



VOLUME III

APPENDIX H  
COMPUTER SIMULATIONS

# FEASIBILITY STUDY FOR INSTALLATION OF UMCS FORT RILEY, KANSAS

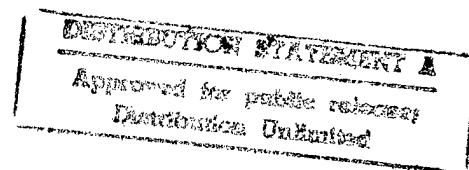
ENERGY ENGINEERING ANALYSIS PROGRAM (EEAP)

Prepared for

U.S. ARMY CORPS OF ENGINEERS  
KANSAS CITY DISTRICT  
KANSAS CITY, MISSOURI

Under

U.S. ARMY ENGINEER DISTRICT, MOBILE  
INDEFINITE DELIVERY A-E CONTRACT  
CONTRACT NO. DACA01-94-D-0033  
DELIVERY ORDER NO. 0001



DENVER, COLORADO  
ATLANTA, GEORGIA




DEPARTMENT OF THE ARMY  
CONSTRUCTION ENGINEERING RESEARCH LABORATORIES, CORPS OF ENGINEERS  
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VOLUME III

APPENDIX H  
COMPUTER SIMULATIONS

FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
FORT RILEY, KANSAS

ENERGY ENGINEERING ANALYSIS PROGRAM (EEAP)

Prepared for

U.S. Army Corps of Engineers  
Kansas City District  
Kansas City, Missouri

Under

Contract No. DACA01-94-D-0033  
Delivery Order 0001  
EMC No. 1406-001

FOOT QUALITY ENGINEERING

July 1995

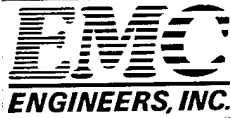
1997 1017 189

By

E M C Engineers, Inc.  
2750 S. Wadsworth, Suite C-200  
Denver, Colorado 80227  
303/988-2951

**COMPUTER ENERGY SIMULATIONS**

**BLDG. 5000  
FIRE STATION**



DENVER - ATLANTA

PROJECT: FEASIBILITY STUDY FOR  
 INSTALLATION OF UMCS  
 LOCATION: FORT RILEY, KANSAS

EMC NO: 1406-001  
 CALC. BY: AJN  
 CHECKED BY: CEL  
 DATE: 05-Jul-95

BUILDING NO.: 5000  
 BLDG. TYPE: FIRE STATION

**ENERGY CONSTANT CALCULATIONS**

	BASERUN	RUN1	RUN2	RUN3	RUN4	RUN5
HEATING (MBtu)	275.6	254.4	226.2	0.0	0.0	0.0
COOLING (kWH)	119,666	119,645	114,483	0	0	0

SUPPLY AIR FAN	4,320 CFM
FLOOR AREA	4,667 FT <sup>2</sup>
CFMI	1512 CFM
UA	582 BTU/HR-°F
BLDG CONSTR.	1 (1 FOR LIGHT ) 2 (2 FOR HEAVY)

**EZDOE COMPUTER RUN DEFINITION:**

BASERUN	EXISTING OPERATION
RUN1	NIGHT SETBACK
RUN2	DDC CONTROL
RUN3	ECONOMIZER
RUN4	NIGHTTIME INFILTRATION (OA)
RUN5	DAYTIME INFILTRATION (OA)

HOURS OF OCCUPANCY			ANNUAL HEATING & COOLING HOURS	
M-F	0	2400	120 HR	HR. ON HEATING 5448 HR/YR
SAT.	0	2400	24 HR	HR. ON COOLING 3312 HR/YR
SUN.	0	2400	24 HR	HR. OFF HEATING 0 HR/YR
	TOTAL OCCUPY HR.		168 HR/WK	HR. OFF COOLING 0 HR/YR
	TOTAL UNOCC. HR.		0 HR/WK	
	ANNUAL OCCUPY HR.		8760 HR/YR	
	ANNUAL UNOCC. HR.		0 HR/YR	

PRESENT HR. OF OPERATION FOR SYS. WITH HEATING AND COOLING 8760 HR/YR  
 PRESENT HR. OF OPERATION FOR SYS. WITH HEATING ONLY 5448 HR/YR  
 PRESENT HR. OF OPERATION FOR SYS. WITH COOLING ONLY 3312 HR/YR  
 HRS SAVED (HTG ONLY) 5448 - 5448 = 0 HR/YR  
 HRS SAVED (CLG ONLY) 3312 - 3312 = 0 HR/YR

HOAUHC	275.56 MBtu	-	0 MBtu	=	0.00E+00 Btu/CFM-HR
	1512 CFM	x	0 HR/YR		
HOAUH	275.56 MBtu	-	0 MBtu	=	0.00E+00 Btu/CFM-HR
	1512 CFM	x	0 HR/YR		
COAUHC	119,666.0 kWH	-	0.0 kWH	=	0.00E+00 kWH/CFM-HR
	1512 CFM	x	0 HR/YR		
COAUC	119,666.0 kWH	-	0.0 kWH	=	0.00E+00 kWH/CFM-HR
	1512 CFM	x	0 HR/YR		
HOAOHC	275.56 MBtu	-	0 MBtu	=	0.00E+00 Btu/CFM-HR
	1512 CFM	x	8760 HR/YR		
HOAOH	275.56 MBtu	-	0 MBtu	=	0.00E+00 Btu/CFM-HR
	1512 CFM	x	5448 HR/YR		
COAOHC	119,666.0 kWH	-	0.0 kWH	=	0.00E+00 kWH/CFM-HR
	1512 CFM	x	8760 HR/YR		
COAOC	119,666.0 kWH	-	0.0 kWH	=	0.00E+00 kWH/CFM-HR
	1512 CFM	x	3312 HR/YR		
DC DUTY	1 / 6 (10 MINUTES PER HOUR)			=	0.17
DC DEMAND	1 / 6 (10 MINUTES PER HOUR)			=	0.17
ECC	119,645.5 kWH	-	0.0 kWH	=	0.00E+00 kWH/CFM-HR
	4320 CFM	x	3312 HR/YR		
ECHC	119,645.5 kWH	-	0.0 kWH	=	0.00E+00 kWH/CFM-HR
	4320 CFM	x	8760 HR/YR		
NSUCHC	119,666.0 kWH	-	119,645.5 kWH	=	0.00E+00 kWH/CFM-HR
	4320 CFM	x	0 HR/YR		
NSUCC	119,666.0 kWH	-	119,645.5 kWH	=	0.00E+00 kWH/CFM-HR
	4320 CFM	x	0 HR/YR		
DDCCHC	119,666.0 kWH	-	114,482.9 kWH	=	1.37E-04 kWH/CFM-HR
	4320 CFM	x	8760 HR/YR		
DDCCC	119,666.0 kWH	-	114,482.9 kWH	=	3.62E-04 kWH/CFM-HR
	4320 CFM	x	3312 HR/YR		
NSC	275.56 MBtu	-	254.39 MBtu	=	3.64E+04 Btu/UA
	581.544 UA				
DDCH	275.56 MBtu	-	226.18 MBtu	=	8.49E+04 Btu/UA
	581.544 UA				
OPT	( 2 HR/DAY X 240 DAY/YR )		132 HR/YR	=	0 HR/YR
CHWR	(1.10 kW X 0.012 Eff. X 664 HRS X 2 Degrees of Reset)			=	17.5 kWH/TON
OAR	567 HR/YR	x	0.01	=	5.67 HR/YR



INPUT LOADS ..

```

$-----$
$ E Z - D O E   L O A D S   I N P U T $
$-----$

```

\$ GENERAL PROJECT DATA

```

TITLE  LINE-1 *      EMC      ENGINEERS      INC.      *
LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
LINE-3 *      DENVER,      CO      80227      *
LINE-4 *BASELINE SIMULATION OF BLDG. #5000      *
LINE-5 *FIRE STATION      * ..

```

```

ABORT          ERRORS ..
DIAGNOSTIC     WARNINGS ..
LOADS-REPORT   VERIFICATION=(LV-D)
               SUMMARY=(LS-C,LS-D)
               HOURLY-DATA-SAVE = YES ..
BUILDING-LOCATION  LATITUDE = 39.0
                 LONGITUDE = 96.5
                 ALTITUDE = 1065.
                 TIME-ZONE = 6
                 GROSS-AREA = 4666.5
                 SHIELDING-COEF = 0.29
                 X-REF = 0.0
                 Y-REF = 0.0 ..
RUN-PERIOD     JAN 1 1994 THRU DEC 31 1994 ..

```

\$ SCHEDULES

```

LD_ON          =DAY-SCHEDULE (1,24) (1.) ..
LD_OFF         =DAY-SCHEDULE (1,24) (0.) ..
LD_LITES       =DAY-SCHEDULE (1,5) (0.)
                 (6,7) (0.5)
                 (8,21) (1.)
                 (22,23) (0.5)
                 (24) (0.) ..
LD_KIT/EQP    =DAY-SCHEDULE (1,5) (0.)
                 (6) (0.1)
                 (7,8) (0.15)
                 (9,13) (0.1,0.,0.25,0.6,0.25)
                 (14,16) (0.)
                 (17) (0.25)
                 (18,19) (0.55)
                 (20) (0.15)
                 (21,24) (0.) ..

```



LW\_LITES =WEEK-SCHEDULE (ALL) LD\_LITES ..  
 LW\_KIT/EQP =WEEK-SCHEDULE (ALL) LD\_KIT/EQP ..  
 LW\_ON =WEEK-SCHEDULE (ALL) LD\_ON ..  
 LW\_OFF =WEEK-SCHEDULE (ALL) LD\_OFF ..

## \$ ON 100% OF THE TIME

L\_ON =SCHEDULE THRU DEC 31 LW\_ON ..

## \$ OFF 100% OF THE TIME

L\_OFF =SCHEDULE THRU DEC 31 LW\_OFF ..

## \$ LIGHTING LOAD

L\_LITES =SCHEDULE THRU DEC 31 LW\_LITES ..

## \$ KITCHEN EQUIPMENT LOAD

L\_KIT/EQP =SCHEDULE THRU DEC 31 LW\_KIT/EQP ..

## \$ CONSTRUCTION TYPES

## \$ EXTERIOR WALL ASB FACIA AL BATT

WALL-1 =LAYERS MATERIAL=(AB02,PW03,AL21,IN02,GP02) I-F-R= 0.6100  
 THICKNESS=(0.021,0.042,0.000,0.296,0.052) ..

EXWALL-1 =CONSTRUCTION LAYERS = WALL-1  
 ABSORPTANCE = 0.880  
 ROUGHNESS = 2 ..

FLOOR =CONSTRUCTION U-VALUE = 0.020  
 ABSORPTANCE = 0.610  
 ROUGHNESS = 5 ..

## \$ BUILT-UP ROOF W/INSL&amp; NO CEILING

BLT-ROOF =LAYERS MATERIAL=(HF-E2,HF-E3,HF-A3,IN47,AL33,AC01)  
 THICKNESS=(0.042,0.031,0.005,0.333,0.000,0.031) ..

ROOF-1 =CONSTRUCTION LAYERS = BLT-ROOF  
 ABSORPTANCE = 0.800  
 ROUGHNESS = 1 ..

## \$ STANDARD METAL DOOR

DOOR-MET =CONSTRUCTION U-VALUE = 0.020  
 ABSORPTANCE = 0.860  
 ROUGHNESS = 5 ..

## \$ EXTERIOR WALL ASB AL FACI AL BATT

WALL-2 =LAYERS MATERIAL=(AB02,AL21,PW03,AL21,IN02,GP02) I-F-R= 0.6100  
 THICKNESS=(0.021,0.000,0.042,0.000,0.296,0.052) ..

EXWALL-2 =CONSTRUCTION LAYERS = WALL-2  
 ABSORPTANCE = 0.880  
 ROUGHNESS = 2 ..

2\_PN\_STD =GLASS-TYPE      GLASS-TYPE-CODE = 2  
 PANES = 2 ..

## \$ SPACE DESCRIPTION

S\_PERI\_ZON =SPACE      AREA = 1779.3    VOLUME = 24019.9  
 TEMPERATURE = (73.)    ZONE-TYPE = CONDITIONED  
 PEOPLE-SCHEDULE = L\_ON    AREA/PERSON = 311.0  
 PEOPLE-HG-LAT = 625.0    PEOPLE-HG-SENS = 375.0  
 LIGHTING-TYPE = SUS-FLUOR    LIGHTING-W/SQFT = 1.5  
 LIGHT-TO-SPACE = 1.0    LIGHTING-SCHEDULE = L\_LITES  
 EQUIP-SCHEDULE = L\_LITES    EQUIPMENT-KW = 0.3  
 SOURCE-SENSIBLE = 0.0    FURN-WEIGHT = 0.5  
 INF-METHOD = NONE ..

E-W      HEIGHT = 9.0    WIDTH = 73.0    CONS = EXWALL-1  
 AZIMUTH = 180    SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 2.5    WIDTH = 3.5    G-T = 2\_PN\_STD  
 MULTIPLIER = 16.0    SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

E-W      HEIGHT = 4.5    WIDTH = 73.0    CONS = EXWALL-2  
 AZIMUTH = 180    SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

E-W      HEIGHT = 9.0    WIDTH = 32.5    CONS = EXWALL-1  
 AZIMUTH = 270    SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

DOOR      HEIGHT = 7.5    WIDTH = 3.5    CONS = DOOR-MET  
 SETBACK = 0.2    SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

E-W      HEIGHT = 3.0    WIDTH = 32.5    CONS = EXWALL-2  
 AZIMUTH = 270    SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

U-W      HEIGHT = 37.0    WIDTH = 48.0    CONS = FLOOR ..

ROOF      HEIGHT = 37.0    WIDTH = 48.0    CONS = ROOF-1  
 TILT = 0    SKY-FORM-FACTOR = 1.0 ..

N\_PERI\_ZON =SPACE      AREA = 1333.5    VOLUME = 18002.3  
 TEMPERATURE = (73.)    ZONE-TYPE = CONDITIONED  
 PEOPLE-SCHEDULE = L\_ON    AREA/PERSON = 311.0  
 PEOPLE-HG-LAT = 625.0    PEOPLE-HG-SENS = 375.0  
 LIGHTING-TYPE = SUS-FLUOR    LIGHTING-W/SQFT = 1.5  
 LIGHTING-KW = 0.67    LIGHT-TO-SPACE = 1.0  
 LIGHTING-SCHEDULE = L\_LITES

EQUIP-SCHEDULE = L\_KIT/EQUP EQUIPMENT-KW = 11.91  
SOURCE-SENSIBLE = 0.0 FURN-WEIGHT = 0.5  
INF-METHOD = NONE ..

E-W HEIGHT = 9.0 WIDTH = 54.0 CONS = EXWALL-1  
AZIMUTH = 0 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

DOOR HEIGHT = 7.5 WIDTH = 3.5 CONS = DOOR-MET  
MULTIPLIER = 2.0 SETBACK = 0.2  
SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 6.0 WIDTH = 8.0 G-T = 2\_PN\_STD  
MULTIPLIER = 4.0 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 4.5 WIDTH = 54.0 CONS = EXWALL-2  
AZIMUTH = 0 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 9.0 WIDTH = 36.5 CONS = EXWALL-1  
AZIMUTH = 270 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 3.0 WIDTH = 36.5 CONS = EXWALL-2  
AZIMUTH = 270 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

U-W HEIGHT = 31.0 WIDTH = 43.0 CONS = FLOOR ..

ROOF HEIGHT = 31.0 WIDTH = 43.0 CONS = ROOF-1  
TILT = 0 SKY-FORM-FACTOR = 1.0 ..

CORE\_ZONE =SPACE AREA = 1553.8 VOLUME = 20975.6  
TEMPERATURE = (73.) ZONE-TYPE = CONDITIONED  
PEOPLE-SCHEDULE = L\_ON AREA/PERSON = 311.0  
PEOPLE-HG-LAT = 625.0 PEOPLE-HG-SENS = 375.0  
LIGHTING-TYPE = SUS-FLUOR LIGHTING-W/SQFT = 1.5  
LIGHT-TO-SPACE = 1.0 LIGHTING-SCHEDULE = L\_LITES  
EQUIP-SCHEDULE = L\_ON EQUIPMENT-KW = 0.98  
SOURCE-SENSIBLE = 0.0 FURN-WEIGHT = 0.5  
INF-METHOD = NONE ..

U-W HEIGHT = 27.5 WIDTH = 56.5 CONS = FLOOR ..

ROOF HEIGHT = 27.5 WIDTH = 65.5 CONS = ROOF-1  
TILT = 0 SKY-FORM-FACTOR = 1.0 ..

END ..

COMPUTE LOADS ..

INPUT SYSTEMS ..

```

$-----$
$ E Z - D O E   S Y S T E M S   I N P U T $
$-----$

```

## \$ GENERAL PROJECT DATA

```

TITLE LINE-1 *      EMC      ENGINEERS      INC.      *
      LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
      LINE-3 *      DENVER,      CO      80227      *

      LINE-4 *BASELINE SIMULATION OF BLDG. #5000      *
      LINE-5 *FIRE STATION                                * ..

ABORT      ERRORS ..
DIAGNOSTIC WARNINGS ..
SYSTEMS-REPORT  VERIFICATION=(SV-A)
                SUMMARY=(SS-A,SS-C,SS-K,SS-O)
                HOURLY-DATA-SAVE = YES ..

```

## \$ SCHEDULES

```

SD_ON      =DAY-SCHEDULE (1,24) (1.) ..
SD_OFF     =DAY-SCHEDULE (1,24) (0.) ..
SD_S_CL_F  =DAY-SCHEDULE (1,24) (72.) ..
SD_W_HT_F  =DAY-SCHEDULE (1,24) (74.) ..
SD_W_CL_F  =DAY-SCHEDULE (1,24) (74.1) ..
SD_S_HT_F  =DAY-SCHEDULE (1,24) (71.9) ..

SW_ON      =WEEK-SCHEDULE (ALL) SD_ON ..
SW_OFF     =WEEK-SCHEDULE (ALL) SD_OFF ..

SW_S_CL_F  =WEEK-SCHEDULE (ALL) SD_S_CL_F ..
SW_W_HT_F  =WEEK-SCHEDULE (ALL) SD_W_HT_F ..
SW_W_CL_F  =WEEK-SCHEDULE (ALL) SD_W_CL_F ..
SW_S_HT_F  =WEEK-SCHEDULE (ALL) SD_S_HT_F ..

```

## \$ FULL ON SYSTEM

```
S_ON      =SCHEDULE THRU DEC 31 SW_ON ..
```

## \$ FULL OFF SYSTEM

```
S_OFF     =SCHEDULE THRU DEC 31 SW_OFF ..
```

## \$ HEATING SEASON

```
S_HE-SCHED =SCHEDULE THRU MAY 15 SW_ON
              THRU OCT 1 SW_OFF
              THRU DEC 31 SW_ON ..
```

## \$ COOLING SEASON

```
S_CL_SCHED =SCHEDULE THRU MAY 15 SW_OFF
              THRU OCT 1 SW_ON
              THRU DEC 31 SW_OFF ..
```

## \$ HEATING SET TEMP

S\_HT\_SET\_F =SCHEDULE THRU MAY 15 SW\_W\_HT\_F  
 THRU OCT 1 SW\_S\_HT\_F  
 THRU DEC 31 SW\_W\_HT\_F ..

S\_HR\_REPOT =SCHEDULE THRU JAN 14 SW\_OFF  
 THRU JAN 15 SW\_ON  
 THRU AUG 20 SW\_OFF  
 THRU AUG 21 SW\_ON  
 THRU DEC 31 SW\_OFF ..

## \$ COOLING SET TEMP

S\_CL\_SET\_F =SCHEDULE THRU MAY 15 SW\_W\_CL\_F  
 THRU OCT 1 SW\_S\_CL\_F  
 THRU DEC 31 SW\_W\_CL\_F ..

## \$ ZONE DESCRIPTION

S\_PERI-ZON =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.1  
 SIZING-OPTION = FROM-LOADS ..

N\_PERI\_ZON =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.1  
 SIZING-OPTION = FROM-LOADS ..

CORE\_ZONE =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.1  
 SIZING-OPTION = FROM-LOADS ..

## \$ SYSTEM DESCRIPTION

MZ\_SYSTEM =SYSTEM SYSTEM-TYPE = PMZS  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_HE-SCHED  
 COOLING-SCHEDULE = S\_CL\_SCHED HEAT-SET-T = 120.0  
 COOL-SET-T = 55.0 OA-CONTROL = FIXED  
 SUPPLY-CFM = 4155. RATED-CFM = 4155.  
 MIN-OUTSIDE-AIR = 0.35 MAX-OA-FRACTION = 0.35  
 SUPPLY-DELTA-T = 2.1 SUPPLY-KW = 0.00069  
 MOTOR-PLACEMENT = OUTSIDE-AIRFLOW  
 NIGHT-CYCLE-CTRL = STAY-OFF MIN-CFM-RATIO = 1.0  
 COOLING-CAPACITY = 118900. COOL-SH-CAP = 87000.  
 HEATING-CAPACITY = -233300. CRANKCASE-HEAT = 1.  
 CRANKCASE-MAX-T = 0. OUTSIDE-FAN-T = 45.  
 HEAT-SOURCE = HOT-WATER SIZING-OPTION = COINCIDENT  
 ZONE-NAMES = (S\_PERI-ZON, N\_PERI\_ZON, CORE\_ZONE) ..

## \$ HOURLY REPORT DESCRIPTION

```

ZONE_1  =REPORT-BLOCK VARIABLE-TYPE = S_PERI-ZON
          VARIABLE-LIST = (17,18,7,6) ..
AHU      =REPORT-BLOCK VARIABLE-TYPE = MZ_SYSTEM
          VARIABLE-LIST = (1,2,3,4,18,19,5,6) ..
ZONE_2  =REPORT-BLOCK VARIABLE-TYPE = N_PERI_ZON
          VARIABLE-LIST = (17,18,7,6) ..
ZONE_3  =REPORT-BLOCK VARIABLE-TYPE = CORE_ZONE
          VARIABLE-LIST = (17,18,7,6) ..
S_ZONE  = HOURLY-REPORT REPORT-SCHEDULE = S_HR_REPOT
          REPORT-BLOCK = (ZONE_1,AHU)
..
AHU_VARIAB = HOURLY-REPORT REPORT-SCHEDULE = S_HR_REPOT
          REPORT-BLOCK = (AHU)
..
N_ZONE    = HOURLY-REPORT REPORT-SCHEDULE = S_HR_REPOT
          REPORT-BLOCK = (ZONE_2)
..
COR_ZON   = HOURLY-REPORT REPORT-SCHEDULE = S_HR_REPOT
          REPORT-BLOCK = (ZONE_3)
..
END ..
COMPUTE SYSTEMS ..

```

INPUT PLANT ..

```

$-----$
$ E Z - D O E   P L A N T S   I N P U T $
$-----$

```

## \$ GENERAL PROJECT DATA

```

TITLE LINE-1 *   EMC   ENGINEERS   INC.   *
      LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
      LINE-3 *   DENVER,   CO   80227   *
      LINE-4 *BASELINE SIMULATION OF BLDG. #5000   *
      LINE-5 *FIRE STATION   * ..

