED BY: _____
CHECKED BY: _____
DATE: _____

BLDG.# 367
EC0 15

LIGHTING

ROOM #	# OF FIXTURES	LAMPS/ FIXTURE	WATTS/ BULB	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCC. SENSOR	NO. OF SWITCHES	UNOCC LIGHTS ON
37	6	4	34	F	ON	Y	Y	1	Y
	2	2	40	F	ON	Y	Y	1	Y
38	4	2	34	F	ON	Y	N	1	Y
39	2	2	40	F	ON	Y	Y	1	Y
[illegible]	2	4	34	"	"	"	"	1	"
40	3	11	"	"	"	"	"	1	"

OF EXIT SIGNS – _____

COMMENTS: _____

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: ____ OF ____
CALCULATED BY:
CHECKED BY:
DATE:

BLDG.# 363
EC0 15

LIGHTING

ROOM #	# OF FIXTURES	LAMPS/ FIXTURE	WATTS/ BULB	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCC. SENSOR	NO. OF SWITCHES	UNOCC LIGHTS ON
D	1	1	54	T	OFF	Y	N	1	N
E	3	4	34	F	ON	Y	N	1	Y
	1	1	300	I	OFF	Y	N	1	Y
F	2	2	34	F	ON	Y	Y	1	Y
	4	2		F	ON	Y	Y	1	Y
13	3	1		MH	ON	Y	N	1	Y
14	5	2		F	ON	Y	N	1	Y
	10	1	150	I	OFF	Y	N	1	N
15	3	1	150	I	OFF	Y	N	1	N
16	3	1		MH	OFF	Y	N	1	N
	16	2		F	OFF	Y	N	1	N
17	6	2		F	OFF	Y	N	1	N
18	3	2		F	OFF	Y	N	1	N
	9	1	100	I	OFF	Y	N	1	N
	11	1		MH	ON	Y	N	1	Y
19	4	4	34	F	OFF	Y	Y	1	N
20	"	"	"	"	ON	Y	Y	1	Y
21	"	"	"	"	ON	Y	N	1	Y

OF EXIT SIGNS – ____

COMMENTS: ____

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO. ____ OF ____
CALCULATED BY: JW
CHECKED BY: ____
DATE: 1/23/92

BLDG.# 363
ECO 15

LIGHTING

ROOM #	# OF FIXTURES	LAMPS/ FIXTURE	WATTS/ BULB	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCC. SENSOR	NO. OF SWITCHES	UNOCC LIGHTS ON
21D2	2	4	34	F	ON	Y	Y	1	Y
21E1	4	↓	34	F	ON	Y	N	1	Y
21E3	4	↓					N	1	N
21F1	3	↓					Y		N
21F3	2	↓					Y	1	N
21F4	2	↓				N	Y	0	Y
21G3	6	↓			ON	Y	Y	2	N
21G1A	1	↓			ON	Y	N	1	Y
21G1B	↓								
21C1	2	↓			OFF	Y	N	2	N
23A1 ~~23A1~~	3	↓	34	F	~~ON~~ OFF	Y	Y	1	N
23D1	39	↓			OFF	Y	N	05	N
24G2 ~~24G2~~	6	4	34	F	OFF	Y	N	2	N
24G1	2	4	↓					1	N
23G3	↓							1	N
23G1	4	4	34	F	ON	Y	Y	1	N
WEIGHT ROOM	8	4	34	F	ON	Y	Y	2	Y
Locker	3	~~42~~		U	ON	Y	Y	1	Y

OF EXIT SIGNS – 3 1 4 34 F ON Y Y 1 Y

COMMENTS: 2 2 F ON Y Y 1 Y

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: JW
CHECKED BY:
DATE: 1/23/92

BLDG.# 363
ECO 15

LIGHTING

ROOM #	# OF FIXTURES	LAMPS/ FIXTURE	WATTS/ BULB	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCC. SENSOR	NO. OF SWITCHES	UNOCC LIGHTS ON
4A1	5	4	34	F	ON	N	N		Y
4D1	2	4	34	F	ON	N	Y	0	Y
1E1	42	2	96	F	ON		N		N
3E1	7	2	96	F	ON	Y	N	1	Y
1D1	29	2	96	F	ON	Y	N	1	N
1C2	2	4	34	F	ON	Y	N	1	Y
3C1	16	4	34	F	ON	Y	N	1	N
3B1	4	2	96	F	ON	Y	N	1	Y
1A3	6	4	34	F	ON	Y	N	1	N
3A1	6	4	34	F	ON	Y	N	1	N
1A4	2	4	34	F	ON	Y	Y	1	N
1A5	↓	↓							
1A1	6	↓							
2A1	1	4	34	F	ON	Y	N	1	Y
2IE2	2/3	4/1	34/50	F/I	ON	Y	N	2	N
2ID3	1	2	96	F	ON	Y	N	1	N
2ID4	4	4	34	F	ON	Y	N	1	N
2ID1	↓								

OF EXIT SIGNS – 111

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO. ____ OF ____
CALCULATED BY: J W
CHECKED BY: ____
DATE: 1/23/92

BLDG.# 363
ECO 15

LIGHTING

ROOM #	# OF FIXTURES	LAMPS/ FIXTURE	WATTS/ BULB	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCC. SENSOR	NO. OF SWITCHES	UNOCC LIGHTS ON
11F2	2	4	34	F	ON	Y	N	1	N
9IB	2	4	34	F	ON	Y	N	1	N
8F2	2	4	34	F	ON	Y	N	2	N
9F1	↓								
73	9	4	34	F	ON	Y	N	1	N
Gen office 7F2	6	4	34	F	ON	Y	N	1	Y
7D3	5	4	34	F	ON	Y	N	1	N
7E1	2	4	34	F	ON	Y	N	1	N
7D2	1	2	96	F	OFF	Y	N	1	N
6D1	3	4	34	F	ON	Y	N	1	N
6F1	2	4	34	F	ON	Y	Y	1	Y
6E1	68	4	34	F	ON		N		N
6A1	4	4	34	F	ON	Y	Y	1	Y
6A2	↓								
7A1	↓								
7A2	10	4	34	F	ON		N		N
NEW 4C1A	6	4	34	F	ON	N	Y		Y
4A1A	1	4	34	F	ON	N	Y		Y

OF EXIT SIGNS – 1

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: JW
CHECKED BY:
DATE: 1/23/92

BLDG.# 363
EC0 15

LIGHTING

ROOM #	# OF FIXTURES	LAMPS/ FIXTURE	WATTS/ BULB	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCC. SENSOR	NO. OF SWITCHES	UNOCC LIGHTS ON
12C1	4	4	34	F	ON	N	N		N
12B1	2	4	34	F	ON	Y	N	1	N
11D1	5	4	34	F	ON		N		N
11A1	2	4	34	F	ON		N		N
10B1	40	4	34	F	ON		N		N
10A1	4	4	34	F	OFF	Y	Y	1	N
9B1	4	4	34	F	ON	Y	Y	1	Y
9A5	4	4	34	F	OFF	Y	Y	1	N
9A6	3/1	2/4	34/34	F	OFF	Y	Y	1	N
9C1	1	1	75	I	OFF	Y	N	1	N
8D1	8	4	34	F	ON		N		N
10E1	26	4	34	F	ON		N		N
9E2	1	1	75	I	OFF	Y	N	1	N
9F2	4	4	34	F	ON	Y	Y	1	Y
903	4	2	34	F	ON	Y	Y	1	Y
10F1	2	4	34	F	ON	Y	Y	1	N
10F2	2	4	34	F	ON	Y	Y	1	Y
11F1	1	2	34	F	ON	Y	Y	1	Y

OF EXIT SIGNS – 111

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: JW
CHECKED BY:
DATE: 1/23/92

BLDG.# 363
EC0 15

LIGHTING

ROOM #	# OF FIXTURES	LAMPS/ FIXTURE	WATTS/ BULB	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCC. SENSOR	NO. OF SWITCHES	UNOCC LIGHTS ON
14E2	4	4	34	F	ON	Y	N	1	N
15E1	15	4	34	F	ON	Y	N	0	N
15F2	8	4	34	F	ON	Y	N	1	N
14F2	2	4	34	F	ON	Y	N	1	N
15F1	2	4	34	F	ON	Y	N	1	N
14F1	2	4	34	F	ON	Y	Y	1	Y
13F1	13	4	34	F	ON	Y	N	2	N
13F2	1	1	75	I	OFF	Y	N	1	N
12F3	4	4		F	OFF	Y	Y	1	N
12F4	4	4		F	ON	Y	Y	1	N
12F1	1	4	34	F	OFF	Y	N	1	N
12D1	12	4		F	ON	Y	N		N
14C1									
12C2A	11	4	34	F	ON	Y	N	1	N
13C1	4	4	34	F	OFF	Y	Y	1	N
13B1	16	4	34	F	ON	Y	N		N
13C2	1	4	34	F	OFF	Y	N	1	N
13B1A	2	4	34	F	OFF	Y	Y	1	N

OF EXIT SIGNS – 11

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB	Ft. McPherson/Ft. Gillem Energy Study
PROJ.#	EMC # 3105.000
SHEET NO.	OF
CALCULATED BY:	JW
CHECKED BY:	
DATE:	1/23/92

BLDG.# 363
EC0 15

LIGHTING

ROOM #	# OF FIXTURES	LAMPS/ FIXTURE	WATTS/ BULB	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCC. SENSOR	NO. OF SWITCHES	UNOCC LIGHTS ON
~~801~~	~~6~~	~~4~~		~~F~~	~~ON~~				
1001									
17D2	1	4	34	F	ON	Y	N	1	N
1901									
19A1	3	4	34	F	ON	Y	Y	1	N
(1) 18A1 (1) 19C1	63	4	34	F	ON	Y	N	BREAKERS	NO
17F1	3	4	34	F	OFF	Y	Y	1	NO
17E1	6	4	34	F	ON	Y	N	2	Y
17D3/04	1	4	34	F	ON	Y	N	1	N
16B1	4/1	4/2	34/96	F	OFF	Y	N	1	N
16B2									
17D1	2	4	34	F	ON	Y	Y	1	N
16E1A	1	4	34	F	ON	N	N	0	N
16E1	5	4	34	F	ON	N	N	0	Y
19E1	5/8	2/2	96/34	F	ON	Y	N	2	Y
162	1	4	34	F	OFF	Y	N	1	N
15E1A	4	4	34	F	ON	Y	N	1	N

OF EXIT SIGNS – ______

COMMENTS: LIGHTS ARE ON 24 HRS/DAY

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB
SHEET NO. OF
CALCULATED BY DATE
CHECKED BY CS DATE
SCALE

Bldg 363

C2

SNYDER GENERAL

MODEL # AD036H

compressor
208V 3Ø
60 HZ 15.3 A

fan motor
208 V 1.1 A

C3 CARRIER

MODEL # 38E036300

comp. 208 V 1Ø
23 A

Fan 208 V 1Ø
2.4 A

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB _____

SHEET NO. _____ OF _____

CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____

SCALE _____

Bldg 363

AHU Schedule

M-F 0700 - 1800

Sat

Boiler

Continuous

Chill Water Pump

Continuous

Backup Chiller Return

550 water it turns on

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB _____

SHEET NO. _____ OF _____

CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____

SCALE _____

@ 363

Cooling tower

CAT# M3311T

BALDOR

7.5HP

23-22/11 AMP

208-230/460 V

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____

SHEET NO. _____ OF _____

CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____

SCALE _____

Chiller

Trane Seriel U91D04030

460V 60 HZ 3 ϕ

	#	V	HZ	ϕ	RLA
Compressor motor	1	460	60	3	206
Oil tank heater	2	115	60	1	2.0
Control circuit	1	115	60	1	1.0

Front AHU < 3 HP - Above ceiling
servel front area

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB _____

SHEET NO. _____ OF _____

CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____

SCALE _____

Bldg 363

FCU #1

Snyder General Model BYHM30-0360

SERIAL R8902003288

208V 1/3 HP 3.1 FLA 60 Hz Ph 1

C #1

TRANE Model: RAUC-356-A

Serial # C790-27685

208-230V

comp: 13.6 FLA 3ϕ

fan: 3.8 FLA 1ϕ 1/2 HP

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB _____

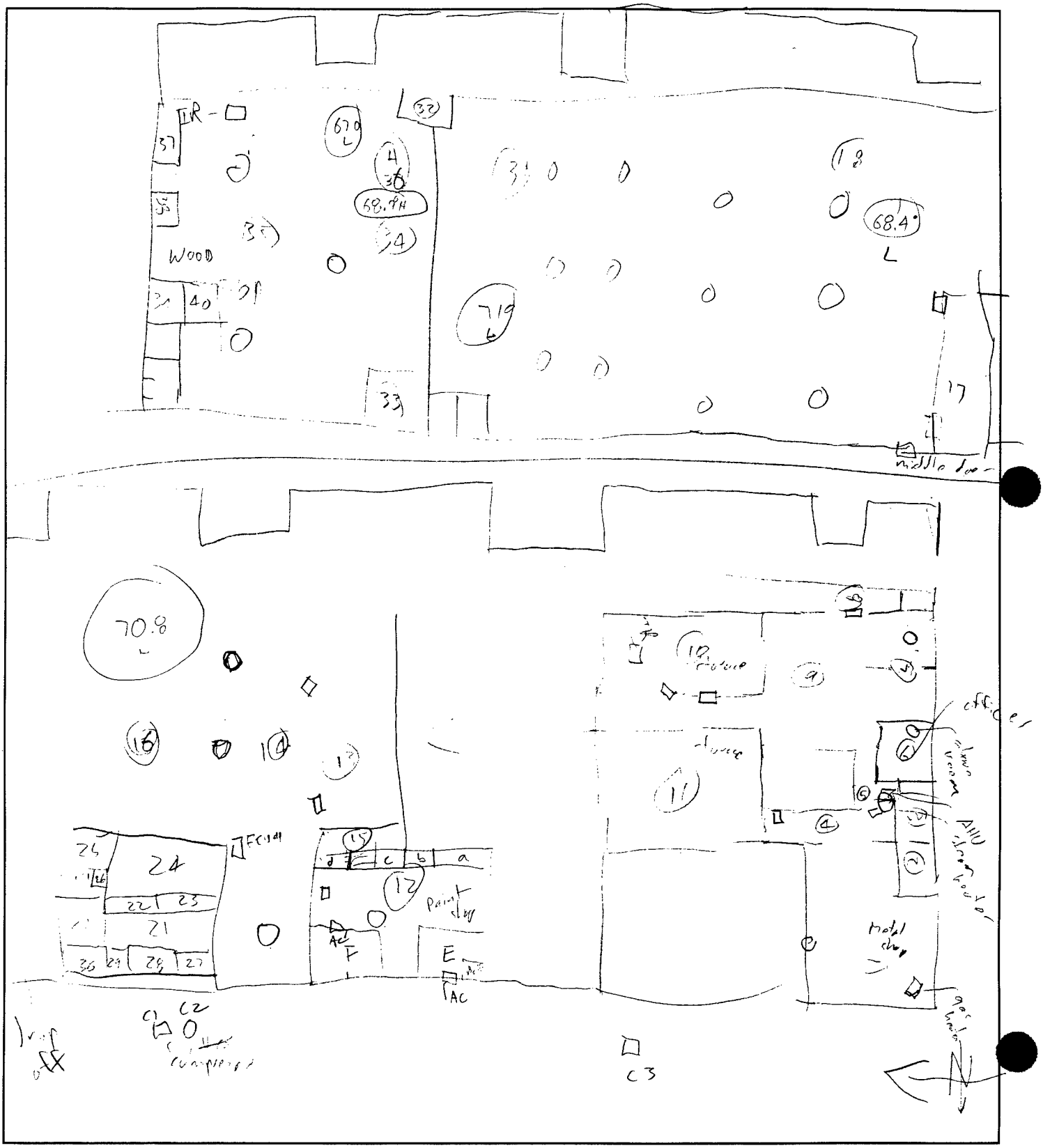
SHEET NO. _____ OF _____

CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____

SCALE _____

Bldg 363



E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB
SHEET NO. OF
CALCULATED BY DATE
CHECKED BY DATE
SCALE

Bldg 363

Shower
- full flow 30 secs 7.5 quarts
7.0 quarts

- reduced flow 30 secs
3.5 quarts
3.5 quarts

Bldg 40

Shower - Same shower -
full 30 secs 4.5 quarts, 6.5 quarts,
low 3.0 quarts

- reducable flow head already on

Bldg 171

HW Temp 104°F

Bldg 401 Raquetball

showers full - 20 secs 7.5 quarts
7.5 quarts,
low - 30 sec 4.0 quarts,

BUILDING 366

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPhereson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: KC
CHECKED BY:
DATE: 12-12-91

BLDG.# 366

DOMESTIC HOT WATER

FAUCET LOCATION	WATER TEMPERATURE
BATHROOM	108 °F
PROBLEMS:	

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPhereson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: KC
CHECKED BY:
DATE: 12-12-91

BLDG.# 366

AIR STRATIFICATION

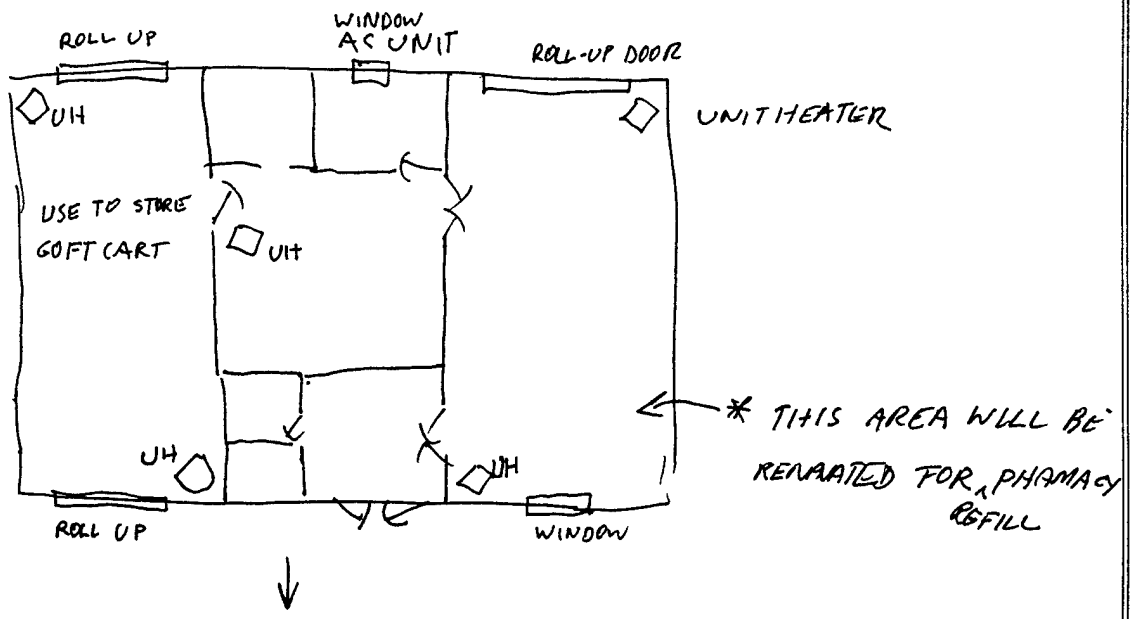
LOCATION _____ REQ. TEMP. _____

TEMP. AT TSTAT _____ SOURCE _____

TEMP. AT CEILING _____ OPP. HOURS _____ TO

TEMP. AT FLOOR _____

SKETCH ROOM – DIMENSIONS, T–STATS, DUCTS, FANS, ETC.



COMMENTS: NOT APPLICABLE

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: Emc # 3105.000
SHEET NO. _____ OF _____
CALCULATED BY: CMD
CHECKED BY: _____
DATE: 12-12-91

BLDG.# 366

LIGHTING

ROOM #	# OF FIXTURES	LAMPS/ FIXTURE	WATTS/ BULB	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCC. SENSOR	NO. OF SWITCHES	UNOCC LIGHTS ON
1	8	2	34	4ft FI	off	Y	N		
2	4	4	34	4' FI	off	Y	N		
3	1	2	34	4' FI	off	Y	Y	1	
2	6	2	34	4' FI	off	Y	N		
4	8	2	34	4' FI	off	Y	N		
5	2	4	34	4' FI	off	Y	Y	1	

OF EXIT SIGNS – 4 – glow in dark - no pwr.

COMMENTS: Bldg unoccupied – To be converted

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB _____

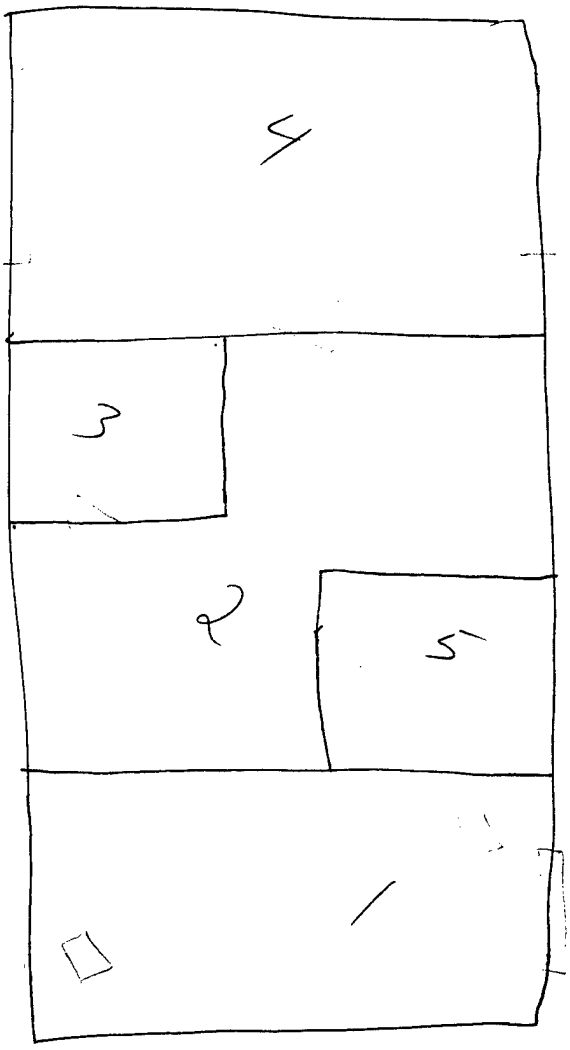
SHEET NO. _____ OF _____

CALCULATED BY CMD DATE 12-12-91

CHECKED BY _____ DATE _____

SCALE NTS

Bldg 366



N

BUILDING 400

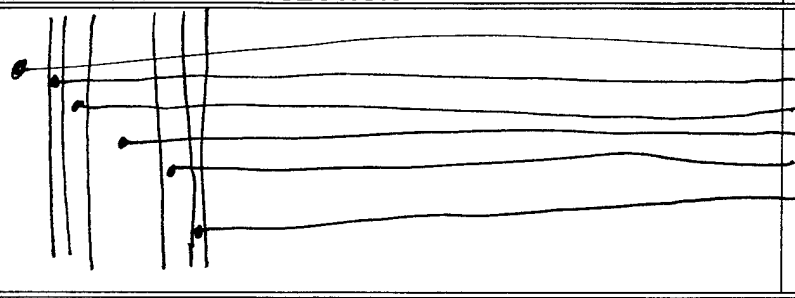
EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

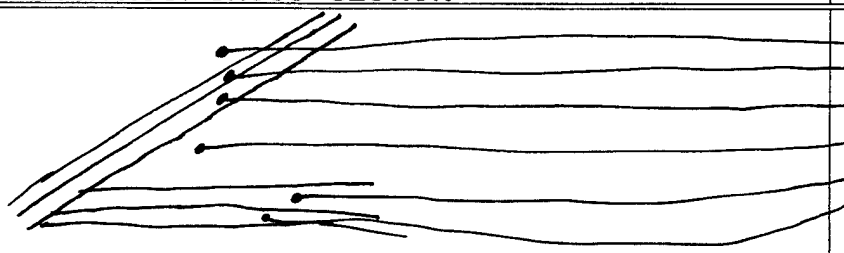
JOB: Ft. McPhereson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: CMD
CHECKED BY:
DATE: 12-11-91

BLDG.# 400

WALL & ROOF INSULATION

AREAS IN SQ. FEET	NORTH	SOUTH	EAST	WEST
WALLS				
WINDOWS	20	0	30	33
OVERHEAD DOORS	—	—	—	—
PERSONNEL DOORS	32	20	0	32

SKETCH WALL CROSS–SECTION	COMPONENTS
	1. OUTSIDE AIR FILM 2. Stucco 3. 2" Polystyrene 4. CMU 5. 2x4 stud 6. GYP Board 7. INSIDE AIR FILM

SKETCH ROOF CROSS–SECTION	COMPONENTS
	1. OUTSIDE AIR FILM 2. Shingles 3. Plywood 4. ceiling space 5. 3½" Fiberglass insulation 6. ceiling tile 7. INSIDE AIR FILM

PERSONNEL DOOR TYPE: Glass	BASEMENT [ ]
OVERHEAD DOOR TYPE: —	SLAB [✓]
	CRAWL SPACE [ ]

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPhereson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: CMD
CHECKED BY:
DATE: 12-11-91

BLDG.# 400

PIPE INSULATION

LOCATION	PIPE DIAMETER	PIPE LENGTH (Ft)	FLUID TYPE	FLUID TEMP.	AIR TEMP. °F	INSULATION TYPE	INSULATION THICKNESS	INSULATION CONDITION
mech rm	1" Cu	≈100	DX supply		68.3	Rubber	1½"	Good
Rad. Ball mech. Rm	3/4" cu	≈50	DX Supply		70	Rubber	½"	Fair

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPhereson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: CMD
CHECKED BY:
DATE: 12-11-91

BLDG.# 400

DUCT INSULATION

LOCATION	DUCT CROSSECTION	SHAPE	DUCT TEMP. (°F)	~~SUPPLY~~ SURROUNDING AIR TEMP. (°F)	INSULATION TYPE	INSULATION THICKNESS	INSULATION CONDITION
Mech Rm		Rect.	71°	73.5	Fiberglass	1" R-4	very good
Rad. Ball mech rm	24x12		71°	70°	NONE		

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. Mcphereson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: CMD
CHECKED BY:
DATE: 12-11-91

BLDG.# 400

WINDOWS SURVEY

WINDOW NO.	SINGLE/DOUBLE PANE	TYPE–SLIDING FIXED, CASEMENT	FRAME MAT'L	ORIENTATION	GLASS SHADING	WINDOW COVER	DIMENSIONS (INCH)
1	Double	Sliding	Al	N	None	Curtains	29x50
2	"	"	"	N	None	"	"
3	"	"	"	W	"	"	"
4	"	"	"	W	"	"	38x50
5	"	"	"	W	"	"	29x50
6	"	"	"	E	"	"	"
7	"	"	"	E	"	"	"
8	"	"	"	E	"	"	"
							"

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPhereson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: CMD
CHECKED BY:
DATE: 12-11-91

BLDG.# 400

WEATHERSTRIPING AND CAULKING

DOOR\ WINDOW	CONDITION OF W.S./CAULK	INFILTRATION	ORIENTATION	DIMENSIONS (INCH)
D1	Poor *1	Large	N	2@ 29x79
D2	Fair *2	small	W	2@ 29x79
D3	FAIR *3	Small	S	36x79

COMMENTS:

*1 Large gap where DOORS MEET ≈ ½".