```

```

ABORT      ERRORS ..
DIAGNOSTIC WARNINGS ..
PLANT-REPORT VERIFICATION=(PV-A)
            SUMMARY=(PS-B,BEPS)
            HOURLY-DATA-SAVE = YES ..

```

## \$ SCHEDULES

```

PD_ON      =DAY-SCHEDULE (1,24) (1.) ..
PD_OFF     =DAY-SCHEDULE (1,24) (0.) ..

```

PW\_ON =WEEK-SCHEDULE (ALL) PD\_ON ..

PW\_OFF =WEEK-SCHEDULE (ALL) PD\_OFF ..

\$ HEATING SEASON

P\_HEAT =SCHEDULE THRU MAY 15 PW\_ON  
THRU OCT 1 PW\_OFF  
THRU DEC 31 PW\_ON ..

\$ COOLING SEASON

P\_COOL =SCHEDULE THRU MAY 15 PW\_OFF  
THRU OCT 1 PW\_ON  
THRU DEC 31 PW\_OFF ..

\$ EQUIPMENT DESCRIPTION

BOILER-HW =PLANT-EQUIPMENT TYPE = HW-BOILER  
SIZE = -999. ..

CHILL-DX =PLANT-EQUIPMENT TYPE = HERM-REC-CHLR  
SIZE = -999. ..

PLANT-PARAMETERS BOILER-FUEL = NATURAL-GAS HERM-REC-COND-TYPE = AIR  
CCIRC-HEAD = 0.0 HCIRC-HEAD = 10.0  
HCIRC-DESIGN-T-DROP = 20.0 ..

ENERGY-RESOURCE RESOURCE = ELECTRICITY ..  
ENERGY-RESOURCE RESOURCE = NATURAL-GAS ..

END ..  
COMPUTE PLANT ..  
STOP ..

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 13:59:18 LDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION OF BLDG. #5000 FIRE STATION TOPEKA, KS  
 REPORT- LV-D DETAILS OF EXTERIOR SURFACES IN THE PROJECT

NUMBER OF EXTERIOR SURFACES 11 RECTANGULAR 11 OTHER 0  
 (U-VALUE INCLUDES INSIDE AIR FILM PLUS OUTSIDE AIR FILM AT 7.5 MPH WINDSPEED )

SURFACE	SPACE	U-VALUE (BTU/HR-SQFT-F)	GLASS AREA (SQFT)	U-VALUE (BTU/HR-SQFT-F)	WALL AREA (SQFT)	U-VALUE (BTU/HR-SQFT-F)	GLASS AREA (SQFT)	U-VALUE (BTU/HR-SQFT-F)	WALL AREA (SQFT)	U-VALUE (BTU/HR-SQFT-F)	GLASS AREA (SQFT)	U-VALUE (BTU/HR-SQFT-F)	WALL AREA (SQFT)	U-VALUE (BTU/HR-SQFT-F)	GLASS AREA (SQFT)	U-VALUE (BTU/HR-SQFT-F)	GLASS+OPAQUE AREA (SQFT)	AZIMUTH
N_PERI_ZON		0.490	192.00	0.068	294.00	0.234	486.00	0.068	294.00	0.234	486.00	0.068	294.00	0.234	486.00	0.068	486.00	NORTH
N_PERI_ZON		0.000	0.00	0.064	0.00	0.064	243.00	0.064	0.00	0.064	243.00	0.064	0.00	0.064	243.00	0.064	243.00	NORTH
S_PERI_ZON		0.490	140.00	0.068	517.00	0.158	657.00	0.068	517.00	0.158	657.00	0.068	517.00	0.158	657.00	0.068	657.00	SOUTH
S_PERI_ZON		0.000	0.00	0.064	328.50	0.064	328.50	0.064	0.00	0.064	328.50	0.064	0.00	0.064	328.50	0.064	328.50	SOUTH
S_PERI_ZON		0.000	0.00	0.068	292.50	0.068	292.50	0.068	292.50	0.068	292.50	0.068	292.50	0.068	292.50	0.068	292.50	WEST
S_PERI_ZON		0.000	0.00	0.064	97.50	0.064	97.50	0.064	97.50	0.064	97.50	0.064	97.50	0.064	97.50	0.064	97.50	WEST
N_PERI_ZON		0.000	0.00	0.068	328.50	0.068	328.50	0.068	328.50	0.068	328.50	0.068	328.50	0.068	328.50	0.068	328.50	WEST
N_PERI_ZON		0.000	0.00	0.064	109.50	0.064	109.50	0.064	109.50	0.064	109.50	0.064	109.50	0.064	109.50	0.064	109.50	WEST
S_PERI_ZON		0.000	0.00	0.036	1776.00	0.036	1776.00	0.036	1776.00	0.036	1776.00	0.036	1776.00	0.036	1776.00	0.036	1776.00	ROOF
N_PERI_ZON		0.000	0.00	0.036	1333.00	0.036	1333.00	0.036	1333.00	0.036	1333.00	0.036	1333.00	0.036	1333.00	0.036	1333.00	ROOF
CORE_ZONE		0.000	0.00	0.036	1801.25	0.036	1801.25	0.036	1801.25	0.036	1801.25	0.036	1801.25	0.036	1801.25	0.036	1801.25	ROOF
S_PERI_ZON		0.000	0.00	0.020	1776.00	0.020	1776.00	0.020	1776.00	0.020	1776.00	0.020	1776.00	0.020	1776.00	0.020	1776.00	UNDERGRND
N_PERI_ZON		0.000	0.00	0.020	1333.00	0.020	1333.00	0.020	1333.00	0.020	1333.00	0.020	1333.00	0.020	1333.00	0.020	1333.00	UNDERGRND
CORE_ZONE		0.000	0.00	0.020	1553.75	0.020	1553.75	0.020	1553.75	0.020	1553.75	0.020	1553.75	0.020	1553.75	0.020	1553.75	UNDERGRND

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 13:59:18 LDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION OF BLDG. #5000 FIRE STATION TOPEKA, KS  
 REPORT- LV-D DETAILS OF EXTERIOR SURFACES IN THE PROJECT

NORTH	SOUTH	WEST	ROOF	ALL WALLS	WALLS+ROOFS	UNDERGRND	BUILDING	AVERAGE U-VALUE/GLASS (BTU/HR-SQFT-F)	AVERAGE U-VALUE/WALLS (BTU/HR-SQFT-F)	AVERAGE U-VALUE/WALLS+GLASS (BTU/HR-SQFT-F)	GLASS AREA (SQFT)	OPAQUE AREA (SQFT)	GLASS+OPAQUE AREA (SQFT)
0.490	0.490	0.000	0.000	0.490	0.000	0.000	0.490	0.066	0.066	0.178	192.00	537.00	729.00
0.066	0.066	0.067	0.036	0.066	0.045	0.020	0.035	0.126	0.126	0.126	140.00	845.50	985.50
0.067	0.067	0.036	0.036	0.036	0.045	0.020	0.035	0.067	0.067	0.067	0.00	828.00	828.00
0.000	0.000	0.036	0.036	0.036	0.045	0.020	0.035	0.036	0.036	0.036	0.00	4910.25	4910.25
0.490	0.490	0.066	0.066	0.122	0.065	0.020	0.048	0.066	0.122	0.122	332.00	2210.50	2542.50
0.000	0.000	0.045	0.045	0.065	0.065	0.020	0.048	0.065	0.122	0.122	332.00	7120.75	7452.75
0.000	0.000	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.00	4662.75	4662.75
0.490	0.490	0.035	0.035	0.035	0.035	0.020	0.048	0.035	0.035	0.035	332.00	11783.50	12115.50



EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 13:59:18 LDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION OF BLDG. #5000 FIRE STATION  
 REPORT- LS-C BUILDING PEAK LOAD COMPONENTS TOPEKA, KS

\*\*\* BUILDING \*\*\*

FLOOR AREA 4667 SQFT 434 SQMT  
 VOLUME 62998 CUFT 1784 CUMT

COOLING LOAD HEATING LOAD  
 -----  
 TIME AUG 4 6PM JAN 15 5AM  
 DRY-BULB TEMP 92F 33C -8F -22C  
 WET-BULB TEMP 70F 21C -9F -23C

	SENSIBLE (KBTU/H)	( KW )	LATENT (KBTU/H)	( KW )	SENSIBLE (KBTU/H)	( KW )
WALLS	5.442	1.594	0.000	0.000	-11.726	-3.434
ROOFS	11.284	3.305	0.000	0.000	-9.323	-2.731
GLASS CONDUCTION	1.979	0.580	0.000	0.000	-13.072	-3.829
GLASS SOLAR	10.219	2.993	0.000	0.000	0.870	0.255
DOOR	0.052	0.015	0.000	0.000	-0.134	-0.039
INTERNAL SURFACES	0.000	0.000	0.000	0.000	0.000	0.000
UNDERGROUND SURFACES	-0.441	-0.129	0.000	0.000	-1.785	-0.523
OCCUPANTS TO SPACE	5.627	1.648	9.378	2.747	3.753	1.099
LIGHT TO SPACE	24.308	7.119	0.000	0.000	3.469	1.016
EQUIPMENT TO SPACE	21.276	6.231	0.000	0.000	1.085	0.318
PROCESS TO SPACE	0.000	0.000	0.000	0.000	0.000	0.000
INFILTRATION	0.000	0.000	0.000	0.000	0.000	0.000
TOTAL LOAD	79.746	23.356	9.378	2.747	-26.864	-7.868
TOTAL LOAD / AREA	89.124 KBTU/H	26.102 KW	26.102 KW	60.207 W /SQMT	-26.864 KBTU/H	-7.868 KW
	19.10BTU/H.SQFT	60.207 W /SQMT		5.757BTU/H.SQFT	18.148 W /SQMT	

\*\*\*\*\*  
 \* NOTE 1) THE ABOVE LOADS EXCLUDE OUTSIDE VENTILATION AIR \*  
 \* --- LOADS \*  
 \* 2) TIMES GIVEN IN STANDARD TIME FOR THE LOCATION \*  
 \* IN CONSIDERATION \*  
 \*\*\*\*\*

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 13:59:18 SDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION OF BLDG. #5000 FIRE STATION TOPEKA, KS  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR MZ\_SYSTEM

MONTH	C O O L I N G				H E A T I N G				E L E C			
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	HEATING LOAD (KBTU/HR)	ELEC- TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-49.094	15	5	-8.F	-9.F	171.380	8003.	19.956
FEB	0.00000				-34.759	3	5	-1.F	-2.F	-150.421	7193.	18.956
MAR	0.00000				-24.629	4	5	14.F	12.F	-115.125	7957.	18.956
APR	0.00000				-5.136	5	5	31.F	29.F	-76.835	7701.	18.956
MAY	19.02822	31	16	88.F	75.F	5	5	44.F	40.F	0.000	12457.	31.032
JUN	51.40951	24	12	84.F	76.F	5	5			0.000	14363.	31.318
JUL	69.27947	1	16	86.F	80.F	5	5			0.000	14261.	31.889
AUG	65.85220	20	13	92.F	78.F	5	5			0.000	10882.	31.736
SEP	34.29221	22	18	85.F	75.F	20	5	25.F	25.F	0.000	10882.	31.165
OCT	0.81302	1	18	83.F	68.F	3	5	13.F	12.F	-81.055	7701.	29.008
NOV	0.00000				-18.773	3	5	4.F	3.F	-114.579	7701.	18.956
DEC	0.00000				-42.321	12	5			-138.342	7958.	18.956
TOTAL	240.665				-178.861					-171.380	116219.	
MAX												31.889

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 13:59:18 SDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION OF BLDG. #5000 FIRE STATION TOPEKA, KS  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR MZ\_SYSTEM

MONTH	HOURS				HOURS				HOURS				HOURS			
	COOLING LOAD	HEATING LOAD	COINCIDENT COOL-HEAT LOAD	FLOATING	HEATING AVAIL.	COOLING AVAIL.	FANS ON	FANS ON	FANS ON	FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)		
JAN	0	744	0	0	744	0	744	0	0	0	60.222	3.847	0	3.847		
FEB	0	672	0	0	672	0	672	0	0	0	-58.174	3.847	0	3.847		
MAR	0	744	0	0	744	0	744	0	0	0	-61.906	3.847	0	3.847		
APR	0	720	0	0	720	0	720	0	0	0	-1.775	3.847	0	3.847		
MAY	244	360	0	140	360	384	744	0	140	156	0.000	24.295	140	24.295		
JUN	564	0	0	156	0	720	720	0	0	37	0.000	31.086	156	31.086		
JUL	707	0	0	37	0	744	744	0	0	58	0.000	27.751	37	27.751		
AUG	686	0	0	58	0	744	744	0	0	310	0.000	30.654	58	30.654		
SEP	410	0	0	310	0	720	744	0	0	13	0.000	29.008	13	29.008		
OCT	11	720	0	13	720	24	744	0	0	0	0.000	3.847	0	3.847		
NOV	0	720	0	0	720	0	744	0	0	0	-77.140	3.847	0	3.847		
DEC	0	744	0	0	744	0	744	0	0	0	-76.802	3.847	0	3.847		
ANNUAL	2622	5424	0	714	5424	3336	8760	0	0	714						

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 13:59:18 PDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION OF BLDG. #5000 FIRE STATION  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY TOTAL (MBTU) PEAK (KBTU) DY/HR	NATURAL-GAS TOTAL (MBTU) PEAK (KBTU) DY/HR
JAN	71.294 29.860 15/12	216.188 72.103 15/12	15/5 52.768 193.981
FEB	38.822 28.923 17/12	155.443 68.688 29/12	4/5 10.010 105.133
MAR	2.002 33.317 105.957	46.419 31/18 42.535	5/5 0.000 0.000
APR	0.000 106.933 28/12	30/1 49.043 108.881	0.000 0.000 0.000
MAY	0.000 108.881 23/12	31/1 48.695 108.360	0.000 0.000 0.000
JUN	0.000 37.154 106.409	31/1 21/12 37.154	0.000 0.000 0.000
JUL	0.000 106.409 7/12	30/1 27.931 99.046	0.000 7.424 116.889
AUG	0.000 27.931 1/18	20/5 27.708 30.173	0.000 30.173 154.836
SEP	0.000 67.920 30/12	3/5 29.608 68.688	0.000 63.063 180.953
OCT	0.000 68.688 31/12	31/12 408.414 108.881	12/5 275.557 216.188
NOV	ONE YEAR USE/PEAK		
DEC			

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 13:59:18 PDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION OF BLDG. #5000 FIRE STATION  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE	ELECTRICITY	NATURAL-GAS
IN SITE MBTU -		
CATEGORY OF USE		
SPACE HEAT	10.72	275.56
SPACE COOL	76.93	0.00
HVAC AUX	86.62	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	152.87	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	81.27	0.00
TOTAL	408.42	275.56

TOTAL SITE ENERGY 683.97 MBTU 146.6 KBTU/SQFT-YR GROSS-AREA 146.6 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 1502.03 MBTU 321.9 KBTU/SQFT-YR GROSS-AREA 321.9 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 3.3  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.



\$-----\$  
\$ E Z - D O E S Y S T E M S I N P U T \$  
\$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
LINE-3 \* DENVER, CO 80227 \*

LINE-4 \*RUN #1 NIGHT SETBACK OF BLDG. #5000 \*  
LINE-5 \*FIRE STATION \* ..

ABORT ERRORS ..  
DIAGNOSTIC WARNINGS ..  
SYSTEMS-REPORT VERIFICATION=(SV-A)  
SUMMARY=(SS-A,SS-C,SS-K,SS-O)  
HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

SD\_ON =DAY-SCHEDULE (1,24) (1.) ..  
SD\_OFF =DAY-SCHEDULE (1,24) (0.) ..  
SD\_S\_CL\_F =DAY-SCHEDULE (1,24) (72.) ..  
SD\_W\_HT\_F =DAY-SCHEDULE (1,4) (65.) ..  
(5,21) (74.) ..  
(22,24) (65.) ..  
SD\_W\_CL\_F =DAY-SCHEDULE (1,4) (65.1) ..  
(5,21) (74.1) ..  
(22,24) (65.1) ..  
SD\_S\_HT\_F =DAY-SCHEDULE (1,24) (71.9) ..  
  
SW\_ON =WEEK-SCHEDULE (ALL) SD\_ON ..  
SW\_OFF =WEEK-SCHEDULE (ALL) SD\_OFF ..  
  
SW\_S\_CL\_F =WEEK-SCHEDULE (ALL) SD\_S\_CL\_F ..  
SW\_W\_HT\_F =WEEK-SCHEDULE (ALL) SD\_W\_HT\_F ..  
SW\_W\_CL\_F =WEEK-SCHEDULE (ALL) SD\_W\_CL\_F ..  
SW\_S\_HT\_F =WEEK-SCHEDULE (ALL) SD\_S\_HT\_F ..



\$ FULL ON SYSTEM

S\_ON =SCHEDULE THRU DEC 31 SW\_ON ..

\$ FULL OFF SYSTEM

S\_OFF =SCHEDULE THRU DEC 31 SW\_OFF ..

\$ HEATING SEASON

S\_HE-SCHED =SCHEDULE THRU MAY 15 SW\_ON  
THRU OCT 1 SW\_OFF  
THRU DEC 31 SW\_ON ..

\$ COOLING SEASON

S\_CL\_SCHED =SCHEDULE THRU MAY 15 SW\_OFF  
 THRU OCT 1 SW\_ON  
 THRU DEC 31 SW\_OFF ..

## \$ HEATING SET TEMP

S\_HT\_SET\_F =SCHEDULE THRU MAY 15 SW\_W\_HT\_F  
 THRU OCT 1 SW\_S\_HT\_F  
 THRU DEC 31 SW\_W\_HT\_F ..

S\_HR\_REPOT =SCHEDULE THRU JAN 14 SW\_OFF  
 THRU JAN 15 SW\_ON  
 THRU AUG 20 SW\_OFF  
 THRU AUG 21 SW\_ON  
 THRU DEC 31 SW\_OFF ..

## \$ COOLING SET TEMP

S\_CL\_SET\_F =SCHEDULE THRU MAY 15 SW\_W\_CL\_F  
 THRU OCT 1 SW\_S\_CL\_F  
 THRU DEC 31 SW\_W\_CL\_F ..

## \$ ZONE DESCRIPTION

S\_PERI-ZON =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.1  
 SIZING-OPTION = FROM-LOADS ..

N\_PERI\_ZON =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.1  
 SIZING-OPTION = FROM-LOADS ..

CORE\_ZONE =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.1  
 SIZING-OPTION = FROM-LOADS ..

## \$ SYSTEM DESCRIPTION

MZ\_SYSTEM =SYSTEM SYSTEM-TYPE = PMZS  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_HE-SCHED  
 COOLING-SCHEDULE = S\_CL\_SCHED HEAT-SET-T = 120.0  
 COOL-SET-T = 55.0 OA-CONTROL = FIXED  
 SUPPLY-CFM = 4155. RATED-CFM = 4155.  
 MIN-OUTSIDE-AIR = 0.35 MAX-OA-FRACTION = 0.35  
 SUPPLY-DELTA-T = 2.1 SUPPLY-KW = 0.00069  
 MOTOR-PLACEMENT = OUTSIDE-AIRFLOW  
 NIGHT-CYCLE-CTRL = STAY-OFF MIN-CFM-RATIO = 1.0  
 COOLING-CAPACITY = 118900. COOL-SH-CAP = 87000.

HEATING-CAPACITY = -233300. CRANKCASE-HEAT = 1.  
CRANKCASE-MAX-T = 0. OUTSIDE-FAN-T = 45.  
HEAT-SOURCE = HOT-WATER SIZING-OPTION = COINCIDENT  
ZONE-NAMES = (S\_PERI-ZON, N\_PERI\_ZON, CORE\_ZONE) ..

\$ HOURLY REPORT DESCRIPTION

ZONE\_1 =REPORT-BLOCK VARIABLE-TYPE = S\_PERI-ZON  
VARIABLE-LIST = (17,18,7,6) ..  
AHU =REPORT-BLOCK VARIABLE-TYPE = MZ\_SYSTEM  
VARIABLE-LIST = (1,2,3,4,18,19,5,6) ..  
ZONE\_2 =REPORT-BLOCK VARIABLE-TYPE = N\_PERI\_ZON  
VARIABLE-LIST = (17,18,7,6) ..  
ZONE\_3 =REPORT-BLOCK VARIABLE-TYPE = CORE\_ZONE  
VARIABLE-LIST = (17,18,7,6) ..  
S\_ZONE = HOURLY-REPORT REPORT-SCHEDULE = S\_HR\_REPOT  
REPORT-BLOCK = (ZONE\_1,AHU)  
..  
AHU\_VARIAB = HOURLY-REPORT REPORT-SCHEDULE = S\_HR\_REPOT  
REPORT-BLOCK = (AHU)  
..  
N\_ZONE = HOURLY-REPORT REPORT-SCHEDULE = S\_HR\_REPOT  
REPORT-BLOCK = (ZONE\_2)  
..  
COR\_ZON = HOURLY-REPORT REPORT-SCHEDULE = S\_HR\_REPOT  
REPORT-BLOCK = (ZONE\_3)  
..  
END ..  
COMPUTE SYSTEMS ..

INPUT PLANT ..

\$-----\$  
\$ E Z - D O E P L A N T S I N P U T \$  
\$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
LINE-3 \* DENVER, CO 80227 \*  
  
LINE-4 \*RUN #1 NIGHT SETBACK OF BLDG. #5000 \*  
LINE-5 \*FIRE STATION \* ..

ABORT ERRORS ..  
DIAGNOSTIC WARNINGS ..  
PLANT-REPORT VERIFICATION=(PV-A)  
SUMMARY=(PS-B,BEPS)  
HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

PD\_ON =DAY-SCHEDULE (1,24) (1.) ..



EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 14:19:11 SDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SETBACK OF BLDG. #5000 FIRE STATION TOPEKA, KS  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR MZ\_SYSTEM

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC LOAD (KW)
JAN	0.00000				-44.919	15	-8.F	-9.F	8003.	-208.905	19.956
FEB	0.00000				-31.233	3	-1.F	-2.F	7193.	-192.986	18.956
MAR	0.00000				-21.536	4	14.F	12.F	7957.	-157.481	18.956
APR	0.00000				-4.247	5	31.F	29.F	7701.	-104.523	18.956
MAY	19.02814	31	16	88.F	-0.593	5	44.F	40.F	9709.	-31.970	31.032
JUN	51.40051	24	12	84.F	0.000				12457.	0.000	31.318
JUL	69.27947	1	16	86.F	0.000				14363.	0.000	31.889
AUG	65.85220	20	13	92.F	0.000				14261.	0.000	31.736
SEP	34.29221	22	18	85.F	0.000				10882.	0.000	31.165
OCT	0.81302	1	18	83.F	-2.955	20	25.F	25.F	8035.	-113.495	29.008
NOV	0.00000				-16.194	3	13.F	12.F	7701.	-156.962	18.956
DEC	0.00000				-38.353	12	4.F	3.F	7958.	-180.691	18.956
TOTAL	240.665				-160.031				116219.	-208.905	31.889
MAX											

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 14:19:11 SDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SETBACK OF BLDG. #5000 FIRE STATION TOPEKA, KS  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR MZ\_SYSTEM

MONTH	HOURS				HOURS				HOURS				COINCIDENT LOADS	
	COOLING LOAD	HEATING LOAD	COOL-HEAT LOAD	FLOATING	HEATING AVAIL.	COOLING AVAIL.	FANS ON	CYCLE ON	FANS ON	NIGHT VENTING	FLOATING WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)	
JAN	0	744	0	0	0	0	744	0	0	0	0	-1.802	3.847	
FEB	0	672	0	0	0	0	672	0	0	0	0	-1.016	3.847	
MAR	0	744	0	0	0	0	744	0	0	0	0	-1.276	3.847	
APR	0	720	0	0	0	0	720	0	0	0	0	-1.775	3.847	
MAY	244	360	0	140	384	720	744	0	0	140	0.000	0.000	24.295	
JUN	564	0	0	156	720	744	744	0	0	156	0.000	0.000	31.086	
JUL	707	0	0	37	744	744	744	0	0	37	0.000	0.000	24.691	
AUG	686	0	0	58	744	744	744	0	0	58	0.000	0.000	27.751	
SEP	410	0	0	310	720	744	744	0	0	310	0.000	0.000	30.654	
OCT	11	720	0	13	24	744	744	0	0	13	0.000	0.000	29.008	
NOV	0	720	0	0	0	720	744	0	0	0	0.000	0.000	3.847	
DEC	0	744	0	0	0	744	744	0	0	0	-13.139	3.847		
ANNUAL	2622	5424	0	714	3336	5424	8760	0	0	714				

EMC ENGINEERS INC. EZZOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 14:19:11 PDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SETBACK OF BLDG. #5000 FIRE STATION  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY	NATURAL-GAS
JAN	29.958 72.970 15/12	67.191 263.524 15/ 5	
FEB	26.705 69.556 17/12	48.652 246.729 3/ 5	
MAR	28.842 69.556 30/12	34.921 208.411 4/ 5	
APR	26.877 66.431 4/12	8.933 149.052 5/ 5	
MAY	33.335 105.957 31/18	2.096 55.373 5/ 5	
JUN	42.535 106.933 28/12	0.000 30/ 1	
JUL	49.043 108.881 23/12	0.000 31/ 1	
AUG	48.695 108.360 21/12	0.000 31/ 1	
SEP	37.154 106.409 7/12	0.000 30/ 1	
OCT	27.933 99.046 1/18	6.965 159.294 20/ 5	
NOV	27.636 69.067 30/12	26.910 207.842 3/ 5	
DEC	29.633 69.556 31/12	58.727 233.595 12/ 5	
	ONE YEAR USE/PEAK	408.344 108.881	254.394 263.524

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 14:19:11 PDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SETBACK OF BLDG. #5000 FIRE STATION  
 REPORT- BEFS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
SPACE HEAT	10.46	254.39
SPACE COOL	76.93	0.00
HVAC AUX	86.81	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	152.87	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	81.27	0.00
TOTAL	408.35	254.39

TOTAL SITE ENERGY 662.74 MBTU 142.0 KBTU/SQFT-YR GROSS-AREA 142.0 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 1480.65 MBTU 317.3 KBTU/SQFT-YR GROSS-AREA 317.3 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 3.4  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

\$-----\$  
\$ E Z - D O E S Y S T E M S I N P U T \$  
\$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
LINE-3 \* DENVER, CO 80227 \*  
  
LINE-4 \*RUN #2 DDC CONTROL OF BLDG. #5000 \*  
LINE-5 \*FIRE STATION \* ..

ABORT ERRORS ..  
DIAGNOSTIC WARNINGS ..  
SYSTEMS-REPORT VERIFICATION=(SV-A)  
SUMMARY=(SS-A,SS-C,SS-K,SS-O)  
HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

SD\_ON =DAY-SCHEDULE (1,24) (1.) ..  
SD\_OFF =DAY-SCHEDULE (1,24) (0.) ..  
SD\_S\_CL\_F =DAY-SCHEDULE (1,24) (76.) ..  
SD\_W\_HT\_F =DAY-SCHEDULE (1,24) (70.) ..  
SD\_W\_CL\_F =DAY-SCHEDULE (1,24) (70.1) ..  
SD\_S\_HT\_F =DAY-SCHEDULE (1,24) (75.9) ..



SW\_ON =WEEK-SCHEDULE (ALL) SD\_ON ..  
SW\_OFF =WEEK-SCHEDULE (ALL) SD\_OFF ..  
  
SW\_S\_CL\_F =WEEK-SCHEDULE (ALL) SD\_S\_CL\_F ..  
  
SW\_W\_HT\_F =WEEK-SCHEDULE (ALL) SD\_W\_HT\_F ..  
  
SW\_W\_CL\_F =WEEK-SCHEDULE (ALL) SD\_W\_CL\_F ..  
  
SW\_S\_HT\_F =WEEK-SCHEDULE (ALL) SD\_S\_HT\_F ..

\$ FULL ON SYSTEM

S\_ON =SCHEDULE THRU DEC 31 SW\_ON ..

\$ FULL OFF SYSTEM

S\_OFF =SCHEDULE THRU DEC 31 SW\_OFF ..

\$ HEATING SEASON

S\_HE-SCHED =SCHEDULE THRU MAY 15 SW\_ON  
THRU OCT 1 SW\_OFF  
THRU DEC 31 SW\_ON ..

\$ COOLING SEASON

S\_CL\_SCHED =SCHEDULE THRU MAY 15 SW\_OFF  
THRU OCT 1 SW\_ON  
THRU DEC 31 SW\_OFF ..

## \$ HEATING SET TEMP

S\_HT\_SET\_F =SCHEDULE THRU MAY 15 SW\_W\_HT\_F  
 THRU OCT 1 SW\_S\_HT\_F  
 THRU DEC 31 SW\_W\_HT\_F ..

S\_HR\_REPOT =SCHEDULE THRU JAN 14 SW\_OFF  
 THRU JAN 15 SW\_ON  
 THRU AUG 20 SW\_OFF  
 THRU AUG 21 SW\_ON  
 THRU DEC 31 SW\_OFF ..

## \$ COOLING SET TEMP

S\_CL\_SET\_F =SCHEDULE THRU MAY 15 SW\_W\_CL\_F  
 THRU OCT 1 SW\_S\_CL\_F  
 THRU DEC 31 SW\_W\_CL\_F ..

## \$ ZONE DESCRIPTION

S\_PERI-ZON =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.1  
 SIZING-OPTION = FROM-LOADS ..

N\_PERI\_ZON =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.1  
 SIZING-OPTION = FROM-LOADS ..

CORE\_ZONE =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.1  
 SIZING-OPTION = FROM-LOADS ..

## \$ SYSTEM DESCRIPTION

MZ\_SYSTEM =SYSTEM SYSTEM-TYPE = PMZS  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_HE-SCHED  
 COOLING-SCHEDULE = S\_CL\_SCHED HEAT-SET-T = 120.0  
 COOL-SET-T = 55.0 OA-CONTROL = FIXED  
 SUPPLY-CFM = 4155. RATED-CFM = 4155.  
 MIN-OUTSIDE-AIR = 0.35 MAX-OA-FRACTION = 0.35  
 SUPPLY-DELTA-T = 2.1 SUPPLY-KW = 0.00069  
 MOTOR-PLACEMENT = OUTSIDE-AIRFLOW  
 NIGHT-CYCLE-CTRL = STAY-OFF MIN-CFM-RATIO = 1.0  
 COOLING-CAPACITY = 118900. COOL-SH-CAP = 87000.  
 HEATING-CAPACITY = -233300. CRANKCASE-HEAT = 1.  
 CRANKCASE-MAX-T = 0. OUTSIDE-FAN-T = 45.  
 HEAT-SOURCE = HOT-WATER SIZING-OPTION = COINCIDENT  
 ZONE-NAMES = (S\_PERI-ZON, N\_PERI\_ZON, CORE\_ZONE) ..

## \$ HOURLY REPORT DESCRIPTION

```

ZONE_1      =REPORT-BLOCK VARIABLE-TYPE = S_PERI-ZON
              VARIABLE-LIST = (17,18,7,6) ..
AHU         =REPORT-BLOCK VARIABLE-TYPE = MZ_SYSTEM
              VARIABLE-LIST = (1,2,3,4,18,19,5,6) ..
ZONE_2      =REPORT-BLOCK VARIABLE-TYPE = N_PERI_ZON
              VARIABLE-LIST = (17,18,7,6) ..
ZONE_3      =REPORT-BLOCK VARIABLE-TYPE = CORE_ZONE
              VARIABLE-LIST = (17,18,7,6) ..
S_ZONE      = HOURLY-REPORT REPORT-SCHEDULE = S_HR_REPOT
              REPORT-BLOCK = (ZONE_1,AHU)
..
AHU_VARIAB = HOURLY-REPORT REPORT-SCHEDULE = S_HR_REPOT
              REPORT-BLOCK = (AHU)
..
N_ZONE      = HOURLY-REPORT REPORT-SCHEDULE = S_HR_REPOT
              REPORT-BLOCK = (ZONE_2)
..
COR_ZON     = HOURLY-REPORT REPORT-SCHEDULE = S_HR_REPOT
              REPORT-BLOCK = (ZONE_3)
..
END ..
COMPUTE SYSTEMS ..

```

INPUT PLANT ..

```

$-----$
$ E Z - D O E   P L A N T S   I N P U T $
$-----$

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## \$ GENERAL PROJECT DATA

```

TITLE LINE-1 *      EMC      ENGINEERS      INC.      *
LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
LINE-3 *      DENVER,      CO      80227      *
LINE-4 *RUN #2 DDC CONTROL OF BLDG. #5000      *
LINE-5 *FIRE STATION      * ..

```

```

ABORT      ERRORS ..
DIAGNOSTIC WARNINGS ..
PLANT-REPORT VERIFICATION=(PV-A)
              SUMMARY=(PS-B,BEPS)
              HOURLY-DATA-SAVE = YES ..

```

## \$ SCHEDULES

```

PD_ON      =DAY-SCHEDULE (1,24) (1.) ..
PD_OFF     =DAY-SCHEDULE (1,24) (0.) ..

```

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 14:28:11 SDL RUN 1  
DENVER, CO 80227 RUN #2 DDC CONTROL OF BLDG. #5000 FIRE STATION TOPEKA, KS  
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR MZ\_SYSTEM

MONTH	COOLING				HEATING				H E A T I N G				E L E C			
	HOURS LOAD	ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	TRICAL ENERGY (KWH)	ELEC LOAD (KW)	MAXIMUM ELEC LOAD (KW)		
JAN	0	0.00000				0.000	-42.471	15	5	-9.F	-162.377	8003.	19.956			
FEB	0	0.00000				0.000	-28.888	3	5	-2.F	-141.440	7193.	18.956			
MAR	0	0.00000				0.000	-18.896	4	5	14.F	-106.070	7957.	18.956			
APR	0	0.00000				0.000	-3.061	5	5	31.F	-56.599	7701.	18.956			
MAY	13	44425	31	18	90.F	129.536	-0.214	1	20	62.F	-2.932	9218.	31.020			
JUN	39	20008	27	15	88.F	128.451	0.000				11394.	13188.	31.109			
JUL	55	78997	17	18	88.F	139.656	0.000				0.000	13230.	31.804			
AUG	54	11045	20	13	92.F	131.521	0.000				0.000	10027.	31.674			
SEP	24	53618	6	13	88.F	130.606	-1.686	20	5	25.F	-63.234	8001.	30.939			
OCT	0	43671	1	18	83.F	84.986	-14.038	3	5	13.F	-105.624	7701.	26.784			
NOV	0	0.00000				0.000	-35.787	12	5	4.F	-129.340	7958.	18.956			
DEC	0	0.00000				0.000										
TOTAL		187.518				139.656	-145.041				-162.377	111569.	31.804			
MAX																

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 14:28:11 SDL RUN 1  
DENVER, CO 80227 RUN #2 DDC CONTROL OF BLDG. #5000 FIRE STATION TOPEKA, KS  
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR MZ\_SYSTEM

MONTH	HOURS		COINCIDENT		NUMBER OF		HOURS		HOURS		HOURS		COINCIDENT	
	COOLING LOAD	HEATING LOAD	COOL-HEAT LOAD	FLOATING	HEATING AVAIL.	HEATING AVAIL.	COOLING AVAIL.	COOLING AVAIL.	FANS ON	FANS ON	FANS ON	FANS ON	HEATING LOAD AT PEAK	ELECTRIC LOAD AT PEAK
JAN	0	0	0	0	744	744	0	0	744	744	0	0	-48.945	3.847
FEB	0	0	0	0	672	672	0	0	672	672	0	0	-44.910	3.847
MAR	0	0	0	0	744	744	0	0	744	744	0	0	-51.195	3.847
APR	0	0	0	0	720	720	0	0	720	720	0	0	-1.774	3.847
MAY	187	360	0	197	360	360	384	744	744	744	0	197	0.000	31.020
JUN	466	0	0	254	0	0	720	720	720	720	0	254	0.000	24.207
JUL	617	0	0	127	0	0	744	744	744	744	0	127	0.000	31.349
AUG	620	0	0	124	0	0	744	744	744	744	0	124	0.000	27.756
SEP	324	0	0	396	0	0	720	720	720	720	0	396	0.000	27.292
OCT	8	0	0	16	0	0	24	744	744	744	0	16	0.000	26.784
NOV	0	0	0	0	720	720	0	0	720	720	0	0	0.000	3.847
DEC	0	0	0	0	744	744	0	0	744	744	0	0	-67.878	3.847
ANNUAL	2222	5424	0	1114	5424	5424	3336	8760	0	0	0	1114	-67.814	3.847

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 14:28:11 PDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL OF BLDG. #5000 FIRE STATION  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY TOTAL (MBTU) PEAK (KBTU) DY/HR	NATURAL-GAS TOTAL (MBTU) PEAK (KBTU) DY/HR
JAN	71.894 15/12	29.582 71.894	62.073 204.831
FEB	68.480 17/12	26.462 68.480	44.460 182.634
MAR	68.101 29/12	28.582 68.101	30.276 143.928
APR	65.376 4/12	26.752 65.376	6.687 87.249
MAY	105.914 31/18	31.594 105.914	1.225 7.223
JUN	106.218 28/12	38.906 106.218	0.000 30/ 1
JUL	108.594 23/12	45.031 108.594	0.000 31/ 1
AUG	108.147 21/12	45.172 108.147	0.000 31/ 1
SEP	105.639 7/12	34.236 105.639	0.000 30/ 1
OCT	91.451 1/18	27.656 91.451	4.439 95.024
NOV	67.026 30/12	27.429 67.026	23.117 143.430
DEC	68.480 31/12	29.326 68.480	53.909 169.563
	ONE YEAR USE/PEAK	390.727 108.594	226.187 204.831



EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 14:28:11 PDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL OF BLDG. #5000 FIRE STATION TOPEKA, KS  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
SPACE HEAT	8.96	226.18
SPACE COOL	61.05	0.00
HVAC AUX	86.57	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	152.87	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	81.27	0.00
TOTAL	390.73	226.18

TOTAL SITE ENERGY 616.91 MBTU 132.2 KBTU/SQFT-YR GROSS-AREA 132.2 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 1399.54 MBTU 299.9 KBTU/SQFT-YR GROSS-AREA 299.9 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 5.6  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

**COMPUTER ENERGY SIMULATIONS**

**BLDG. 7450  
ADMINISTRATION BUILDINGS**



DENVER - ATLANTA

PROJECT: FEASIBILITY STUDY FOR  
 INSTALLATION OF UMCS  
 LOCATION: FORT RILEY, KANSAS

EMC NO: 1406-001  
 CALC. BY: AJN  
 CHECKED BY: CEL  
 DATE: 05-Jul-95

BUILDING NO.: 7450  
 BLDG. TYPE: REGIMENTAL HEADQUARTERS BUILDING

**ENERGY CONSTANT CALCULATIONS**

	BASERUN	RUN1	RUN2	RUN3	RUN4	RUN5
HEATING (MBtu)	293.3	150.6	250.9	0.0	0.0	0.0
COOLING (kWH)	133,273	123,082	130,152	0	0	0

SUPPLY AIR FAN	9,800 CFM
FLOOR AREA	3,200 FT <sup>2</sup>
CFMI	860 CFM
UA	1308 BTU/HR-°F
BLDG CONSTR.	2 (1 FOR LIGHT ) (2 FOR HEAVY)

EZDOE COMPUTER RUN DEFINITION:	
BASERUN	EXISTING OPERATION
RUN1	NIGHT SETBACK
RUN2	DDC CONTROL
RUN3	ECONOMIZER
RUN4	NIGHTTIME INFILTRATION (OA)
RUN5	DAYTIME INFILTRATION (OA)

HOURS OF OCCUPANCY			ANNUAL HEATING & COOLING HOURS	
M-F	600	1700	55 HR	HR. ON HEATING 1784 HR/YR
SAT.	0	0	0 HR	HR. ON COOLING 1084 HR/YR
SUN.	0	0	0 HR	HR. OFF HEATING 3664 HR/YR
	TOTAL OCCUPY HR.		55 HR/WK	HR. OFF COOLING 2228 HR/YR
	TOTAL UNOCC. HR.		113 HR/WK	
	ANNUAL OCCUPY HR.		2868 HR/YR	
	ANNUAL UNOCC. HR.		5892 HR/YR	

PRESENT HR. OF OPERATION FOR SYS. WITH HEATING AND COOLING 8760 HR/YR  
 PRESENT HR. OF OPERATION FOR SYS. WITH HEATING ONLY 5448 HR/YR  
 PRESENT HR. OF OPERATION FOR SYS. WITH COOLING ONLY 3312 HR/YR  
 HRS SAVED (HTG ONLY) 5448 - 1784 = 3664 HR/YR  
 HRS SAVED (CLG ONLY) 3312 - 1084 = 2228 HR/YR

HOAUHC	293.33 MBtu	-	0 MBtu	=	0.00E+00 Btu/CFM-HR
	860 CFM	x	5892 HR/YR		
HOAUH	293.33 MBtu	-	0 MBtu	=	0.00E+00 Btu/CFM-HR
	860 CFM	x	3664 HR/YR		
COAUHC	133,272.8 kWH	-	0.0 kWH	=	0.00E+00 kWH/CFM-HR
	860 CFM	x	5892 HR/YR		
COAUC	133,272.8 kWH	-	0.0 kWH	=	0.00E+00 kWH/CFM-HR
	860 CFM	x	2228 HR/YR		
HOAOHC	293.33 MBtu	-	0 MBtu	=	0.00E+00 Btu/CFM-HR
	860 CFM	x	2868 HR/YR		
HOAOH	293.33 MBtu	-	0 MBtu	=	0.00E+00 Btu/CFM-HR
	860 CFM	x	1784 HR/YR		
COAOHC	133,272.8 kWH	-	0.0 kWH	=	0.00E+00 kWH/CFM-HR
	860 CFM	x	2868 HR/YR		
COAOC	133,272.8 kWH	-	0.0 kWH	=	0.00E+00 kWH/CFM-HR
	860 CFM	x	1084 HR/YR		
DC DUTY	1 / 6 (10 MINUTES PER HOUR)			=	0.17
DC DEMAND	1 / 6 (10 MINUTES PER HOUR)			=	0.17
ECC	123,082.3 kWH	-	0.0 kWH	=	0.00E+00 kWH/CFM-HR
	9800 CFM	x	1084 HR/YR		
ECHC	123,082.3 kWH	-	0.0 kWH	=	0.00E+00 kWH/CFM-HR
	9800 CFM	x	2868 HR/YR		
NSUCHC	133,272.8 kWH	-	123,082.3 kWH	=	1.76E-04 kWH/CFM-HR
	9800 CFM	x	5892 HR/YR		
NSUCC	133,272.8 kWH	-	123,082.3 kWH	=	4.67E-04 kWH/CFM-HR
	9800 CFM	x	2228 HR/YR		
DDCCHC	133,272.8 kWH	-	130,152.4 kWH	=	1.11E-04 kWH/CFM-HR
	9800 CFM	x	2868 HR/YR		
DDCCC	133,272.8 kWH	-	130,152.4 kWH	=	2.94E-04 kWH/CFM-HR
	9800 CFM	x	1084 HR/YR		
NSC	293.33 MBtu	-	150.61 MBtu	=	1.09E+05 Btu/UA
	1307.5584 UA				
DDCH	293.33 MBtu	-	250.85 MBtu	=	3.25E+04 Btu/UA
	1307.5584 UA				
OPT	(2 HR/DAY X 240 DAY/YR)		175 HR/YR	=	305 HR/YR
CHWR	(1.10 kW X 0.012 Eff. X 664 HRS X 2 Degrees of Reset)			=	17.5 kWH/TON
OAR	567 HR/YR	x	0.01	=	5.67 HR/YR



INPUT LOADS ..