*2 Small gap between DOORS.

*3 DOOR DOES NOT Seal against Frame

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: CMD
CHECKED BY:
DATE: 12-11-91

BLDG.# 400

WEATHERSTRIPING AND CAULKING

DOOR\ WINDOW	CONDITION OF W.S./CAULK	INFILTRATION	ORIENTATION	DIMENSIONS (INCH)
1	Good	very Low	N	29x50
2	Good	"	N	"
3	"	"	W	"
4	"	"	W	38 x50
5	"	"	W	29x50
6	"	"	E	"
7	"	"	E	"
8	"	"	E	"

COMMENTS: All window look new, good condition.

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPhereson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: KC
CHECKED BY:
DATE: 12-11-91

BLDG.# 400

DOMESTIC HOT WATER

FAUCET LOCATION	WATER TEMPERATURE
Kitchen	109 °F
Men's Room	109° F
PROBLEMS:	
Bad Taste in water Fountain	

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPhereson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: CMO
CHECKED BY:
DATE: 12-11-91

BLDG.# 400

MOTORS

MOTOR #	1	HP	1.5	PH	3	RPM	
MODEL #		VOLTS	200	AMPS	5		
SERIAL #		PRESENT HR.	0	TO	2400		
MFG	TRANE	REQUIRED HR.	0630	TO	1930		
FRAME		EFF.					
DESCRIPTION	AHU-01	COMMENTS					

MOTOR #	2	HP	1.5	PH	3	RPM	
MODEL #		VOLTS	200	AMPS	5		
SERIAL #		PRESENT HR.	0	TO	2400		
MFG	TRANE	REQUIRED HR.	0630	TO	1930		
FRAME		EFF.					
DESCRIPTION	AHU-2	COMMENTS					

MOTOR #		HP		PH		RPM	
MODEL #		VOLTS		AMPS			
SERIAL #		PRESENT HR.		TO			
MFG		REQUIRED HR.		TO			
FRAME		EFF.					
DESCRIPTION		COMMENTS					

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPhereson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: LLC
CHECKED BY:
DATE: 12-11-91

BLDG.# 400

MOTORS

MOTOR # _____ HP _____ PH _____ RPM _____
MODEL # _____ VOLTS _____ AMPS _____
SERIAL # _____ PRESENT HR. _____ TO _____
MFG _____ REQUIRED HR. _____ TO _____
FRAME _____ EFF. _____
DESCRIPTION _____ COMMENTS _____

MOTOR # 3 HP 1/2 PH 1Ø RPM _____
MODEL # 394GAD06Ø15Ø VOLTS 115V AMPS 8.5
SERIAL # _____ PRESENT HR. 600 TO 2200
MFG Bryan REQUIRED HR. 7.00 TO 19300
FRAME _____ EFF. _____
DESCRIPTION FOR RACKET BALL COURT COMMENTS AHU-3

MOTOR # 4 HP 1/2 PH 1 RPM _____
MODEL # 394GAD06Ø15Ø VOLTS 115 AMPS 8.5
SERIAL # _____ PRESENT HR. 600 TO 2200
MFG Bryan REQUIRED HR. 630 TO 1930
FRAME _____ EFF. _____
DESCRIPTION FOR RACKET BALL COURT COMMENTS AHU-4

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: Emc # 3105.000
SHEET NO.: OF
CALCULATED BY: KC
CHECKED BY:
DATE:

BLDG.# 400

LIGHTING

TEMP. REC ROOM 44.5°F

ROOM #	# OF FIXTURES	LAMPS/ FIXTURE	WATTS/ BULB	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCC. SENSOR	NO. OF SWITCHES	UNOCC LIGHTS ON
REC. RM.	31	4	34W	4' FLORES.	ON	YES	NO	4 1 PER ROOM	Y
KIT	2	4	34W	4' FL	ON	Y	Y	1	Y
MEN1	2	4	34W	4' FL	ON	Y	Y	1	Y
WOMEN1	2	4	34	4' FLR	ON	Y	Y	1	Y
01	2	4	34W	4' FLOR.	ON	YES	Y	1	Y
02	2	4	34W	4' FLOR	ON	Y	Y	1	Y
03	4	4	34W	4' FLOR	ON	Y	Y	1	Y
HALL 1ST FLOOR	4	2	34W	4' FLR	ON	Y	N	2	—
C1	8	4	34	4' FLR	OF	Y	Y	1	N
RAC. BALL COURT(S)	each 8 2 TOTAL	1	?	MERCURY VAPOR	ON	~~NO~~ YES	N	1	Y
MEN2	1	2	34W						
LADY2	1	2	34W	INC.	OFF	Y	Y	1	—
MEN SHOWER	1	1	34W	INC	OFF	Y	Y	1	—
WOMEN SHOWER	1	1	34W	INC	OFF	Y	Y	1	—
HALL	3	2	34W	INC	ON	Y	N	1	—

OF EXIT SIGNS – 2

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: emc # 3105.000
SHEET NO.: OF
CALCULATED BY: KL
CHECKED BY:
DATE: 12-11-91

BLDG.# 400

SECOND FLOOR

LIGHTING

2ND FLOOR 77.8°F

ALSO TURN COMPUTER ON/OFF * 4 SW FOR 2ND FLOOR

ROOM #	# OF FIXTURES	LAMPS/ FIXTURE	WATTS/ BULB	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCC. SENSOR	NO. OF SWITCHES	UNOCC LIGHTS ON
04	4	4	34W	FLR	ON	NO	NO	—	—
05	4	4	34	FLR	ON	NO	NO		
06	~~8~~ 4	4	34	FLR	ON	NO	NO		
07	4	4	34	FLR	ON	NO	NO		
08	~~8 4 13~~	4	34	FLR	ON	NO	NO	—	—
09	13	4	34W	FLR	ON	NO		—	
010	~~13~~ 4	4	34W	FLR	ON	NO	NO	—	
C2	8	4	34W	FLR	ON	NO	NO		
S1	8	4	34	FLR	ON	NO	NO	—	—
S2	~~13~~ 4	4	34	FLR	ON	NO	NO	—	—
HALL	Ø	Ø	Ø	—					
C3	1	4	34	FLR	ON	NO	NO	—	—
HALL NEAR RACKET BALL	4	2	34	FLR	ON	NO	NO	—	—

OF EXIT SIGNS – 2

COMMENTS:

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

Bldg 400 2nd Floor

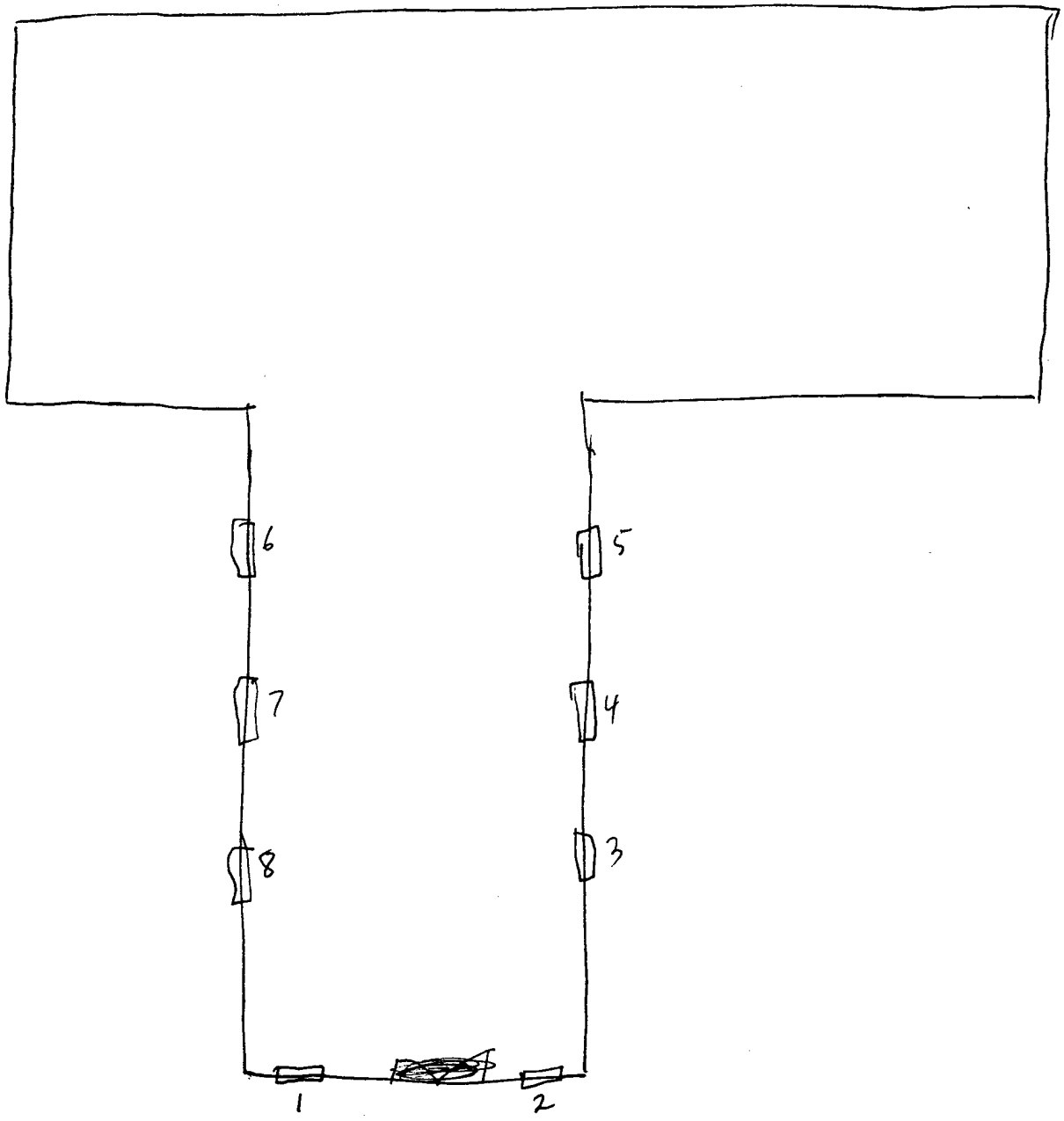
JOB _____

SHEET NO. _____ OF _____

CALCULATED BY CMD DATE 12-11-91

CHECKED BY _____ DATE _____

SCALE NTS



E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

Bldg 400 1st Fl

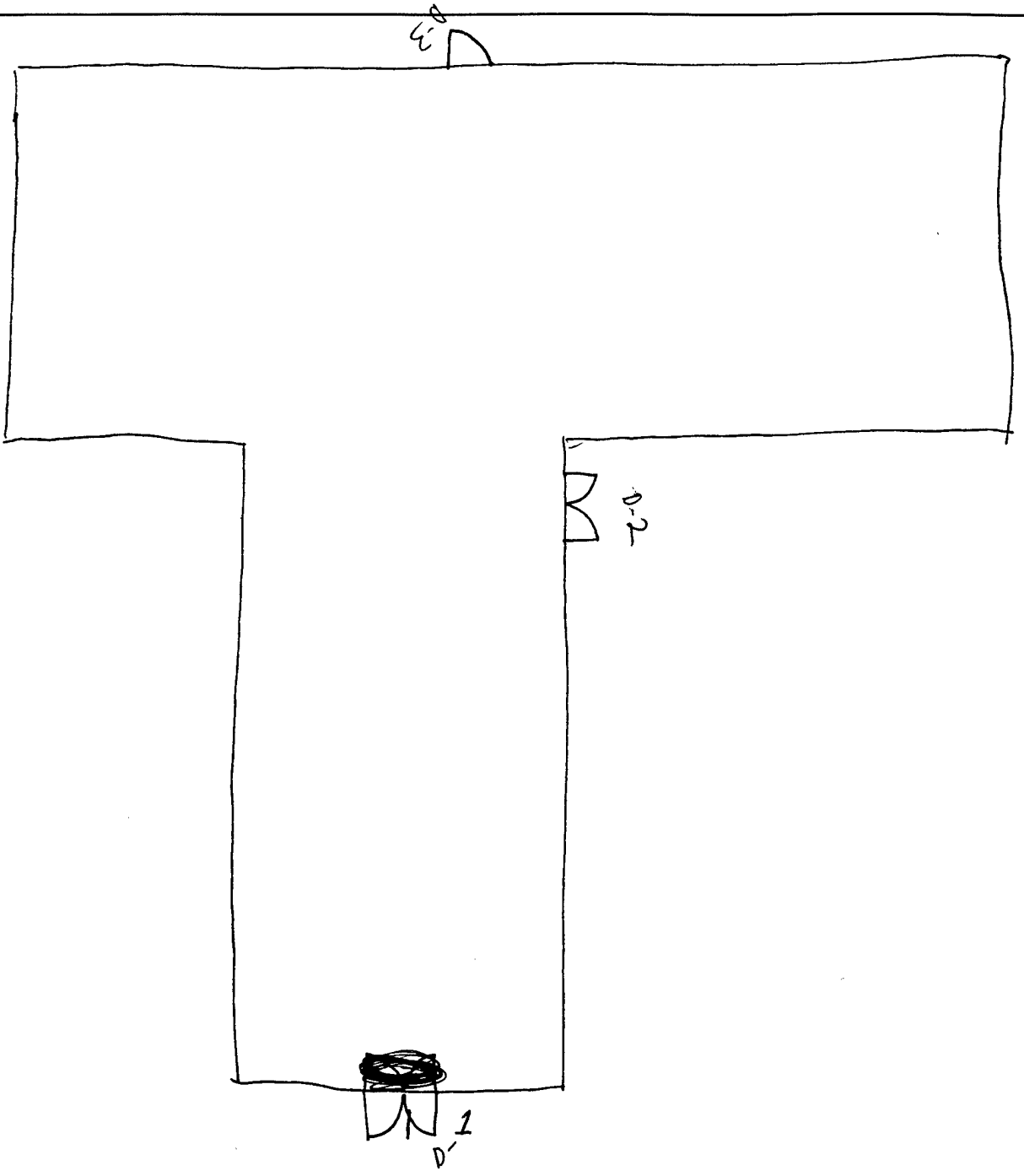
JOB _____

SHEET NO. _____ OF _____

CALCULATED BY CMD DATE 12-11-91

CHECKED BY _____ DATE _____

SCALE NTS



E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB
SHEET NO. OF
CALCULATED BY CMD DATE 12-11-91
CHECKED BY DATE
SCALE

Bldg 400

1st Fl. Hours

0630 - 1930 M - Sat

BUILDING 401

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPhereson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: CMD
CHECKED BY:
DATE: 12-11-91

BLDG.# 401

DOMESTIC HOT WATER

FAUCET LOCATION	WATER TEMPERATURE
Kitchen	137°F
Men's Room	121°F
PROBLEMS:	

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPhereson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: KC
CHECKED BY:
DATE: 12-1-91

BLDG.# 401

MOTORS

MOTOR #	1 ~~KSF~~	HP	5	PH	3	RPM	1740
MODEL #	5K184AX2048/AX	VOLTS	208	AMPS	14.6		
SERIAL #		PRESENT HR.	0	TO	2,400		
MFG	GE	REQUIRED HR.		TO			
FRAME	184T	EFF.	85.5				
DESCRIPTION	AHU	COMMENTS	NEW				

MOTOR #	2	HP	1/4	PH	1	RPM	1725
MODEL #	6K890	VOLTS	115	AMPS	5.1		
SERIAL #		PRESENT HR.		TO			
MFG	DAYTON	REQUIRED HR.		TO			
FRAME	48Y	EFF.					
DESCRIPTION	HWP SUPPLY	COMMENTS	NEW HWR PUMP IS REMOVED - REPAIR?				

MOTOR #		HP		PH		RPM	
MODEL #		VOLTS		AMPS			
SERIAL #		PRESENT HR.		TO			
MFG		REQUIRED HR.		TO			
FRAME		EFF.					
DESCRIPTION		COMMENTS					

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: emc # 3105.000
SHEET NO.: OF
CALCULATED BY: CMD
CHECKED BY:
DATE: 12-11-91

BLDG.# 401

LIGHTING

ROOM #	# OF FIXTURES	LAMPS/ FIXTURE	WATTS/ BULB	BULB TYPE /NC	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCC. SENSOR	NO. OF SWITCHES	UNOCC LIGHTS ON
Ent	1	2	34	4Ft FI	on	No	No		
1	2	3	34	4Ft FI	on	Y	Y	1	
2	2	4	34	4Ft FI	ON	Y	Y	1	—
1	1	2		18" Flu	ON	Y	Y	1	
3	1	3	34	4Ft FI	OFF	Y	Y	1	
4	4	2		18" Flu	ON	Y	N		
4	2	3	34	4Ft FI	ON	Y	N		
5	14	2	34	4Ft FI	ON	Y	N		
6	2	3	34	4Ft FI	ON	N	N		
7	30	2	60	8Ft FI	ON	Y	N		
8	1	2	34	4Ft FI	ON	Y	N		
8	1	4	34	4Ft FI	ON	Y	N		
9	"	"	"	" "	"	"	"		
10	1	2		Fl u	ON	Y	N	1	
10	3	4	34	Fl 4Ft	ON	Y	N		

OF EXIT SIGNS – 4

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: emc # 3105.000
SHEET NO. _____ OF _____
CALCULATED BY: KC
CHECKED BY: _____
DATE: 12-11-91

BLDG.# 401

LIGHTING

ROOM #	# OF FIXTURES	LAMPS/ FIXTURE	WATTS/ BULB	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCC. SENSOR	NO. OF SWITCHES	UNOCC LIGHTS ON
LOCKER	1	2	~~60~~W	8' FLR	ON	Y	N	1	—
OLD MECH	2	2	~~6~~0W	8' FLR	ON	Y	Y	2	Y
PIN. MACH	6	2	60W	8' FLR	ON	Y	N	1	Y
S1	2	2	60W	8' FLR	ON	Y	Y	1	Y
S2	1 2	2 2	60W 40W	8' FLR 4' FLR	ON	Y	Y	1	Y
~~B~~									
~~BIG~~ LOCKER									

OF EXIT SIGNS – _____

COMMENTS: _____

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____
SHEET NO. _____ OF _____
CALCULATED BY CMP DATE 12-11-91
CHECKED BY _____ DATE _____
SCALE _____

Bldg 401 hrs.

M-F 600 - 2300

SAT 900 - 2300

SUN 900 - 2100

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____
SHEET NO. _____ OF _____
CALCULATED BY _____ DATE _____
CHECKED BY _____ DATE _____
SCALE _____

Bldg 401

- ROOFTOP AHU 3ϕ 60HZ 12.6A 230V 5HP.

PACKAGE UNIT TRANE

- SFCB-C153LA 300,000 BTUH INPUT
  225,000 " — " OUTPUT

- N. GAS FURNACE

- 1 AIR COOLED CHILLER

SHOWERS

FULL - ~~20 sec~~ - 7.5 gts = ~~5~~ 5.64 gpm

LOW - 30 sec - 4.8 gts = 2.09 gpm

BUILDING 500

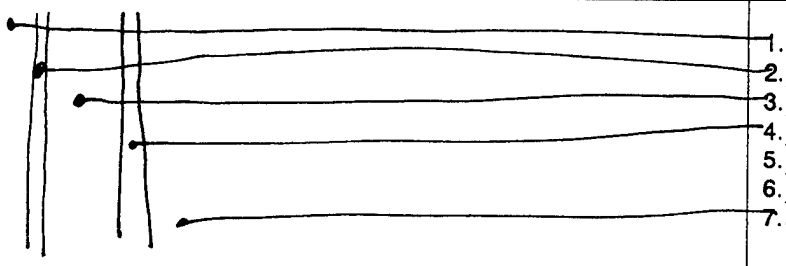
EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

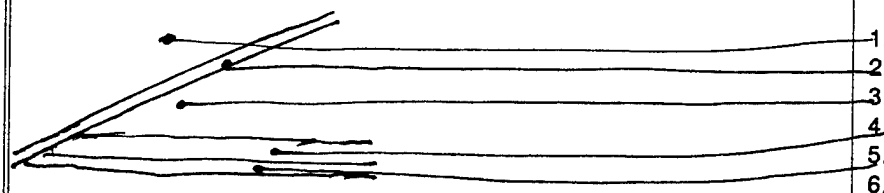
JOB	Ft. McPhereson/Ft. Gillem Energy Study
PROJ.#	EMC # 3105.000
SHEET NO.	1 OF
CALCULATED BY:	CMD
CHECKED BY:	
DATE:	12-10-91

BLDG.# 500

WALL & ROOF INSULATION

AREAS IN SQ. FEET	NORTH	SOUTH	EAST	WEST
WALLS				
WINDOWS	232	126	140	147
OVERHEAD DOORS	—	—	—	—
PERSONNEL DOORS	82	69	81	42

SKETCH WALL CROSS–SECTION	COMPONENTS
	1. OUTSIDE AIR FILM 2. STUCCO 3. ~~Brick~~ Brick ≈ 1 Ft 4. STUCCO 5. 6. 7. INSIDE AIR FILM

SKETCH ROOF CROSS–SECTION	COMPONENTS
	1. OUTSIDE AIR FILM 2. Tin Roof 3. ceiling space 4. 9½" Fiberglass insulation R-30 5. ceiling tile 6. 7. INSIDE AIR FILM

PERSONNEL DOOR TYPE: WOOD	BASEMENT [ ]
OVERHEAD DOOR TYPE: NONE	SLAB [X]
	CRAWL SPACE [ ]

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. Mcphereson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: 2 OF
CALCULATED BY: CMB
CHECKED BY:
DATE: 12-10-91

BLDG.# 500

WINDOWS SURVEY

WINDOW NO.	SINGLE/DOUBLE PANE	TYPE–SLIDING FIXED, CASEMENT	FRAME MAT'L	ORIENTATION	GLASS SHADING	WINDOW COVER	DIMENSIONS H (INCH) W
1	S	Fixed	METAL	E	None	None	58 x 308
2	D	Sliding	AL.	E	None	Blinds	22 x 32
3	D	N/A	AL	E	Opaque	None	23x34
4	D	Fixed	WOOD	S (Add)*	None	Shutters	55 x 65
5	"	"	"	"	"	"	3@ 55x65
6	"	"	"	N (add)	"	None	5@ 55x65
7	D	Sliding	AL	E	Opaque	None	44" x 18"
8	"	"	"	N	"	"	"
9	S	Sliding	WOOD	N	None	None	67" x 28" (2@)
10	S	Sliding	WOOD	N	None	None	45 x 20
11	"	"	"	"	"	"	"

COMMENTS: * Add - Addition to Bldg

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. Mcphereson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: 3 OF
CALCULATED BY: CMD
CHECKED BY:
DATE: 12-10-91

BLDG.# 500

WINDOWS SURVEY

WINDOW NO.	SINGLE/DOUBLE PANE	TYPE–SLIDING FIXED, CASEMENT	FRAME MAT'L	ORIENTATION	GLASS SHADING	WINDOW COVER	DIMENSIONS H (INCH) W
~~12~~	D	Sliding	AL	N	None	Blinds	70x62
~~13~~	D	Sliding	AL	N	None	window shade	50x20
~~14~~	S	Sliding	wood	W	opaque	N/A	64x20
~~15~~	S	Fixed	wood	N	None	shutters	40x95
~~16~~	"	"	metal	W	"	"	"
~~17~~	"	"	"	"	"	"	"
~~18~~	"	"	"	S	"	"	"
~~19~~	S	Fixed	wood	W	None	None	52x118
~~20~~	D "	"	"	"	"	"	"

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPhereson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: Kc
CHECKED BY:
DATE: 12-10-91

BLDG.# 500

DOMESTIC HOT WATER

FAUCET LOCATION	WATER TEMPERATURE
BATH ROOM (SOUTHEND DOWNSTAIR)	146°F
~~BATH ROOM~~ (NORTH END UPSTAIR NEAR TENNESY ROOM	134° F
PROBLEMS:	

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPhereson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: 8 OF
CALCULATED BY: CMD
CHECKED BY:
DATE: 12-10-91

BLDG.# 500

MOTORS

MOTOR #	13	HP	3	PH	3	RPM	1725
MODEL #		VOLTS	208	AMPS	7.8		
SERIAL #		PRESENT HR.		TO			
MFG	BALDOR	REQUIRED HR.		TO			
FRAME		EFF.					
DESCRIPTION	EF-5	COMMENTS					

MOTOR #	14	HP	5	PH	3	RPM	1740
MODEL #	WVD 184 TTDR 7357BP	VOLTS	208	AMPS			
CAT ~~SERIAL~~ #	M317	PRESENT HR.		TO			
MFG	MARATHON	REQUIRED HR.		TO			
FRAME	184JM	EFF.					
DESCRIPTION	CHW Pump	COMMENTS					

MOTOR #	15-20	HP	1.5 ea.	PH	3 ea.	RPM	1740 ea
MODEL #		VOLTS	208 ea	AMPS	5.2 ea		
SERIAL #		PRESENT HR.		TO			
MFG		REQUIRED HR.		TO			
FRAME		EFF.					
DESCRIPTION	CHILLER FANS	COMMENTS					

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: 4 OF 9
CALCULATED BY: CMD
CHECKED BY:
DATE: 12-10-91

BLDG.# 500

MOTORS

MOTOR # 1 | HP 3 | PH 3 | RPM ~~1720~~ 1730
MODEL # SBFC | VOLTS 208 | AMPS 10.7
SERIAL # [illegible] | PRESENT HR. | TO
MFG Westinghouse | REQUIRED HR. | TO
FRAME 182T | EFF. 81.5
DESCRIPTION ~~Exh~~ Supply Fan, AHU-1 | COMMENTS

MOTOR # 2 | HP 5 | PH 3 | RPM ~~1725~~ 1740
MODEL # SBFC | VOLTS 208 | AMPS 15
SERIAL # 8505 | PRESENT HR. | TO
MFG ~~WEST~~ WESTINGHOUSE | REQUIRED HR. | TO
FRAME N/A | EFF. N/A
DESCRIPTION Supply Fan, AHU-2 | COMMENTS