```

$-----$
$ E Z - D O E   L O A D S   I N P U T $
$-----$

```

\$ GENERAL PROJECT DATA

```

TITLE  LINE-1 *      EMC      ENGINEERS      INC.      *
        LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
        LINE-3 *      DENVER,      CO      80227      *
        LINE-4 *BASELINE SIMULATION FOR BLDG. #7450      *
        LINE-5 *REGIMENTAL HQ BLDG      * ..

```

```

ABORT      ERRORS ..
DIAGNOSTIC WARNINGS ..
LOADS-REPORT VERIFICATION=(LV-D)
            SUMMARY=(LS-C,LS-D)
            HOURLY-DATA-SAVE = YES ..
BUILDING-LOCATION LATITUDE = 39.0
                LONGITUDE = 96.5
                ALTITUDE = 1065.
                TIME-ZONE = 6
                GROSS-AREA = 9600
                SHIELDING-COEF = 0.29
                X-REF = 0.0
                Y-REF = 0.0 ..
RUN-PERIOD JAN 1 1994 THRU DEC 31 1994 ..

```

\$ SCHEDULES

```

LD_ON      =DAY-SCHEDULE (1,24) (1.) ..
LD_OFF     =DAY-SCHEDULE (1,24) (0.) ..
LD_PEOPLE  =DAY-SCHEDULE (1,5) (0.)
                (6,11) (1.)
                (12) (0.5)
                (13,17) (1.)
                (18,24) (0.) ..
LD_LIT/EQP =DAY-SCHEDULE (1,5) (0.1)
                (6,17) (1.)
                (18) (0.5)
                (19,24) (0.1) ..
LW_ON      =WEEK-SCHEDULE (ALL) LD_ON ..
LW_OFF     =WEEK-SCHEDULE (ALL) LD_OFF ..
LW_PEOPLE  =WEEK-SCHEDULE (WD) LD_PEOPLE

```

(WEH) LD\_OFF ..

LW\_LIT/EQP =WEEK-SCHEDULE (WD) LD\_LIT/EQP  
(WEH) LD\_OFF ..

\$ ON 100% LOADS

L\_ON =SCHEDULE THRU DEC 31 LW\_ON ..

\$ OFF 100% LOADS

L\_OFF =SCHEDULE THRU DEC 31 LW\_OFF ..

\$ PEOPLE LOAD

L\_PEOPLE =SCHEDULE THRU DEC 31 LW\_PEOPLE ..

\$ LIGHTS AND EQUIPMENT

L\_EQUI/LIG =SCHEDULE THRU DEC 31 LW\_LIT/EQP ..

\$ CONSTRUCTION TYPES

\$ U-VAL FROM PLANS + I-F-R = .61

WALL =CONSTRUCTION U-VALUE = 0.094  
ABSORPTANCE = 0.880  
ROUGHNESS = 2 ..

\$ SLAB FLOOR

FLOOR =CONSTRUCTION U-VALUE = 0.020  
ABSORPTANCE = 0.610  
ROUGHNESS = 5 ..

\$ STANDARD METAL DOOR

DOOR-MET =CONSTRUCTION U-VALUE = 0.480  
ABSORPTANCE = 0.860  
ROUGHNESS = 5 ..

\$ U-VAL FROM PLANS ROOF+I-F-R =.68

BLT-ROOF =CONSTRUCTION U-VALUE = 0.048  
ABSORPTANCE = 0.880  
ROUGHNESS = 1 ..

INS-PANE =CONSTRUCTION U-VALUE = 0.220  
ABSORPTANCE = 0.820  
ROUGHNESS = 2 ..

2PN-INS =GLASS-TYPE GLASS-TYPE-CODE = 4  
PANES = 2 ..

GLS-DOOR =GLASS-TYPE GLASS-TYPE-CODE = 3  
PANES = 1 ..

## \$ SPACE DESCRIPTION

FRONT-SPAC =SPACE AREA = 1200.0 VOLUME = 34800.0  
 TEMPERATURE = (73.) ZONE-TYPE = CONDITIONED  
 PEOPLE-SCHEDULE = L\_PEOPLE AREA/PERSON = 100.0  
 PEOPLE-HG-LAT = 625.0 PEOPLE-HG-SENS = 375.0  
 LIGHTING-TYPE = SUS-FLUOR LIGHTING-W/SQFT = 6.0  
 LIGHT-TO-SPACE = 1.0 LIGHTING-SCHEDULE = L\_EQUI/LIG  
 EQUIP-SCHEDULE = L\_EQUI/LIG EQUIPMENT-W/SQFT = 2.48  
 FURN-WEIGHT = 0.8 INF-METHOD = NONE ..

E-W HEIGHT = 27.0 WIDTH = 57.0 CONS = WALL  
 AZIMUTH = 135 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 27.0 WIDTH = 16.8 CONS = WALL  
 AZIMUTH = 45 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 27.0 WIDTH = 16.8 CONS = WALL  
 AZIMUTH = 225 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 27.0 WIDTH = 24.0 CONS = INS-PANE  
 AZIMUTH = 135 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 5.3 WIDTH = 2.0 G-T = 2PN-INS  
 MULTIPLIER = 18.0 SETBACK = 0.5  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 8.0 WIDTH = 11.0 G-T = GLS-DOOR  
 SETBACK = 0.5 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 OVERHANG-A = 1.  
 OVERHANG-W = 14. OVERHANG-D = 6.5 ..

WINDOW HEIGHT = 9.0 WIDTH = 11.0 G-T = 2PN-INS  
 SETBACK = 0.5 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 27.0 WIDTH = 4.0 CONS = INS-PANE  
 AZIMUTH = 45 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 5.3 WIDTH = 2.0 G-T = 2PN-INS  
 MULTIPLIER = 6.0 SETBACK = 0.5  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 27.0 WIDTH = 4.0 CONS = INS-PANE  
 AZIMUTH = 225 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 5.3 WIDTH = 2.0 G-T = 2PN-INS  
 MULTIPLIER = 6.0 SETBACK = 0.5  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

U-W HEIGHT = 20.0 WIDTH = 75.0 CONS = FLOOR ..

ROOF HEIGHT = 30.0 WIDTH = 40.0 CONS = BLT-ROOF  
TILT = 0 INSIDE-VIS-REFL = 0.2 ..

BACK-SPACE =SPACE AREA = 1200.0 VOLUME = 34800.0  
TEMPERATURE = (73.) ZONE-TYPE = CONDITIONED  
PEOPLE-SCHEDULE = L\_PEOPLE AREA/PERSON = 100.0  
PEOPLE-HG-LAT = 625.0 PEOPLE-HG-SENS = 375.0  
LIGHTING-TYPE = SUS-FLUOR LIGHTING-W/SQFT = 6.0  
LIGHT-TO-SPACE = 1.0 LIGHTING-SCHEDULE = L\_EQUI/LIG  
EQUIP-SCHEDULE = L\_EQUI/LIG EQUIPMENT-W/SQFT = 2.48  
FURN-WEIGHT = 0.8 INF-METHOD = NONE ..

E-W HEIGHT = 27.0 WIDTH = 65.0 CONS = WALL  
AZIMUTH = 315 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 3.0 WIDTH = 1.5 G-T = GLS-DOOR  
MULTIPLIER = 4.0 SETBACK = 0.5  
SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5  
OVERHANG-A = 1. OVERHANG-W = 14. OVERHANG-D = 6.5 ..

DOOR HEIGHT = 13.0 WIDTH = 1.0 CONS = DOOR-MET  
MULTIPLIER = 4.0 SETBACK = 0.5  
SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

DOOR HEIGHT = 7.5 WIDTH = 3.5 CONS = DOOR-MET  
SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 27.0 WIDTH = 16.8 CONS = WALL  
AZIMUTH = 225 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 27.0 WIDTH = 16.8 CONS = WALL  
AZIMUTH = 45 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 27.0 WIDTH = 16.0 CONS = INS-PANE  
AZIMUTH = 315 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 6.0 WIDTH = 2.0 G-T = 2PN-INS  
MULTIPLIER = 16.0 SETBACK = 0.5  
SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 27.0 WIDTH = 4.0 CONS = INS-PANE  
AZIMUTH = 45 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 5.3 WIDTH = 2.0 G-T = 2PN-INS  
MULTIPLIER = 6.0 SETBACK = 0.5  
SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 27.0 WIDTH = 4.0 CONS = INS-PANE



AZIMUTH = 225 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 6.0 WIDTH = 2.0 G-T = 2PN-INS  
MULTIPLIER = 4.0 SETBACK = 0.5  
SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

U-W HEIGHT = 20.0 WIDTH = 75.0 CONS = FLOOR ..

ROOF HEIGHT = 30.0 WIDTH = 40.0 CONS = BLT-ROOF  
TILT = 0 INSIDE-VIS-REFL = 0.2 ..

CORE-ZONE =SPACE AREA = 800.0 VOLUME = 23200.0  
TEMPERATURE = (73.) ZONE-TYPE = CONDITIONED  
PEOPLE-SCHEDULE = L\_PEOPLE AREA/PERSON = 100.0  
PEOPLE-HG-LAT = 625.0 PEOPLE-HG-SENS = 375.0  
LIGHTING-TYPE = SUS-FLUOR LIGHTING-W/SQFT = 6.0  
LIGHT-TO-SPACE = 1.0 LIGHTING-SCHEDULE = L\_EQUI/LIG  
EQUIP-SCHEDULE = L\_EQUI/LIG EQUIPMENT-W/SQFT = 2.48  
FURN-WEIGHT = 0.8 INF-METHOD = NONE ..

ROOF HEIGHT = 20.0 WIDTH = 40.0 CONS = BLT-ROOF  
TILT = 0 SKY-FORM-FACTOR = 1.0 ..

U-W HEIGHT = 20.0 WIDTH = 40.0 CONS = FLOOR ..

END ..  
COMPUTE LOADS ..  
INPUT SYSTEMS ..

\$-----\$  
\$ E Z - D O E S Y S T E M S I N P U T \$  
\$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
LINE-3 \* DENVER, CO 80227 \*  
  
LINE-4 \*BASELINE SIMULATION FOR BLDG. #7450 \*  
LINE-5 \*REGIMENTAL HQ BLDG \* ..  
  
ABORT ERRORS ..  
DIAGNOSTIC WARNINGS ..  
SYSTEMS-REPORT VERIFICATION=(SV-A)  
SUMMARY=(SS-A,SS-C,SS-K,SS-O)  
HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

SD\_ON =DAY-SCHEDULE (1,24) (1.) ..  
SD\_OFF =DAY-SCHEDULE (1,24) (0.) ..

SD\_WT\_HT =DAY-SCHEDULE (1,24) (74.) ..  
 SD\_SM\_CL =DAY-SCHEDULE (1,24) (72.) ..  
 SD\_WT\_CL =DAY-SCHEDULE (1,24) (76.) ..  
 SD\_SM\_HT =DAY-SCHEDULE (1,24) (70.) ..

SW\_ON =WEEK-SCHEDULE (ALL) SD\_ON ..

SW\_OFF =WEEK-SCHEDULE (ALL) SD\_OFF ..

SW\_WT\_HT =WEEK-SCHEDULE (ALL) SD\_WT\_HT ..

SW\_SM\_CL =WEEK-SCHEDULE (ALL) SD\_SM\_CL ..

SW\_WT\_CL =WEEK-SCHEDULE (ALL) SD\_WT\_CL ..

SW\_SM\_HT =WEEK-SCHEDULE (ALL) SD\_SM\_HT ..

\$ FULL ON SYSTEM

S\_ON =SCHEDULE THRU DEC 31 SW\_ON ..

\$ FULL OFF SYSTEM

S\_OFF =SCHEDULE THRU DEC 31 SW\_OFF ..

\$ HEATING SEASON

S\_HE-SCHED =SCHEDULE THRU MAY 15 SW\_ON  
 THRU OCT 1 SW\_OFF  
 THRU DEC 31 SW\_ON ..

\$ COOLING SEASON

S\_CL\_SCHED =SCHEDULE THRU MAY 15 SW\_OFF  
 THRU OCT 1 SW\_ON  
 THRU DEC 31 SW\_OFF ..

\$ HEATING SET TEMP

S\_HT\_SET\_F =SCHEDULE THRU MAY 15 SW\_WT\_HT  
 THRU OCT 1 SW\_SM\_HT  
 THRU DEC 31 SW\_WT\_HT ..

\$ COOLING SET TEMP

S\_CL\_SET\_F =SCHEDULE THRU MAY 15 SW\_WT\_CL  
 THRU OCT 1 SW\_SM\_CL  
 THRU DEC 31 SW\_WT\_CL ..

HRLY-RPT =SCHEDULE THRU JAN 12 SW\_OFF  
 THRU JAN 15 SW\_ON  
 THRU AUG 20 SW\_OFF  
 THRU AUG 23 SW\_ON  
 THRU DEC 31 SW\_OFF ..

\$ ZONE DESCRIPTION

FRONT-SPAC =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F

ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL ASSIGNED-CFM = 3950.  
 SIZING-OPTION = FROM-LOADS ..

BACK-SPACE =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL ASSIGNED-CFM = 4650.  
 SIZING-OPTION = FROM-LOADS ..

CORE-ZONE =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL ASSIGNED-CFM = 825.  
 OUTSIDE-AIR-CFM = 825. SIZING-OPTION = FROM-LOADS ..

#### \$ SYSTEM DESCRIPTION

FRESH-AIR =SYSTEM SYSTEM-TYPE = PSZ  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_HE-SCHED  
 COOLING-SCHEDULE = S\_CL\_SCHED SUPPLY-CFM = 825.  
 RATED-CFM = 825. MIN-OUTSIDE-AIR = 1.0  
 SUPPLY-DELTA-T = 1.8 SUPPLY-KW = 0.00059  
 MOTOR-PLACEMENT = OUTSIDE-AIRFLOW  
 NIGHT-CYCLE-CTRL = STAY-OFF NIGHT-VENT-DT = 0.0  
 COOLING-CAPACITY = 55000. COOL-SH-CAP = 44000.  
 COOL-FT-MIN = 0. HEATING-CAPACITY = -63260.  
 CRANKCASE-MAX-T = 0. OUTSIDE-FAN-T = 45.  
 HEAT-SOURCE = HOT-WATER SIZING-OPTION = COINCIDENT  
 REFG-FAN-KW = 0.1 REFG-PUMP-KW = 0.0  
 ZONE-NAMES = (CORE-ZONE) ..

FC'S-ZN-#1 =SYSTEM SYSTEM-TYPE = TPFC  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_HE-SCHED  
 COOLING-SCHEDULE = S\_CL\_SCHED RATED-CFM = 3950.  
 MIN-AIR-SCH = S\_OFF SUPPLY-DELTA-T = 0.2  
 SUPPLY-KW = 0.00007 NIGHT-CYCLE-CTRL = STAY-OFF  
 COOLING-CAPACITY = 116400. COOL-SH-CAP = 86200.  
 COOL-FT-MIN = 0. HEATING-CAPACITY = -414000.  
 ZONE-NAMES = (FRONT-SPAC) ..

FC'S-ZN-#2 =SYSTEM SYSTEM-TYPE = TPFC  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_HE-SCHED  
 COOLING-SCHEDULE = S\_CL\_SCHED RATED-CFM = 4650.  
 MIN-AIR-SCH = S\_OFF SUPPLY-DELTA-T = 0.2  
 SUPPLY-KW = 0.00007 NIGHT-CYCLE-CTRL = STAY-OFF  
 COOLING-CAPACITY = 134300. COOL-SH-CAP = 98700.  
 COOL-FT-MIN = 0. HEATING-CAPACITY = -488000.  
 ZONE-NAMES = (BACK-SPACE) ..

#### \$ HOURLY REPORT DESCRIPTION

```

AHU-BLK  =REPORT-BLOCK VARIABLE-TYPE = FRESH-AIR
          VARIABLE-LIST = (3,5,6,17) ..
FANCL-BLOK =REPORT-BLOCK VARIABLE-TYPE = FC'S-ZN-#2
          VARIABLE-LIST = (3,5,6,17) ..
PERI-BLK  =REPORT-BLOCK VARIABLE-TYPE = FRONT-SPAC
          VARIABLE-LIST = (17,18,7,6) ..
CORE-BLK  =REPORT-BLOCK VARIABLE-TYPE = CORE-ZONE
          VARIABLE-LIST = (17,18,7,6) ..
AHUS-RPT  = HOURLY-REPORT REPORT-SCHEDULE = HRLY-RPT
          REPORT-BLOCK = (AHU-BLK,FANCL-BLOK)
..
ZONE-BLK  = HOURLY-REPORT REPORT-SCHEDULE = HRLY-RPT
          REPORT-BLOCK = (PERI-BLK,CORE-BLK)
..
END ..
COMPUTE SYSTEMS ..

INPUT PLANT ..

```

```

$-----$
$ E Z - D O E   P L A N T S   I N P U T $
$-----$

```

\$ GENERAL PROJECT DATA

```

TITLE  LINE-1 *   EMC      ENGINEERS      INC.      *
        LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
        LINE-3 *   DENVER,      CO      80227      *

        LINE-4 *BASELINE SIMULATION FOR BLDG. #7450      *
        LINE-5 *REGIMENTAL HQ BLDG                        * ..

```

```

ABORT          ERRORS ..
DIAGNOSTIC     WARNINGS ..
PLANT-REPORT   VERIFICATION=(PV-A)
               SUMMARY=(PS-B,BEPS)
               HOURLY-DATA-SAVE = YES ..

```

\$ SCHEDULES

```

PD_ON  =DAY-SCHEDULE (1,24) (1.) ..
PD_OFF =DAY-SCHEDULE (1,24) (0.) ..

PW_OFF =WEEK-SCHEDULE (ALL) PD_OFF ..
PW_ON  =WEEK-SCHEDULE (ALL) PD_ON  ..

```

\$ HEATING SEASON

```

P_HEAT  =SCHEDULE THRU MAY 15 PW_ON
          THRU OCT  1 PW_OFF
          THRU DEC 31 PW_ON  ..

```

\$ COOLING SEASON

P\_COOL =SCHEDULE THRU MAY 15 PW\_OFF  
THRU OCT 1 PW\_ON  
THRU DEC 31 PW\_OFF ..

\$ EQUIPMENT DESCRIPTION

BOIL-HW =PLANT-EQUIPMENT TYPE = HW-BOILER  
SIZE = -999. ..

HER-REC-CH =PLANT-EQUIPMENT TYPE = HERM-REC-CHLR  
SIZE = -999. INSTALLED-NUMBER = 2  
MAX-NUMBER-AVAIL = 2 ..

PLANT-PARAMETERS BOILER-FUEL = NATURAL-GAS HERM-REC-COND-TYPE = AIR  
CCIRC-HEAD = 85.0 HCIRC-HEAD = 85.0 ..

ENERGY-RESOURCE RESOURCE = ELECTRICITY ..  
ENERGY-RESOURCE RESOURCE = NATURAL-GAS ..

P-HEAT-SEA =LOAD-ASSIGNMENT TYPE = HEATING  
OPERATION-MODE = RUN-NEEDED

LOAD-RANGE = 0.000  
PLANT-EQUIPMENT = BOIL-HW  
NUMBER = 1 ..

P-COOL-SEA =LOAD-ASSIGNMENT TYPE = COOLING  
OPERATION-MODE = RUN-NEEDED

LOAD-RANGE = 0.000  
PLANT-EQUIPMENT = HER-REC-CH  
NUMBER = 2 ..

END ..  
COMPUTE PLANT ..  
STOP ..

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOB-2.1D 5/16/1995 8:25:23 LDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #7450 REGIMENTAL HQ BLDG TOPEKA, KS  
 REPORT- LV-D DETAILS OF EXTERIOR SURFACES IN THE PROJECT

NUMBER OF EXTERIOR SURFACES 15 RECTANGULAR 15 OTHER 0  
 (U-VALUE INCLUDES INSIDE AIR FILM PLUS OUTSIDE AIR FILM AT 7.5 MPH WINDSPEED )

SURFACE	SPACE	U-VALUE (BTU/HR-SQFT-F)	AREA (SQFT)	U-VALUE (BTU/HR-SQFT-F)	W A L L (BTU/HR-SQFT-F)	U-VALUE (BTU/HR-SQFT-F)	W A L L + G L A S S (BTU/HR-SQFT-F)	AREA (SQFT)	AZIMUTH
FRONT-SPAC		0.000	0.00	0.092		0.092		453.60	NORTH-EAST
FRONT-SPAC		0.490	63.60	0.210		0.375		108.00	NORTH-EAST
BACK-SPACE		0.000	0.00	0.092		0.092		453.60	NORTH-EAST
BACK-SPACE		0.490	63.60	0.210		0.375		108.00	NORTH-EAST
FRONT-SPAC		0.614	377.80	0.210		0.445		648.00	SOUTH-EAST
FRONT-SPAC		0.000	0.00	0.092		0.092		1539.00	SOUTH-EAST
BACK-SPACE		0.000	0.00	0.092		0.092		453.60	SOUTH-WEST
FRONT-SPAC		0.000	0.00	0.092		0.092		453.60	SOUTH-WEST
FRONT-SPAC		0.490	63.60	0.210		0.375		108.00	SOUTH-WEST
BACK-SPACE		0.490	48.00	0.210		0.334		108.00	SOUTH-WEST
BACK-SPACE		1.021	18.00	0.092		0.102		1755.00	SOUTH-WEST
BACK-SPACE		0.490	192.00	0.210		0.334		432.00	NORTH-WEST
FRONT-SPAC		0.000	0.00	0.048		0.048		1200.00	ROOF
BACK-SPACE		0.000	0.00	0.048		0.048		1200.00	ROOF
CORE-ZONE		0.000	0.00	0.048		0.048		800.00	ROOF
FRONT-SPAC		0.000	0.00	0.020		0.020		1500.00	UNDERGRND
BACK-SPACE		0.000	0.00	0.020		0.020		1500.00	UNDERGRND
CORE-ZONE		0.000	0.00	0.020		0.020		800.00	UNDERGRND

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOB-2.1D 5/16/1995 8:25:23 LDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #7450 REGIMENTAL HQ BLDG TOPEKA, KS  
 REPORT- LV-D DETAILS OF EXTERIOR SURFACES IN THE PROJECT

NORTH-EAST	SOUTH-EAST	SOUTH-WEST	NORTH-WEST	ROOF	ALL WALLS	WALLS+ROOFS	UNDERGRND	BUILDING	AVERAGE U-VALUE/GLASS (BTU/HR-SQFT-F)	AVERAGE U-VALUE/WALLS (BTU/HR-SQFT-F)	AVERAGE U-VALUE WALLS+GLASS (BTU/HR-SQFT-F)	GLASS AREA (SQFT)	OPAQUE AREA (SQFT)	GLASS+OPAQUE AREA (SQFT)
					0.490	0.103	0.147	127.20	0.147	0.147	127.20	996.00	1123.20	
					0.614	0.110	0.197	377.80	0.197	0.197	377.80	1809.20	2187.00	
					0.490	0.104	0.143	111.60	0.143	0.143	111.60	1011.60	1123.20	
					0.536	0.106	0.148	210.00	0.148	0.148	210.00	1977.00	2187.00	
					0.000	0.048	0.048	0.00	0.048	0.048	0.00	3200.00	3200.00	
					0.558	0.106	0.163	826.60	0.163	0.163	826.60	5793.80	6620.40	
					0.558	0.086	0.125	826.60	0.125	0.125	826.60	8993.80	9820.40	
					0.000	0.020	0.020	0.00	0.020	0.020	0.00	3800.00	3800.00	
					0.558	0.066	0.096	826.60	0.096	0.096	826.60	12793.80	13620.40	

\*\*\* BUILDING \*\*\*

FLOOR AREA 3200 SQFT 297 SQMT  
 VOLUME 92800 CUFT 2628 CUMT

COOLING LOAD  
 \*\*\*\*\*  
 TIME MAY 31 5PM  
 DRY-BULB TEMP 90F 32C  
 WET-BULB TEMP 75F 24C

HEATING LOAD  
 \*\*\*\*\*  
 TIME JAN 15 8AM  
 DRY-BULB TEMP -6F -21C  
 WET-BULB TEMP -7F -22C

	SENSIBLE (KBTU/H) ( KW )		LATENT (KBTU/H) ( KW )		SENSIBLE (KBTU/H) ( KW )	
WALLS	23.103	6.766	0.000	0.000	-49.553	-14.513
ROOFS	11.839	3.467	0.000	0.000	-12.618	-3.695
GLASS CONDUCTION	6.754	1.978	0.000	0.000	-35.746	-10.469
GLASS SOLAR	26.904	7.880	0.000	0.000	1.299	0.380
DOOR	0.961	0.281	0.000	0.000	-2.641	-0.774
INTERNAL SURFACES	0.000	0.000	0.000	0.000	0.000	0.000
UNDERGROUND SURFACES	-1.779	-0.521	0.000	0.000	-2.182	-0.639
OCCUPANTS TO SPACE	11.030	3.230	20.000	5.857	0.440	0.129
LIGHT TO SPACE	59.157	17.326	0.000	0.000	4.754	1.392
EQUIPMENT TO SPACE	25.298	7.409	0.000	0.000	1.334	0.391
PROCESS TO SPACE	0.000	0.000	0.000	0.000	0.000	0.000
INFILTRATION	0.000	0.000	0.000	0.000	0.000	0.000
TOTAL	163.266	47.817	20.000	5.857	-94.913	-27.798
TOTAL LOAD	183.266	KBTU/H	53.674	KW	-94.913	KBTU/H
TOTAL LOAD / AREA	57.27	BTU/H.SQFT	180.545	W /SQMT	29.660	BTU/H.SQFT

\*\*\*\*\*  
 \* \* \* NOTE 1) THE ABOVE LOADS EXCLUDE OUTSIDE VENTILATION AIR \* \* \*  
 \* \* \* LOADS \* \* \*  
 \* \* \* 2) TIMES GIVEN IN STANDARD TIME FOR THE LOCATION \* \* \*  
 \* \* \* IN CONSIDERATION \* \* \*  
 \*\*\*\*\*

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/16/1995 8:25:23 SDL RUN 1												
DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #7450 REGIMENTAL HQ BLDG												
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR FRESH-AIR TOPEKA, KS												
----- C O O L I N G ----- H E A T I N G ----- E L E C -----												
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELECTRIC ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				0.000	-28.429	15	6	-8.F	-9.F	2303.	7.368
FEB	0.00000				0.000	-21.520	3	7	-5.F	-6.F	2080.	7.368
MAR	0.00000				0.000	-16.876	4	5	14.F	12.F	2483.	7.268
APR	0.00000				0.000	-6.469	3	1	33.F	32.F	2287.	7.268
MAY	4.35980	31	18	90.F	76.F	-1.782	1	6	37.F	37.F	2712.	12.741
JUN	14.95887	27	16	89.F	77.F	0.000			0.000	0.000	3790.	13.184
JUL	20.04893	21	16	89.F	79.F	0.000			0.000	0.000	4089.	13.494
AUG	20.85109	22	17	95.F	77.F	0.000			0.000	0.000	4518.	13.550
SEP	9.32246	7	16	93.F	76.F	0.000			0.000	0.000	3178.	13.236
OCT	0.03419	1	17	85.F	68.F	-6.053	20	5	25.F	25.F	2210.	7.268
NOV	0.00000				0.000	-14.618	3	5	13.F	12.F	2195.	7.268
DEC	0.00000				0.000	-25.319	14	22	2.F	1.F	2299.	7.368
TOTAL	69.645				68.010	-121.066					34143.	13.550
MAX												

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/16/1995 8:25:23 SDL RUN 1												
DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #7450 REGIMENTAL HQ BLDG												
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR FRESH-AIR TOPEKA, KS												
----- N U M B E R O F H O U R S -----												
MONTH	HOURS COOLING LOAD	HOURS HEATING LOAD	HOURS COINCIDENT COOL-HEAT LOAD	HOURS FLOATING	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.	HOURS FANS ON	HOURS FANS ON CYCLE	HOURS NIGHT VENTING	HOURS FLOATING WHEN FANS ON	HEATING LOAD AT PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)
JAN	0	730	0	14	744	0	744	0	0	14	-35.001	1.165
FEB	0	657	0	15	672	0	672	0	0	15	-35.455	1.165
MAR	0	650	0	94	744	0	744	0	0	94	-34.738	1.165
APR	0	409	0	311	720	0	720	0	0	311	-22.945	0.487
MAY	274	155	0	315	360	279	744	0	0	315	0.000	9.499
JUN	641	0	0	79	0	642	720	0	0	79	0.000	13.184
JUL	710	0	0	34	0	713	744	0	0	34	0.000	13.459
AUG	727	0	0	17	0	728	744	0	0	17	0.000	13.525
SEP	445	0	0	275	0	454	720	0	0	275	0.000	13.236
OCT	5	422	0	317	720	5	744	0	0	317	0.000	1.529
NOV	0	589	0	131	720	0	720	0	0	131	-41.434	1.165
DEC	0	722	0	22	744	0	744	0	0	22	-45.030	0.487
ANNUAL	2802	4334	0	1624	5424	2821	8760	0	0	1624		



EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/16/1995 8:25:23 SDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #7450 REGIMENTAL HQ BLDG  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR FC'S-ZN-#1 TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	ELECTRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	ELECTRIC LOAD (KW)
JAN	0.00000				-9.721	15	-6.F	-7.F	3111.	-49.373	10.448
FEB	0.00000				-5.976	3	-1.F	-2.F	2814.	-38.358	10.448
MAR	0.00000				-3.966	14	16.F	14.F	3387.	-35.298	10.448
APR	0.00000				-1.243	17	35.F	31.F	3104.	-15.599	10.448
MAY	9.62606	31	17	90.F	0.000	9	45.F	44.F	3111.	-7.997	10.448
JUN	20.08339	28	17	90.F	0.000				3242.	0.000	10.448
JUL	20.98320	13	17	92.F	0.000				2972.	0.000	10.448
AUG	22.92898	11	16	100.F	0.000				3387.	0.000	10.448
SEP	16.07776	7	17	92.F	0.000				3104.	0.000	10.448
OCT	0.20464	1	17	85.F	-1.595	30	46.F	42.F	2972.	-17.484	10.448
NOV	0.00000				-3.799	12	19.F	18.F	2966.	-32.281	10.448
DEC	0.00000				-8.742	12	4.F	3.F	3111.	-43.583	10.448
TOTAL	89.904				-35.609				37285.	-49.373	10.448
MAX											

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/16/1995 8:25:23 SDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #7450 REGIMENTAL HQ BLDG  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR FC'S-ZN-#1 TOPEKA, KS

MONTH	HOURS OF				HOURS OF				COINCIDENT LOADS			
	COOLING LOAD	HEATING LOAD	COINCIDENT COOL-HEAT LOAD	FLOATING	HEATING AVAIL.	COOLING AVAIL.	FANS ON	NIGHT VENTING	FANS ON	FLOATING WHEN FANS ON	HEATING AT LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT LOAD AT COOLING PEAK (KW)
JAN	0	567	0	177	744	0	744	0	0	177	-3.386	1.294
FEB	0	460	0	212	672	0	672	0	0	212	-3.114	1.294
MAR	0	460	0	284	744	0	744	0	0	284	-3.024	1.294
APR	0	392	0	328	720	0	720	0	0	328	-3.247	0.277
MAY	364	200	0	180	360	384	744	0	0	180	0.000	10.448
JUN	704	0	0	16	0	720	720	0	0	16	0.000	10.448
JUL	744	0	0	0	0	744	744	0	0	0	0.000	10.448
AUG	744	0	0	0	0	744	744	0	0	0	0.000	10.448
SEP	622	0	0	98	720	24	744	0	0	98	0.000	10.448
OCT	17	421	0	306	720	0	744	0	0	306	-8.249	0.277
NOV	0	470	0	250	720	0	744	0	0	250	-8.249	1.294
DEC	0	559	0	185	744	0	744	0	0	185	-31.502	0.277
ANNUAL	3195	3529	0	2036	5424	3336	8760	0	0	2036		

EMC ENGINEERS INC. 80227 EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/16/1995 8:25:23 SDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #7450 REGIMENTAL HQ BLDG  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR FC'S-ZN-#2 TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-10.180	15	-6.F	-7.F	-43.423	3147.	10.497
FEB	0.00000				-6.667	3	-1.F	-2.F	-34.673	2847.	10.497
MAR	0.00000				-4.198	6	19.F	18.F	-31.775	3424.	10.497
APR	0.00000				-1.416	4	33.F	31.F	-17.536	3139.	10.497
MAY	8.71709	31	90.F	75.F	-0.581	9	45.F	44.F	-7.756	3147.	10.497
JUN	18.35137	27	89.F	77.F	0.000				0.000	3278.	10.497
JUL	19.34946	7	83.F	73.F	0.000				0.000	3009.	10.497
AUG	20.47105	4	92.F	70.F	0.000				0.000	3424.	10.497
SEP	13.65467	7	92.F	75.F	0.000				0.000	3139.	10.497
OCT	0.07060	1	83.F	68.F	-1.733	2	53.F	51.F	-15.650	3009.	10.497
NOV	0.00000				-4.457	12	19.F	18.F	-30.260	3001.	10.497
DEC	0.00000				-8.453	12	4.F	3.F	-37.248	3147.	10.497
TOTAL	80.614				-37.687				-43.423	37712.	10.497
MAX											

EMC ENGINEERS INC. 80227 EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/16/1995 8:25:23 SDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #7450 REGIMENTAL HQ BLDG  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR FC'S-ZN-#2 TOPEKA, KS

MONTH	HOURS				HOURS				HOURS				COINCIDENT LOADS	
	COOLING LOAD	HEATING LOAD	COINCIDENT COOL-HEAT LOAD	FLOATING	HEATING AVAIL.	COOLING AVAIL.	FANS ON	FANS ON	FANS ON	FANS ON	FANS ON	FANS ON	HEATING LOAD AT PEAK (KBTU/HR)	ELECTRIC LOAD AT PEAK (KW)
JAN	0	566	0	178	744	0	744	0	0	0	178	-5.619	1.343	
FEB	0	472	0	200	672	0	672	0	0	0	200	-3.034	1.343	
MAR	0	468	0	276	744	0	744	0	0	0	276	-2.924	1.343	
APR	0	395	0	325	720	0	720	0	0	0	325	-3.432	0.326	
MAY	371	200	0	173	360	384	744	0	0	0	173	0.000	10.497	
JUN	703	0	0	17	720	720	720	0	0	0	17	0.000	10.497	
JUL	744	0	0	0	744	744	744	0	0	0	0	0.000	10.497	
AUG	744	0	0	0	744	744	744	0	0	0	0	0.000	10.497	
SEP	618	0	0	102	720	720	744	0	0	0	102	0.000	10.497	
OCT	13	424	0	307	720	24	744	0	0	0	307	0.000	0.326	
NOV	0	486	0	234	720	0	744	0	0	0	234	-9.988	1.343	
DEC	0	543	0	201	744	0	744	0	0	0	201	-27.439	0.326	
ANNUAL	3193	3554	0	2013	5424	3336	8760	0	0	0	2013			

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/16/1995 8:25:23 PDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #7450 REGIMENTAL HQ BLDG  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY TOTAL (MBTU) PEAK (KBTU) DY/HR	NATURAL-GAS TOTAL (MBTU) PEAK (KBTU) DY/HR
JAN	32.182 101.160 28/ 9	32.182 101.160 28/ 9	69.221 205.948 15/ 6
FEB	28.969 101.160 3/ 8	28.969 101.160 3/ 8	50.999 177.708 3/ 5
MAR	33.963 100.818 21/ 6	33.963 100.818 21/ 6	38.721 161.816 14/ 5
APR	30.392 99.509 4/ 6	30.392 99.509 4/ 6	15.504 102.324 4/ 5
MAY	38.115 161.117 31/17	38.115 161.117 31/17	5.129 68.863 1/ 6
JUN	49.935 160.088 27/17	49.935 160.088 27/17	0.000 30/ 1 0.000
JUL	50.193 163.456 22/16	50.193 163.456 22/16	0.000 31/ 1 0.000
AUG	55.793 164.876 23/16	55.793 164.876 23/16	0.000 31/ 1 0.000
SEP	43.806 161.886 7/16	43.806 161.886 7/16	0.000 30/ 1 15.898
OCT	29.427 100.145 20/ 7	29.427 100.145 20/ 7	89.070 30/24 35.556
NOV	29.956 100.818 28/ 6	29.956 100.818 28/ 6	155.907 12/ 6 62.304
DEC	32.105 101.160 13/ 8	32.105 101.160 13/ 8	184.967 12/ 5 293.332
	ONE YEAR USE/PEAK	454.836 164.876	205.948

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/16/1995 8:25:23 PDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #7450 REGIMENTAL HQ BLDG  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE	ELECTRICITY	NATURAL-GAS
IN SITE MBTU -		
CATEGORY OF USE		
SPACE HEAT	11.68	293.33
SPACE COOL	82.19	0.00
HVAC AUX	43.56	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	224.60	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	92.83	0.00
TOTAL	454.86	293.33

TOTAL SITE ENERGY 748.17 MBTU 77.9 KBTU/SQFT-YR GROSS-AREA 233.8 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 1659.21 MBTU 172.8 KBTU/SQFT-YR GROSS-AREA 518.5 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 12.0  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

AZIMUTH = 225 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 6.0 WIDTH = 2.0 G-T = 2PN-INS  
MULTIPLIER = 4.0 SETBACK = 0.5  
SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

U-W HEIGHT = 20.0 WIDTH = 75.0 CONS = FLOOR ..

ROOF HEIGHT = 30.0 WIDTH = 40.0 CONS = BLT-ROOF  
TILT = 0 INSIDE-VIS-REFL = 0.2 ..

CORE-ZONE =SPACE AREA = 800.0 VOLUME = 23200.0  
TEMPERATURE = (73.) ZONE-TYPE = CONDITIONED  
PEOPLE-SCHEDULE = L\_PEOPLE AREA/PERSON = 100.0  
PEOPLE-HG-LAT = 625.0 PEOPLE-HG-SENS = 375.0  
LIGHTING-TYPE = SUS-FLUOR LIGHTING-W/SQFT = 6.0  
LIGHT-TO-SPACE = 1.0 LIGHTING-SCHEDULE = L\_EQUI/LIG  
EQUIP-SCHEDULE = L\_EQUI/LIG EQUIPMENT-W/SQFT = 2.48  
FURN-WEIGHT = 0.8 INF-METHOD = NONE ..

ROOF HEIGHT = 20.0 WIDTH = 40.0 CONS = BLT-ROOF  
TILT = 0 SKY-FORM-FACTOR = 1.0 ..

U-W HEIGHT = 20.0 WIDTH = 40.0 CONS = FLOOR ..

END ..  
COMPUTE LOADS ..  
INPUT SYSTEMS ..

\$-----\$  
\$ E Z - D O E S Y S T E M S I N P U T \$  
\$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
LINE-3 \* DENVER, CO 80227 \*  
  
LINE-4 \*RUN #1 NIGHT SETBACK FOR BLDG. #7450 \*  
LINE-5 \*REGIMENTAL HQ BLDG \* ..  
  
ABORT ERRORS ..  
DIAGNOSTIC WARNINGS ..  
SYSTEMS-REPORT VERIFICATION=(SV-A)  
SUMMARY=(SS-A,SS-C,SS-K,SS-O)  
HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

SD\_ON =DAY-SCHEDULE (1,24) (1.) ..  
SD\_OFF =DAY-SCHEDULE (1,24) (0.) ..

```

SD_WT_HT =DAY-SCHEDULE (1,5) (55.)
              (6,18) (74.)
              (19,24) (55.) ..
SD_SM_CL =DAY-SCHEDULE (1,5) (85.)
              (6,18) (72.)
              (19,24) (85.) ..
SD_WT_CL =DAY-SCHEDULE (1,5) (57.)
              (6,18) (76.)
              (19,24) (57.) ..
SD_SM_HT =DAY-SCHEDULE (1,5) (83.)
              (6,18) (70.)
              (19,24) (83.) ..
SD_WT_HT_D =DAY-SCHEDULE (1,24) (55.) ..
SD_SM_CL_D =DAY-SCHEDULE (1,24) (85.) ..
SD_WT_CL_D =DAY-SCHEDULE (1,24) (57.) ..
SD_SM_HT_D =DAY-SCHEDULE (1,24) (83.) ..
SD_FAN_CYC =DAY-SCHEDULE (1,5) (0.)
              (6,18) (1.)
              (19,24) (0.) ..

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SW_ON =WEEK-SCHEDULE (ALL) SD_ON ..
SW_OFF =WEEK-SCHEDULE (ALL) SD_OFF ..
SW_WT_HT =WEEK-SCHEDULE (WD) SD_WT_HT
              (WEH) SD_WT_HT_D ..
SW_SM_CL =WEEK-SCHEDULE (WD) SD_SM_CL
              (WEH) SD_SM_CL_D ..
SW_WT_CL =WEEK-SCHEDULE (WD) SD_WT_CL
              (WEH) SD_WT_CL_D ..
SW_SM_HT =WEEK-SCHEDULE (WD) SD_SM_HT
              (WEH) SD_SM_HT_D ..
SW_FAN_CYC =WEEK-SCHEDULE (WD) SD_FAN_CYC
              (WEH) SD_OFF ..

```

\$ FULL ON SYSTEM

S\_ON =SCHEDULE THRU DEC 31 SW\_ON ..

\$ FULL OFF SYSTEM

S\_OFF =SCHEDULE THRU DEC 31 SW\_OFF ..

\$ HEATING SEASON

```

S_HE-SCHED =SCHEDULE THRU MAY 15 SW_ON
              THRU OCT 1 SW_OFF
              THRU DEC 31 SW_ON ..

```

\$ COOLING SEASON