MOTOR # 3 | HP 5 | PH 3 | RPM ~~1725~~ 1740
MODEL # SBFC | VOLTS 208 | AMPS 15
SERIAL # 8505 | PRESENT HR. | TO
MFG WESTINGHOUSE | REQUIRED HR. | TO
FRAME 184T | EFF. 86.5
DESCRIPTION Supply Fan, AHU-3 | COMMENTS

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPhereson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: 5 OF
CALCULATED BY: CMP
CHECKED BY:
DATE: 12-10-91

BLDG.# 500

MOTORS

MOTOR #	4	HP	2	PH	3	RPM	1063
CAT MODEL #	N315TT	VOLTS	208	AMPS	6.8		
SERIAL #	F1088	PRESENT HR.			TO		
MFG	BALDOR	REQUIRED HR.			TO		
FRAME	145T	EFF.	78.5				
DESCRIPTION	Supply Fan, AHU-4	COMMENTS					

MOTOR #	5	HP	2	PH	3	RPM	1785
MODEL #	RVD145TTR5328AA	VOLTS	208	AMPS	5.5		
SERIAL #		PRESENT HR.			TO		
MFG	MARATHON ELECTRIC	REQUIRED HR.			TO		
FRAME	145T-0	EFF.					
DESCRIPTION	Supply Fan, AHU-5	COMMENTS					

MOTOR #	6	HP	1	PH	3	RPM	1252
MODEL #		VOLTS	208	AMPS			
SERIAL #		PRESENT HR.			TO		
MFG		REQUIRED HR.			TO		
FRAME		EFF.					
DESCRIPTION	Supply Fan AHU-6	COMMENTS					

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPhereson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: 6 OF
CALCULATED BY: CMD
CHECKED BY:
DATE: 12-10-91

BLDG.# 500

MOTORS

MOTOR # 7 HP 1.5 PH 3 RPM ~~1752~~ 1735
MODEL # RVD145TTFR5328AA VOLTS 208 AMPS 5.5
SERIAL # PRESENT HR. TO
MFG Marathon REQUIRED HR. TO
FRAME 140T-70 EFF.
DESCRIPTION Supply Fan, AHU-7 COMMENTS

MOTOR # 8 HP 2 PH 3 RPM ~~1752~~ 1017
MODEL # SBFc VOLTS 208 AMPS 6.7
SERIAL # 8505 PRESENT HR. TO
MFG Westinghouse REQUIRED HR. TO
FRAME 145T EFF.
DESCRIPTION Supply Fan, AHU-8 COMMENTS

MOTOR # 9 HP 1/6 PH 1 RPM 1140
MODEL # VOLTS 120 AMPS
SERIAL # PRESENT HR. TO
MFG REQUIRED HR. TO
FRAME EFF.
DESCRIPTION EF-1 COMMENTS

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPhereson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: 7 OF
CALCULATED BY: CMD
CHECKED BY:
DATE: 12-16-91

BLDG.# 500

MOTORS

MOTOR # 10 HP 1/6 PH 1 RPM 1140
MODEL # VOLTS 120 AMPS
SERIAL # PRESENT HR. TO
MFG REQUIRED HR. TO
FRAME EFF.
DESCRIPTION EF-2 COMMENTS

MOTOR # 11 HP 1/2 PH 3 RPM 1750
MODEL # VOLTS 208 AMPS
SERIAL # PRESENT HR. TO
MFG REQUIRED HR. TO
FRAME EFF.
DESCRIPTION EF-3 COMMENTS

MOTOR # 12 HP 1/6 PH 1 RPM 1140
MODEL # VOLTS 120 AMPS
SERIAL # PRESENT HR. TO
MFG REQUIRED HR. TO
FRAME EFF.
DESCRIPTION EF-4 COMMENTS

DATE: 12-10-91
BY: CMD

I. AIR HANDLING UNIT SURVEY OBSERVATIONS

BLDG NO: 500 BLDG NAME: O-club JOB: 3105.000
AHU NO: 3 LOCATION:
ZONE NO. SERVED: MainBall Rm REF. SYS. SERVING AHU: CHLR-1
([ ] VERIFIED ZONE OCCUPANCY AND TEMP. REQUIREMENTS ON SURVEY FORM VI.)
UNIT TYPE: SINGLE ZONE [ ] MULTIZONE [ ] DOUBLE DT [ ] REHEAT [ ]
HEAT & VENT [ ] 2-PIPE FC [ ] 4-PIPE FC [ ] UNIT HT [ ]
OTHER [ ]
MFG: McQuay MODEL: 3QFB06B6-B6C(REC.)
SUPPLY FAN: FAN HP: 5 MFG: AHU MODEL: LSL/B8CU
CFM: SA 3960 RA OA 1250 (MEASURED [ ] ESTIMATED [ ])
PRESENT DAILY STARTUP: M-F TO, SAT TO, SUN TO
STARTUP METHOD: MANUAL [ ] TIMECLOCK [ ] (WORKING, YES [ ] NO [ ])
SEASONAL SWITCHOVER: SUM TO, WIN TO
REQUIRED DAILY STARTUP: M-F TO, SAT TO, SUN TO

COILS:
PREHEAT: NONE [✓] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
HEATING: NONE [ ] STM [ ] HW [✓] ELEC [ ] MOD VLV [ ]
REHEAT: NONE [✓] STM [ ] HW [Ø] ELEC [ ] MOD VLV [ ]
HUMID: NONE [✓] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
COOLING: NONE [ ] CW [✓] DX [ ] SPRAY [ ] OTHER [ ]

REMARK:

DAMPERS:
OUTSIDE AIR: MAX %, MIN %, DAMPER MTR YES [ ] NO [ ]
RETURN AIR: MAX %, MIN %, DAMPER MTR YES [ ] NO [ ]
RELIEF AIR: MAX %, MIN %, DAMPER MTR YES [ ] NO [ ]
MIXED AIR CONTROL [ ], ECONOMIZER (DB [ ] OR ENTH [ ]) NONE [ ]

REMARKS:

SUPPORT FANS: UNIT RETURN FAN [ ] EXHAUST FAN [ ] OTHER [ ]
FAN HP: MFG: MODEL:
THERMOSTAT TYPE: SINGLE SETPOINT [ ] DUAL SETPOINT [ ] SETBACK [ ]
PNEUMATIC [ ] ELECTRIC/ELECTRONIC [ ] NO. OF ZONES
SETPOINT: OCC HEAT °F UNOCC HEAT °F OCC COOL °F UNOCC COOL °F
RESET CONTROLS: YES [ ] NO [ ], DECK SETPOINT HOT °F COLD °F
DEMAND LIMITING, DUTY CYCLING YES [ ] NO [ ]
REMARKS:

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB 3105.000

SHEET NO. _____ OF _____

CALCULATED BY KC DATE 12-11-91

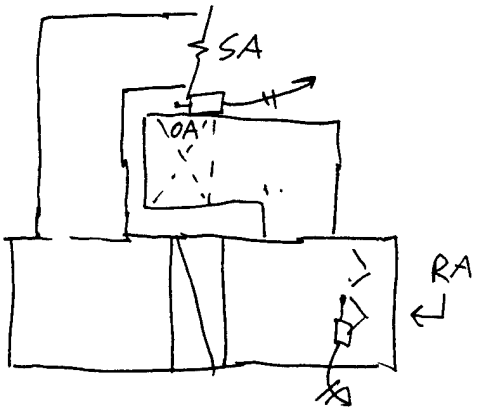
CHECKED BY _____ DATE _____

SCALE _____

DTWC-3

ANNEX BLDG 500

IN AUTO

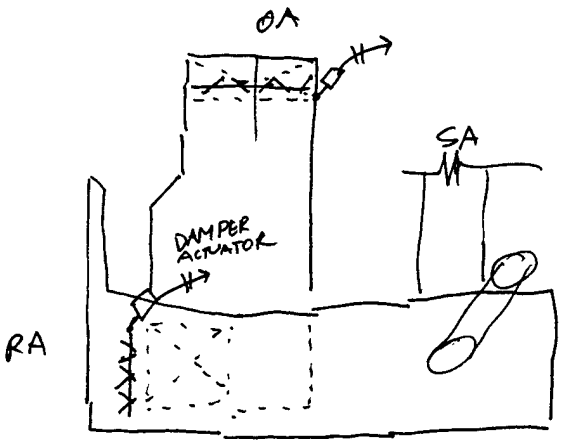


ELECTRONIC CONTROL

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

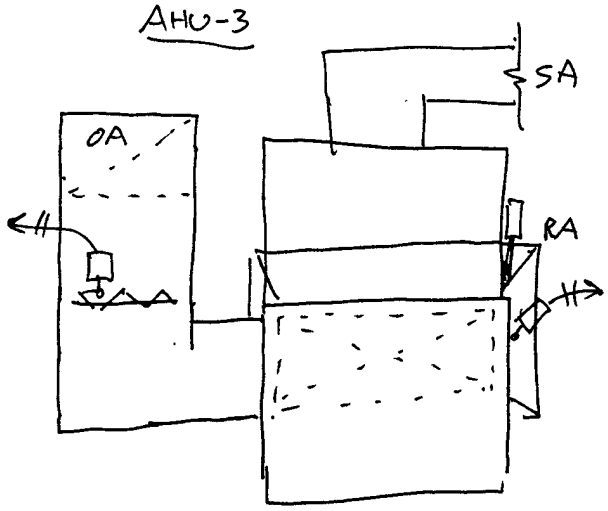
JOB 3105.000
SHEET NO. _____ OF _____
CALCULATED BY KC DATE 12-10-91
CHECKED BY NTS DATE _____
SCALE _____

AHU 4 BLDG 500



DDC LOCAL CONTROL
- EXISTING ECONOMIZER CONTROL
- HAS ~~any~~ RETAIR DAMPER
- DAMPER ACTUATOR
  COLMAN HYDRALIC ACTUATOR
  MP-5430

AHU-3



SAME AS AHU4

DATE: 12-10-91
BY: CMD

I. AIR HANDLING UNIT SURVEY OBSERVATIONS

BLDG NO: 500 BLDG NAME: O-Club JOB: 3105.000
AHU NO: 2 LOCATION: Mech Closet By Dining
ZONE NO. SERVED: Main Dining REF. SYS. SERVING AHU:
([ ] VERIFIED ZONE OCCUPANCY AND TEMP. REQUIREMENTS ON SURVEY FORM VI.)
UNIT TYPE: SINGLE ZONE [✓] MULTIZONE [ ] DOUBLE DT [ ] REHEAT [ ]
HEAT & VENT [ ] 2-PIPE FC [ ] 4-PIPE FC [ ] UNIT HT [ ]
OTHER [ ] _____
MFG: McQuay MODEL:
SUPPLY FAN: FAN HP: 5 MFG: MODEL:
CFM: SA 4000 RA — OA ~~Blank~~ 500 (MEASURED [ ] ESTIMATED [ ])
PRESENT DAILY STARTUP: M-F_____TO_____, SAT_____TO_____, SUN_____TO_____
STARTUP METHOD: MANUAL [ ] TIMECLOCK [ ] (WORKING, YES [ ] NO [ ])
SEASONAL SWITCHOVER: SUM_____TO_____, WIN_____TO_____
REQUIRED DAILY STARTUP: M-F_____TO_____, SAT_____TO_____, SUN_____TO_____

COILS:
PREHEAT: NONE [✓] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
HEATING: NONE [ ] STM [ ] HW [✓] ELEC [ ] MOD VLV [ ]
REHEAT: NONE [✓] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
HUMID: NONE [✓] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
COOLING: NONE [ ] CW [✓] DX [ ] SPRAY[ ] OTHER [ ]

REMARK:

DAMPERS:
OUTSIDE AIR: MAX %_____, MIN %_____, DAMPER MTR YES [ ] NO [ ]
RETURN AIR: MAX %_____, MIN %_____, DAMPER MTR YES [ ] NO [ ]
RELIEF AIR: MAX %_____, MIN %_____, DAMPER MTR YES [ ] NO [ ]
MIXED AIR CONTROL [ ], ECONOMIZER (DB [ ] OR ENTH [ ]) NONE [ ]

REMARKS:

SUPPORT FANS: UNIT_____ RETURN FAN [ ] EXHAUST FAN [ ] OTHER [ ]
FAN HP:_____ MFG:_____ MODEL:_____
THERMOSTAT TYPE: SINGLE SETPOINT [ ] DUAL SETPOINT [ ] SETBACK [ ]
PNEUMATIC [ ] ELECTRIC/ELECTRONIC [ ] NO. OF ZONES_____
SETPOINT: OCC HEAT_____°F UNOCC HEAT_____°F OCC COOL_____°F UNOCC COOL_____°F
RESET CONTROLS: YES [ ] NO [ ], DECK SETPOINT HOT_____°F COLD_____°F
DEMAND LIMITING, DUTY CYCLING YES [ ] NO [ ]
REMARKS:

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB 3105.000

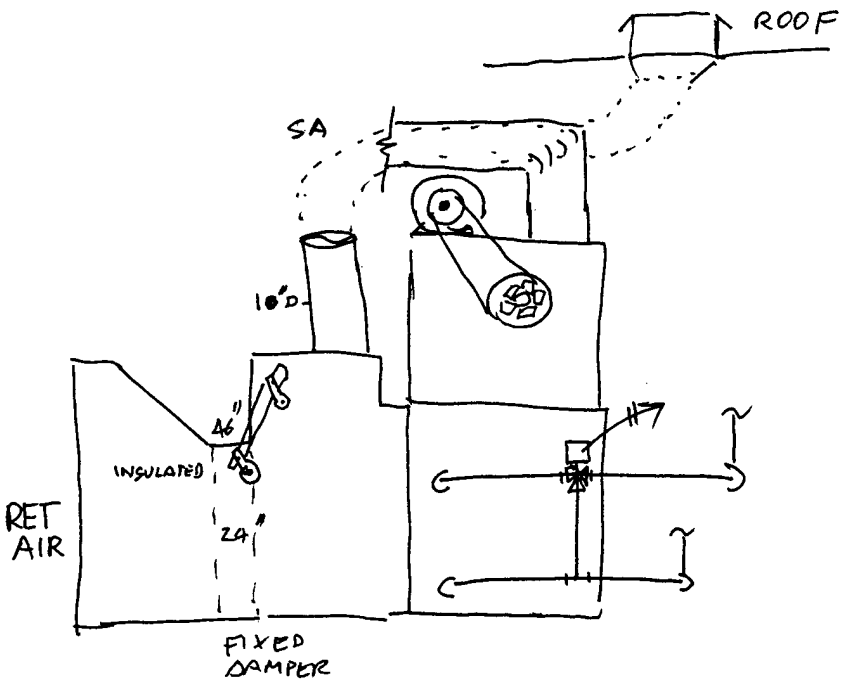
SHEET NO. _____ OF _____

CALCULATED BY KC DATE 12-10-91

CHECKED BY _____ DATE _____

SCALE NTS

BLDG 500 AHU-2



DATE: 12-10-91
BY: CMP

I. AIR HANDLING UNIT SURVEY OBSERVATIONS

BLDG NO: 500 BLDG NAME: O-CLUB JOB: ____
AHU NO: 1 LOCATION: ~~[illegible]~~ mech rm in ENTRANCE HALL
ZONE NO. SERVED: Alex Room REF. SYS. SERVING AHU: ____
([ ] VERIFIED ZONE OCCUPANCY AND TEMP. REQUIREMENTS ON SURVEY FORM VI.)
UNIT TYPE: SINGLE ZONE [✓] MULTIZONE [ ] DOUBLE DT [ ] REHEAT [ ]
HEAT & VENT [ ] 2-PIPE FC [ ] 4-PIPE FC [ ] UNIT HT [ ]
OTHER [ ] ____
MFG: McQuay MODEL: 3QF00604-06
SUPPLY FAN: FAN HP: 3 MFG: ____ MODEL: ____
CFM: SA 3600 RA ____ OA 400 (MEASURED [ ] ESTIMATED [ ]) Schedule
PRESENT DAILY STARTUP: M-F ____ TO ____, SAT ____ TO ____, SUN ____ TO ____
STARTUP METHOD: MANUAL [ ] TIMECLOCK [ ] (WORKING, YES [ ] NO [ ])
SEASONAL SWITCHOVER: SUM ____ TO ____, WIN ____ TO ____
REQUIRED DAILY STARTUP: M-F ____ TO ____, SAT ____ TO ____, SUN ____ TO ____

COILS:
PREHEAT: NONE [✓] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
HEATING: NONE [ ] STM [ ] HW [✓] ELEC [ ] MOD VLV [ ]
REHEAT: NONE [✓] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
HUMID: NONE [✓] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
COOLING: NONE [ ] CW [✓] DX [ ] SPRAY [ ] OTHER [ ]

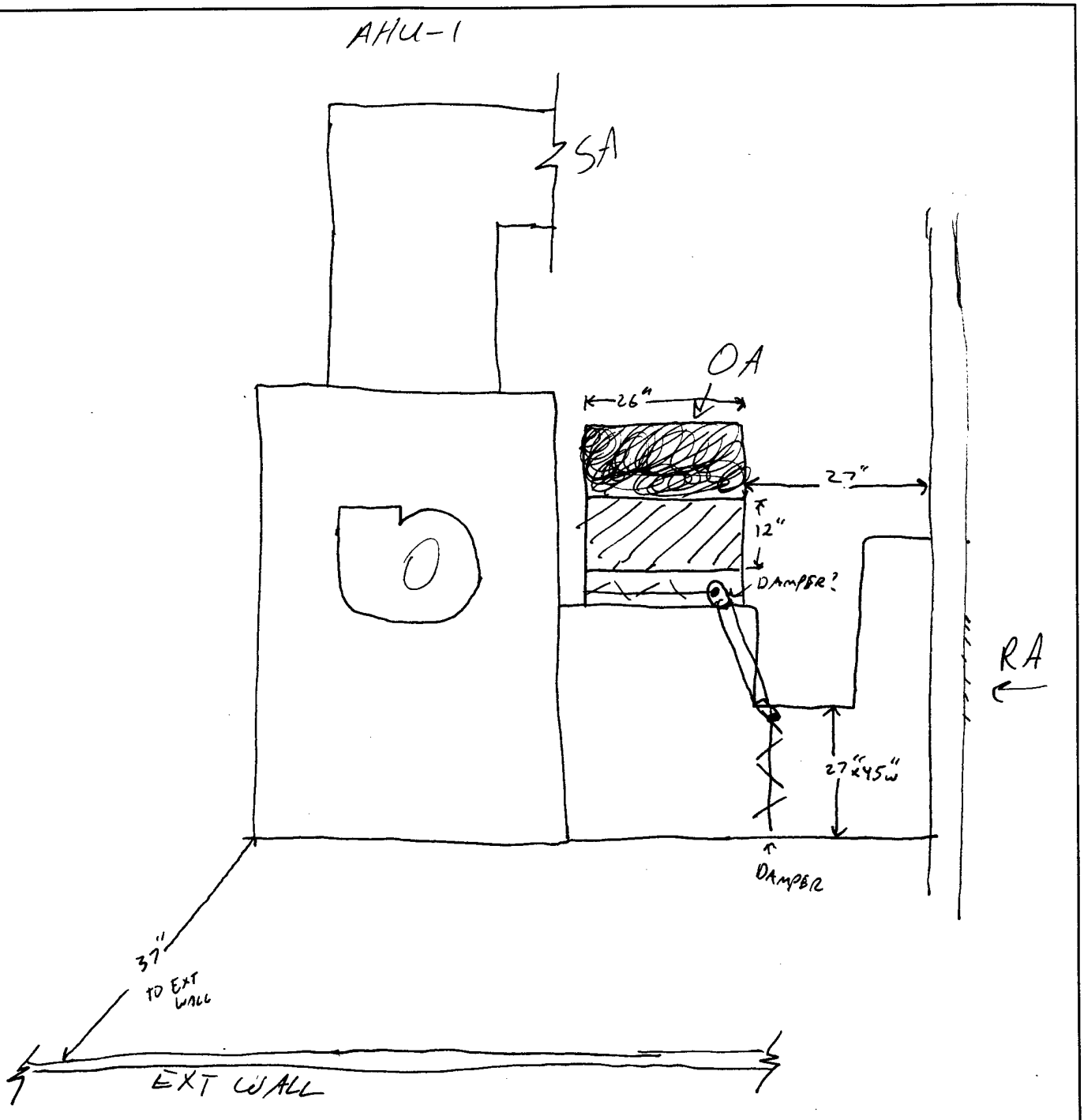
REMARK: ____
DAMPERS: OUTSIDE AIR: MAX % ____, MIN % ____, DAMPER MTR YES [ ] NO [ ]
RETURN AIR: MAX % ____, MIN % ____, DAMPER MTR YES [ ] NO [ ]
RELIEF AIR: MAX % ____, MIN % ____, DAMPER MTR YES [ ] NO [ ]
MIXED AIR CONTROL [ ], ECONOMIZER (DB [ ] OR ENTH [ ]) NONE [ ]

REMARKS: ____
SUPPORT FANS: UNIT ____ RETURN FAN [ ] EXHAUST FAN [ ] OTHER [ ]
FAN HP: ____ MFG: ____ MODEL: ____
THERMOSTAT TYPE: SINGLE SETPOINT [ ] DUAL SETPOINT [ ] SETBACK [ ]
PNEUMATIC [ ] ELECTRIC/ELECTRONIC [ ] NO. OF ZONES ____
SETPOINT: OCC HEAT ____ °F UNOCC HEAT ____ °F OCC COOL ____ °F UNOCC COOL ____ °F
RESET CONTROLS: YES [ ] NO [ ], DECK SETPOINT HOT ____ °F COLD ____ °F
DEMAND LIMITING, DUTY CYCLING YES [ ] NO [ ]
REMARKS:

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB 3105.000
SHEET NO. _____ OF _____
CALCULATED BY CMD DATE 12-10-91
CHECKED BY _____ DATE _____
SCALE NTS

Bldg 500



DATE: 12-10-91
BY: CMO

I. AIR HANDLING UNIT SURVEY OBSERVATIONS

BLDG NO: 500 BLDG NAME: O-club JOB: 3105.000
AHU NO: 4 LOCATION:
ZONE NO. SERVED: Private Dining Rm REF. SYS. SERVING AHU: CHLR 1
([ ] VERIFIED ZONE OCCUPANCY AND TEMP. REQUIREMENTS ON SURVEY FORM VI.)
UNIT TYPE: SINGLE ZONE [✓] MULTIZONE [ ] DOUBLE DT [ ] REHEAT [ ]
HEAT & VENT [ ] 2-PIPE FC [ ] 4-PIPE FC [ ] UNIT HT [ ]
OTHER [ ]
MFG: McQuay MODEL: 3QF ØØ611-ØØ5 (SERIAL) LSL106CH (MOD)
SUPPLY FAN: FAN HP: 2 MFG: MODEL:
CFM: SA 2400 RA OA 325 (MEASURED [ ] ESTIMATED [ ])
PRESENT DAILY STARTUP: M-F TO, SAT TO, SUN TO
STARTUP METHOD: MANUAL [ ] TIMECLOCK [ ] (WORKING, YES [ ] NO [ ])
SEASONAL SWITCHOVER: SUM TO, WIN TO
REQUIRED DAILY STARTUP: M-F TO, SAT TO, SUN TO

COILS:
PREHEAT: NONE [✓] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
HEATING: NONE [ ] STM [ ] HW [✓] ELEC [ ] MOD VLV [ ]
REHEAT: NONE [✓] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
HUMID: NONE [✓] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
COOLING: NONE [ ] CW [✓] DX [ ] SPRAY [ ] OTHER [ ]

REMARK:

DAMPERS:
OUTSIDE AIR: MAX %, MIN %, DAMPER MTR YES [ ] NO [ ]
RETURN AIR: MAX %, MIN %, DAMPER MTR YES [ ] NO [ ]
RELIEF AIR: MAX %, MIN %, DAMPER MTR YES [ ] NO [ ]
MIXED AIR CONTROL [ ], ECONOMIZER (DB [ ] OR ENTH [ ]) NONE [ ]

REMARKS:

SUPPORT FANS: UNIT RETURN FAN [ ] EXHAUST FAN [ ] OTHER [ ]
FAN HP: MFG: MODEL:
THERMOSTAT TYPE: SINGLE SETPOINT [ ] DUAL SETPOINT [ ] SETBACK [ ]
PNEUMATIC [ ] ELECTRIC/ELECTRONIC [ ] NO. OF ZONES
SETPOINT: OCC HEAT °F UNOCC HEAT °F OCC COOL °F UNOCC COOL °F
RESET CONTROLS: YES [ ] NO [ ], DECK SETPOINT HOT °F COLD °F
DEMAND LIMITING, DUTY CYCLING YES [ ] NO [ ]
REMARKS:

DATE: 12-10-91
BY: CMD

I. AIR HANDLING UNIT SURVEY OBSERVATIONS

BLDG NO: 500 BLDG NAME: O-Club JOB: 3105.000
AHU NO: 5 LOCATION: Tennessee Rm
ZONE NO. SERVED: Tennessee Rm. REF. SYS. SERVING AHU: CHLR-1
([ ] VERIFIED ZONE OCCUPANCY AND TEMP. REQUIREMENTS ON SURVEY FORM VI.)
UNIT TYPE: SINGLE ZONE [✓] MULTIZONE [ ] DOUBLE DT [ ] REHEAT [ ]
HEAT & VENT [ ] 2-PIPE FC [ ] 4-PIPE FC [ ] UNIT HT [ ]
OTHER [ ] _____
MFG: N/A MODEL: N/A
SUPPLY FAN: FAN HP: 2 MFG: _____ MODEL: _____
CFM: SA 2500 RA N/A OA 300 (MEASURED [ ] ESTIMATED [ ])
PRESENT DAILY STARTUP: M-F_____TO_____, SAT_____TO_____, SUN_____TO_____
STARTUP METHOD: MANUAL [ ] TIMECLOCK [ ] (WORKING, YES [ ] NO [ ])
SEASONAL SWITCHOVER: SUM_____TO_____, WIN_____TO_____
REQUIRED DAILY STARTUP: M-F_____TO_____, SAT_____TO_____, SUN_____TO_____

COILS:
PREHEAT: NONE [✓] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
HEATING: NONE [ ] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
REHEAT: NONE [✓] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
HUMID: NONE [✓] STM [ ] HW [✓] ELEC [ ] MOD VLV [ ]
COOLING: NONE [ ] CW [✓] DX [ ] SPRAY [ ] OTHER [ ]

REMARK: _____

DAMPERS:
OUTSIDE AIR: MAX %_____, MIN %_____, DAMPER MTR YES [ ] NO [ ]
RETURN AIR: MAX %_____, MIN %_____, DAMPER MTR YES [ ] NO [ ]
RELIEF AIR: MAX %_____, MIN %_____, DAMPER MTR YES [ ] NO [ ]
MIXED AIR CONTROL [ ], ECONOMIZER (DB [ ] OR ENTH [ ]) NONE [ ]

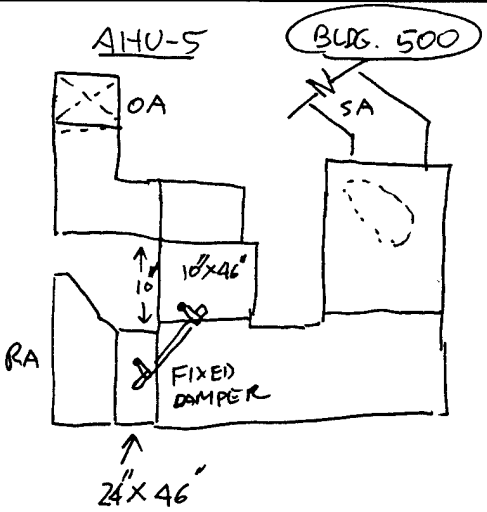
REMARKS: _____

SUPPORT FANS: UNIT_____ RETURN FAN [ ] EXHAUST FAN [ ] OTHER [ ]
FAN HP:_____ MFG:_____ MODEL:_____
THERMOSTAT TYPE: SINGLE SETPOINT [ ] DUAL SETPOINT [ ] SETBACK [ ]
PNEUMATIC [ ] ELECTRIC/ELECTRONIC [ ] NO. OF ZONES_____
SETPOINT: OCC HEAT_____°F UNOCC HEAT_____°F OCC COOL_____°F UNOCC COOL_____°F
RESET CONTROLS: YES [ ] NO [ ], DECK SETPOINT HOT_____°F COLD_____°F
DEMAND LIMITING, DUTY CYCLING YES [ ] NO [ ]
REMARKS:

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB 3105.000
SHEET NO. _____ OF _____
CALCULATED BY KC DATE 12-10-91
CHECKED BY _____ DATE _____
SCALE NTS

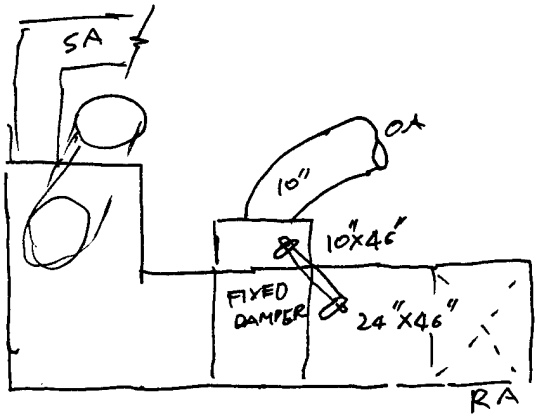
AHU-5



TENNESSEE ROOM

AHU 6

SMALL DINNING DOWNSTAIR.



DATE: 12-10-91
BY: CMO

I. AIR HANDLING UNIT SURVEY OBSERVATIONS

BLDG NO: 500 BLDG NAME: O-CLUB JOB: 3105.000
AHU NO: 6 LOCATION: Tennessee Ln
ZONE NO. SERVED: SMALL DNNWL AREA REF. SYS. SERVING AHU: CHLR-1
([ ] VERIFIED ZONE OCCUPANCY AND TEMP. REQUIREMENTS ON SURVEY FORM VI.)
UNIT TYPE: SINGLE ZONE [✓] MULTIZONE [ ] DOUBLE DT [ ] REHEAT [ ]
HEAT & VENT [ ] 2-PIPE FC [ ] 4-PIPE FC [ ] UNIT HT [ ]
OTHER [ ] _____
MFG: McQuay MODEL: LSL103CV ser- 3QF006009-06
SUPPLY FAN: FAN HP: 1 MFG: _____ MODEL: _____
CFM: SA 1200 RA _____ OA 175 (MEASURED [ ] ESTIMATED [ ])
PRESENT DAILY STARTUP: M-F _____ TO _____, SAT _____ TO _____, SUN _____ TO _____
STARTUP METHOD: MANUAL [ ] TIMECLOCK [ ] (WORKING, YES [ ] NO [ ])
SEASONAL SWITCHOVER: SUM _____ TO _____, WIN _____ TO _____
REQUIRED DAILY STARTUP: M-F _____ TO _____, SAT _____ TO _____, SUN _____ TO _____

COILS:
PREHEAT: NONE [✓] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
HEATING: NONE [ ] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
REHEAT: NONE [✓] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
HUMID: NONE [✓] STM [ ] HW [✓] ELEC [ ] MOD VLV [ ]
COOLING: NONE [ ] CW [✓] DX [ ] SPRAY [ ] OTHER [ ]

REMARK: _____

DAMPERS:
OUTSIDE AIR: MAX % _____, MIN % _____, DAMPER MTR YES [ ] NO [ ]
RETURN AIR: MAX % _____, MIN % _____, DAMPER MTR YES [ ] NO [ ]
RELIEF AIR: MAX % _____, MIN % _____, DAMPER MTR YES [ ] NO [ ]
MIXED AIR CONTROL [ ], ECONOMIZER (DB [ ] OR ENTH [ ]) NONE [ ]

REMARKS: _____

SUPPORT FANS: UNIT _____ RETURN FAN [ ] EXHAUST FAN [ ] OTHER [ ]
FAN HP: _____ MFG: _____ MODEL: _____
THERMOSTAT TYPE: SINGLE SETPOINT [ ] DUAL SETPOINT [ ] SETBACK [ ]
PNEUMATIC [ ] ELECTRIC/ELECTRONIC [ ] NO. OF ZONES _____
SETPOINT: OCC HEAT _____ °F UNOCC HEAT _____ °F OCC COOL _____ °F UNOCC COOL _____ °F
RESET CONTROLS: YES [ ] NO [ ], DECK SETPOINT HOT _____ °F COLD _____ °F
DEMAND LIMITING, DUTY CYCLING YES [ ] NO [ ]
REMARKS:

DATE: 12-10-91
BY: CMO

I. AIR HANDLING UNIT SURVEY OBSERVATIONS

BLDG NO: 500 BLDG NAME: O-CLUB JOB: 3105.000
AHU NO: 1 LOCATION:
ZONE NO. SERVED: FORMAL BAR REF. SYS. SERVING AHU: CHLR-1
([ ] VERIFIED ZONE OCCUPANCY AND TEMP. REQUIREMENTS ON SURVEY FORM VI.)
UNIT TYPE: SINGLE ZONE [✓] MULTIZONE [ ] DOUBLE DT [ ] REHEAT [ ]
HEAT & VENT [ ] 2-PIPE FC [ ] 4-PIPE FC [ ] UNIT HT [ ]
OTHER [ ]
MFG: MODEL:
SUPPLY FAN: FAN HP: 1 MFG: MODEL:
CFM: SA 1800 RA OA 700 (MEASURED [ ] ESTIMATED [ ])
PRESENT DAILY STARTUP: M-F TO , SAT TO , SUN TO
STARTUP METHOD: MANUAL [ ] TIMECLOCK [ ] (WORKING, YES [ ] NO [ ])
SEASONAL SWITCHOVER: SUM TO , WIN TO
REQUIRED DAILY STARTUP: M-F TO , SAT TO , SUN TO

COILS: PREHEAT: NONE [✓] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
HEATING: NONE [ ] STM [ ] HW [✓] ELEC [ ] MOD VLV [ ]
REHEAT: NONE [✓] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
HUMID: NONE [✓] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
COOLING: NONE [ ] CW [✓] DX [ ] SPRAY[ ] OTHER [ ]

REMARK:
DAMPERS: OUTSIDE AIR: MAX %, MIN %, DAMPER MTR YES [ ] NO [ ]
RETURN AIR: MAX %, MIN %, DAMPER MTR YES [ ] NO [ ]
RELIEF AIR: MAX %, MIN %, DAMPER MTR YES [ ] NO [ ]
MIXED AIR CONTROL [ ], ECONOMIZER (DB [ ] OR ENTH [ ]) NONE [ ]

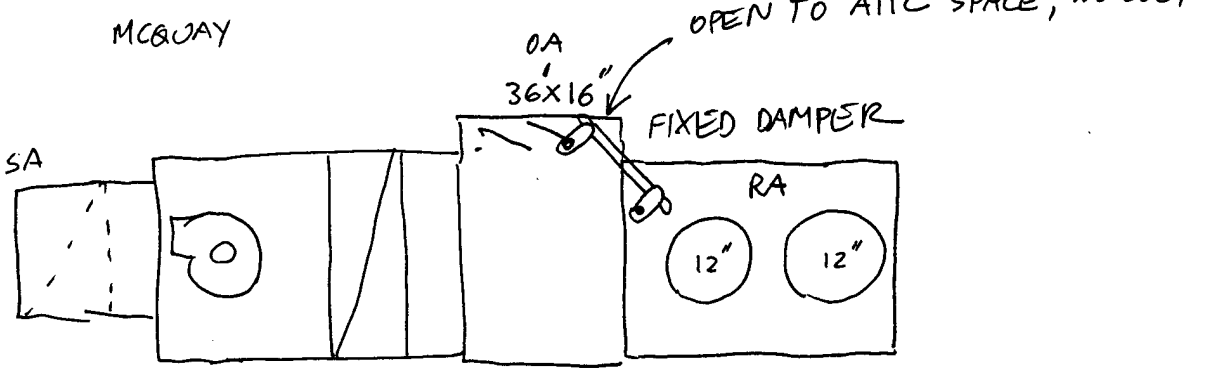
REMARKS:
SUPPORT FANS: UNIT RETURN FAN [ ] EXHAUST FAN [ ] OTHER [ ]
FAN HP: MFG: MODEL:
THERMOSTAT TYPE: SINGLE SETPOINT [ ] DUAL SETPOINT [ ] SETBACK [ ]
PNEUMATIC [ ] ELECTRIC/ELECTRONIC [ ] NO. OF ZONES
SETPOINT: OCC HEAT °F UNOCC HEAT °F OCC COOL °F UNOCC COOL °F
RESET CONTROLS: YES [ ] NO [ ], DECK SETPOINT HOT °F COLD °F
DEMAND LIMITING, DUTY CYCLING YES [ ] NO [ ]
REMARKS:

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

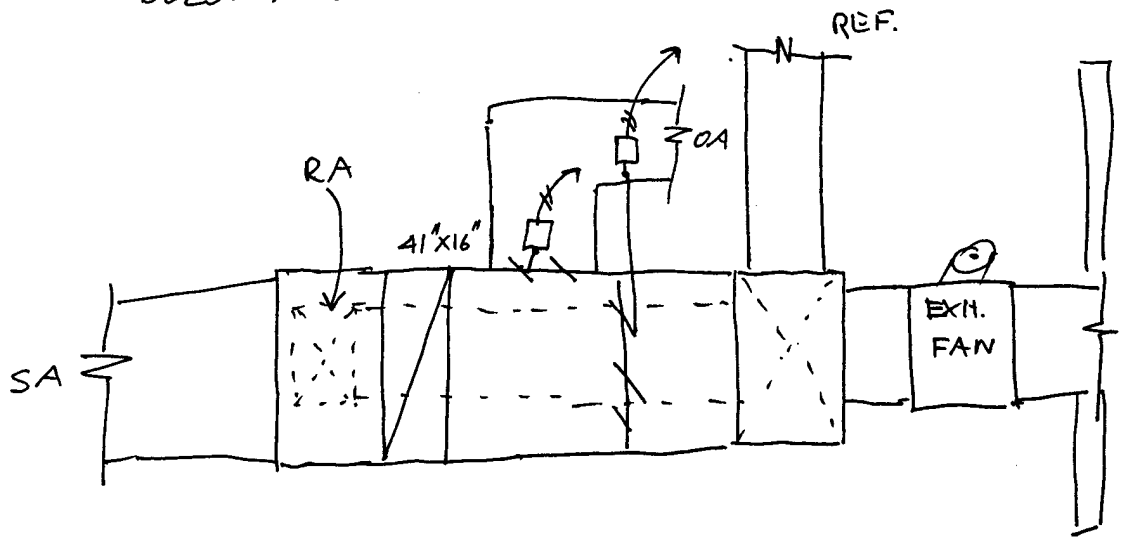
JOB _____
SHEET NO. _____ OF _____
CALCULATED BY _____ DATE _____
CHECKED BY _____ DATE _____
SCALE _____

AHU-~~4~~ 6 BLDG 500
ABOVE OFFICE (NORTHEND)

MCQUAY



AHU - 7
- UNIT HAS ECONOMIZER CONTROL
- EXH. FAN TIES TO AHU 7
- IN AUTO POSITION
- DOES NOT RUN WHEN SWITCH TO HAND



Ft. McPherson/ Ft. Gillem Energy Study
EMC # 3105.000

DATE: 12-11-91
BY: CMP

I. AIR HANDLING UNIT SURVEY OBSERVATIONS

BLDG NO: 500 BLDG NAME: O-CLUB JOB: _____
AHU NO: 7 LOCATION: _____
ZONE NO. SERVED: _____ REF. SYS. SERVING AHU: _____
([ ] VERIFIED ZONE OCCUPANCY AND TEMP. REQUIREMENTS ON SURVEY FORM VI.)
UNIT TYPE: SINGLE ZONE [✓] MULTIZONE [ ] DOUBLE DT [ ] REHEAT [ ]
HEAT & VENT [ ] 2-PIPE FC [ ] 4-PIPE FC [ ] UNIT HT [ ]
OTHER [ ] _____
MFG: McQuay MODEL: LSL106 CV Ser- 3QF000608-06
SUPPLY FAN: FAN HP: _____ MFG: _____ MODEL: _____
CFM: SA _____ RA _____ OA _____ (MEASURED [ ] ESTIMATED [ ])
PRESENT DAILY STARTUP: M-F _____ TO _____, SAT _____ TO _____, SUN _____ TO _____
STARTUP METHOD: MANUAL [ ] TIMECLOCK [ ] (WORKING, YES [ ] NO [ ])
SEASONAL SWITCHOVER: SUM _____ TO _____, WIN _____ TO _____
REQUIRED DAILY STARTUP: M-F _____ TO _____, SAT _____ TO _____, SUN _____ TO _____

COILS:
PREHEAT: NONE [✓] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
HEATING: NONE [ ] STM [ ] HW [✓] ELEC [ ] MOD VLV [ ]
REHEAT: NONE [✓] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
HUMID: NONE [✓] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
COOLING: NONE [ ] CW [✓] DX [ ] SPRAY [ ] OTHER [ ]

REMARK: _____

DAMPERS:
OUTSIDE AIR: MAX %_____, MIN %_____, DAMPER MTR YES [ ] NO [ ]
RETURN AIR: MAX %_____, MIN %_____, DAMPER MTR YES [ ] NO [ ]
RELIEF AIR: MAX %_____, MIN %_____, DAMPER MTR YES [ ] NO [ ]
MIXED AIR CONTROL [ ], ECONOMIZER (DB [ ] OR ENTH [ ]) NONE [ ]

REMARKS: _____

SUPPORT FANS: UNIT _____ RETURN FAN [ ] EXHAUST FAN [ ] OTHER [ ]
FAN HP: _____ MFG: _____ MODEL: _____
THERMOSTAT TYPE: SINGLE SETPOINT [ ] DUAL SETPOINT [ ] SETBACK [ ]
PNEUMATIC [ ] ELECTRIC/ELECTRONIC [ ] NO. OF ZONES _____
SETPOINT: OCC HEAT _____ °F UNOCC HEAT _____ °F OCC COOL _____ °F UNOCC COOL _____ °F
RESET CONTROLS: YES [ ] NO [ ], DECK SETPOINT HOT _____ °F COLD _____ °F
DEMAND LIMITING, DUTY CYCLING YES [ ] NO [ ]
REMARKS:

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB Ft. McPherson / Ft. Gillem Energy Study

SHEET NO. _____ OF _____

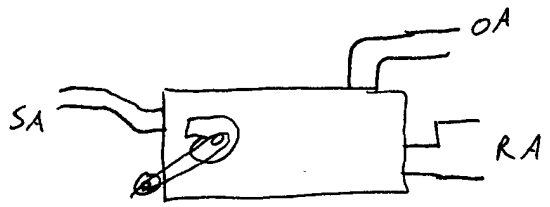
CALCULATED BY _____ DATE _____

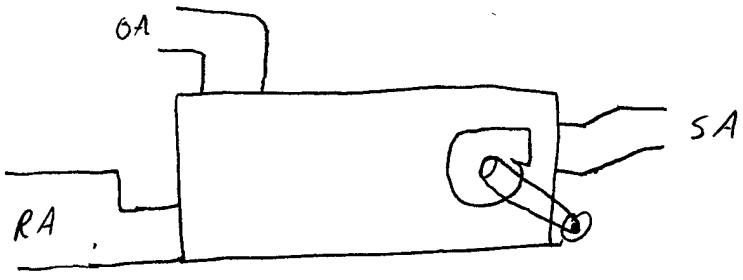
CHECKED BY _____ DATE _____

SCALE NTS

ECONOMIZER DATA:
Sketch AHU, Ductwork
Note Dampers, Actuators, Dimensions

OA 41"x15"





DATE: 12-10-91
BY: CMO

I. AIR HANDLING UNIT SURVEY OBSERVATIONS

BLDG NO: 500 BLDG NAME: O-CLUB JOB: 3105
AHU NO: 8 LOCATION:
ZONE NO. SERVED: 2nd Floor OFFICES & CORR REF. SYS. SERVING AHU: CHLR-1
([ ] VERIFIED ZONE OCCUPANCY AND TEMP. REQUIREMENTS ON SURVEY FORM VI.)
UNIT TYPE: SINGLE ZONE [✓] MULTIZONE [ ] DOUBLE DT [ ] REHEAT [ ]
HEAT & VENT [ ] 2-PIPE FC [ ] 4-PIPE FC [ ] UNIT HT [ ]
OTHER [ ]
MFG: MODEL:
SUPPLY FAN: FAN HP: 2 MFG: MODEL:
CFM: SA 2500 RA OA 600 (MEASURED [ ] ESTIMATED [ ])
PRESENT DAILY STARTUP: M-F TO , SAT TO , SUN TO
STARTUP METHOD: MANUAL [ ] TIMECLOCK [ ] (WORKING, YES [ ] NO [ ])
SEASONAL SWITCHOVER: SUM TO , WIN TO
REQUIRED DAILY STARTUP: M-F TO , SAT TO , SUN TO

COILS: PREHEAT: NONE [✓] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
HEATING: NONE [ ] STM [ ] HW [✓] ELEC [ ] MOD VLV [ ]
REHEAT: NONE [✓] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
HUMID: NONE [✓] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
COOLING: NONE [ ] CW [✓] DX [ ] SPRAY[ ] OTHER [ ]

REMARK:
DAMPERS: OUTSIDE AIR: MAX %, MIN %, DAMPER MTR YES [ ] NO [ ]
RETURN AIR: MAX %, MIN %, DAMPER MTR YES [ ] NO [ ]
RELIEF AIR: MAX %, MIN %, DAMPER MTR YES [ ] NO [ ]
MIXED AIR CONTROL [ ], ECONOMIZER (DB [ ] OR ENTH [ ]) NONE [ ]

REMARKS:
SUPPORT FANS: UNIT RETURN FAN [ ] EXHAUST FAN [ ] OTHER [ ]
FAN HP: MFG: MODEL:
THERMOSTAT TYPE: SINGLE SETPOINT [ ] DUAL SETPOINT [ ] SETBACK [ ]
PNEUMATIC [ ] ELECTRIC/ELECTRONIC [ ] NO. OF ZONES
SETPOINT: OCC HEAT °F UNOCC HEAT °F OCC COOL °F UNOCC COOL °F
RESET CONTROLS: YES [ ] NO [ ], DECK SETPOINT HOT °F COLD °F
DEMAND LIMITING, DUTY CYCLING YES [ ] NO [ ]
REMARKS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPheerson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: CMD
CHECKED BY:
DATE: 12-11-91

BLDG.# 500

HW PUMPS

CIRCULATION PUMPS

RPM	FT HD	GPM	MODEL #	SERIAL #	MFG.	HOURS REQUIRED	HOURS PRESENT	PUMP #
			A68 *	102214 *	Bell & Gossett			1

PUMP MOTORS

VOLTS	AMPS	PHASE	MODEL #	SERIAL #	MFG.	HOURS REQUIRED	HOURS PRESENT	FRAME	MOTOR#
115	2.4	1			Bell & Gossett				1

1/6 hp

COMMENTS: * Numbers are on plate, but not sure which is serial # + which is model #

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPheerson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO. ____ OF ____
CALCULATED BY: CMD
CHECKED BY: ____
DATE: 12-11-91

BLDG.# 500

HW PUMPS

HW PUMPS

RPM	FT HD	GPM	MODEL #	SERIAL #	MFG.	HOURS REQUIRED	HOURS PRESENT	PUMP #
N/A	N/A	N/A	313T	1263510	Bell & Gossett			1

PUMP MOTORS

VOLTS	AMPS	PHASE	MODEL #	SERIAL #	MFG.	HOURS REQUIRED	HOURS PRESENT	FRAME	MOTOR#
5 HP 208	5.5	3	PVF184TTD	NA	Marathon electric			184Jm	1
			R7357AN7						

COMMENTS: Motor P.F. 81

Ft. McPherson / Ft. Gillem Energy Study
EMC # 3105.000

DATE: 12-11-91
BY: CMD

III. BOILER AND CONVERTER SURVEY OBSERVATIONS

BLDG NO: 500 BLDG NAME: O-C146 JOB: _____

BOILER/CONV. NO. _____ LOCATION : _____

BOILER TYPE: STEAM [ ] _____PSI HOT WATER [✓] 130 °F SET POINT

BOILER FUEL: OIL [ ]#____ GAS [✓] ELECTRIC [ ] OTHER [ ] _____

MFG. NO PLATE MODEL _____

CAPACITY:MAX BTUH OUTPUT _____ MAX BTUH INPUT _____

BURNER TYPE: _____

STACK TEMP.:_____°F STACK GAS:_____%O2 _____%CO COIN.LOAD_____LBS/HR

SEASONAL SWITCHOVER: SUM_____TO_____, WIN_____TO_____

CONTROL MFG. AND TYPE:

CONVERTER : STEAM TO HW [ ]_____°F SET POINT

HTHW TO HW [ ]_____°F SET POINT

HTHW TO STEAM [ ]_____PSI

OUTSIDE UTILITIES: STEAM [ ] _____PSI - FROM PLANT:_____

HTHW [ ] _____°F - FROM PLANT:_____

OTHER [ ] _____

CONVERTER: USE_____RATING_____

HW PUMPS: NO. OF PUMPS_____ PUMP 1 HP_____ PUMP 2 HP_____

PUMP 3 HP_____ PUMP 4 HP_____

PRESENT DAILY STARTUP: M-F_____TO_____,SAT_____TO_____,SUN_____TO_____

STARTUP METHOD: MANUAL [ ] TIMECLOCK [ ] (WORKING YES [ ] NO [ ])

SEASONAL SWITCHOVER: SUM_____TO_____, WIN_____TO_____

REQUIRED DAILY STARTUP:M-F_____TO_____,SAT_____TO_____,SUN_____TO_____

TEMPERATURE CONTROL MFG. AND TYPE:

STEAM SUPPLY HEADER SIZE:_____INCHES DIA.

HW SUPPLY SIZE:_____IN DIA., HW RETURN SIZE:_____IN DIA.