```

S_CL_SCHED =SCHEDULE THRU MAY 15 SW_OFF
              THRU OCT 1 SW_ON
              THRU DEC 31 SW_OFF ..

```

## \$ HEATING SET TEMP

S\_HT\_SET\_F =SCHEDULE THRU MAY 15 SW\_WT\_HT  
 THRU OCT 1 SW\_SM\_HT  
 THRU DEC 31 SW\_WT\_HT ..

## \$ COOLING SET TEMP

S\_CL\_SET\_F =SCHEDULE THRU MAY 15 SW\_WT\_CL  
 THRU OCT 1 SW\_SM\_CL  
 THRU DEC 31 SW\_WT\_CL ..

HRLY-RPT =SCHEDULE THRU JAN 12 SW\_OFF  
 THRU JAN 15 SW\_ON  
 THRU AUG 20 SW\_OFF  
 THRU AUG 23 SW\_ON  
 THRU DEC 31 SW\_OFF ..

S\_FAN\_CYCL =SCHEDULE THRU DEC 31 SW\_FAN\_CYC ..

## \$ ZONE DESCRIPTION

FRONT-SPAC =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL ASSIGNED-CFM = 3950.  
 SIZING-OPTION = FROM-LOADS ..

BACK-SPACE =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL ASSIGNED-CFM = 4650.  
 SIZING-OPTION = FROM-LOADS ..

CORE-ZONE =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL ASSIGNED-CFM = 825.  
 OUTSIDE-AIR-CFM = 825. SIZING-OPTION = FROM-LOADS ..

## \$ SYSTEM DESCRIPTION

FRESH-AIR =SYSTEM SYSTEM-TYPE = PSZ  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_HE-SCHED  
 COOLING-SCHEDULE = S\_CL\_SCHED SUPPLY-CFM = 825.  
 RATED-CFM = 825. MIN-OUTSIDE-AIR = 1.0  
 FAN-SCHEDULE = S\_FAN\_CYCL SUPPLY-DELTA-T = 1.8  
 SUPPLY-KW = 0.00059  
 MOTOR-PLACEMENT = OUTSIDE-AIRFLOW  
NIGHT-CYCLE-CTRL = CYCLE-ON-ANY NIGHT-VENT-DT = 0.0 ←  
 COOL-CAPACITY = 55000. COOL-SH-CAP = 44000.  
 COOL-FT-MIN = 0. HEATING-CAPACITY = -63260.  
 CRANKCASE-MAX-T = 0. OUTSIDE-FAN-T = 45.  
 HEAT-SOURCE = HOT-WATER SIZING-OPTION = COINCIDENT

REFG-FAN-KW = 0.1 REFG-PUMP-KW = 0.0  
ZONE-NAMES = (CORE-ZONE) ..

FC'S-ZN-#1 =SYSTEM SYSTEM-TYPE = TPFC  
MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
HEATING-SCHEDULE = S\_HT\_SET\_F  
COOLING-SCHEDULE = S\_CL\_SCHED RATED-CFM = 3950.  
MIN-AIR-SCH = S\_OFF FAN-SCHEDULE = S\_FAN\_CYCL  
SUPPLY-DELTA-T = 0.2 SUPPLY-KW = 0.00007  
NIGHT-CYCLE-CTRL = CYCLE-ON-ANY ←  
COOLING-CAPACITY = 116400. COOL-SH-CAP = 86200.  
COOL-FT-MIN = 0. HEATING-CAPACITY = -414000.  
ZONE-NAMES = (FRONT-SPAC) ..

FC'S-ZN-#2 =SYSTEM SYSTEM-TYPE = TPFC  
MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
HEATING-SCHEDULE = S\_HT\_SET\_F  
COOLING-SCHEDULE = S\_CL\_SCHED RATED-CFM = 4650.  
MIN-AIR-SCH = S\_OFF FAN-SCHEDULE = S\_FAN\_CYCL  
SUPPLY-DELTA-T = 0.2 SUPPLY-KW = 0.00007  
NIGHT-CYCLE-CTRL = CYCLE-ON-ANY  
COOLING-CAPACITY = 134300. COOL-SH-CAP = 98700.  
COOL-FT-MIN = 0. HEATING-CAPACITY = -488000.  
ZONE-NAMES = (BACK-SPACE) ..

\$ HOURLY REPORT DESCRIPTION

AHU-BLK =REPORT-BLOCK VARIABLE-TYPE = FRESH-AIR  
VARIABLE-LIST = (3,5,6,17) ..  
FANCL-BLOK =REPORT-BLOCK VARIABLE-TYPE = FC'S-ZN-#2  
VARIABLE-LIST = (3,5,6,17) ..  
PERI-BLK =REPORT-BLOCK VARIABLE-TYPE = FRONT-SPAC  
VARIABLE-LIST = (17,18,7,6) ..  
CORE-BLK =REPORT-BLOCK VARIABLE-TYPE = CORE-ZONE  
VARIABLE-LIST = (17,18,7,6) ..  
AHUS-RPT = HOURLY-REPORT REPORT-SCHEDULE = HRLY-RPT  
REPORT-BLOCK = (AHU-BLK,FANCL-BLOK)

..  
ZONE-BLK = HOURLY-REPORT REPORT-SCHEDULE = HRLY-RPT  
REPORT-BLOCK = (PERI-BLK,CORE-BLK)

..  
END ..  
COMPUTE SYSTEMS ..

INPUT PLANT ..

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\$ E Z - D O E P L A N T S I N P U T \$  
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\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*



EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 17:20:34 SDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SETBACK FOR BLDG. #7450 REGIMENTAL HQ BLDG  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR FRESH-AIR TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	ELEC- TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-12.905	14	9	-3. F	4. F	-66.436	7.368
FEB	0.00000				-8.552	3	7	-5. F	-6. F	-68.518	7.368
MAR	0.00000				-6.171	14	7	16. F	14. F	-61.571	7.268
APR	0.00000				-1.545	4	7	32. F	30. F	-40.360	7.268
MAY	2.90320	31	18	90. F	76. F	9	7	43. F	43. F	-29.638	12.741
JUN	8.91745	27	16	89. F	77. F					0.000	13.184
JUL	10.53200	21	16	89. F	79. F					0.000	13.494
AUG	12.07589	22	17	95. F	77. F					0.000	13.550
SEP	6.23749	7	16	93. F	76. F					2818.	13.236
OCT	0.00000				-1.402	20	7	23. F	23. F	-44.399	7.268
NOV	0.00000				-4.506	3	6	13. F	12. F	-50.054	7.268
DEC	0.00000				-10.649	12	6	3. F	2. F	-63.944	7.368
TOTAL	40.666				-45.989					-68.518	13.550
MAX											

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 17:20:34 SDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SETBACK FOR BLDG. #7450 REGIMENTAL HQ BLDG  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR FRESH-AIR TOPEKA, KS

MONTH	H O U R S				H O U R S				C O I N C I D E N T				C O I N C I D E N T L O A D S			
	HOURS COOLING LOAD	HOURS HEATING LOAD	HOURS COOL-HEAT LOAD	HOURS FLOATING	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.	HOURS FANS ON	HOURS FANS ON CYCLE	HOURS NIGHT VENTING	HOURS FLOATING WHEN FANS ON	HEATING LOAD AT PEAK (KBTU/HR)	ELECTRIC LOAD AT PEAK (KW)	COOLING PEAK (KW)	HEATING LOAD AT PEAK (KBTU/HR)	ELECTRIC LOAD AT PEAK (KW)	
JAN	0	421	0	323	744	0	456	183	0	35	0.000	0.678	0.000	0.000	0.678	
FEB	0	364	0	308	672	0	406	159	0	42	0.000	0.678	0.000	0.000	0.678	
MAR	0	329	0	415	744	0	539	240	0	210	0.000	0.678	0.000	0.000	0.678	
APR	0	126	0	594	720	0	669	396	0	543	0.000	0.487	0.000	0.000	0.487	
MAY	138	29	0	577	360	218	658	385	0	491	0.000	9.499	0.000	0.000	9.499	
JUN	292	0	0	428	0	494	536	250	0	244	0.000	13.184	0.000	0.000	13.184	
JUL	291	0	0	453	0	620	448	188	0	157	0.000	13.459	0.000	0.000	13.459	
AUG	347	0	0	397	0	578	533	234	0	186	0.000	13.525	0.000	0.000	13.525	
SEP	245	0	0	475	0	375	603	439	0	358	0.000	13.236	0.000	0.000	13.236	
OCT	0	116	0	628	720	0	699	236	0	583	0.000	1.165	0.000	0.000	1.165	
NOV	0	258	0	462	720	0	496	236	0	238	0.000	0.678	0.000	0.000	0.678	
DEC	0	403	0	341	744	0	450	177	0	47	0.000	0.000	0.000	0.000	0.000	
ANNUAL	1313	2046	0	5401	5424	2285	6493	3217	0	3134						

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 17:20:34 SDL RUN 1												
DENVER, CO 80227 RUN #1 NIGHT SETBACK FOR BLDG. #7450 REGIMENTAL HQ BLDG												
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR FC'S-ZN-#1 TOPEKA, KS												
----- C O O L I N G ----- H E A T I N G ----- E L E C -----												
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	TRICAL ENERGY (KWH)	ELEC LOAD (KW)
JAN	0.00000				0.000	-5.129	28	-2. F	-3. F	-58.180	3079.	10.448
FEB	0.00000				0.000	-2.683	7	26. F	25. F	-56.005	2800.	10.448
MAR	0.00000				0.000	-1.903	14	15. F	13. F	-54.109	3383.	10.448
APR	0.00000				0.000	-0.649	15	51. F	44. F	-6.309	3104.	10.448
MAY	8.05695	31	17	90. F	75. F	-0.854	24	56. F	55. F	-21.718	3069.	10.448
JUN	16.98055	27	16	89. F	77. F	-0.766	11	58. F	56. F	-24.007	3162.	10.448
JUL	16.69001	13	16	93. F	77. F	-0.284	30	62. F	59. F	-16.971	2880.	10.448
AUG	19.31336	11	13	96. F	73. F	-0.388	4	56. F	55. F	-16.274	3305.	10.448
SEP	14.49438	6	16	93. F	76. F	-2.285	18	51. F	50. F	-33.688	3031.	10.448
OCT	0.03265	1	17	85. F	68. F	-0.831	1	46. F	44. F	-37.269	2968.	10.448
NOV	0.00000				0.000	-1.434	14	29. F	29. F	-36.176	2961.	10.448
DEC	0.00000				0.000	-4.365	12	3. F	2. F	-77.704	3088.	10.448
TOTAL	75.568				74.163	-21.572				-77.704	36832.	10.448

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 17:20:34 SDL RUN 1											
DENVER, CO 80227 RUN #1 NIGHT SETBACK FOR BLDG. #7450 REGIMENTAL HQ BLDG											
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR FC'S-ZN-#1 TOPEKA, KS											
----- N U M B E R O F H O U R S -----											
MONTH	HOURS COOLING LOAD	HOURS HEATING LOAD	HOURS COINCIDENT COOL-HEAT LOAD	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.	HOURS FANS ON	HOURS FANS ON CYCLE	HOURS NIGHT VENTING	HOURS FLOATING WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)
JAN	0	474	0	744	0	629	356	0	155	-3.029	1.294
FEB	0	416	0	663	0	620	373	0	204	-2.779	1.294
MAR	0	418	0	711	0	727	428	0	309	-2.896	1.294
APR	0	206	0	452	0	720	447	0	514	-3.247	0.277
MAY	179	118	0	447	384	594	321	0	297	0.000	10.448
JUN	362	67	0	491	720	429	143	0	0	0.000	10.448
JUL	375	36	0	445	744	411	151	0	0	0.000	10.448
AUG	406	40	0	383	744	446	147	0	0	0.000	10.448
SEP	315	139	0	538	720	454	181	0	0	0.000	10.448
OCT	3	240	0	482	24	729	469	0	486	0.000	0.277
NOV	0	370	0	629	0	701	441	0	331	-2.751	1.294
DEC	0	512	0	744	0	662	389	0	150	0.000	0.000
ANNUAL	1640	3036	0	6732	3336	7122	3846	0	2446		

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 17:20:34 SDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SETBACK FOR BLDG. #7450 REGIMENTAL HQ BLDG  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR FC'S-ZN-#2 TOPEKA, KS

MONTH	COOLING				HEATING				ELECTRIC			
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	MAXIMUM COOLING LOAD (KBTU/HR)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-5.817	31	21.F	19.F	3107.	-55.412	0.000	10.497
FEB	0.00000				-3.192	28	12.F	11.F	2818.	-56.688	0.000	10.497
MAR	0.00000				-2.049	14	15.F	13.F	3415.	-49.514	0.000	10.497
APR	0.00000				-0.669	4	32.F	31.F	3139.	-8.805	0.000	10.497
MAY	7.40370	31	90.F	75.F	-0.879	24	56.F	55.F	3097.	-19.993	75.031	10.497
JUN	15.71539	27	89.F	77.F	-0.820	2	50.F	49.F	3183.	-22.934	68.491	10.497
JUL	15.52774	13	92.F	78.F	-0.296	30	62.F	59.F	2897.	-15.312	68.717	10.497
AUG	17.43436	11	98.F	71.F	-0.470	4	55.F	54.F	3324.	-16.407	68.970	10.497
SEP	12.82128	6	93.F	75.F	-2.599	11	40.F	40.F	3057.	-32.794	65.156	10.497
OCT	0.00000				-0.854	1	46.F	44.F	3004.	-33.600	0.000	10.497
NOV	0.00000				-1.713	14	29.F	29.F	2983.	-45.502	0.000	10.497
DEC	0.00000				-4.171	12	3.F	2.F	3116.	-66.140	0.000	10.497
TOTAL	68.902				-23.529				37141.	-66.140		10.497
MAX										75.031		

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 17:20:34 SDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SETBACK FOR BLDG. #7450 REGIMENTAL HQ BLDG  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR FC'S-ZN-#2 TOPEKA, KS

MONTH	COOLING LOAD		HEATING LOAD		COINCIDENT COOL-HEAT LOAD		HOURS OF FLOATING		HOURS OF COOLING AVAIL.		HOURS OF HEATING AVAIL.		HOURS OF FANS ON		HOURS OF NIGHT VENTING		HOURS OF FLOATING WHEN FANS ON		COINCIDENT LOADS	
	COOLING LOAD	HEATING LOAD	COINCIDENT COOL-HEAT LOAD	FLOATING	HEATING AVAIL.	COOLING AVAIL.	HEATING AVAIL.	FANS ON	FANS ON	FANS ON	FANS ON	FANS ON	FANS ON	FANS ON	NIGHT VENTING	FLOATING WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)		
JAN	0	0	0	247	744	0	620	347	0	123	-2.633	1.343								
FEB	0	0	0	252	663	0	582	335	0	162	-2.495	1.343								
MAR	0	0	0	309	711	0	716	417	0	281	-2.797	1.343								
APR	0	0	0	508	452	0	720	447	0	508	-3.431	0.326								
MAY	170	125	0	449	450	384	591	318	0	296	0.000	10.497								
JUN	351	78	0	291	491	720	429	143	0	0	0.000	10.497								
JUL	358	42	0	344	445	744	400	140	0	0	0.000	10.497								
AUG	380	56	0	308	383	744	436	137	0	0	0.000	10.497								
SEP	293	173	0	254	538	720	466	193	0	0	0.000	10.497								
OCT	0	247	0	497	482	24	470	406	0	483	-2.238	1.343								
NOV	0	354	0	366	629	0	666	374	0	312	-2.732	1.343								
DEC	0	508	0	236	744	0	647	374	0	139	0.000	0.000								
ANNUAL	1552	3147	0	4061	6732	3336	7003	3727	0	2304										

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 17:20:34 PDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SETBACK FOR BLDG. #7450 REGIMENTAL HQ BLDG  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY 30.972 102.361 28/ 9	NATURAL-GAS 37.704 222.951 28/ 6
JAN	27.656 102.361 3/ 8	17.215 214.108 14/ 6	23.640 228.922 28/ 6
FEB	32.900 102.020 31/ 7	5.215 81.283 4/ 6	17.215 214.108 14/ 6
MAR	29.650 101.801 4/ 6	35.418 164.968 31/17	5.215 81.283 4/ 6
APR	44.174 164.183 27/17	42.172 167.316 22/16	3.550 69.951 24/ 5
MAY	48.542 169.350 22/16	48.542 169.350 22/16	2.758 77.644 2/ 5
JUN	40.642 165.722 7/16	28.541 102.020 31/ 7	1.038 54.545 30/ 7
JUL	40.642 165.722 7/16	28.541 102.020 31/ 7	1.533 52.050 3/ 5
AUG	28.541 102.020 31/ 7	28.669 102.020 29/ 8	8.355 100.512 18/ 7
SEP	28.669 102.020 29/ 8	30.728 102.361 13/ 8	5.606 108.771 1/ 7
OCT	30.728 102.361 13/ 8	420.063 169.350	13.183 174.837 14/ 6
NOV	30.728 102.361 13/ 8		30.818 261.103 12/ 6
DEC	ONE YEAR USE/PEAK		150.615 261.103

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 17:20:34 PDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SETBACK FOR BLDG. #7450 REGIMENTAL HQ BLDG  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
SPACE HEAT	7.28	150.61
SPACE COOL	61.13	0.00
HVAC AUX	34.25	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	224.60	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	92.83	0.00
TOTAL	420.08	150.61

TOTAL SITE ENERGY 570.68 MBTU 59.4 KBTU/SQFT-YR GROSS-AREA 178.3 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 1412.07 MBTU 147.1 KBTU/SQFT-YR GROSS-AREA 441.3 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 18.1  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.



AZIMUTH = 225 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 6.0 WIDTH = 2.0 G-T = 2PN-INS  
MULTIPLIER = 4.0 SETBACK = 0.5  
SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

U-W HEIGHT = 20.0 WIDTH = 75.0 CONS = FLOOR ..

ROOF HEIGHT = 30.0 WIDTH = 40.0 CONS = BLT-ROOF  
TILT = 0 INSIDE-VIS-REFL = 0.2 ..

CORE-ZONE =SPACE AREA = 800.0 VOLUME = 23200.0  
TEMPERATURE = (73.) ZONE-TYPE = CONDITIONED  
PEOPLE-SCHEDULE = L\_PEOPLE AREA/PERSON = 100.0  
PEOPLE-HG-LAT = 625.0 PEOPLE-HG-SENS = 375.0  
LIGHTING-TYPE = SUS-FLUOR LIGHTING-W/SQFT = 6.0  
LIGHT-TO-SPACE = 1.0 LIGHTING-SCHEDULE = L\_EQUI/LIG  
EQUIP-SCHEDULE = L\_EQUI/LIG EQUIPMENT-W/SQFT = 2.48  
FURN-WEIGHT = 0.8 INF-METHOD = NONE ..

ROOF HEIGHT = 20.0 WIDTH = 40.0 CONS = BLT-ROOF  
TILT = 0 SKY-FORM-FACTOR = 1.0 ..

U-W HEIGHT = 20.0 WIDTH = 40.0 CONS = FLOOR ..

END ..  
COMPUTE LOADS ..

INPUT SYSTEMS ..

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\$ E Z - D O E S Y S T E M S I N P U T \$  
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\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
LINE-3 \* DENVER, CO 80227 \*  
  
LINE-4 \*RUN #2 DDC CONTROL FOR BLDG. #7450 \*  
LINE-5 \*REGIMENTAL HQ BLDG \* ..

ABORT ERRORS ..  
DIAGNOSTIC WARNINGS ..  
SYSTEMS-REPORT VERIFICATION=(SV-A)  
SUMMARY=(SS-A,SS-C,SS-K,SS-O)  
HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

SD\_ON =DAY-SCHEDULE (1,24) (1.) ..  
SD\_OFF =DAY-SCHEDULE (1,24) (0.) ..

```

SD_WT_HT =DAY-SCHEDULE (1,24) (70.) ..
SD_SM_CL =DAY-SCHEDULE (1,24) (76.) ..
SD_WT_CL =DAY-SCHEDULE (1,24) (72.) ..
SD_SM_HT =DAY-SCHEDULE (1,24) (74.) ..

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SW_ON =WEEK-SCHEDULE (ALL) SD_ON ..
SW_OFF =WEEK-SCHEDULE (ALL) SD_OFF ..
SW_WT_HT =WEEK-SCHEDULE (ALL) SD_WT_HT ..
SW_SM_CL =WEEK-SCHEDULE (ALL) SD_SM_CL ..
SW_WT_CL =WEEK-SCHEDULE (ALL) SD_WT_CL ..
SW_SM_HT =WEEK-SCHEDULE (ALL) SD_SM_HT ..

```

\$ FULL ON SYSTEM

S\_ON =SCHEDULE THRU DEC 31 SW\_ON ..

\$ FULL OFF SYSTEM

S\_OFF =SCHEDULE THRU DEC 31 SW\_OFF ..

\$ HEATING SEASON

```

S_HE-SCHED =SCHEDULE THRU MAY 15 SW_ON
              THRU OCT 1 SW_OFF
              THRU DEC 31 SW_ON ..

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\$ COOLING SEASON

```

S_CL_SCHED =SCHEDULE THRU MAY 15 SW_OFF
              THRU OCT 1 SW_ON
              THRU DEC 31 SW_OFF ..

```

\$ HEATING SET TEMP

```

S_HT_SET_F =SCHEDULE THRU MAY 15 SW_WT_HT
              THRU OCT 1 SW_SM_HT
              THRU DEC 31 SW_WT_HT ..

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\$ COOLING SET TEMP

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S_CL_SET_F =SCHEDULE THRU MAY 15 SW_WT_CL
              THRU OCT 1 SW_SM_CL
              THRU DEC 31 SW_WT_CL ..

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HRLY-RPT =SCHEDULE THRU JAN 12 SW_OFF
              THRU JAN 15 SW_ON
              THRU AUG 20 SW_OFF
              THRU AUG 23 SW_ON
              THRU DEC 31 SW_OFF ..

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\$ ZONE DESCRIPTION

```

FRONT-SPAC =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0
              HEAT-TEMP-SCH = S_HT_SET_F COOL-TEMP-SCH = S_CL_SET_F

```



ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL ASSIGNED-CFM = 3950.  
 SIZING-OPTION = FROM-LOADS ..

BACK-SPACE =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL ASSIGNED-CFM = 4650.  
 SIZING-OPTION = FROM-LOADS ..

CORE-ZONE =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL ASSIGNED-CFM = 825.  
 OUTSIDE-AIR-CFM = 825. SIZING-OPTION = FROM-LOADS ..

#### \$ SYSTEM DESCRIPTION

FRESH-AIR =SYSTEM SYSTEM-TYPE = PSZ  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_HE-SCHED  
 COOLING-SCHEDULE = S\_CL\_SCHED SUPPLY-CFM = 825.  
 RATED-CFM = 825. MIN-OUTSIDE-AIR = 1.0  
 SUPPLY-DELTA-T = 1.8 SUPPLY-KW = 0.00059  
 MOTOR-PLACEMENT = OUTSIDE-AIRFLOW  
 NIGHT-CYCLE-CTRL = STAY-OFF NIGHT-VENT-DT = 0.0  
 COOLING-CAPACITY = 55000. COOL-SH-CAP = 44000.  
 COOL-FT-MIN = 0. HEATING-CAPACITY = -63260.  
 CRANKCASE-MAX-T = 0. OUTSIDE-FAN-T = 45.  
 HEAT-SOURCE = HOT-WATER SIZING-OPTION = COINCIDENT  
 REFG-FAN-KW = 0.1 REFG-PUMP-KW = 0.0  
 ZONE-NAMES = (CORE-ZONE) ..

FC'S-ZN-#1 =SYSTEM SYSTEM-TYPE = TPFC  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_HE-SCHED  
 COOLING-SCHEDULE = S\_CL\_SCHED RATED-CFM = 3950.  
 MIN-AIR-SCH = S\_OFF SUPPLY-DELTA-T = 0.2  
 SUPPLY-KW = 0.00007. NIGHT-CYCLE-CTRL = STAY-OFF  
 COOLING-CAPACITY = 116400. COOL-SH-CAP = 86200.  
 COOL-FT-MIN = 0. HEATING-CAPACITY = -414000.  
 ZONE-NAMES = (FRONT-SPAC) ..

FC'S-ZN-#2 =SYSTEM SYSTEM-TYPE = TPFC  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_HE-SCHED  
 COOLING-SCHEDULE = S\_CL\_SCHED RATED-CFM = 4650.  
 MIN-AIR-SCH = S\_OFF SUPPLY-DELTA-T = 0.2  
 SUPPLY-KW = 0.00007. NIGHT-CYCLE-CTRL = STAY-OFF  
 COOLING-CAPACITY = 134300. COOL-SH-CAP = 98700.  
 COOL-FT-MIN = 0. HEATING-CAPACITY = -488000.  
 ZONE-NAMES = (BACK-SPACE) ..

#### \$ HOURLY REPORT DESCRIPTION

```

AHU-BLK   =REPORT-BLOCK VARIABLE-TYPE = FRESH-AIR
          VARIABLE-LIST = (3,5,6,17) ..
FANCL-BLOK =REPORT-BLOCK VARIABLE-TYPE = FC'S-ZN-#2
          VARIABLE-LIST = (3,5,6,17) ..
PERI-BLK  =REPORT-BLOCK VARIABLE-TYPE = FRONT-SPAC
          VARIABLE-LIST = (17,18,7,6) ..
CORE-BLK  =REPORT-BLOCK VARIABLE-TYPE = CORE-ZONE
          VARIABLE-LIST = (17,18,7,6) ..
AHUS-RPT  = HOURLY-REPORT REPORT-SCHEDULE = HRLY-RPT
          REPORT-BLOCK = (AHU-BLK,FANCL-BLOK)
..
ZONE-BLK  = HOURLY-REPORT REPORT-SCHEDULE = HRLY-RPT
          REPORT-BLOCK = (PERI-BLK,CORE-BLK)
..
END ..
COMPUTE SYSTEMS ..

INPUT PLANT ..

```

```

$-----$
$ E Z - D O E   P L A N T S   I N P U T $
$-----$

```

\$ GENERAL PROJECT DATA

```

TITLE LINE-1 *   EMC   ENGINEERS   INC.   *
      LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
      LINE-3 *   DENVER,   CO   80227   *

      LINE-4 *RUN #2 DDC CONTROL FOR BLDG. #7450   *
      LINE-5 *REGIMENTAL HQ BLDG   * ..

```

```

ABORT          ERRORS ..
DIAGNOSTIC     WARNINGS ..
PLANT-REPORT   VERIFICATION=(PV-A)
               SUMMARY=(PS-B,BEPS)
               HOURLY-DATA-SAVE = YES ..

```

\$ SCHEDULES

```

PD_ON   =DAY-SCHEDULE (1,24) (1.) ..
PD_OFF  =DAY-SCHEDULE (1,24) (0.) ..

PW_OFF  =WEEK-SCHEDULE (ALL) PD_OFF ..
PW_ON   =WEEK-SCHEDULE (ALL) PD_ON  ..

```

\$ HEATING SEASON

```

P_HEAT  =SCHEDULE THRU MAY 15 PW_ON
          THRU OCT  1 PW_OFF
          THRU DEC 31 PW_ON ..