REMARKS:

DATE: 12-10-91
BY: KC

IV. REFRIGERATION EQUIPMENT SURVEY OBSERVATIONS

BLDG NO: 500 BLDG NAME: O CLUB JOB: 3105.000
CHILLER/COMPRESSOR NO: 1 LOCATION: SOUTH END OUTSIDE
REFRIG. EQUIP. TYPE: CENTRIFUGAL [ ] RECIPROCATING [✓] ABSORBTION [ ]
OTHER [ ]
CW [✓] DX [ ] OTHER [ ]
MANUFACTURER: MCQUAY MODEL NO. ALR094AD
SERIAL NO. 3QD000604 14
(2) COMPRESSORS NAMEPLATE: 208 VOLTS 195 AMPS 3 PH 60 HZ 60 Hp EACH
CAPACITY: 90.6 (TONS) CHW TEMP: SUPPLY ____ °F RETURN ____ °F

AHU'S SERVED: ____

PRESENT DAILY STARTUP: M-F ____ TO ____, SAT ____ TO ____, SUN ____ TO ____
STARTUP METHOD: MANUAL [ ] TIMECLOCK [ ] (WORKING YES [ ] NO [ ])
SEASONAL SWITCHOVER: SUM ____ TO ____, WIN ____ TO ____
REQUIRED DAILY STARTUP: M-F ____ TO ____, SAT ____ TO ____, SUN ____ TO ____

CONDENSING EQUIP.: AIR COOLED [✓] EVAP. [ ] WINTERIZED [ ]
WATER COOOLED [ ] 3-WAY VALVE [ ] NO. OF CELLS [ ]
OTHER [ ]
MANUFACTURER: ____ MODEL NO. ____
SERIAL NO. ____
NO. OF FANS 8, EACH FAN: 208 VOLTS 5.2 AMPS 3 PH 60 HZ 1.5 Hp
CAPACITY: ____ (TONS) CNW TEMP: SUPPLY ____ °F RETURN ____ °F

SYSTEM AUXILLARIES:
PUMPS: CHW PUMP [✓] 208 VOLTS ____ AMPS 3 PH 60 HZ 5 Hp 1740 RPM
CNW PUMP [ ] ____ VOLTS ____ AMPS ____ PH ____ HZ ____ HP ____ RPM
CAT # M317 FRAME 184JM
MODEL WD184TTDR7357BP MARATHON.
TEMP. CONTROLS MFG. AND TYPE ____

CHILLER INTERLOCKS WITH CHW PUMP [ ] CNW PUMP [ ] OTHER [ ] ____

CONTROL PANEL INDICATIONS:	HI (LGTS)	LO (LGHTS)	GAUGES
MOTOR TEMP	[ ]	[ ]	[ ]
REFRIG TEMP	[ ]	[ ]	[ ]
COND TEMP	[ ]	[ ]	[ ]
OIL TEMP	[ ]	[ ]	[ ]
OIL PRESS	[ ]	[ ]	[ ]
OTHER ____			

REMARKS: PACKAGE UNIT

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO. ____ OF ____
CALCULATED BY: KC
CHECKED BY: ____
DATE: 12-11-91

BLDG.# 500
EC0 15

LIGHTING

ROOM #	# OF FIXTURES	LAMPS/ FIXTURE	WATTS/ BULB	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCC. SENSOR	NO. OF SWITCHES	UNOCC LIGHTS ON
1	8	1	60	INC.	OFF	Y	NO	1	
2	4	10	25	INC.	ON	Y	NO	1	
2	12	1	50	INC.	ON	Y	NO	1	
2	5	1	50	INC.	ON	Y	↓	1	
2	3	1	50	INC.	ON	Y	↓	1	
3	4	1	60	↓	ON	Y	NO	1	
3	1	7	60	↓	ON	Y	Y	1	
3	2	5	60	↓	ON	Y	Y	1	
4	4	2	25	INC	ON	Y	N	1	
4					ON	Y	N	1	
4	3 4	10 1	25 60	INC.	ON	Y	N	1	
5	5	1	60	INC	ON	Y	N	1	
5	1	1	60	INC	OFF	Y	X	1	
6	3 3	8 2	25 25	INC.	ON ~~OFF~~	Y	Y	1	
6	9	1	50	INC.	ON	Y	Y	1	
~~7~~	2	2	34	FLOR.	ON	Y	Y	1	
8	4	1	50	INC.	ON	Y	N	1	
9	11	1	50	INC.	ON	Y	N	1	

OF EXIT SIGNS – ____

COMMENTS: ____

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: KC
CHECKED BY:
DATE: 12-11-91

BLDG.# 500
EC0 15

LIGHTING

ROOM #	# OF FIXTURES	LAMPS/ FIXTURE	WATTS/ BULB	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCC. SENSOR	NO. OF SWITCHES	UNOCC LIGHTS ON
10	9	1	50	INC.	ON	Y	NO	1	
10	3	2	25	INC.	ON	Y	NO	1	
11	4	2	34	FLOR.	ON	Y	NO	1	
14	4	2	34	FLOR.	ON	Y	Y	1	
15	10	1	25	INC	ON	Y	N	1	
15	5	5	25	INC.	ON	Y	N	1	
15	14	1	50	INC.	ON	Y	N	1	

OF EXIT SIGNS – _____

COMMENTS: _____

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: emc # 3105.000
SHEET NO.: _____ OF _____
CALCULATED BY: cmb
CHECKED BY: _____
DATE: 12-11-91

BLDG.# 500
2nd Floor

LIGHTING

ROOM #	# OF FIXTURES	LAMPS/ FIXTURE	WATTS/ BULB	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCC. SENSOR	NO. OF SWITCHES	UNOCC LIGHTS ON
ENT	4	1	60	IN	ON				
H2	5	1	60	I	ON	Y	N		
ENT	2	2		FI u	ON	Y	N		
ENT	2	2	25	I	ON	Y	N		
9	2	2	40	FI 4Ft	ON	Y	Y	1	—
H1	5	1	50	I	ON	Y	N		
1	3	2	40	FI 4Ft	ON	Y	N		
1	1	1	50	I	ON	Y	N		
2	5	5	25	I	ON	Y	N		
3	1	2		FI u	ON	Y	N		
3a	2	2	40	FI	ON	Y	Y-move switch	1	—
H3	4	1	50	I	ON	Y	No		
4a	1	4	40	F 4Ft	OFF	Y	Y	1	.
4	1	4	40	FI 4Ft	ON	Y	Y	1	✓
7	3	2	40	FI 4Ft	ON	Y	Y	1	
7a	2	4	40	FI 4Ft	ON	Y	Y	1	✓
8	1	2		FI u	ON	Y	Y	1	
8	1	8	54	I	ON	Y	Y		
8	1	4	40	FI 4Ft	ON	Y	Y	1	

OF EXIT SIGNS – 4

COMMENTS: _____

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB Ft. McPherson/Ft. Gillem Energy Study
PROJ.# Emc # 3105.000
SHEET NO. _____ OF _____
CALCULATED BY: _____
CHECKED BY: _____
DATE: _____

BLDG.# 500 OFFICER CLUB

LIGHTING

ROOM #	# OF FIXTURES	LAMPS/ FIXTURE	WATTS/ BULB	BULB TYPE	ON/OFF DURING SURVEY	SWITCH YES/NO	GOOD FOR OCC. SENSOR	NO. OF SWITCHES	UNOCC LIGHTS ON
ANNEX	36	1	60	INC.	ON	3 YES	NO	4 DIMMER	YES
ANNEX	40	1	50	INC.	ON	YES	NO	2 DIMMER	YES.

OF EXIT SIGNS – _____

COMMENTS: _____

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____

SHEET NO. _____ OF _____

CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____

SCALE _____

500

DTWC 1 & 2

Bohn

~~SEP~~ MOD# 120DA-4
208 V 41A 3Ø 60Hz

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB
SHEET NO. OF
CALCULATED BY DATE
CHECKED BY DATE
SCALE

500

DTWC-3 ANNEX

No Plate

MOTOR - No plate ≈ ½-1 hp

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB 3105.000

SHEET NO. _____ OF _____

CALCULATED BY LEC DATE 12-1-91

CHECKED BY [illegible] DATE _____

SCALE BUILDING 500

CHWPUMP

PEERLESS PUMP
SERIES C
STYLE M
TYPE 825A
DESIGN DB
IMP. NO. 2683738
DIA. 7.75.

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB 3105-000

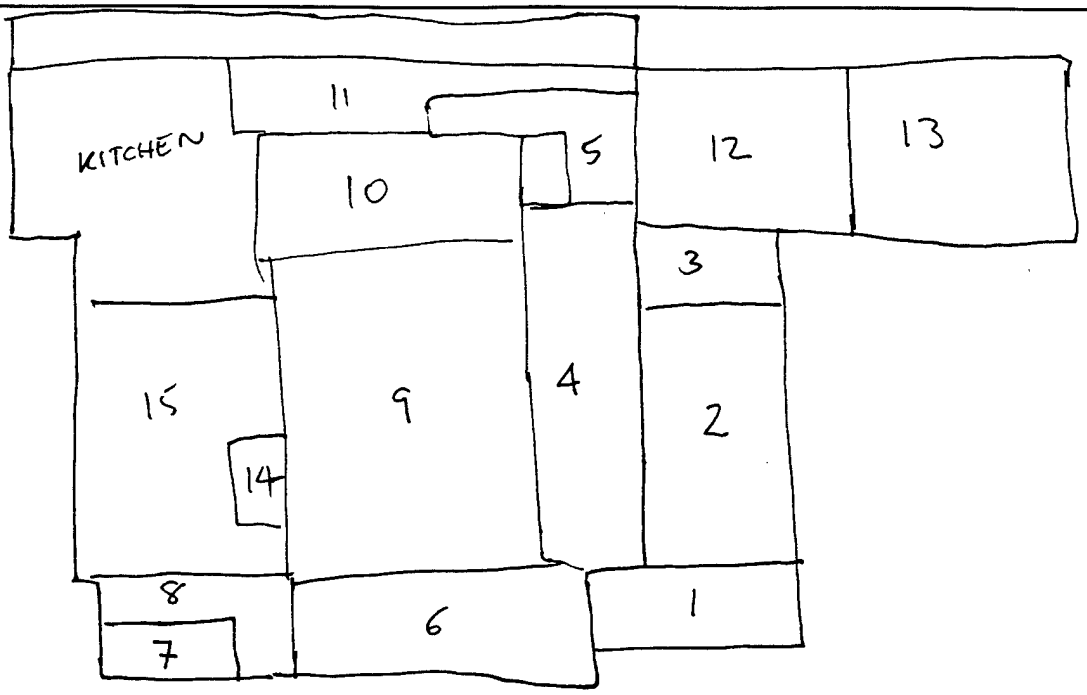
SHEET NO. _____ OF _____

CALCULATED BY KC DATE 12-11-91

CHECKED BY _____ DATE _____

SCALE _____

Building 500



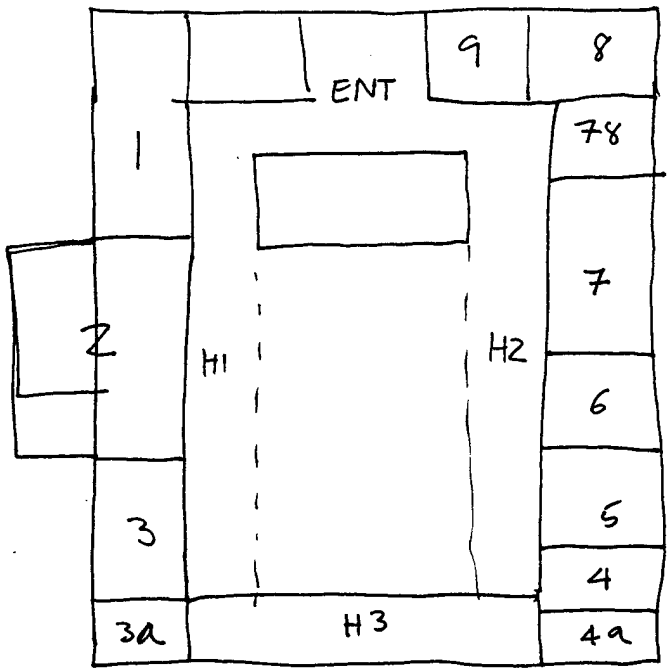
FIRST FLOOR.

Light load: ~~8405 W~~ 12205 W

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB 3105-000
SHEET NO. _____ OF _____
CALCULATED BY KC DATE 12-11-91
CHECKED BY _____ DATE _____
SCALE _____

Building 500



UPSTAIR

Light: 3664 w

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

Bldg 500 2nd Floor Lighting

JOB

SHEET NO. OF

CALCULATED BY CMD DATE 12-11-91

CHECKED BY DATE

SCALE NTS

4 computer printer TV

7 computer, copy mach., printer, intercom system

1 coffeepot, Big Refrig., Tea Brewer, 1 WAC unit

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____

SHEET NO. _____ OF _____

CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____

SCALE _____

BLDG. 500 ANNEX

3+7 TVs SKY LIGHT

1 JUNK BOX

1 EXIT SIGN.

3 CASH REGISTERS

1 ICE MACHINE

1 SOUND SYSTEM AMP+TAPE REEL VCR+CASSETT TAPE +EQ.

2 LED BOARD

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB _____

SHEET NO. _____ OF _____

CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____

SCALE _____

SERVING
11 – 2:00 PM M-F
BAR 4 - 8:00 M–T
F 4–11:00 F
SAT PRIVATE FUNCTION
SUN 4–8:00

M–F
7:30 - 5:00

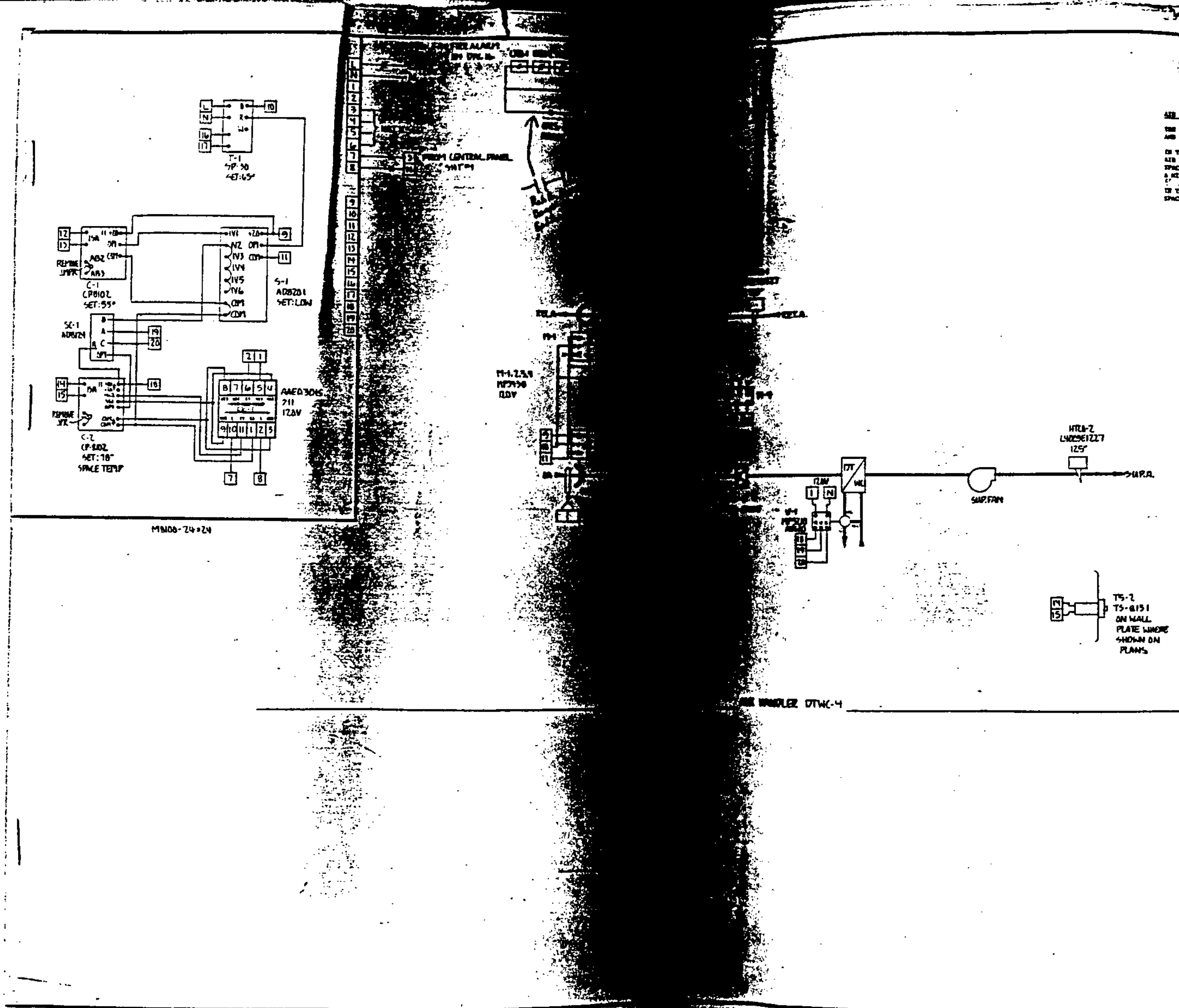
PARTY PRIVATE

UP TO 200
AVG. 50–75

WORKING

- NORMAL 16-20 PEOPLE MORNING

MEAL SERVE 250–300 MEALS



GENERAL NOTES AND EQUIPMENT SCHEDULE

SEQUENCE OF OPERATION

AIR HANDLER DTWC-4

THE SUPPLY FAN IS STARTED BY THE UNCS SUBJECT TO HIGH TEMPERATURE CUT-OUTS HTCO-1 AND 2 AND LOW TEMPERATURE CUT-OUT LTCO-1.

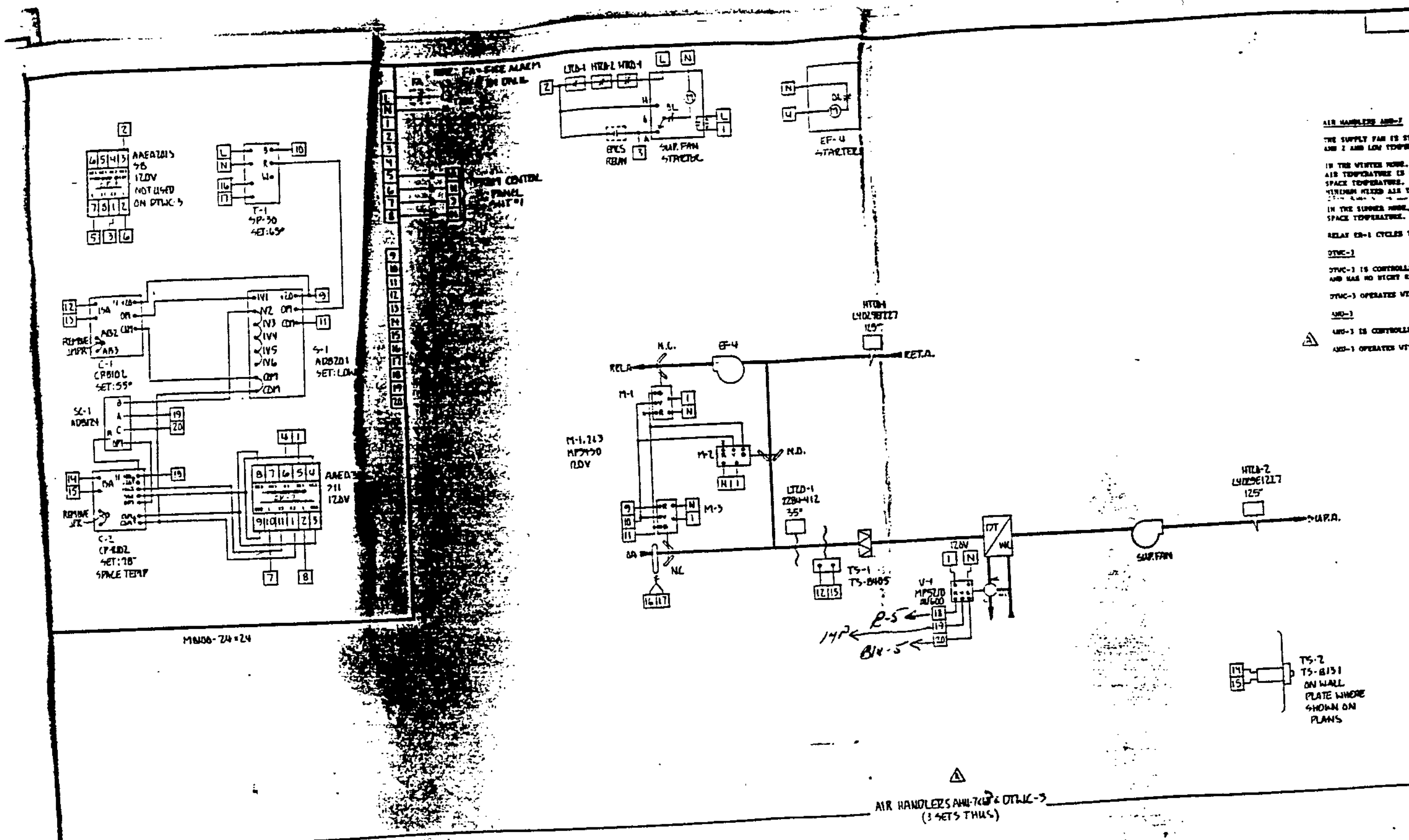
IN THE WINTER MODE, SPACE TEMPERATURE CONTROLLER C-2 MODULATES V-1 AND WHEN OUTSIDE AIR TEMPERATURE IS BELOW 63°, DAMPER MOTORS M-1, 2, 3, AND 4 IN SEQUENCE TO MAINTAIN SPACE TEMPERATURE. C-1 CAN OVERRIDE C-2 THROUGH SELECTOR RELAY S-1 TO MAINTAIN A MINIMUM MIXED AIR TEMPERATURE OF 55°.

IN THE SUMMER MODE, C-2 MODULATES V-1 ALONE TO MAINTAIN SPACE TEMPERATURE.

SHEARER CONTROL SYSTEMS INC.

JOB NAME	BLDG. 500 RENOVATION
LOCATION	FORT MCPHERSON, GA
ARCHITECT	
ENGINEER	
CONTRACTOR	PATKEN
DRAWN BY	L. HALDEN
CHECKED BY	
DATE	5-30-85

DATE	CHANGE
9-4-85	AS-BUILT



SEQUENCE OF OPERATION

AIR HANDLERS AHU-7

THE SUPPLY FAN IS STARTED BY THE EMCS SUBJECT TO HIGH TEMPERATURE CUT-OUTS HTCO-1 AND 2 AND LOW TEMPERATURE CUT-OUT LTCO-1.

IN THE WINTER MODE, SPACE TEMPERATURE CONTROLLER C-1 MODULATES V-1 AND, WHEN OUTSIDE AIR TEMPERATURE IS BELOW 65°, DAMPER MOTORS M-1, 2 AND 3 IN SEQUENCE TO MAINTAIN SPACE TEMPERATURE. C-1 CAN OVERRIDE C-2 THROUGH SELECTOR RELAY S-1 TO MAINTAIN A MINIMUM MIXED AIR TEMPERATURE OF 55°.

IN THE SUMMER MODE, C-2 MODULATES V-1 ALONE TO MAINTAIN SPACE TEMPERATURE.

RELAY ER-1 CYCLES THE UNIT AT NIGHT TO MAINTAIN A REDUCED UNOCCUPIED SETPOINT.

DTUC-3

DTUC-3 IS CONTROLLED EXACTLY THE SAME AS AHU-7 EXCEPT IT IS NOT CYCLED ON AT NIGHT AND HAS NO NIGHT RELAY.

DTUC-3 OPERATES WITH EF-1.

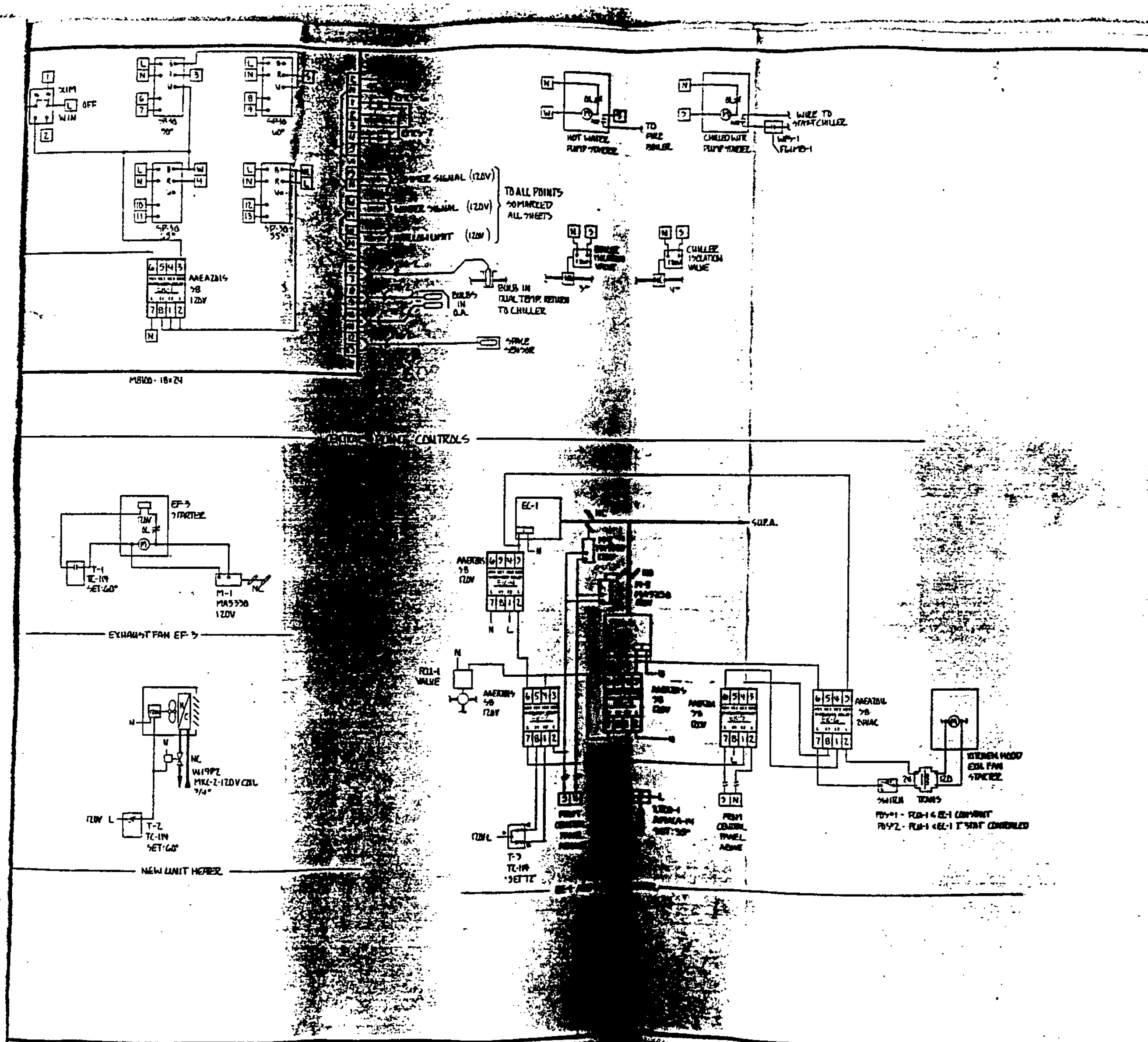
AHU-3

AHU-3 IS CONTROLLED EXACTLY THE SAME AS AHU-7.

AHU-3 OPERATES WITH EF-5

SHEARER CONTROL SYSTEMS INC

DATE / CHANGE	6-11-95 REVISE; 9-1-95 AS BUILT
JOB NAME	BLDG 500 RENOVATION
LOCATION	FORT MCPHERSON, GA
ARCHITECT	
ENGINEER	
CONTRACTOR	PATKEN
DRAWN BY	L. WALDEN
CHECKED BY	
DATE	5-30-95
DRAWING NO.	SHT 4 of 5



GENERAL NOTES AND EQUIPMENT SCHEDULE

SEQUENCE OF OPERATION

CENTRAL PLANT CONTROLS

THE SYSTEM IS CHANGED TO THE SUMMER OR WINTER MODE BY SWITCH S-1 SUBJECT TO THE EXISTING EMCS SYSTEM.

WITH S-1 IN THE WINTER POSITION, AND EMCS RELAY #7 ENERGIZED, THE WINTER MODE IS SELECTED. IF THE OUTSIDE AIR TEMPERATURE IS BELOW 65°, THE HOT WATER PUMP IS [illegible] THROUGH A N.O. AUXILIARY CONTACT. THE BOILER CONTROLS ARE ACTIVATED TO FIRE THE [illegible] THE BOILER AND CHILLER ISOLATION VALVES REMAIN IN THEIR NORMAL POSITIONS.

WHEN S-1 IS SWITCHED TO THE SUMMER POSITION, AND EMCS RELAY #6 IS ENERGIZED, A THERMOSTAT SENSING CHILLED WATER RETURN, STOPS THE BOILER BUT ALLOWS THE SYSTEM TO STAY IN THE WINTER MODE UNTIL THE CHILLED WATER RETURN DROPS BELOW 90°. WITH THE CHILLED WATER RETURN BELOW 90° AND OUTSIDE AIR TEMPERATURE ABOVE 60°, THE HOT [illegible] PUMP STOPS, THE ISOLATION VALVES POSITION FOR CHILLED WATER FLOW. THE CHILLED [illegible] PUMP STARTS AND THE CHILLER IS INTERLOCKED TO START THROUGH AUXILIARY CONTACTS [illegible] FLOW SWITCH WFS-1. FURTHER, ALL BUILDING AIR HANDLERS ARE INDEXED TO THE "COOL[illegible] MODE.

IN THE OFF POSITION OF S-1, A THERMOSTAT SENSING SPACE TEMPERATURE CYCLES THE [illegible] AND PUMP AND SELECTED AIR HANDLERS TO MAINTAIN A MINIMUM UNOCCUPIED SETPOINT.

EXHAUST FAN EF-3

EF-3 IS CYCLED BY ROOM THERMOSTAT T-1. MOTOR M-1 OPENS THE INLET DAMPER WHEN [illegible] RUNS.

NEW UNIT HEATER

T-2 CYCLES THE UNIT HEATER FAN AND COIL ISOLATION SOLENOID TO MAINTAIN SPACE TE[illegible]

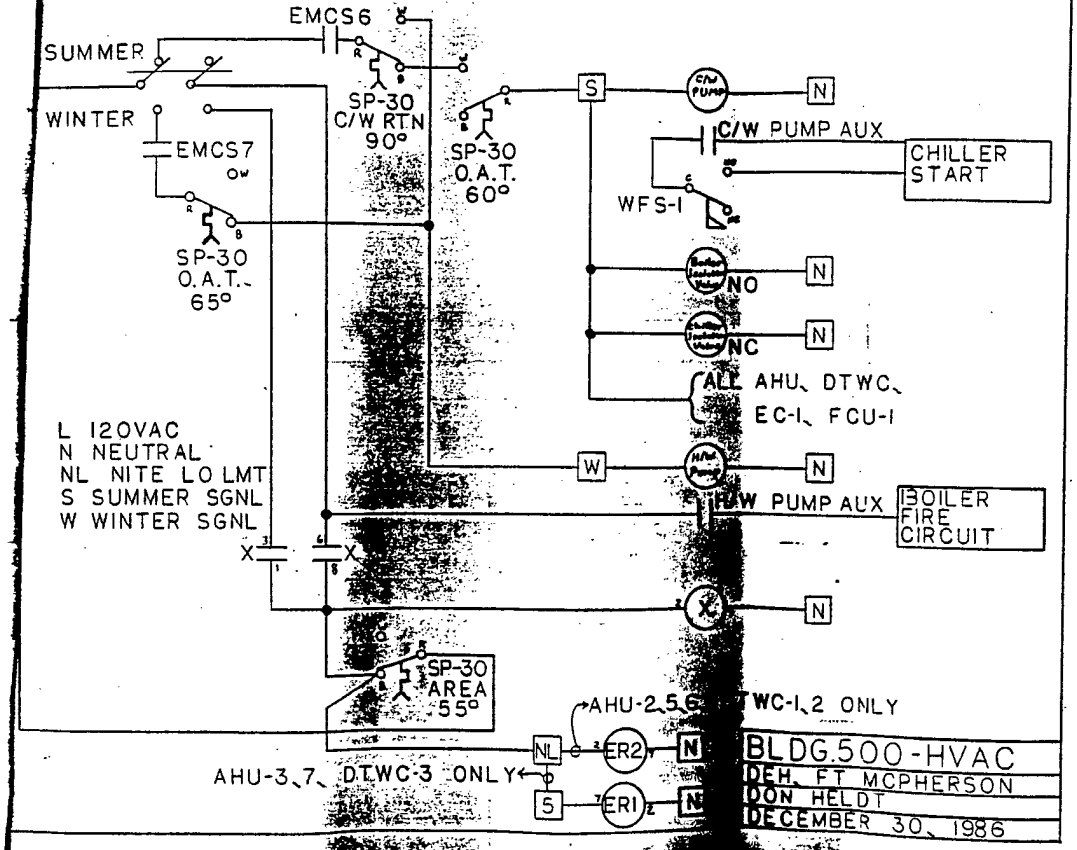
EC-1 AND FCU-1
SWITCH IN POS #1
T-3 CYCLES EC-1 OR FCU-1 (AS SELECTED BY THE CENTRAL CONTROLS THROUGH EB-2) TO [illegible] SPACE TEMPERATURE. ISOLATION DAMPER MOTORS ARE POSITIONED ACCORDINGLY BY CENTRAL CONTROLS.

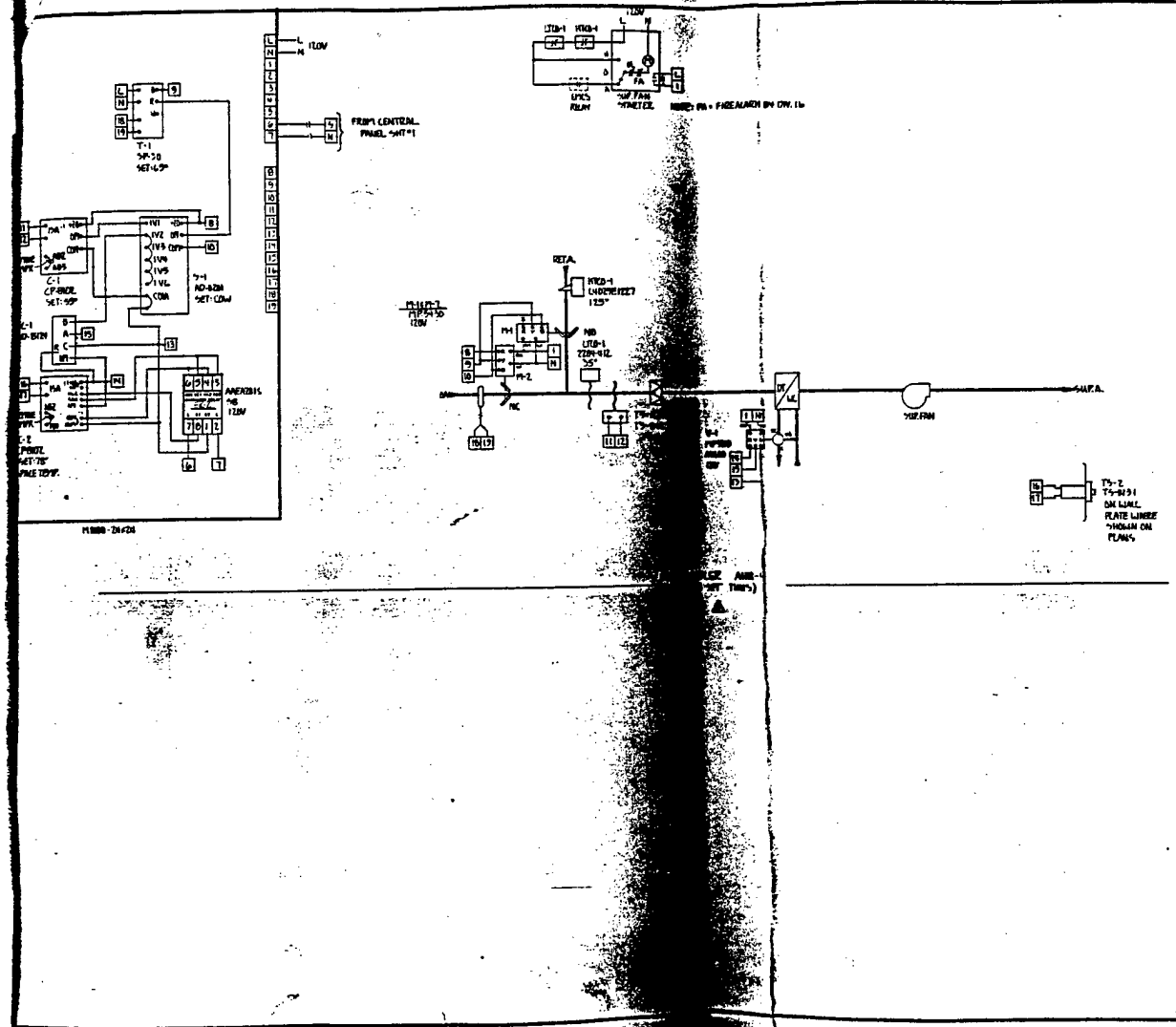
SWITCH IN POS#2
EC-1 OR FCU-1 (AS SELECTED BY CENTRAL CONTROLS) RUNS WITH THE KITCHEN EXHAUST FAN. ISOLATION DAMPERS ARE POSITIONED ACCORDING[illegible] BY CENTRAL CONTROLS.
[illegible] STOPS FCU-1 IF DISCHARGE TEMP FALLS BELOW 35°

SHEARER CONTROL SYSTEMS IN[C]

REVISIONS			
DATE	CHANGE	JOB NAME	BLDG 500 RENOVATION
6-29-95	AS BUILT	LOCATION	FORT McPHERSON, GA
		ARCHITECT	
		ENGINEER	
		CONTRACTOR	PATKEN
		DRAWN BY	L.L.WALDEN
		CHECKED BY	LW
		DATE	5-24-95

DRAWING NO. SHT 1 of 5


EMCS6
SUMMER
WINTER
EMCS7
SP-30
C/W RTN
90°
SP-30
O.A.T.
60°
SP-30
O.A.T.
65°
S
N
C/W PUMP
C/W PUMP AUX
CHILLER
START
WFS-1
NO
NC
ALL AHU, DTWC,
EC-1, FCU-1
W
HW PUMP
HW PUMP AUX
BOILER
FIRE
CIRCUIT
L 120VAC
N NEUTRAL
NL NITE LO LMT
S SUMMER SGNL
W WINTER SGNL
X
SP-30
AREA
55°
AHU-2,5,6
DTWC-1,2 ONLY
NL
ER2
AHU-3,7, DTWC-3 ONLY
5
ER1
BLDG 500-HVAC
DEH, FT MCPHERSON
DON HELDT
DECEMBER 30, 1986



GENERAL NOTES AND EQUIPMENT SCHEDULE

SEQUENCE OF OPERATION

AIR HANDLER AHU-1

THE SUPPLY FAN IS STARTED BY THE DDC AND RUNS INDIRECT TO KEEP TEMPERATURE CUT-OUT HTCO-1 AND LOW TEMPERATURE CUT-OUT LTCO-1.

TO THE HEATING MODE AS SELECTED BY CENTRAL CONTROLS AND EN-2. SPACE TEMPERATURE CONTROLLER C-1 MODULATES VALVE V-1 AND, WHEN OUTSIDE AIR TEMPERATURE IS BELOW 55°, DAMPER MOTORS M-1 AND M-2 IN SEQUENCE TO MAINTAIN SPACE TEMPERATURE. CONTROLLER C-1 CAN OVERRIDE C-2 THROUGH SELECTOR RELAY S-1 TO MAINTAIN A MINIMUM MIXED AIR TEMPERATURE OF 55°.

TO THE COOLING MODE, C-2 MODULATES V-1 ALONE TO MAINTAIN SPACE TEMPERATURE.

SHEARER CONTROL SYSTEMS INC.

BLDG. 500 RENOVATION

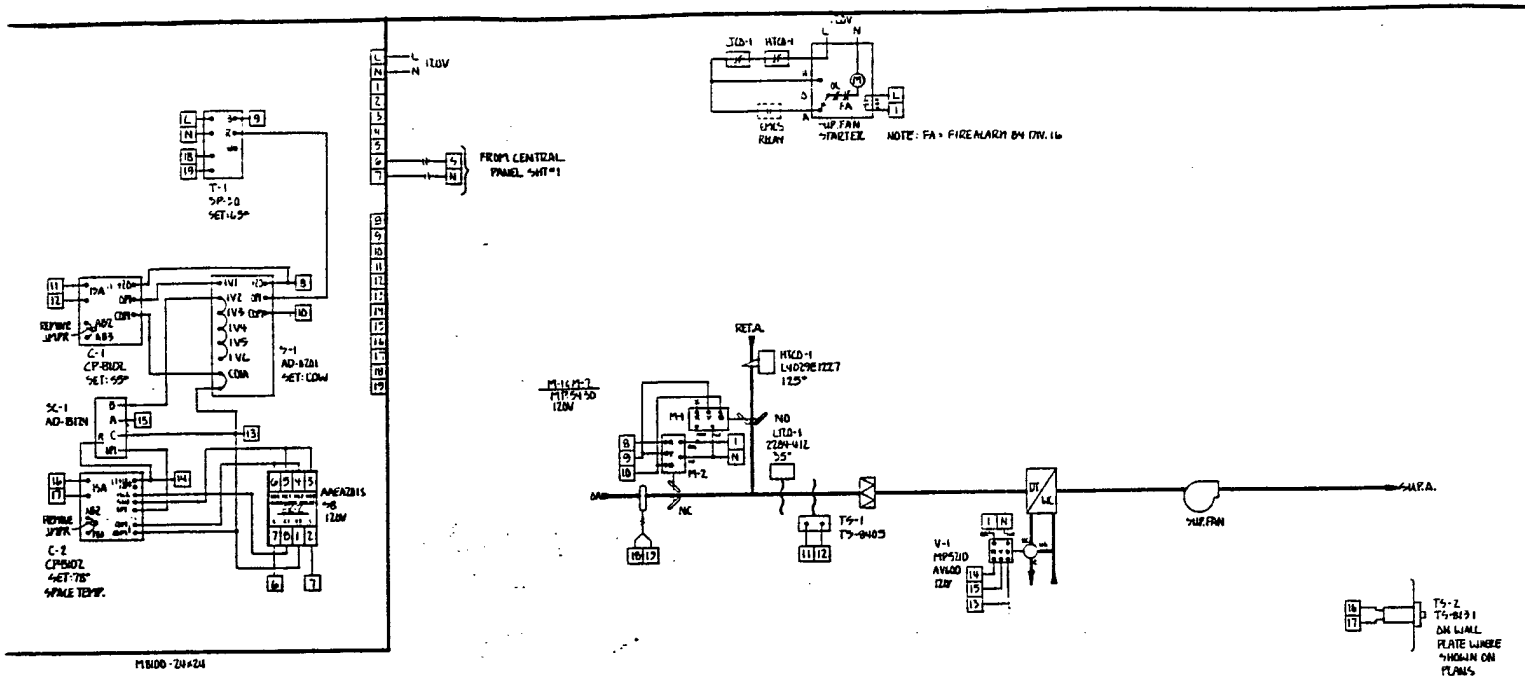
FORT MCPHERSON, GA

PATTERN

L.WALDEN

5-30-95

SHT 3 of 5



AIR HANDLER AHU-4
(1 SET THIS)

GENERAL NOTES AND EQUIPMENT SCHEDULE

SEQUENCE OF OPERATION

AIR HANDLER AHU-4

THE SUPPLY FAN IS STARTED BY THE DDCS AND RUNS SUBJECT TO HIGH TEMPERATURE CUT-OUT HTCD-1 AND LOW TEMPERATURE CUT-OUT LTCD-1.

IN THE HEATING MODE AS SELECTED BY CENTRAL CONTROLS AND EX-1, SPACE TEMPERATURE CONTROLLER C-2 MODULATES VALVE V-1 AND, WHEN OUTSIDE AIR TEMPERATURE IS BELOW 65°, DAMPER MOTORS M-1 AND M-2 IN SEQUENCE TO MAINTAIN SPACE TEMPERATURES. CONTROLLER C-1 CAN OVERRIDE C-2 THROUGH SELECTOR RELAY S-1 TO MAINTAIN A MINIMUM MIXED AIR TEMPERATURE OF 55°.

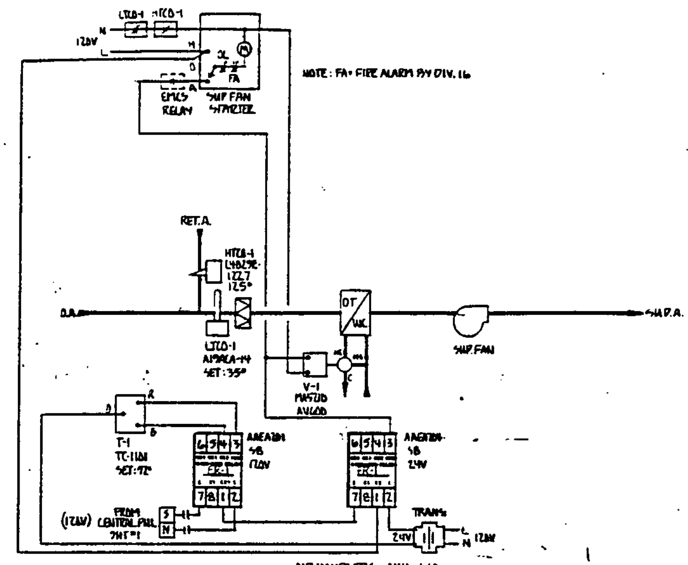
IN THE COOLING MODE, C-2 MODULATES V-1 ALONE TO MAINTAIN SPACE TEMPERATURES.

Building 500

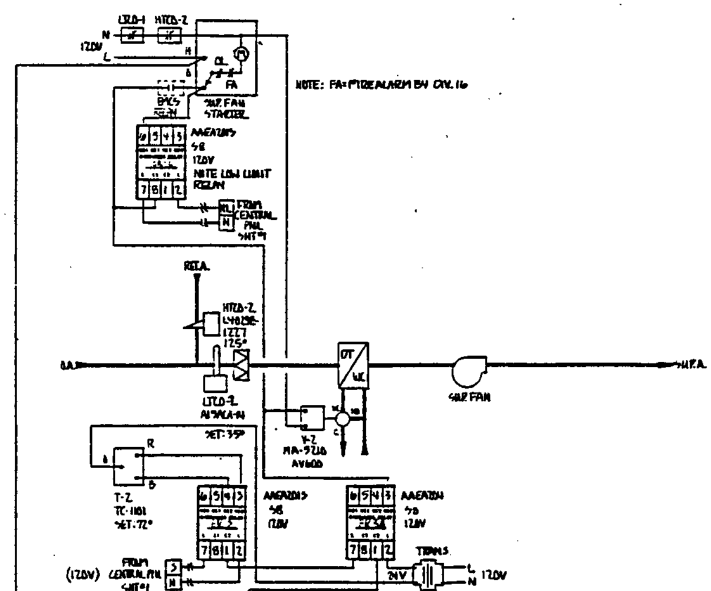
SHEARER CONTROL SYSTEMS INC.

DATE	CHANGES
4-4-85	SET SUB
5-1-85	AS BUILT

BLDG. 500 RENOVATION
FORT MCPHERSON, GA
PATTEN
L. WALDEN
5-30-85
SHT 3 of 5



AIR HANDLERS AHU-1&8.
(2 SETS THUS)



AIR HANDLERS AHU-2,5,6, DTWC-1&2
(5 SETS THUS)

GENERAL NOTES AND EQUIPMENT SCHEDULE

SEQUENCE OF OPERATION

AIR HANDLERS AHU-1 AND 8

ROOM THERMOSTAT T-1 CYCLES THE AIR HANDLER SUPPLY FAN AND UNIT VALVE SUBJECT TO CENTRAL CONTROLS RELAY CR-1 AND THE EMCS TO MAINTAIN SPACE TEMPERATURE.

AIR HANDLERS AHU-2, 3, 5, 6, DTWC-1 AND 2

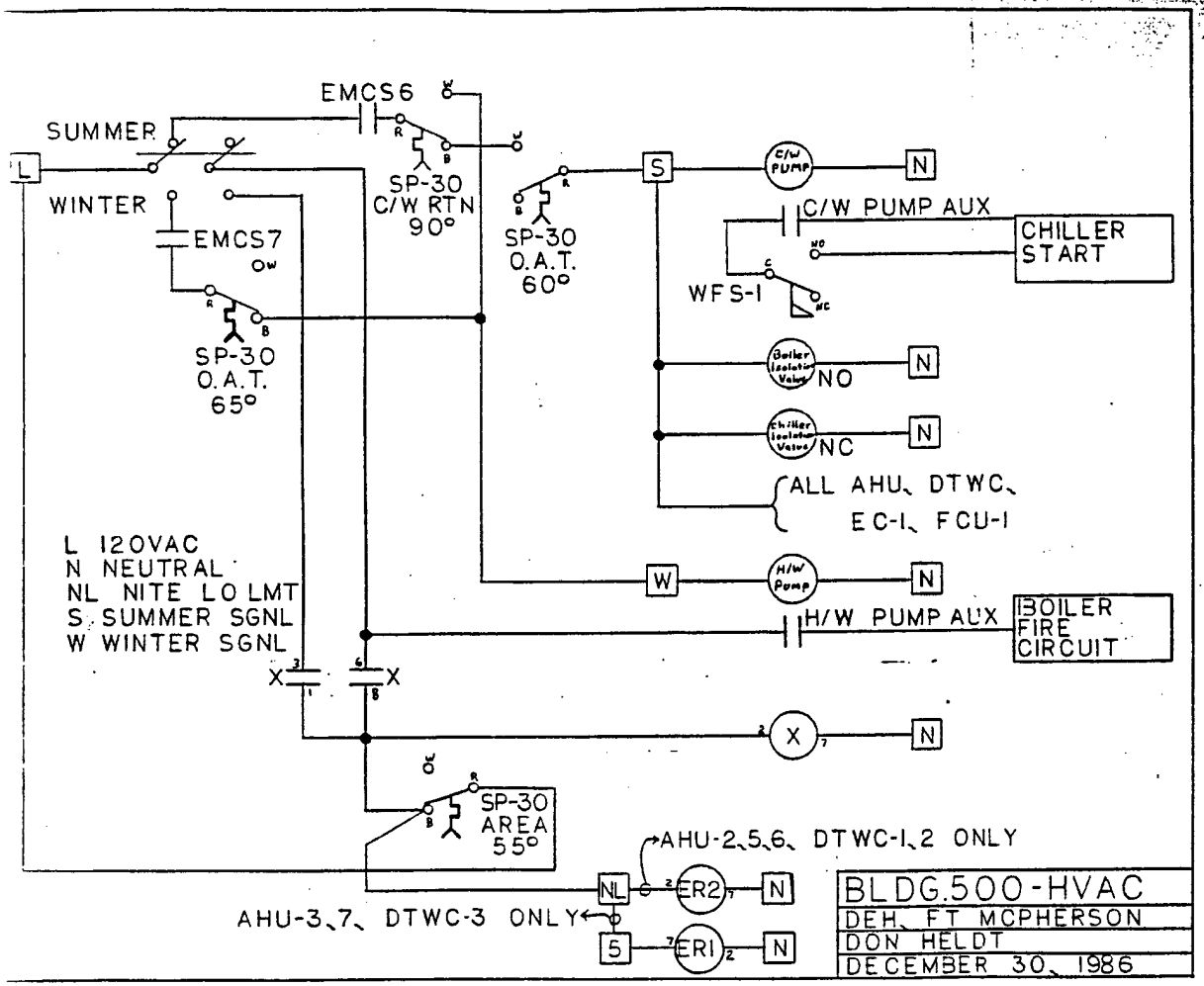
ROOM THERMOSTAT T-2 CYCLES THE AIR HANDLER SUPPLY FAN AND UNIT VALVE SUBJECT TO CR-1 AND THE EMCS TO MAINTAIN SPACE TEMPERATURE.

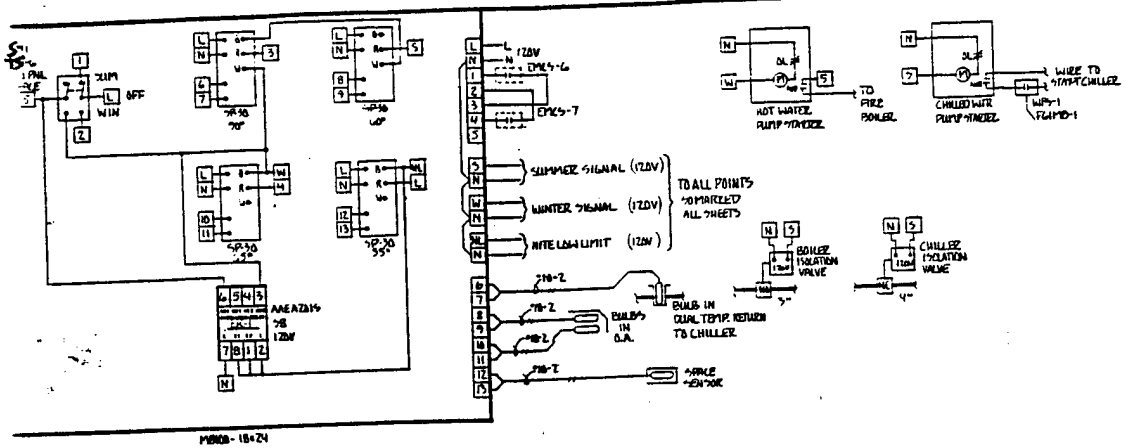
NIGHT RELAY CR-2 OVERRIDES THE OFF POSITION OF THE EMCS TO MAINTAIN A REDUCED NIGHT SETPOINT.

LOW TEMP CUTOUTS LTCO-1 & LTCO-2 STOP [illegible] SUPPLY FANS IF MIXED AIR TEMP. FALLS BELOW 35°

SHEARER CONTROL SYSTEMS INC.

REVISIONS — DATE / CHANGE	8-8-95 AS BUILT
JOB NAME	BLDG. 700 RENOVATION
LOCATION	FORT McPHERSON, GA
ARCHITECT	
ENGINEER	
CONTRACTOR	PATKEN
DRAWN BY	L. WALDEN
CHECKED BY	
DATE	5-29-95
DRAWING NO.	SHT. 2 of 5


EMCS6
SUMMER
L
WINTER
EMCS7
SP-30
O.A.T.
65°
SP-30
C/W RTN
90°
SP-30
O.A.T.
60°
S
C/W PUMP
N
C/W PUMP AUX
CHILLER
START
WFS-1
Boiler Isolation Valve
NO
N
Chiller Isolation Valve
NC
N
ALL AHU, DTWC,
EC-1, FCU-1
L 120VAC
N NEUTRAL
NL NITE LO LMT
S SUMMER SGNL
W WINTER SGNL
W
H/W Pump
N
H/W PUMP AUX
BOILER
FIRE
CIRCUIT
X
X
X
N
SP-30
AREA
55°
AHU-2,5,6, DTWC-1,2 ONLY
NL
ER2
N
AHU-3,7, DTWC-3 ONLY
5
ER1
N
BLDG.500-HVAC
DEH, FT MCPHERSON
DON HELDT
DECEMBER 30, 1986



GENERAL NOTES AND EQUIPMENT SCHEDULE

SEQUENCE OF OPERATION

CENTRAL PLANT CONTROLS

THE SYSTEM IS INDICATED TO THE SUMMER OR WINTER MODE BY SWITCH S-1 SUBJECT TO THE EXISTING DDCS SYSTEM.