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EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/16/1995 8:22:58 SDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. #7450 REGIMENTAL HQ BLDG  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR FRESH-AIR TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C	
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-25.663	15	-8.F	-9.F	2303.	7.368
FEB	0.00000				-18.899	3	-1.F	-2.F	2080.	7.368
MAR	0.00000				-14.199	4	14.F	12.F	2483.	7.268
APR	0.00000				-4.741	3	33.F	32.F	2287.	7.268
MAY	3.30266	31	17	90.F	-1.130	1	37.F	37.F	2615.	12.741
JUN	12.22892	27	16	89.F	0.000				3545.	13.184
JUL	16.58689	21	16	89.F	0.000				3777.	13.494
AUG	17.81778	22	17	95.F	0.000				4240.	13.550
SEP	7.66400	7	16	93.F	0.000				3024.	13.236
OCT	0.00000				-4.206	20	25.F	25.F	2207.	7.268
NOV	0.00000				-12.234	3	13.F	12.F	2195.	7.268
DEC	0.00000				-22.419	14	2.F	1.F	2299.	7.368
TOTAL	57.600				-103.490				33054.	
MAX										13.550

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/16/1995 8:22:58 SDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. #7450 REGIMENTAL HQ BLDG  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR FRESH-AIR TOPEKA, KS

MONTH	N U M B E R O F H O U R S				C O I N C I D E N T C O O L - H E A T L O A D				C O I N C I D E N T L O A D S			
	HOURS COOLING LOAD	HOURS HEATING LOAD	HOURS COOL-HEAT LOAD	HOURS FLOATING	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.	HOURS FANS ON CYCLE	HOURS NIGHT VENTING	HOURS FLOATING WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)	
JAN	0	715	0	29	744	0	0	0	29	-31.047	1.165	
FEB	0	651	0	21	672	0	0	0	21	-30.982	1.165	
MAR	0	609	0	135	744	0	0	0	135	-30.800	1.165	
APR	0	352	0	368	720	0	0	0	368	-18.865	0.487	
MAY	211	119	0	414	360	213	0	0	414	0.000	12.741	
JUN	565	0	0	155	744	570	0	0	155	0.000	13.184	
JUL	642	0	0	102	744	646	0	0	102	0.000	13.459	
AUG	651	0	0	93	744	655	0	0	93	0.000	13.525	
SEP	364	0	0	356	720	371	0	0	356	0.000	13.236	
OCT	0	348	0	396	720	0	0	0	396	-20.159	1.165	
NOV	0	541	0	179	720	0	0	0	179	-37.420	1.165	
DEC	0	706	0	38	744	0	0	0	38	-41.058	0.487	
ANNUAL	2433	4041	0	2286	5424	2455	0	0	2286			

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/16/1995 8:22:58 SDL RUN 1  
DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. #7450 REGIMENTAL HQ BLDG  
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR FC'S-ZN-#1 TOPEKA, KS

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C O O L I N G H E A T I N G E L E C

MONTH	COOLING ENERGY (MBTU)		TIME OF MAX		DRY-BULB TEMP		WET-BULB TEMP		HEATING ENERGY (MBTU)		TIME OF MAX		DRY-BULB TEMP		WET-BULB TEMP		HEATING ENERGY (KWH)		ELECTRIC LOAD (KW)		
	OF DY	HR	OF DY	HR	OF DY	HR	OF DY	HR	OF DY	HR	OF DY	HR	OF DY	HR	OF DY	HR	OF DY	HR	OF DY	HR	
JAN	0	0.00000							-8.245	15	8	-6.F	-7.F	3111.							10.448
FEB	0	0.00000						-4.787	3	5	-1.F	-2.F	2814.								10.448
MAR	0	0.00000						-3.148	6	7	19.F	18.F	3387.								10.448
APR	0	0.00000						-1.137	4	5	33.F	31.F	3104.								10.448
MAY	8	6.1113	31	17	90.F	75.F		-0.556	3	19	65.F	61.F	3111.								10.448
JUN	18	26715	28	17	90.F	76.F		0.000					3242.								10.448
JUL	19	09994	13	17	92.F	78.F		0.000					2972.								10.448
AUG	21	02761	11	16	100.F	71.F		0.000					3387.								10.448
SEP	14	40827	7	17	92.F	75.F		0.000					3104.								10.448
OCT	0	0.15326	1	17	85.F	68.F		-1.336	30	24	46.F	42.F	2972.								10.448
NOV	0	0.00000						-2.919	12	6	19.F	18.F	2966.								10.448
DEC	0	0.00000						-7.239	12	5	4.F	3.F	3111.								10.448
TOTAL		81.567						-29.366													37285.
MAX																					10.448

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/16/1995 8:22:58 SDL RUN 1  
DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. #7450 REGIMENTAL HQ BLDG  
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR FC'S-ZN-#1 TOPEKA, KS

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N U M B E R O F H O U R S

MONTH	COOLING LOAD		HEATING LOAD		COINCIDENT LOAD		HOURS COOLING AVAIL.		HOURS HEATING AVAIL.		HOURS FANS ON CYCLE		HOURS NIGHT VENTING		HOURS FLOATING WHEN FANS ON		HEATING LOAD AT COOLING PEAK		ELECTRIC LOAD AT COOLING PEAK		
	OF DY	HR	OF DY	HR	OF DY	HR	OF DY	HR	OF DY	HR	OF DY	HR	OF DY	HR	OF DY	HR	OF DY	HR	OF DY	HR	
JAN	0	0	0	0	0	0	198	744	0	744	0	744	0	0	198	-3.261	1.294				
FEB	0	0	0	0	0	0	227	672	0	672	0	672	0	0	227	-2.991	1.294				
MAR	0	0	0	0	0	0	295	744	0	744	0	744	0	0	295	-2.925	1.294				
APR	0	0	0	0	0	0	328	720	0	720	0	720	0	0	328	-3.247	0.277				
MAY	343	200	201	360	201	360	201	384	744	744	0	744	0	0	201	0.000	10.448				
JUN	691	0	0	0	0	0	29	720	0	720	0	720	0	0	29	0.000	10.448				
JUL	725	0	0	0	0	0	19	744	0	744	0	744	0	0	19	0.000	10.448				
AUG	735	0	0	0	0	0	134	744	0	744	0	744	0	0	9	0.000	10.448				
SEP	586	0	0	0	0	0	311	720	0	720	0	720	0	0	134	0.000	10.448				
OCT	14	419	0	0	0	0	263	720	0	720	0	744	0	0	311	0.000	0.277				
NOV	0	457	0	0	0	0	720	744	0	744	0	744	0	0	263	-2.764	1.294				
DEC	0	526	0	0	0	0	744	0	744	0	744	0	0	218	-28.833	0.277					
ANNUAL	3094	3434	0	0	0	0	2232	5424	3336	8760	0	0	0	0	2232						

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/16/1995 8:22:58 SDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. #7450 REGIMENTAL HQ BLDG  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR FC'S-ZN-#2 TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC LOAD (KW)
JAN	0.00000				-8.783	15	6	-8.F	-9.F	-41.176	3147.
FEB	0.00000				-5.488	3	5	-1.F	-2.F	-31.818	2847.
MAR	0.00000				-3.362	6	7	19.F	18.F	-29.541	3424.
APR	0.00000				-1.176	4	5	33.F	31.F	-12.465	3139.
MAY	7.80364	31	17	90.F	0.000	13	19	78.F	65.F	-6.546	3147.
JUN	16.72780	27	17	89.F	59.886					0.000	3278.
JUL	17.65842	7	17	83.F	62.328					0.000	3009.
AUG	18.77177	4	17	92.F	62.742					0.000	3424.
SEP	12.18850	7	17	92.F	57.594					0.000	3139.
OCT	0.04249	1	18	83.F	8.207	30	24	46.F	42.F	-12.052	3009.
NOV	0.00000				-1.304	12	6	19.F	18.F	-27.829	3001.
DEC	0.00000				-7.049	12	5	4.F	3.F	-34.859	3147.
TOTAL	73.193				-31.276					-41.176	37712.
MAX											10.497

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/16/1995 8:22:58 SDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. #7450 REGIMENTAL HQ BLDG  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR FC'S-ZN-#2 TOPEKA, KS

MONTH	HOURS OF				HOURS OF				COINCIDENT LOADS			
	COOLING LOAD	HEATING LOAD	COINCIDENT COOL-HEAT LOAD	FLOATING	HEATING AVAIL.	COOLING AVAIL.	FANS ON CYCLE	NIGHT VENTING	FLOATING WHEN FANS ON	HEATING LOAD AT PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)	
JAN	0	547	0	197	744	0	744	0	197	-2.857	1.343	
FEB	0	459	0	213	672	0	672	0	213	-2.696	1.343	
MAR	0	459	0	285	744	0	744	0	285	-2.818	1.343	
APR	0	388	0	332	720	0	720	0	332	-3.431	0.326	
MAY	347	200	0	197	360	384	744	0	197	0.000	10.497	
JUN	692	0	0	28	0	720	720	0	28	0.000	10.497	
JUL	728	0	0	16	0	744	744	0	16	0.000	10.497	
AUG	734	0	0	10	0	744	744	0	10	0.000	10.497	
SEP	579	0	0	141	0	720	744	0	141	0.000	10.497	
OCT	11	415	0	318	720	24	744	0	318	0.000	10.497	
NOV	0	468	0	252	720	0	744	0	252	-3.681	1.343	
DEC	0	525	0	219	744	0	744	0	219	-25.045	0.326	
ANNUAL	3091	3461	0	2208	5424	3336	8760	0	2208			

EMC ENGINEERS INC. E2DOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/16/1995 8:22:58 PDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. #7450 REGIMENTAL HQ BLDG  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY TOTAL (KWH) PEAK (KW) DY/HR	NATURAL-GAS TOTAL (MBTU) PEAK (KBTU) DY/HR
JAN	31.990 101.031 28/9	31.990 101.031 28/9	61.803 200.027 15/6
FEB	28.781 101.031 3/8	28.781 101.031 3/8	44.287 170.262 3/5
MAR	33.724 100.689 15/6	33.724 100.689 15/6	32.565 151.043 6/7
APR	30.200 99.131 4/6	30.200 99.131 4/6	12.184 82.219 4/5
MAY	37.018 159.593 31/17	37.018 159.593 31/17	4.000 62.818 1/6
JUN	47.990 158.529 27/17	47.990 158.529 27/17	0.000 0.000 30/1
JUL	47.911 161.780 22/16	47.911 161.780 22/16	0.000 0.000 31/1
AUG	53.648 163.149 23/16	53.648 163.149 23/16	0.000 0.000 31/1
SEP	42.168 160.208 7/16	42.168 160.208 7/16	0.000 0.000 30/1
OCT	29.140 99.757 20/7	29.140 99.757 20/7	11.829 76.142 30/24
NOV	29.718 100.689 3/6	29.718 100.689 3/6	29.584 144.223 12/6
DEC	31.899 101.031 13/8	31.899 101.031 13/8	54.594 178.597 12/5
	ONE YEAR USE/PEAK	444.187 163.149	250.846 200.027

EMC ENGINEERS INC. E2DOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/16/1995 8:22:58 PDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. #7450 REGIMENTAL HQ BLDG  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE	ELECTRICITY	NATURAL-GAS
IN SITE MBTU -		
CATEGORY OF USE		
SPACE HEAT	10.36	250.85
SPACE COOL	73.55	0.00
HVAC AUX	42.88	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	224.60	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	92.83	0.00
TOTAL	444.21	250.85

TOTAL SITE ENERGY 695.03 MBTU 72.4 KBTU/SQFT-YR GROSS-AREA 217.2 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 1584.74 MBTU 165.1 KBTU/SQFT-YR GROSS-AREA 495.2 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 6.3  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.





**COMPUTER ENERGY SIMULATIONS**

**BLDG. 8021**

**ADMINISTRATION AND SUPPLY BUILDINGS**



DENVER - ATLANTA

PROJECT: FEASIBILITY STUDY FOR  
 INSTALLATION OF UMCS  
 LOCATION: FORT RILEY, KANSAS

EMC NO: 1406-001  
 CALC. BY: AJN  
 CHECKED BY: CEL  
 DATE: 05-Jul-95

BUILDING NO.: 8021  
 BLDG. TYPE: ADMIN & SUPPLY BUILDING

**ENERGY CONSTANT CALCULATIONS**

	BASERUN	RUN1	RUN2	RUN3	RUN4	RUN5
HEATING (MBtu)	1166.5	793.6	1046.7	0.0	0.0	0.0
COOLING (kWH)	202,124	156,880	200,747	0	0	0

SUPPLY AIR FAN	31,200 CFM
FLOOR AREA	20,818 FT <sup>2</sup>
CFMI	13790 CFM
UA	4005 BTU/HR-°F
BLDG CONSTR.	2 (1 FOR LIGHT ) (2 FOR HEAVY)

EZDOE COMPUTER RUN DEFINITION:	
BASERUN	EXISTING OPERATION
RUN1	NIGHT SETBACK
RUN2	DDC CONTROL
RUN3	ECONOMIZER
RUN4	NIGHTTIME INFILTRATION (OA)
RUN5	DAYTIME INFILTRATION (OA)

HOURS OF OCCUPANCY			ANNUAL HEATING & COOLING HOURS	
M-F	700	1600	45 HR	HR. ON HEATING 1459 HR/YR
SAT.	0	0	0 HR	HR. ON COOLING 887 HR/YR
SUN.	0	0	0 HR	HR. OFF HEATING 3989 HR/YR
	TOTAL OCCUPY HR.		45 HR/WK	HR. OFF COOLING 2425 HR/YR
	TOTAL UNOCC. HR.		123 HR/WK	
	ANNUAL OCCUPY HR.		2346 HR/YR	
	ANNUAL UNOCC. HR.		6414 HR/YR	

PRESENT HR. OF OPERATION FOR SYS. WITH HEATING AND COOLING 8760 HR/YR  
 PRESENT HR. OF OPERATION FOR SYS. WITH HEATING ONLY 5448 HR/YR  
 PRESENT HR. OF OPERATION FOR SYS. WITH COOLING ONLY 3312 HR/YR  
 HRS SAVED (HTG ONLY) 5448 - 1459 = 3989 HR/YR  
 HRS SAVED (CLG ONLY) 3312 - 887 = 2425 HR/YR

HOAUHC	1166.47 MBtu	-	0 MBtu	=	0.00E+00 Btu/CFM-HR
	13790 CFM	x	6414 HR/YR		
HOAUH	1166.47 MBtu	-	0 MBtu	=	0.00E+00 Btu/CFM-HR
	13790 CFM	x	3989 HR/YR		
COAUHC	202,124.2 kWH	-	0.0 kWH	=	0.00E+00 kWH/CFM-HR
	13790 CFM	x	6414 HR/YR		
COAUH	202,124.2 kWH	-	0.0 kWH	=	0.00E+00 kWH/CFM-HR
	13790 CFM	x	2425 HR/YR		
HOAOHC	1166.47 MBtu	-	0 MBtu	=	0.00E+00 Btu/CFM-HR
	13790 CFM	x	2346 HR/YR		
HOAOH	1166.47 MBtu	-	0 MBtu	=	0.00E+00 Btu/CFM-HR
	13790 CFM	x	1459 HR/YR		
COAOHC	202,124.2 kWH	-	0.0 kWH	=	0.00E+00 kWH/CFM-HR
	13790 CFM	x	2346 HR/YR		
COAOH	202,124.2 kWH	-	0.0 kWH	=	0.00E+00 kWH/CFM-HR
	13790 CFM	x	887 HR/YR		
DC DUTY	1 / 6 (10 MINUTES PER HOUR)			=	0.17
DC DEMAND	1 / 6 (10 MINUTES PER HOUR)			=	0.17
ECC	156,879.6 kWH	-	0.0 kWH	=	0.00E+00 kWH/CFM-HR
	31200 CFM	x	887 HR/YR		
ECHC	156,879.6 kWH	-	0.0 kWH	=	0.00E+00 kWH/CFM-HR
	31200 CFM	x	2346 HR/YR		
NSUCHC	202,124.2 kWH	-	156,879.6 kWH	=	2.26E-04 kWH/CFM-HR
	31200 CFM	x	6414 HR/YR		
NSUCC	202,124.2 kWH	-	156,879.6 kWH	=	5.98E-04 kWH/CFM-HR
	31200 CFM	x	2425 HR/YR		
DDCCHC	202,124.2 kWH	-	200,747.1 kWH	=	1.88E-05 kWH/CFM-HR
	31200 CFM	x	2346 HR/YR		
DDCCC	202,124.2 kWH	-	200,747.1 kWH	=	4.98E-05 kWH/CFM-HR
	31200 CFM	x	887 HR/YR		
NSC	1166.47 MBtu	-	793.56 MBtu	=	9.31E+04 Btu/UA
	4005.072 UA				
DDCH	1166.47 MBtu	-	1046.69 MBtu	=	2.99E+04 Btu/UA
	4005.072 UA				
OPT	( 2 HR/DAY X 240 DAY/YR )		175 HR/YR	=	305 HR/YR
CHWR	(1.10 kW X 0.012 Eff. X 664 HRS X 2 Degrees of Reset)			=	17.5 kWH/TON
OAR	567 HR/YR	x	0.01	=	5.67 HR/YR



INPUT LOADS ..

```

$-----$
$ E Z - D O E   L O A D S   I N P U T $
$-----$

```

\$ GENERAL PROJECT DATA

```

TITLE  LINE-1 *      EMC      ENGINEERS      INC.      *
        LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
        LINE-3 *      DENVER,      CO      80227      *
        LINE-4 *BASELINE SIMULATION FOR BLDG. 8021      *
        LINE-5 *ADM. & SUPPORT BLDG      * ..

```

```

ABORT          ERRORS ..
DIAGNOSTIC     WARNINGS ..
LOADS-REPORT   VERIFICATION=(LV-D)
               SUMMARY=(LS-C,LS-D)
               HOURLY-DATA-SAVE = YES ..
BUILDING-LOCATION  LATITUDE = 39.0
                LONGITUDE = 96.5
                ALTITUDE = 1065.
                TIME-ZONE = 6
                GROSS-AREA = 23486
                SHIELDING-COEF = 0.29
                X-REF = 0.0
                Y-REF = 0.0 ..
RUN-PERIOD     JAN 1 1994 THRU DEC 31 1994 ...

```

\$ SCHEDULES

```

LD_OFF        =DAY-SCHEDULE (1,24) (0.) ..
LD_FULL_ON   =DAY-SCHEDULE (1,24) (1.) ..
LD_7-4-M-F   =DAY-SCHEDULE (1,6) (0.)
               (7,16) (1.)
               (17,24) (0.) ..
LW_OFF        =WEEK-SCHEDULE (ALL) LD_OFF ..
LW-7-4M-F    =WEEK-SCHEDULE (WD) LD_7-4-M-F
               (WEH) LD_OFF ..
LW_FULL_ON   =WEEK-SCHEDULE (ALL) LD_FULL_ON ..
L_FULL-OFF   =SCHEDULE THRU DEC 31 LW_OFF ..
L_7-4M-F     =SCHEDULE THRU DEC 31 LW-7-4M-F ..

```

L\_WINTinfl =SCHEDULE THRU MAY 15 LW\_FULL\_ON  
 THRU OCT 1 LW\_OFF  
 THRU DEC 31 LW\_FULL\_ON ..

L\_FULL\_ON =SCHEDULE THRU DEC 31 LW\_FULL\_ON ..

\$ CONSTRUCTION TYPES

\$ BUILT UP ROOF ON METAL DECKING

ROOF-1 =CONSTRUCTION U-VALUE = 0.020  
 ABSORPTANCE = 0.500  
 ROUGHNESS = 1 ..

\$ EXTERIOR WALL CONSTRUCTION

WALL-1 =LAYERS MATERIAL=(CM03,AL11,PW05,IN23,GP02) I-F-R= 0.6100  
 THICKNESS=(0.083,0.000,0.063,0.167,0.052) ..  
 EXWALL-1 =CONSTRUCTION LAYERS = WALL-1  
 ROUGHNESS = 2 ..

\$ INTERIOR WALL CONSTRUCTION

IW\_LAYER =LAYERS MATERIAL=(GP01,WD01,AL21,GP01)  
 THICKNESS=(0.042,0.063,0.000,0.042) ..  
 INWALL =CONSTRUCTION LAYERS = IW\_LAYER  
 ROUGHNESS = 5 ..

\$ DOOR CONSTRUCTION

DOORCON =CONSTRUCTION U-VALUE = 0.400 ..

\$ SLAB FLOOR

FLOOR =CONSTRUCTION U-VALUE = 0.020  
 ABSORPTANCE = 0.750  
 ROUGHNESS = 5 ..  
 VAULT =CONSTRUCTION LAYERS = ASHI-21 ..

\$ BUILT UP ROOF ON METAL DECKING

ASHR-17A =LAYERS MATERIAL=(HF-E2, HF-E3, HF-B6, HF-A3)  
 THICKNESS=(0.042,0.031,0.167,0.005) ..  
 ROOF-2 =CONSTRUCTION LAYERS = ASHR-17A  
 ABSORPTANCE = 0.500  
 ROUGHNESS = 1 ..

GTYPE\_1 =GLASS-TYPE GLASS-TYPE-CODE = 1  
 PANES = 1 ..  
 GTYPE\_2 =GLASS-TYPE SHADING-COEF = 0.300  
 PANES = 1  
 GLASS-CONDUCTANCE = 0.790 ..  
 GTYPE\_3 =GLASS-TYPE SHADING-COEF = 0.400  
 PANES = 1  
 GLASS-CONDUCTANCE = 0.360 ..

## \$ SPACE DESCRIPTION

1ST\_COMPNY =SPACE AREA = 1331.5 VOLUME = 15978.0  
 TEMPERATURE = (73.) ZONE-TYPE = CONDITIONED  
 PEOPLE-SCHEDULE = L\_7-4M-F NUMBER-OF-PEOPLE = 12.0  
 PEOPLE-HEAT-GAIN = 1000.0 PEOPLE-HG-LAT = 625.0  
 PEOPLE-HG-SENS = 375.0 LIGHTING-TYPE = SUS-FLUOR  
 LIGHTING-KW = 2.99 LIGHT-TO-SPACE = 1.0  
 LIGHTING-SCHEDULE = L\_7-4M-F  
 EQUIP-SCHEDULE = L\_7-4M-F EQUIPMENT-KW = 0.86  
 FURN-WEIGHT = 1. INF-METHOD = NONE ..

E-W HEIGHT = 12.0 WIDTH = 50.0 CONS = EXWALL-1  
 AZIMUTH = 135 ..

WINDOW HEIGHT = 8.0 WIDTH = 3.0 G-T = GTYPE\_1  
 MULTIPLIER = 6.0 SHADING-DIVISION = 8 ..

E-W HEIGHT = 12.0 WIDTH = 35.0 CONS = EXWALL-1  
 AZIMUTH = 45 ..

U-W HEIGHT = 46.0 WIDTH = 29.0 CONS = FLOOR ..

ROOF HEIGHT = 46.0 WIDTH = 29.0 CONS = ROOF-1  
 TILT = 0 ..

1ARMS-VALT =SPACE AREA = 340.0 VOLUME = 4080.0  
 TEMPERATURE = (68.) ZONE-TYPE = UNCONDITIONED  
 PEOPLE-SCHEDULE = L\_7-4M-F AREA/PERSON = 100.0  
 PEOPLE-HEAT-GAIN = 1000.0 PEOPLE-HG-LAT = 625.0  
 PEOPLE-HG-SENS = 375.0 LIGHTING-TYPE = SUS-FLUOR  
 LIGHT-TO-SPACE = 1.0 LIGHTING-SCHEDULE = L\_7-4M-F  
 EQUIP-SCHEDULE = L\_7-4M-F FURN-WEIGHT = 40.  
 INF-METHOD = NONE ..

I-W HEIGHT = 8.0 WIDTH = 17.0 CONS = VAULT  
 AZIMUTH = 135 NEXT-TO = 1ST\_COMPNY ..

I-W HEIGHT = 8.0 WIDTH = 20.0 CONS = VAULT  
 AZIMUTH = 45 NEXT-TO = 1ST\_COMPNY ..

I-W HEIGHT = 8.0 WIDTH = 20.0 CONS = VAULT  
 AZIMUTH = 225 NEXT-TO = 2-COMPNY ..

I-W HEIGHT = 8.0 WIDTH = 17.0 CONS = VAULT  
 AZIMUTH = 315 NEXT-TO = 1EQUPMAIN ..

ROOF HEIGHT = 17.0 WIDTH = 20.0 CONS = ROOF-1  
 TILT = 0 ..

U-W HEIGHT = 17.0 WIDTH = 20.0 CONS = FLOOR ..