WITH S-1 IN THE WINTER POSITION, AND SPACE RELAY #7 ENERGIZED, THE WINTER MODE IS SELECTED. IF THE OUTSIDE AIR TEMPERATURE IS BELOW 65°, THE HOT WATER PUMP IS STARTED THROUGH A N.O. AUXILIARY CONTACT. THE BOILER CONTROLS ARE ACTIVATED TO FIRE THE BOILER. THE BOILER AND CHILLER ISOLATION VALVES REMAIN IN THEIR NORMAL POSITIONS.

WHEN S-1 IS SWITCHED TO THE SUMMER POSITION, AND SPACE RELAY #6 IS ENERGIZED, A THERMOSTAT SENSING CHILLED WATER RETURN, STOPS THE BOILER BUT ALLOWS THE SYSTEM TO STAY IN THE WINTER MODE UNTIL THE CHILLED WATER RETURN DROPS BELOW 70°. WITH THE CHILLED WATER RETURN BELOW 70° AND OUTSIDE AIR TEMPERATURE ABOVE 60°, THE HOT WATER PUMP STOPS. THE ISOLATION VALVES POSITION FOR CHILLED WATER FLOW. THE CHILLED WATER PUMP STARTS AND THE CHILLER IS INTERLOCKED TO START THROUGH AUXILIARY CONTACTS AND FLOW SWITCH WPS-1. FURTHER, ALL BUILDING AIR HANDLERS ARE INDICATED TO THE "COOLING" MODE.

IN THE OFF POSITION OF S-1, A THERMOSTAT SENSING SPACE TEMPERATURE CYCLES THE BOILER AND PUMP AND SELECTED AIR HANDLERS TO MAINTAIN A MINIMUM UNOCCUPIED SETPOINT.

CERAMIC FAN EF-3

EF-3 IS CYCLED BY ROOM THERMOSTAT T-1. MOTOR M-1 OPENS THE INLET DAMPER WHEN EF-3 RUNS.

UNIT HEATER

T-2 CYCLES THE UNIT HEATER FAN AND COIL ISOLATION SOLENOID TO MAINTAIN SPACE TEMPERATURE.

EC-1 AND FCU-1

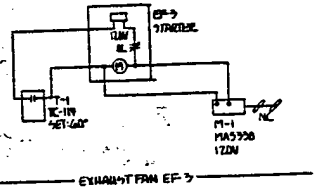
T-3 LOCATED OUT OF FCU-1 (AS SELECTED BY THE CENTRAL CONTROLS THROUGH KA-3) TO MAINTAIN SPACE TEMPERATURE. ISOLATION DAMPER MOTORS ARE POSITIONED ACCORDINGLY BY CENTRAL CONTROLS.

SWITCH IN POS #2

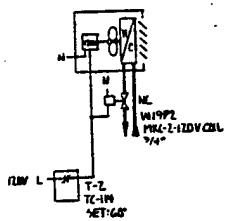
EC-1 OR FCU-1 (AS SELECTED BY CENTRAL CONTROLS) RUNS WITH THE KITCHEN EXHAUST FAN. ISOLATION DAMPERS ARE POSITIONED ACCORDINGLY BY CENTRAL CONTROLS.

LTLO-1 STOPS FCU-1 IF DISCHARGE TEMP FALLS BELOW 35°

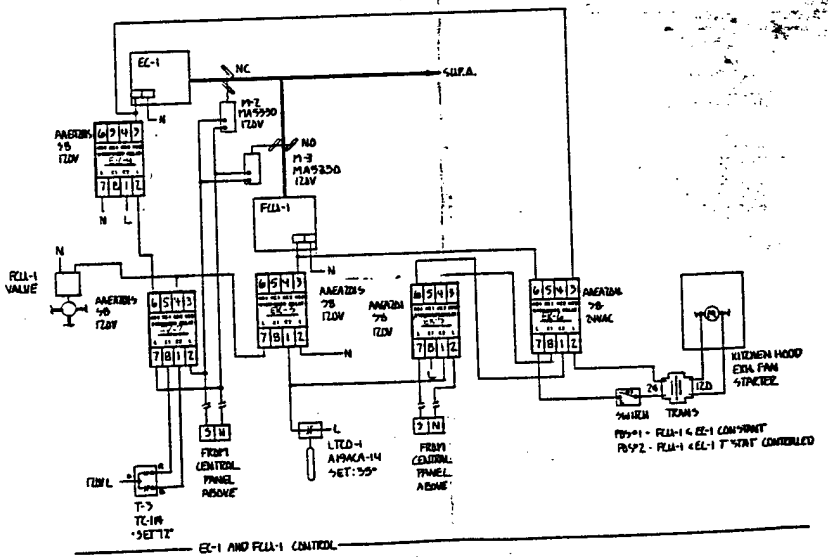
CENTRAL PLANT CONTROLS



EXHAUST FAN EF-3



NEW UNIT HEATER



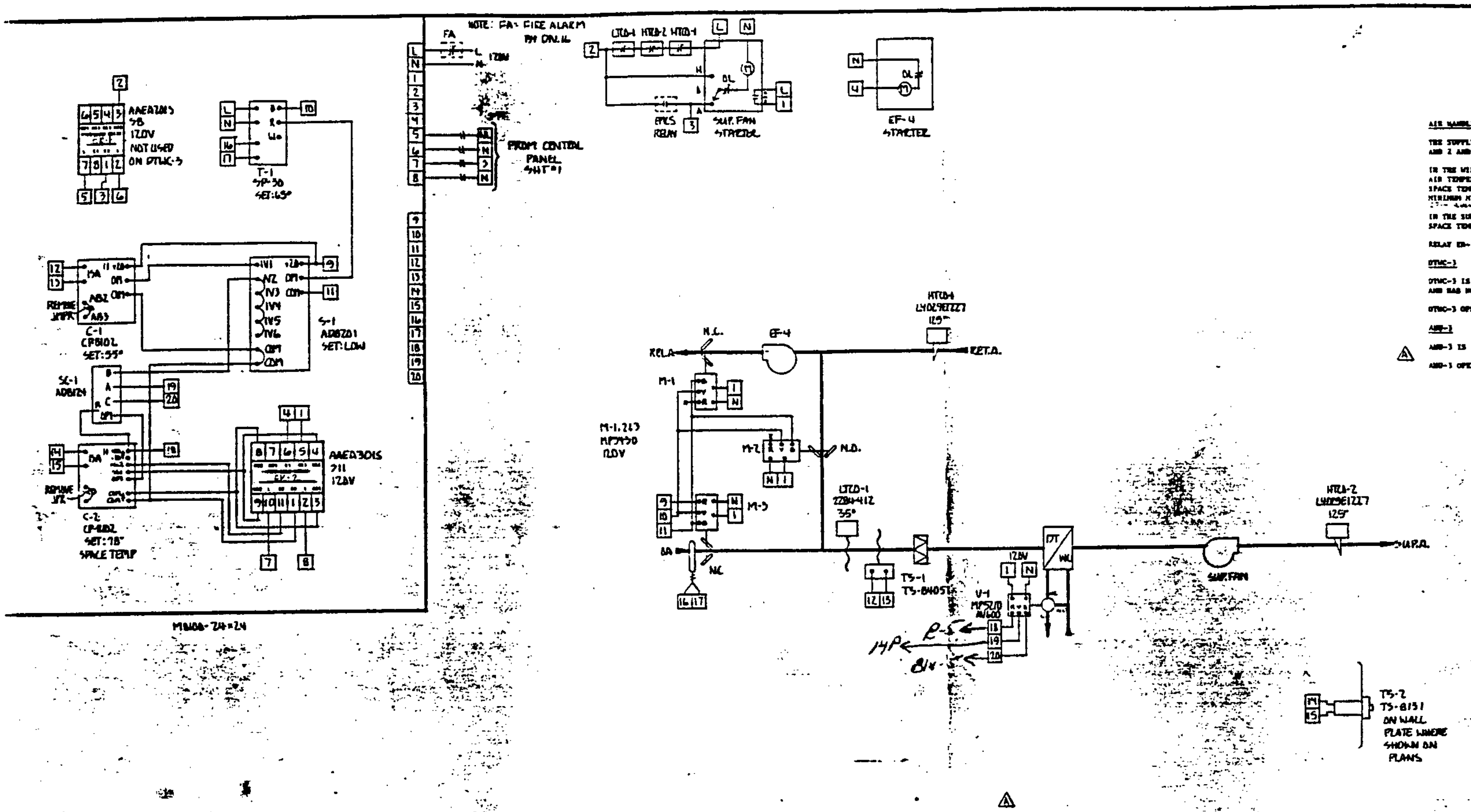
EC-1 AND FCU-1 CONTROL

SHEARER CONTROL SYSTEMS INC.

DATE	CHANGES
4-25-85	AS BUILT

JOB NAME: BLDG 500 RENOVATION
LOCATION: FORT MCPHERSON, GA
ARCHITECT:
ENGINEER:
CONTRACTOR: PATKEN
DRAWN BY: L.WALDEN
CHECKED BY: LW
DATE: 2-24-85
DRAWING NO.
SHT 1 of 5

GENERAL NOTES AND EQUIPMENT SCHEDULE



AIR HANDLERS AHU-7 & 3 & DTUC-5 (3 SETS THUS)

SEQUENCE OF OPERATION

AIR HANDLERS AHU-7

THE SUPPLY FAN IS STARTED BY THE EMCS SUBJECT TO HIGH TEMPERATURE CUT-OUTS HTCO-1 AND 2 AND LOW TEMPERATURE CUT-OUT LTCO-1.

IN THE WINTER MODE, SPACE TEMPERATURE CONTROLLER C-2 MODULATES V-1 AND, WHEN OUTSIDE AIR TEMPERATURE IS BELOW 65°, DAMPER MOTORS M-1, 2 AND 3 IN SEQUENCE TO MAINTAIN SPACE TEMPERATURE. C-1 CAN OVERRIDE C-2 THROUGH SELECTOR RELAY S-1 TO MAINTAIN A MINIMUM MIXED AIR TEMPERATURE OF 55°.

IN THE SUMMER MODE, C-2 MODULATES V-1 ALONE TO MAINTAIN SPACE TEMPERATURE.

RELAY ER-1 CYCLES THE UNIT AT NIGHT TO MAINTAIN A REDUCED UNOCCUPIED SETPOINT.

DTUC-3

DTUC-3 IS CONTROLLED EXACTLY THE SAME AS AHU-7 EXCEPT IT IS NOT CYCLED ON AT NIGHT AND HAS NO NIGHT RELAY.

DTUC-3 OPERATES WITH EF-1.

AHU-3

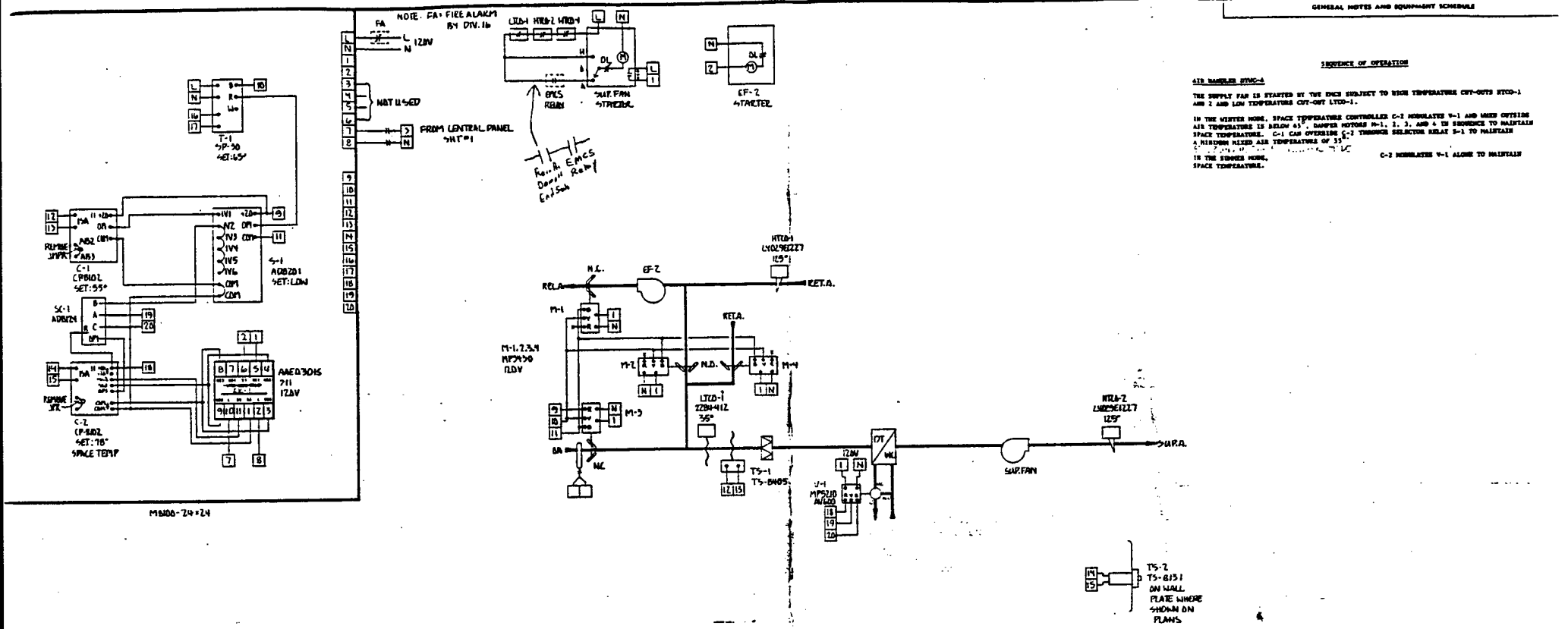
△ AHU-3 IS CONTROLLED EXACTLY THE SAME AS AHU-7.

AHU-3 OPERATES WITH EF-5

SHEARER CONTROL SYSTEMS INC.

DATE	CHANGE		
1-11-95		JOB NAME	BLDG 500 RENOVATION
5-4-05	AS BUILT	LOCATION	FORT McPHERSON, GA
		ARCHITECT	
		ENGINEER	
		CONTRACTOR	PRITKEN
		DRAWN BY	L. HALDEN
		CHECKED BY	LW
		DATE	5-30-95

SHT 4 of 5



M8806-24-24

GENERAL NOTES AND EQUIPMENT SCHEDULE

SEQUENCE OF OPERATION

AIR HANDLER DTWC-4

THE SUPPLY FAN IS STARTED BY THE EMCS SUBJECT TO HIGH TEMPERATURE CUT-OUTS HTCD-1 AND 2 AND LOW TEMPERATURE CUT-OUT LTCD-1.

IN THE WINTER MODE, SPACE TEMPERATURE CONTROLLER C-2 MODULATES V-1 AND MIXES OUTSIDE AIR TEMPERATURE IS BELOW 65°, DAMPER MOTORS M-1, 2, 3, AND 4 IN SEQUENCE TO MAINTAIN SPACE TEMPERATURE. C-1 CAN OVERRIDE C-2 THERMOS SELECTION RELAY S-1 TO MAINTAIN A MINIMUM MIXED AIR TEMPERATURE OF 55°

IN THE SUMMER MODE, C-2 MODULATES V-1 ALONE TO MAINTAIN SPACE TEMPERATURE.

AIR HANDLER DTWC-4

SHEARER CONTROL SYSTEMS INC.

DATE	CHANGES
5-14-85	AS BUILT

BLDG. 500 RENOVATION
FORT MCPHERSON, GA
ARCHITECT
ENGINEER
CONTRACTOR PATKEN
DRAWN BY L. WALDEN
CHECKED BY
DATE 5-30-85
DRAWING NO. SHT. 5 of 5

BUILDING 514

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB	Ft. McPhereson/Ft. Gillem Energy Study
PROJ.#	EMC # 3105.000
SHEET NO.	1 OF 12
CALCULATED BY:	KC
CHECKED BY:	
DATE:	12-10-91

BLDG.# 514

DOMESTIC HOT WATER

FAUCET LOCATION	WATER TEMPERATURE
BATHROOM NEAR OFFICE "B" (NEW SECTION)	97.4 °F
KITCHEN SINK NEAR ROOM 4 COPPOSITE END)	149.7 °F
PROBLEMS:	

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPhereson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: [illegible] OF [illegible]
CALCULATED BY: [illegible]
CHECKED BY:
DATE: [illegible]

BLDG.# 514

MOTORS

MOTOR #	1	HP	[illegible]	PH		RPM	45
MODEL #	[illegible]	VOLTS	[illegible]	AMPS	[illegible]		
~~SERIAL~~ #	[illegible]	PRESENT HR.	[illegible]	TO	[illegible]		
MFG	[illegible]	REQUIRED HR.	[illegible]	TO	[illegible]		
FRAME	[illegible]	EFF.	[illegible]				
DESCRIPTION	[illegible]	COMMENTS					

MOTOR #		HP		PH		RPM	
MODEL #		VOLTS		AMPS			
SERIAL #		PRESENT HR.		TO			
MFG		REQUIRED HR.		TO			
FRAME		EFF.					
DESCRIPTION		COMMENTS					

MOTOR #		HP		PH		RPM	
MODEL #		VOLTS		AMPS			
SERIAL #		PRESENT HR.		TO			
MFG		REQUIRED HR.		TO			
FRAME		EFF.					
DESCRIPTION		COMMENTS					

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPhereson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: 1 OF 12
CALCULATED BY:
CHECKED BY:
DATE:

BLDG.# 514

ECONOMIZER DATA

UNIT #	MFG.	MODEL #	SERIAL #	UNIT TYPE
3	Lennox	G2-025-1 FW	5484[illegible]8	[illegible]

SUPPLY FAN	DAMPERS					COILS	TYPE
CFM N/A		OA	SA	RA	REL. AIR	MIX AIR	~~PREHEAT~~
HP 5	MAX%	N/A	NONE				HEAT * [illegible]
MFG. CENTURY MOTOR	MIN%	N/A					~~HUMID~~
MODEL # N/A	DAMPER MTR.	NO					COOLING — [illegible]
SERIAL # N/A							

COMMENTS:
* Gas Furnace Installed in SA Duct
FOR FAN MOTOR DATA SEE MOTOR FORM

OCCUPANCY [illegible]

MIN OA REQUIRED

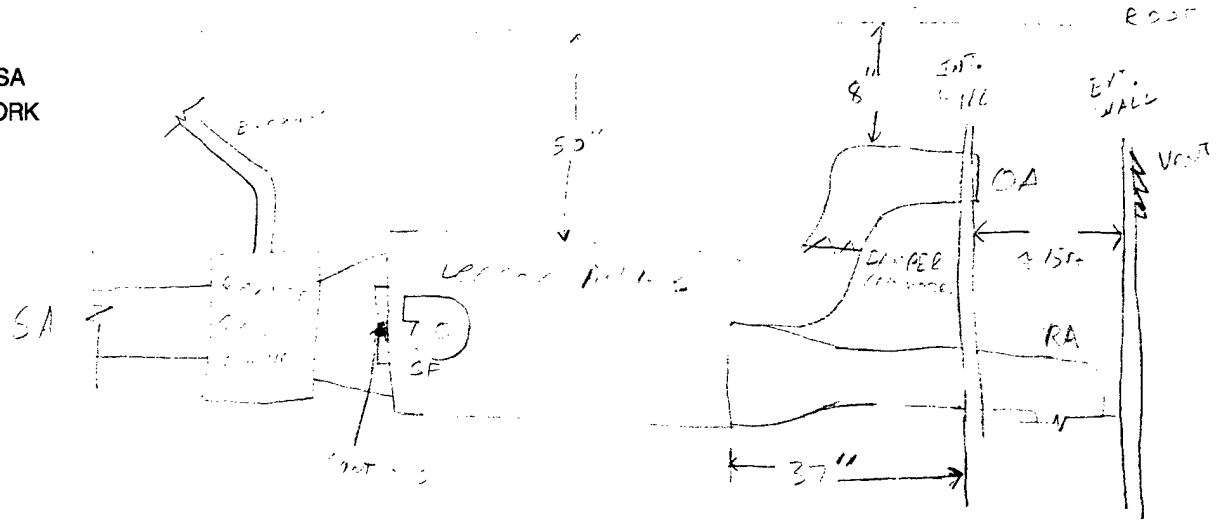
EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB	Ft. McPhereson/Ft. Gillem Energy Study
PROJ.#	EMC # 3105.000
SHEET NO.	2 OF 12
CALCULATED BY:	
CHECKED BY:	
DATE:	

BLDG.# 5 1

DUCTWORK

SKETCH
RA, OA, SA
DUCTWORK



OA DUCT	DAMPERS				
	DAMPER#	LOCATION	SIZE	ACTUATOR	CONTROLS
SIZE	1			NONE	MANUAL
CFM					
N/A					

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPhereson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: 4 OF 12
CALCULATED BY: KC
CHECKED BY:
DATE: 12-10-91

BLDG.# 514

ECONOMIZER DATA AHU-3

SKETCH CONTROLS AHU ON NEW SECTION ABOVE CEILING.

HAS LENNOX BM-3179 CONTROL
RL-45

FURNACE & DX WITH T'STAT

MOTOR STR WITH H-O-A SW.

COMMENTS:

- HAS OA DUCT W/ BALANCING DAMPER SET FOR MIN OA.
- HAS ROOM FOR ECONOMIZER.

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPhereson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF 12
CALCULATED BY: CEL
CHECKED BY:
DATE: 12-10-91

BLDG.# 514

ECONOMIZER DATA

UNIT #	MFG.	MODEL #	SERIAL #	UNIT TYPE
AHU-1	CARRIER	58GP125-DA	100	SINGLE ZONE INPUT 125,000 BTU/HR — FURNACE SECTION
AHU-2	" — "	" — "	100	" — "

SUPPLY FAN	DAMPERS					COILS	TYPE
CFM		OA	SA	RA	REL. AIR	MIX AIR	PREHEAT	—
HP ½ HP	MAX%	NONE					HEAT	GAS FURNACE
MFG. ~~CARRIER~~	MIN%	NONE					HUMID	—
MODEL # ~~58GP125-DA~~	DAMPER MTR.						COOLING	DX
SERIAL #								

COMMENTS:
NO OA ON SYSTEMS
- TWO FURNANCES SIDE BY SIDE
- MOTOR FIX TO FAN, NAME PLATE NOT ACCESSIBLE
- PRESENT RUN 0-2400 S-S

OCCUPANCY M-F 0630 — 1800

MIN OA REQUIRED

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB _____

SHEET NO. 7 OF 12

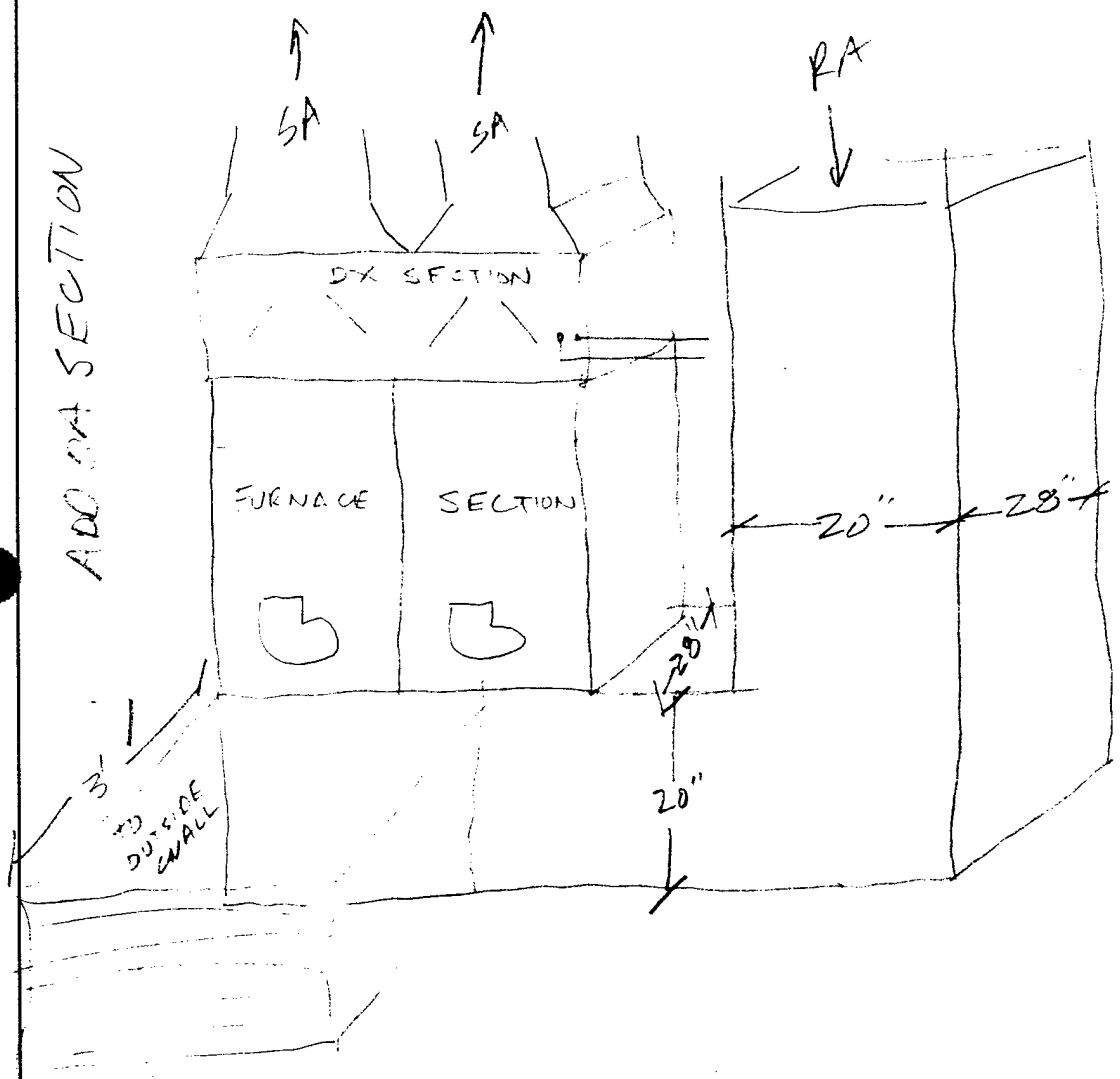
CALCULATED BY CEL DATE 12/10/91

CHECKED BY _____ DATE _____

SCALE _____

514

AHU 1&2



ADDITIONAL SECTION

DATE: 12/10/91
BY: CRL

I. AIR HANDLING UNIT SURVEY OBSERVATIONS

BLDG NO: 514 BLDG NAME: CHILD CARE JOB:
AHU NO: 1 & 2 LOCATION: MECH RM
ZONE NO. SERVED: REF. SYS. SERVING AHU:
([ ] VERIFIED ZONE OCCUPANCY AND TEMP. REQUIREMENTS ON SURVEY FORM VI.)
UNIT TYPE: SINGLE ZONE [✓] MULTIZONE [ ] DOUBLE DT [ ] REHEAT [ ]
HEAT & VENT [ ] 2-PIPE FC [ ] 4-PIPE FC [ ] UNIT HT [ ]
OTHER [ ] FURNACE, FAN CYCLES
MFG: CARRIER MODEL: 58GP125-DA
SUPPLY FAN: FAN HP: 1/2 * MFG: MODEL:
CFM: SA RA OA (MEASURED [ ] ESTIMATED [ ])
PRESENT DAILY STARTUP: M-F 0 TO 2400 SAT 0 TO 2400 SUN 0 TO 2400
STARTUP METHOD: MANUAL [✓] TIMECLOCK [ ] (WORKING, YES [ ] NO [ ])
SEASONAL SWITCHOVER: SUM TO , WIN TO
REQUIRED DAILY STARTUP: M-F 0630 TO 1800, SAT 0 TO 0, SUN 0 TO 0

COILS:
PREHEAT: NONE [✓] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
HEATING: NONE [ ] STM [ ] HW [ ] ELEC [ ] ~~MOD VLV [ ]~~ GAS *
REHEAT: NONE [✓] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
HUMID: NONE [✓] STM [ ] HW [ ] ELEC [ ] MOD VLV [ ]
COOLING: NONE [ ] CW [ ] DX [✓] SPRAY [ ] OTHER [ ]

REMARK:

DAMPERS:
OUTSIDE AIR: MAX % 0, MIN % 0, DAMPER MTR YES [ ] NO [✓]
RETURN AIR: MAX % 100 MIN % 100 DAMPER MTR YES [ ] NO [✓]
RELIEF AIR: MAX % —, MIN % —, DAMPER MTR YES [ ] NO [ ]
MIXED AIR CONTROL [ ], ECONOMIZER (DB [ ] OR ENTH [ ]) NONE [ ]

REMARKS: NO OA ON SYSTEM
SUPPORT FANS: UNIT NONE RETURN FAN [ ] EXHAUST FAN [ ] OTHER [ ]
FAN HP: MFG: MODEL:
THERMOSTAT TYPE: SINGLE SETPOINT [✓] DUAL SETPOINT [ ] SETBACK [ ]
PNEUMATIC [ ] ELECTRIC/ELECTRONIC [✓] NO. OF ZONES
SETPOINT: OCC HEAT °F UNOCC HEAT °F OCC COOL °F UNOCC COOL °F
RESET CONTROLS: YES [ ] NO [✓], DECK SETPOINT HOT °F COLD °F
DEMAND LIMITING, DUTY CYCLING YES [ ] NO [ ]
REMARKS: TWO FURNACES, SET SIDE BY SIDE

* FURNACES SECTION
MODEL 58GP125-DA
SERIES 100
INPUT 125,000 BTU/HR } 2a

* MOTOR FIX TO FAN
NAMEPLATE NOT ACCESSIBLE

Ft. Story EMCS Feasibility Study
EMC #3104.000

DATE: 12/10/91
BY: [illegible]

IV. REFRIGERATION EQUIPMENT SURVEY OBSERVATIONS

BLDG NO: 514 BLDG NAME: CHILD CARE JOB: _____
CHILLER/COMPRESSOR NO: 2 LOCATION: ON PAD
REFRIG. EQUIP. TYPE: CENTRIFUGAL [ ] RECIPROCATING [✓] ABSORBTION [ ]
OTHER [ ] _____
CW [ ] DX [✓] OTHER [ ] _____
MANUFACTURER: LENNOX MODEL NO: *NAMEPLATE NOT LEGIBLE
SERIAL NO. _____
COMPRESSOR NAMEPLATE: * VOLTS _____ AMPS _____ PH _____ HZ _____ Hp
CAPACITY: est 20 (TONS) CHW TEMP: SUPPLY _____ °F RETURN _____ °F

AHU'S SERVED: 3

PRESENT DAILY STARTUP: M-F 0 TO 2400 SAT 0 TO 2400, SUN 0 TO 2400
STARTUP METHOD: MANUAL [✓] TIMECLOCK [ ] (WORKING YES [ ] NO [ ])
SEASONAL SWITCHOVER: SUM _____ TO _____, WIN _____ TO _____
REQUIRED DAILY STARTUP: M-F 0630 TO 1800, SAT 0 TO 0, SUN 0 TO 0

CONDENSING EQUIP.: AIR COOLED [ ] EVAP. [ ] WINTERIZED [ ]
WATER COOOLED [ ] 3-WAY VALVE [ ] NO. OF CELLS [ ]
OTHER [ ] _____
MANUFACTURER: _____ MODEL NO. _____
SERIAL NO. _____
NO. OF FANS 2, EACH FAN: * VOLTS _____ AMPS _____ PH _____ HZ _____ Hp
CAPACITY: _____ (TONS) CNW TEMP: SUPPLY _____ °F RETURN _____ °F

SYSTEM AUXILLARIES:
PUMPS: CHW PUMP [ ] _____ VOLTS _____ AMPS _____ PH _____ HZ _____ Hp _____ RPM
CNW PUMP [ ] _____ VOLTS _____ AMPS _____ PH _____ HZ _____ HP _____ RPM
NONE

TEMP. CONTROLS MFG. AND TYPE _____

CHILLER INTERLOCKS WITH CHW PUMP [ ] CNW PUMP [ ] OTHER [ ] _____

CONTROL PANEL INDICATIONS:	HI (LGTS)	LO (LGHTS)	GAUGES
MOTOR TEMP	[ ]	[ ]	[ ]
REFRIG TEMP	[ ]	[ ]	[ ]
COND TEMP	[ ]	[ ]	[ ]
OIL TEMP	[ ]	[ ]	[ ]
OIL PRESS	[ ]	[ ]	[ ]
OTHER _____			

REMARKS:

Ft. Story EMCS Feasibility Study
EMC #3104.000

DATE: 12/10/91
BY: CRL

IV. REFRIGERATION EQUIPMENT SURVEY OBSERVATIONS

BLDG NO: 514 BLDG NAME: CHILD CARE JOB: _____
CHILLER/COMPRESSOR NO: 1 LOCATION: ON PAD
REFRIG. EQUIP. TYPE: CENTRIFUGAL [ ] RECIPROCATING [✓] ABSORBTION [ ]
OTHER [ ] _____
CW [ ] DX [✓] OTHER [ ] _____
MANUFACTURER: CARRIER MODEL NO. 38BA 009350
SERIAL NO. 4988614348
COMPRESSOR NAMEPLATE: 208 VOLTS 39.6 AMPS 3 PH 60 HZ — Hp
CAPACITY: 4 + 10 (TONS) CHW TEMP: SUPPLY _____ °F RETURN _____ °F

AHU'S SERVED: 1 & 2

PRESENT DAILY STARTUP: M-F 0 TO 2400, SAT 0 TO 2400, SUN 0 TO 2400
STARTUP METHOD: MANUAL [✓] TIMECLOCK [ ] (WORKING YES [ ] NO [ ])
SEASONAL SWITCHOVER: SUM _____ TO _____, WIN _____ TO _____
REQUIRED DAILY STARTUP: M-F 0630 TO 1800, SAT 0 TO 0, SUN 0 TO 0

CONDENSING EQUIP.: AIR COOLED [✓] EVAP. [ ] WINTERIZED [ ]
WATER COOOLED [ ] 3-WAY VALVE [ ] NO. OF CELLS [ ]
OTHER [ ] _____
MANUFACTURER: _____ MODEL NO. _____
SERIAL NO. _____
NO. OF FANS 1, EACH FAN: 208 VOLTS 3.6 AMPS 3 PH 60 HZ .31 Hp
CAPACITY: — (TONS) CNW TEMP: SUPPLY _____ °F RETURN _____ °F

SYSTEM AUXILLARIES:
PUMPS: CHW PUMP [ ] _____ VOLTS _____ AMPS _____ PH _____ HZ _____ Hp _____ RPM
CNW PUMP [ ] _____ VOLTS _____ AMPS _____ PH _____ HZ _____ HP _____ RPM
NONE

TEMP. CONTROLS MFG. AND TYPE _____

CHILLER INTERLOCKS WITH CHW PUMP [ ] CNW PUMP [ ] OTHER [ ] _____

CONTROL PANEL INDICATIONS:	HI (LGTS)	LO (LGHTS)	GAUGES
MOTOR TEMP	[ ]	[ ]	[ ]
REFRIG TEMP	[ ]	[ ]	[ ]
COND TEMP	[ ]	[ ]	[ ]
OIL TEMP	[ ]	[ ]	[ ]
OIL PRESS	[ ]	[ ]	[ ]
OTHER _____			

REMARKS:

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB
SHEET NO. 12 OF 12
CALCULATED BY CBL DATE 12/10/91
CHECKED BY DATE
SCALE

514

HOURS OF OPERATION
> 0630 - 1300 M-F

SYSTEMS RUN ALL THE TIME
> "MAYBE (?) THEY SETBACK"

CURRENT TEMP 75.3°F

OCCUPANCY
> STAFF — BETWEEN 27-33
> CHILDREN — 60-65

OTHER ECO's
- DELAMP
-

BUILDING 522

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

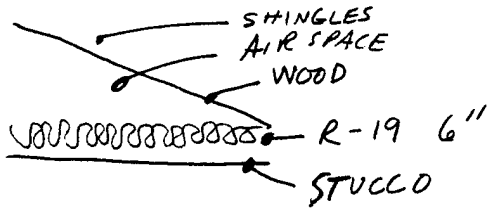
JOB	Ft. McPherson/Ft. Gillem Energy Study
PROJ.#	EMC # 3105.000
SHEET NO.	OF
CALCULATED BY:	JW
CHECKED BY:	
DATE:	12/31/91

BLDG.# 522
ECO 1

WALL & ROOF INSULATION

AREAS IN SQ. FEET	NORTH	SOUTH	EAST	WEST
WALLS				
WINDOWS				
OVERHEAD DOORS				
PERSONNEL DOORS				

SKETCH WALL CROSS–SECTION	COMPONENTS
	1. OUTSIDE AIR FILM 2. ____ 3. ____ 4. ____ 5. ____ 6. ____ 7. INSIDE AIR FILM

SKETCH ROOF CROSS–SECTION	COMPONENTS
	1. OUTSIDE AIR FILM 2. ____ 3. ____ 4. ____ 5. ____ 6. ____ 7. INSIDE AIR FILM

PERSONNEL DOOR TYPE ____	BASEMENT [ ]
OVERHEAD DOOR TYPE ____	SLAB [ ]
	CRAWL SPACE [ ]

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: CEL
CHECKED BY:
DATE: 12/31/91

BLDG.# 522
ECO 1

PIPE INSULATION

LOCATION	PIPE DIAMETER	PIPE LENGTH	FLUID TYPE	FLUID TEMP.	AIR TEMP.	INSULATION TYPE	INSULATION THICKNESS	INSULATION CONDITION
MECH RM	1 1/2" (TYPICAL)		HW	120° HW	65°F	FIBER	1"	GOOD
"	1" (TYPICAL)		CHW	~45°	90°F	"	1"	"
"	1" (TYPICAL)		DHW	~ SEE DHW	AVG 70	"	1/2"	"
"	1 1/2" "		CHW	45°	90°	"	1"	"
"	3/4" "		DHW*	~ SEE DHW	AVG 70	"	1/2"	"

COMMENTS:
ESTIMATE 6' OF HW LINE NOT INSULATED
" 6' OF 3/4" DHW RETURN LINE NOT INSULATED
* DHW RETURN RECIRC LINE

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: KEC
CHECKED BY:
DATE: 12-31-91

BLDG.# 522 LEE HALL
ECO 1

DUCT INSULATION

LOCATION	DUCT CROSSECTION	SHAPE	DUCT TEMP. (°F)	SURROUND AIR TEMP. (°F)	INSULATION TYPE	INSULATION THICKNESS	INSULATION CONDITION

COMMENTS: BUILDING HAS 4-PIPE FAN COILS; no duct work.

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

BLDG.# 522
ECO 2

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: JW
CHECKED BY:
DATE: 12/31/91

WINDOWS SURVEY

WINDOW NO.	SINGLE/DOUBLE PANE	TYPE–SLIDING FIXED, CASEMENT	FRAME MAT'L	ORIENTATION	GLASS SHADING	WINDOW COVER	DIMENSIONS (INCH)
	DOUBLE	SLIDING	ALUM	W	NONE	DRAPES	32X61

COMMENTS: ALL WINDOWS ARE NEW W/ NO INFILTRATION.

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: J W
CHECKED BY:
DATE: 12/31/91

BLDG.# 522
ECO 3

WEATHERSTRIPING AND CAULKING

DOOR\ WINDOW	CONDITION OF W.S./CAULK	INFILTRATION	ORIENTATION	DIMENSIONS (INCH)	#
W	GOOD	NONE	W	32x61	14
D	FAIR	MED	E	36 x 81	1
W	GOOD	NONE	E	32x61	16
W	GOOD	NONE	E	24X48	4
D	GOOD	LOW	N	36x81	1
W	"	NONE	N	32x61	1
W	"	NONE	W	24x48	5
W	"	"	S	32x61	1
D			S		

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJ.#: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: JW
CHECKED BY:
DATE: 12/31/91

BLDG.# 522
ECO 4

DOMESTIC HOT WATER

FAUCET LOCATION	WATER TEMPERATURE
KITCHEN SINK	125°F
PROBLEMS:	

COMMENTS:

EMC ENGINEERS, INC.
DENVER * ATLANTA * GERMANY

JOB: Ft. McPherson/Ft. Gillem Energy Study
PROJECT NO.: EMC # 3105.000
SHEET NO.: OF
CALCULATED BY: JW
CHECKED BY:
DATE: 12/31/91

BLDG.# 522
ECO 5

MOTORS

MOTOR # CHWP ~~DIFF TEMP CHK.~~ HP 2 PH 1 RPM 1725
MODEL # 5K49UG1342H VOLTS 200 AMPS 8.1
SERIAL # PRESENT HR. TO
MFG GE REQUIRED HR. TO
FRAME EFF.
DESCRIPTION COMMENTS

MOTOR # DOM. HW CIRC. HP 1/2 PH 1 RPM 1725
~~MODEL~~ ID # M09181 4-90 VOLTS 115 AMPS 1.75
SERIAL # PRESENT HR. TO
MFG BELL & GOSSETT REQUIRED HR. TO
FRAME EFF.
DESCRIPTION COMMENTS

MOTOR # HWP HP 2 PH 3 RPM 1725
MODEL # VOLTS 200 AMPS 4.2
SERIAL # PRESENT HR. TO
MFG REQUIRED HR. TO
FRAME EFF.
DESCRIPTION COMMENTS

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB

SHEET NO. 1 OF

CALCULATED BY CBL DATE 12/31/91

CHECKED BY DATE

SCALE

522 FOR ECO 9, HEAT RECLAIM

DOMESTIC HW HEATER

- BRADFORD WHITE WATER HEATER
- MODEL M-I-82U-199-3N
- 82 GAL
- INPUT 199,999 BTU/HR N. GAS
- 181.8 GAL/HR RECOVERY

JOB Ft. McPherson/Ft. Gillem Energy Study
PROJ.# EMC # 3105.000
SHEET NO. ______ OF ______
CALCULATED BY: ______
CHECKED BY: ______
DATE: 12/3/91

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 522 BLDG NAME: OFFICERS QTRS JOB: ~~3105.000~~
PRIMARY FUNCTION: ______ GROSS SQ FT ______ NO OF FLRS ______
BUILDING MANAGER NAME: ______
PHONE: ______ OFFICE NO. ______
SPECIAL AREAS: COMPUTER FACILITY [ ] - ZONE NO'S. ______
AUDITORIUM [ ] - ZONE NO'S. ______
LABORATORIES [ ] - ZONE NO'S. ______
CAFETERIA [ ] - ZONE NO'S. ______
OTHER [ ] ______ - ZONE NO'S. ______

ZONE NO. ______ FUNCTION: ______ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: ______ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F 0 TO 240, SAT ______ TO ______, SUN ______ TO ______
PRESENT TEMP: WINTER OCC ______ °F UNOCC ______ °F, SUMMER OCC ______ °F UNOCC ______ °F
REQUIRE TEMP: WINTER OCC ______ °F UNOCC ______ °F, SUMMER OCC ______ °F UNOCC ______ °F

REMARKS: ______

ZONE NO. ______ FUNCTION: ______ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: ______ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F ______ TO ______, SAT ______ TO ______, SUN ______ TO ______
PRESENT TEMP: WINTER OCC ______ °F UNOCC ______ °F, SUMMER OCC ______ °F UNOCC ______ °F
REQUIRE TEMP: WINTER OCC ______ °F UNOCC ______ °F, SUMMER OCC ______ °F UNOCC ______ °F

REMARKS: ______

ZONE NO. ______ FUNCTION: ______ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: ______ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F ______ TO ______, SAT ______ TO ______, SUN ______ TO ______
PRESENT TEMP: WINTER OCC ______ °F UNOCC ______ °F, SUMMER OCC ______ °F UNOCC ______ °F
REQUIRE TEMP: WINTER OCC ______ °F UNOCC ______ °F, SUMMER OCC ______ °F UNOCC ______ °F

REMARKS: ______

ZONE NO. ______ FUNCTION: ______ SPECIAL REQ. YES [ ] NO [ ]
LOCATION: ______ (IDENTIFIED ON FLOOR PLAN [ ])
OCCUPANCY HOURS: M-F ______ TO ______, SAT ______ TO ______, SUN ______ TO ______
PRESENT TEMP: WINTER OCC ______ °F UNOCC ______ °F, SUMMER OCC ______ °F UNOCC ______ °F
REQUIRE TEMP: WINTER OCC ______ °F UNOCC ______ °F, SUMMER OCC ______ °F UNOCC ______ °F

REMARKS: ______

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB

SHEET NO. OF

CALCULATED BY DATE

CHECKED BY DATE

SCALE

BLDG. 522

6 ROOMS

2 - DOWNSTAIR 4 - UPSTAIR

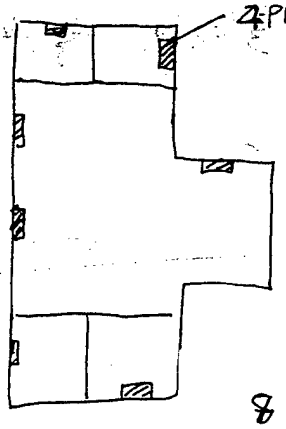
THE ROOM

FAN DATA

3 - SPEED FAN (OFF-L-M-H)

MOTOR

5KSP29DK 14875 1.5A 1/30 HP 115V



SHOWER 5 QT IN 30 SEC
3½ QT IN 30 SEC

FAUSETS 5 CUPS IN 3 SEC.

8 FAN COILS DOWNSTAIR.

6 " — " UPSTAIR.

WINDOW - WOOD FRAME 32" X 61" DOUBLE PANE
32" X 37" " — "

E M C ENGINEERS, INC.
Denver • Colorado Springs • Atlanta • West Germany

JOB
SHEET NO. OF
CALCULATED BY JW DATE 12/31/91
CHECKED BY DATE
SCALE

BLDG 522

~~DUAL TEMP PUMP:~~
~~GE~~
~~MOD:~~

CHILLER TYPE: 3 FAN w/ WATER (NO DX)

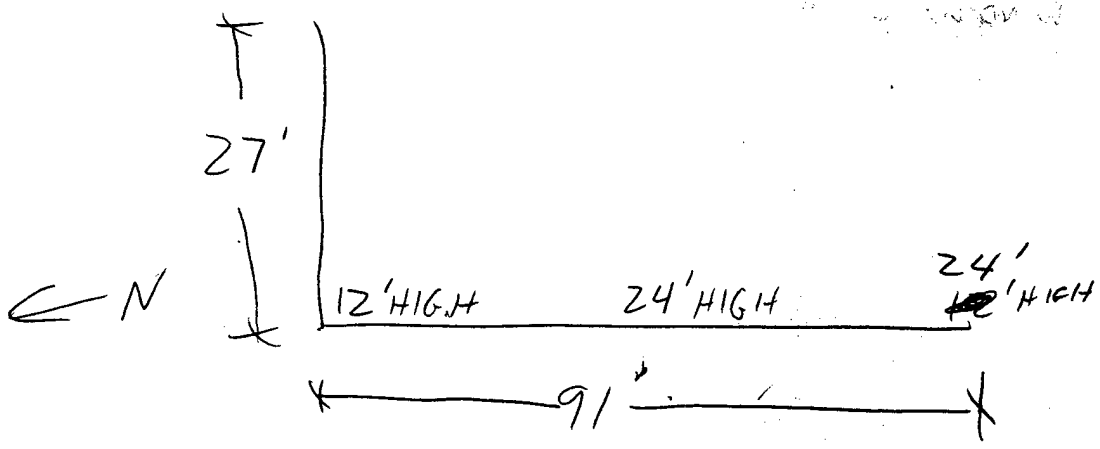
TRANE
S# L79K07794
208-240 V

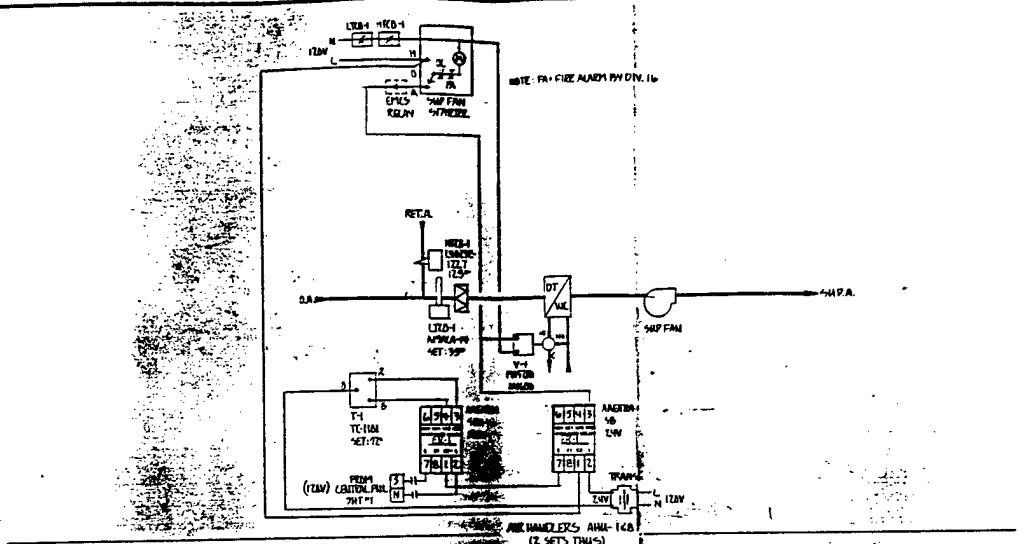
2 COMPRESSORS
3ϕ 60Hz 37.8 RLA
179 LRA

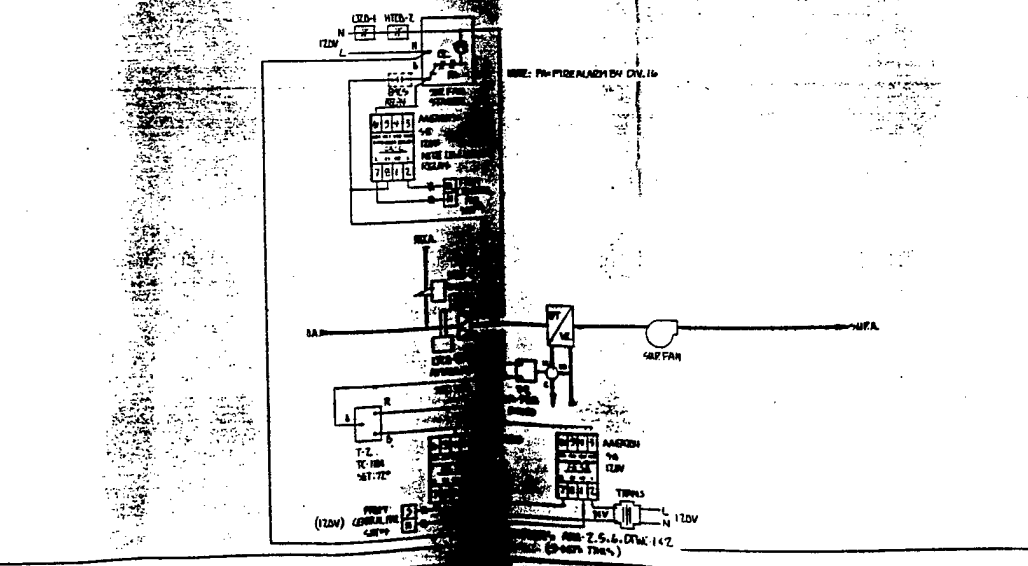
3 FAN MOTORS
1ϕ 60Hz 2.3 FLA ~~1~~ 1/3 HP

MOD #
CGAA0156JB53CG5C4A311CK

BUILDING DIMENSION







GENERAL NOTES AND EQUIPMENT SCHEDULE

SEQUENCE OF OPERATION

AIR HANDLERS AHU-1 AND 6

ROOM THERMOSTAT T-1 CYCLES THE AIR HANDLER SUPPLY FAN AND UNIT VALVE SUBJECT TO CONTROLS RELAY CR-1 AND THE DUCT TO MAINTAIN SPACE TEMPERATURE.

AIR HANDLERS AHU-2, 3, 4, 5, OTHC-1 AND 2

ROOM THERMOSTAT T-2 CYCLES THE AIR HANDLER SUPPLY FAN AND UNIT VALVE SUBJECT TO AND THE DUCT TO MAINTAIN SPACE TEMPERATURE.

RIGHT RELAY CR-2 OVERRIDES THE OFF PORTION OF THE DUCT TO MAINTAIN A REDUCED SETPOINT.

LOW TEMP CUTOUTS LTCO-1 & LTCO-2 STOP [illegible] FAN

MIXED AIR TEMP. FALLS BELOW 55°

SHEARER CONTROL SYSTEMS

PLOT 300 RENOVATION

FORT MCPHERSON, GA

PATKEN

L WALDEN

5-27-96