1EQUPTMAIN =SPACE AREA = 2832.0 VOLUME = 36816.0  
 TEMPERATURE = (73.) ZONE-TYPE = CONDITIONED  
 PEOPLE-SCHEDULE = L\_7-4M-F NUMBER-OF-PEOPLE = 10.0  
 PEOPLE-HEAT-GAIN = 1000.0 PEOPLE-HG-LAT = 625.0  
 PEOPLE-HG-SENS = 375.0 LIGHTING-TYPE = SUS-FLUOR  
 LIGHTING-KW = 3.84 LIGHT-TO-SPACE = 1.0  
 LIGHTING-SCHEDULE = L\_7-4M-F  
 EQUIP-SCHEDULE = L\_7-4M-F FURN-WEIGHT = 1.  
 INF-METHOD = AIR-CHANGE AIR-CHANGES/HR = 0.31 ..

E-W HEIGHT = 13.0 WIDTH = 50.0 CONS = EXWALL-1  
 AZIMUTH = 315 ..

E-W HEIGHT = 13.0 WIDTH = 59.0 CONS = EXWALL-1  
 AZIMUTH = 45 ..

ROOF HEIGHT = 50.0 WIDTH = 59.0 CONS = ROOF-2  
 TILT = 0 ..

U-W HEIGHT = 50.0 WIDTH = 59.0 CONS = FLOOR ..

2-COMPNY =SPACE AREA = 1331.5 VOLUME = 15978.0  
 TEMPERATURE = (73.) ZONE-TYPE = CONDITIONED  
 PEOPLE-SCHEDULE = L\_7-4M-F NUMBER-OF-PEOPLE = 12.0  
 PEOPLE-HEAT-GAIN = 1000.0 PEOPLE-HG-LAT = 625.0  
 PEOPLE-HG-SENS = 375.0 LIGHTING-TYPE = SUS-FLUOR  
 LIGHTING-KW = 2.99 LIGHT-TO-SPACE = 1.0  
 LIGHTING-SCHEDULE = L\_7-4M-F  
 EQUIP-SCHEDULE = L\_7-4M-F EQUIPMENT-KW = 0.86  
 FURN-WEIGHT = 1. INF-METHOD = NONE ..

E-W HEIGHT = 12.0 WIDTH = 50.0 CONS = EXWALL-1  
 AZIMUTH = 135 ..

WINDOW HEIGHT = 8.0 WIDTH = 3.0 G-T = GTYPE\_1  
 MULTIPLIER = 6.0 SHADING-DIVISION = 8 ..

U-W HEIGHT = 46.0 WIDTH = 29.0 CONS = FLOOR ..

ROOF HEIGHT = 46.0 WIDTH = 29.0 CONS = ROOF-1  
 TILT = 0 ..

2-VALT =SPACE AREA = 340.0 VOLUME = 4080.0  
 TEMPERATURE = (68.) ZONE-TYPE = UNCONDITIONED  
 PEOPLE-SCHEDULE = L\_7-4M-F AREA/PERSON = 100.0  
 PEOPLE-HEAT-GAIN = 1000.0 PEOPLE-HG-LAT = 625.0  
 PEOPLE-HG-SENS = 375.0 LIGHTING-TYPE = SUS-FLUOR  
 LIGHT-TO-SPACE = 1.0 LIGHTING-SCHEDULE = L\_7-4M-F  
 EQUIP-SCHEDULE = L\_7-4M-F FURN-WEIGHT = 40.  
 INF-METHOD = NONE ..

I-W HEIGHT = 8.0 WIDTH = 17.0 CONS = VAULT  
 AZIMUTH = 135 NEXT-TO = 2-COMPNY ..

I-W HEIGHT = 8.0 WIDTH = 20.0 CONS = VAULT  
AZIMUTH = 45 NEXT-TO = 2-COMPNY ..

I-W HEIGHT = 8.0 WIDTH = 20.0 CONS = VAULT  
AZIMUTH = 225 NEXT-TO = 3-VALT ..

I-W HEIGHT = 8.0 WIDTH = 17.0 CONS = VAULT  
AZIMUTH = 315 NEXT-TO = 2-EQUPMAN ..

ROOF HEIGHT = 17.0 WIDTH = 20.0 CONS = ROOF-1  
TILT = 0 ..

U-W HEIGHT = 17.0 WIDTH = 20.0 CONS = FLOOR ..

2-EQUPMAN =SPACE AREA = 2832.0 VOLUME = 36816.0  
TEMPERATURE = (73.) ZONE-TYPE = CONDITIONED  
PEOPLE-SCHEDULE = L\_7-4M-F NUMBER-OF-PEOPLE = 10.0  
PEOPLE-HEAT-GAIN = 1000.0 PEOPLE-HG-LAT = 625.0  
PEOPLE-HG-SENS = 375.0 LIGHTING-TYPE = SUS-FLUOR  
LIGHTING-KW = 3.84 LIGHT-TO-SPACE = 1.0  
LIGHTING-SCHEDULE = L\_7-4M-F  
EQUIP-SCHEDULE = L\_7-4M-F FURN-WEIGHT = 1.  
INF-METHOD = AIR-CHANGE AIR-CHANGES/HR = 0.31 ..

E-W HEIGHT = 13.0 WIDTH = 50.0 CONS = EXWALL-1  
AZIMUTH = 315 ..

ROOF HEIGHT = 50.0 WIDTH = 59.0 CONS = ROOF-2  
TILT = 0 ..

U-W HEIGHT = 50.0 WIDTH = 59.0 CONS = FLOOR ..

5TH\_COMPNY =SPACE AREA = 1331.5 VOLUME = 15978.0  
TEMPERATURE = (73.) ZONE-TYPE = CONDITIONED  
PEOPLE-SCHEDULE = L\_7-4M-F NUMBER-OF-PEOPLE = 12.0  
PEOPLE-HEAT-GAIN = 1000.0 PEOPLE-HG-LAT = 625.0  
PEOPLE-HG-SENS = 375.0 LIGHTING-TYPE = SUS-FLUOR  
LIGHTING-KW = 2.99 LIGHT-TO-SPACE = 1.0  
LIGHTING-SCHEDULE = L\_7-4M-F  
EQUIP-SCHEDULE = L\_7-4M-F EQUIPMENT-KW = 0.86  
FURN-WEIGHT = 1. INF-METHOD = NONE ..

E-W HEIGHT = 12.0 WIDTH = 50.0 CONS = EXWALL-1  
AZIMUTH = 135 ..

WINDOW HEIGHT = 8.0 WIDTH = 3.0 G-T = GTYPE\_1  
MULTIPLIER = 6.0 SHADING-DIVISION = 8 ..

E-W HEIGHT = 12.0 WIDTH = 35.0 CONS = EXWALL-1  
AZIMUTH = 225 ..

U-W HEIGHT = 46.0 WIDTH = 29.0 CONS = FLOOR ..

ROOF HEIGHT = 46.0 WIDTH = 29.0 CONS = ROOF-1



TILT = 0 ..

5-VALT =SPACE AREA = 340.0 VOLUME = 4080.0  
 TEMPERATURE = (68.) ZONE-TYPE = UNCONDITIONED  
 PEOPLE-SCHEDULE = L\_7-4M-F AREA/PERSON = 100.0  
 PEOPLE-HEAT-GAIN = 1000.0 PEOPLE-HG-LAT = 625.0  
 PEOPLE-HG-SENS = 375.0 LIGHTING-TYPE = SUS-FLUOR  
 LIGHT-TO-SPACE = 1.0 LIGHTING-SCHEDULE = L\_7-4M-F  
 EQUIP-SCHEDULE = L\_7-4M-F FURN-WEIGHT = 40.  
 INF-METHOD = NONE ..

I-W HEIGHT = 8.0 WIDTH = 17.0 CONS = VAULT  
 AZIMUTH = 135 NEXT-TO = 5TH\_COMPNY ..

I-W HEIGHT = 8.0 WIDTH = 20.0 CONS = VAULT  
 AZIMUTH = 45 NEXT-TO = 5TH\_COMPNY ..

I-W HEIGHT = 8.0 WIDTH = 20.0 CONS = VAULT  
 AZIMUTH = 225 NEXT-TO = 4-VALT ..

I-W HEIGHT = 8.0 WIDTH = 17.0 CONS = VAULT  
 AZIMUTH = 315 NEXT-TO = 5EQUPTAIN ..

ROOF HEIGHT = 17.0 WIDTH = 20.0 CONS = ROOF-1  
 TILT = 0 ..

U-W HEIGHT = 17.0 WIDTH = 20.0 CONS = FLOOR ..

5EQUPTAIN =SPACE AREA = 2832.0 VOLUME = 36816.0  
 TEMPERATURE = (73.) ZONE-TYPE = CONDITIONED  
 PEOPLE-SCHEDULE = L\_7-4M-F NUMBER-OF-PEOPLE = 10.0  
 PEOPLE-HEAT-GAIN = 1000.0 PEOPLE-HG-LAT = 625.0  
 PEOPLE-HG-SENS = 375.0 LIGHTING-TYPE = SUS-FLUOR  
 LIGHTING-KW = 3.84 LIGHT-TO-SPACE = 1.0  
 LIGHTING-SCHEDULE = L\_7-4M-F  
 EQUIP-SCHEDULE = L\_7-4M-F FURN-WEIGHT = 1.  
 INF-METHOD = AIR-CHANGE AIR-CHANGES/HR = 0.31 ..

E-W HEIGHT = 13.0 WIDTH = 50.0 CONS = EXWALL-1  
 AZIMUTH = 315 ..

E-W HEIGHT = 13.0 WIDTH = 59.0 CONS = EXWALL-1  
 AZIMUTH = 225 ..

ROOF HEIGHT = 50.0 WIDTH = 59.0 CONS = ROOF-2  
 TILT = 0 ..

U-W HEIGHT = 50.0 WIDTH = 59.0 CONS = FLOOR ..

3-COMPNY =SPACE AREA = 1331.5 VOLUME = 15978.0  
 TEMPERATURE = (73.) ZONE-TYPE = CONDITIONED  
 PEOPLE-SCHEDULE = L\_7-4M-F NUMBER-OF-PEOPLE = 12.0  
 PEOPLE-HEAT-GAIN = 1000.0 PEOPLE-HG-LAT = 625.0

PEOPLE-HG-SENS = 375.0 LIGHTING-TYPE = SUS-FLUOR  
 LIGHTING-KW = 2.99 LIGHT-TO-SPACE = 1.0  
 LIGHTING-SCHEDULE = L\_7-4M-F  
 EQUIP-SCHEDULE = L\_7-4M-F EQUIPMENT-KW = 0.86  
 FURN-WEIGHT = 1. INF-METHOD = NONE ..

E-W HEIGHT = 12.0 WIDTH = 50.0 CONS = EXWALL-1  
 AZIMUTH = 135 ..

WINDOW HEIGHT = 8.0 WIDTH = 3.0 G-T = GTYPE\_1  
 MULTIPLIER = 6.0 SHADING-DIVISION = 8 ..

U-W HEIGHT = 46.0 WIDTH = 29.0 CONS = FLOOR ..

ROOF HEIGHT = 46.0 WIDTH = 29.0 CONS = ROOF-1  
 TILT = 0 ..

3-VALT =SPACE AREA = 340.0 VOLUME = 4080.0  
 TEMPERATURE = (68.) ZONE-TYPE = UNCONDITIONED  
 PEOPLE-SCHEDULE = L\_7-4M-F AREA/PERSON = 100.0  
 PEOPLE-HEAT-GAIN = 1000.0 PEOPLE-HG-LAT = 625.0  
 PEOPLE-HG-SENS = 375.0 LIGHTING-TYPE = SUS-FLUOR  
 LIGHT-TO-SPACE = 1.0 LIGHTING-SCHEDULE = L\_7-4M-F  
 EQUIP-SCHEDULE = L\_7-4M-F FURN-WEIGHT = 40.  
 INF-METHOD = NONE ..

I-W HEIGHT = 8.0 WIDTH = 17.0 CONS = VAULT  
 AZIMUTH = 135 NEXT-TO = 3-COMPNY ..

I-W HEIGHT = 8.0 WIDTH = 20.0 CONS = VAULT  
 AZIMUTH = 45 NEXT-TO = 3-COMPNY ..

I-W HEIGHT = 8.0 WIDTH = 20.0 CONS = VAULT  
 AZIMUTH = 225 NEXT-TO = 2-VALT ..

I-W HEIGHT = 8.0 WIDTH = 17.0 CONS = VAULT  
 AZIMUTH = 315 NEXT-TO = 3-EQUIPMAN ..

ROOF HEIGHT = 17.0 WIDTH = 20.0 CONS = ROOF-1  
 TILT = 0 ..

U-W HEIGHT = 17.0 WIDTH = 20.0 CONS = FLOOR ..

3-EQUIPMAN =SPACE AREA = 2832.0 VOLUME = 36816.0  
 TEMPERATURE = (73.) ZONE-TYPE = CONDITIONED  
 PEOPLE-SCHEDULE = L\_7-4M-F NUMBER-OF-PEOPLE = 10.0  
 PEOPLE-HEAT-GAIN = 1000.0 PEOPLE-HG-LAT = 625.0  
 PEOPLE-HG-SENS = 375.0 LIGHTING-TYPE = SUS-FLUOR  
 LIGHTING-KW = 3.84 LIGHT-TO-SPACE = 1.0  
 LIGHTING-SCHEDULE = L\_7-4M-F  
 EQUIP-SCHEDULE = L\_7-4M-F FURN-WEIGHT = 1.  
 INF-METHOD = AIR-CHANGE AIR-CHANGES/HR = 0.31 ..

E-W HEIGHT = 13.0 WIDTH = 50.0 CONS = EXWALL-1

AZIMUTH = 315 ..

ROOF HEIGHT = 50.0 WIDTH = 59.0 CONS = ROOF-2  
TILT = 0 ..

U-W HEIGHT = 50.0 WIDTH = 59.0 CONS = FLOOR ..

4-COMPNY =SPACE AREA = 1331.5 VOLUME = 15978.0  
TEMPERATURE = (73.) ZONE-TYPE = CONDITIONED  
PEOPLE-SCHEDULE = L\_7-4M-F NUMBER-OF-PEOPLE = 12.0  
PEOPLE-HEAT-GAIN = 1000.0 PEOPLE-HG-LAT = 625.0  
PEOPLE-HG-SENS = 375.0 LIGHTING-TYPE = SUS-FLUOR  
LIGHTING-KW = 2.99 LIGHT-TO-SPACE = 1.0  
LIGHTING-SCHEDULE = L\_7-4M-F  
EQUIP-SCHEDULE = L\_7-4M-F EQUIPMENT-KW = 0.86  
FURN-WEIGHT = 1. INF-METHOD = NONE ..

E-W HEIGHT = 12.0 WIDTH = 50.0 CONS = EXWALL-1  
AZIMUTH = 135 ..

WINDOW HEIGHT = 8.0 WIDTH = 3.0 G-T = GTYPE\_1  
MULTIPLIER = 6.0 SHADING-DIVISION = 8 ..

U-W HEIGHT = 46.0 WIDTH = 29.0 CONS = FLOOR ..

ROOF HEIGHT = 46.0 WIDTH = 29.0 CONS = ROOF-1  
TILT = 0 ..

4-VALT =SPACE AREA = 340.0 VOLUME = 4080.0  
TEMPERATURE = (68.) ZONE-TYPE = UNCONDITIONED  
PEOPLE-SCHEDULE = L\_7-4M-F AREA/PERSON = 100.0  
PEOPLE-HEAT-GAIN = 1000.0 PEOPLE-HG-LAT = 625.0  
PEOPLE-HG-SENS = 375.0 LIGHTING-TYPE = SUS-FLUOR  
LIGHT-TO-SPACE = 1.0 LIGHTING-SCHEDULE = L\_7-4M-F  
EQUIP-SCHEDULE = L\_7-4M-F FURN-WEIGHT = 40.  
INF-METHOD = NONE ..

I-W HEIGHT = 8.0 WIDTH = 17.0 CONS = VAULT  
AZIMUTH = 135 NEXT-TO = 4-COMPNY ..

I-W HEIGHT = 8.0 WIDTH = 20.0 CONS = VAULT  
AZIMUTH = 45 NEXT-TO = 4-COMPNY ..

I-W HEIGHT = 8.0 WIDTH = 20.0 CONS = VAULT  
AZIMUTH = 225 NEXT-TO = 5-VALT ..

I-W HEIGHT = 8.0 WIDTH = 17.0 CONS = VAULT  
AZIMUTH = 315 NEXT-TO = 4-EQUPMAN ..

ROOF HEIGHT = 17.0 WIDTH = 20.0 CONS = ROOF-1  
TILT = 0 ..

U-W HEIGHT = 17.0 WIDTH = 20.0 CONS = FLOOR ..

```

4-EQUIPMAN =SPACE  AREA = 2832.0  VOLUME = 36816.0
                    TEMPERATURE = (73.)  ZONE-TYPE = CONDITIONED
                    PEOPLE-SCHEDULE = L_7-4M-F  NUMBER-OF-PEOPLE = 10.0
                    PEOPLE-HEAT-GAIN = 1000.0  PEOPLE-HG-LAT = 625.0
                    PEOPLE-HG-SENS = 375.0  LIGHTING-TYPE = SUS-FLUOR
                    LIGHTING-KW = 3.84  LIGHT-TO-SPACE = 1.0
                    LIGHTING-SCHEDULE = L_7-4M-F
                    EQUIP-SCHEDULE = L_7-4M-F  FURN-WEIGHT = 1.
                    INF-METHOD = AIR-CHANGE  AIR-CHANGES/HR = 0.31  ..

```

```

E-W  HEIGHT = 13.0  WIDTH = 50.0  CONS = EXWALL-1
     AZIMUTH = 315  ..

```

```

ROOF  HEIGHT = 50.0  WIDTH = 59.0  CONS = ROOF-2
     TILT = 0  ..

```

```

U-W  HEIGHT = 50.0  WIDTH = 59.0  CONS = FLOOR ..

```

END ..

COMPUTE LOADS ..

INPUT SYSTEMS ..

```

$-----$
$ E Z - D O E   S Y S T E M S   I N P U T $
$-----$

```

\$ GENERAL PROJECT DATA

```

TITLE  LINE-1 *   EMC   ENGINEERS   INC.   *
        LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
        LINE-3 *   DENVER,   CO   80227   *

        LINE-4 *BASELINE SIMULATION FOR BLDG. 8021   *
        LINE-5 *ADM. & SUPPORT BLDG   * ..

ABORT      ERRORS  ..
DIAGNOSTIC WARNINGS ..
SYSTEMS-REPORT  VERIFICATION=(SV-A)
                SUMMARY=(SS-A,SS-C,SS-K,SS-O)
                HOURLY-DATA-SAVE = YES  ..

```

\$ SCHEDULES

```

SD_FULL   =DAY-SCHEDULE  (1,24) (1.)  ..
SD_WT_HT  =DAY-SCHEDULE  (1,24) (74.)  ..
SD_SM_CL  =DAY-SCHEDULE  (1,24) (72.)  ..
SD_OTAIR_ =DAY-SCHEDULE  (1,24) (0.07)  ..
SD_OFF    =DAY-SCHEDULE  (1,24) (0.)  ..
SD_OA%_WT =DAY-SCHEDULE  (1,24) (0.)  ..
SD_SM_HT  =DAY-SCHEDULE  (1,24) (70.)  ..
SD_WT_CL  =DAY-SCHEDULE  (1,24) (76.)  ..

SW_FULL_ON =WEEK-SCHEDULE  (ALL) SD_FULL  ..

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```

SW_WT_HT =WEEK-SCHEDULE (ALL) SD_WT_HT ..
SW_SM_CL =WEEK-SCHEDULE (ALL) SD_SM_CL ..
SW_OTAIR_% =WEEK-SCHEDULE (ALL) SD_OTAIR_% ..
SW_off =WEEK-SCHEDULE (ALL) SD_OFF ..
SW_OA%_SM =WEEK-SCHEDULE (ALL) SD_OA%_WT ..
SW_SM_HT =WEEK-SCHEDULE (ALL) SD_SM_HT ..
SW_WT_CL =WEEK-SCHEDULE (ALL) SD_WT_CL ..

S_FULL_ON =SCHEDULE THRU DEC 31 SW_FULL_ON ..
S_FULL_OFF =SCHEDULE THRU DEC 31 SW_off ..
S_HEAT_SET =SCHEDULE THRU MAY 15 SW_WT_HT
              THRU OCT 1 SW_SM_HT
              THRU DEC 31 SW_WT_HT ..

$ OUTSIDE_AIR_0.07%
S_OTSIDAIR =SCHEDULE THRU DEC 31 SW_OTAIR_% ..

S_HE_SCHED =SCHEDULE THRU MAY 15 SW_FULL_ON
              THRU OCT 1 SW_off
              THRU DEC 31 SW_FULL_ON ..

S_CL_SCHED =SCHEDULE THRU MAY 15 SW_off
              THRU OCT 1 SW_FULL_ON
              THRU DEC 31 SW_off ..

$ %OA_WINTER_%OA_SUM
S_OA_S_VNT =SCHEDULE THRU MAY 15 SW_OA%_SM
              THRU OCT 1 SW_FULL_ON
              THRU DEC 31 SW_OA%_SM ..

S_HRLY-RPT =SCHEDULE THRU JAN 13 SW_off
              THRU JAN 15 SW_FULL_ON
              THRU AUG 20 SW_off
              THRU AUG 21 SW_FULL_ON
              THRU AUG 22 SW_off
              THRU AUG 23 SW_FULL_ON
              THRU DEC 31 SW_off ..

S_COOL_SET =SCHEDULE THRU MAY 15 SW_WT_CL
              THRU OCT 1 SW_SM_CL
              THRU DEC 31 SW_WT_CL ..

```

\$ ZONE DESCRIPTION

1ST\_COMPNY =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HEAT\_SET COOL-TEMP-SCH = S\_COOL\_SET  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL  
SIZING-OPTION = FROM-LOADS RATED-CFM = 3600.0  
HEATING-CAPACITY = -68484.0  
COOLING-CAPACITY = 68484.0 COOL-SH-CAP = 57094.0 ..

1ARMS-VALT =ZONE DESIGN-HEAT-T = 68.0 DESIGN-COOL-T = 80.0  
ZONE-TYPE = UNCONDITIONED SIZING-OPTION = FROM-LOADS ..

1EQUPMAN =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HEAT\_SET COOL-TEMP-SCH = S\_COOL\_SET  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL  
SIZING-OPTION = FROM-LOADS RATED-CFM = 2400.0  
HEATING-CAPACITY = -45000.0 ..

2-COMPNY =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HEAT\_SET COOL-TEMP-SCH = S\_COOL\_SET  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL  
SIZING-OPTION = FROM-LOADS RATED-CFM = 3600.0  
HEATING-CAPACITY = -68484.0  
COOLING-CAPACITY = 68484.0 COOL-SH-CAP = 57094.0 ..

2-VALT =ZONE DESIGN-HEAT-T = 68.0 DESIGN-COOL-T = 80.0  
ZONE-TYPE = UNCONDITIONED SIZING-OPTION = FROM-LOADS ..

2-EQUPMAN =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HEAT\_SET COOL-TEMP-SCH = S\_COOL\_SET  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL  
SIZING-OPTION = FROM-LOADS RATED-CFM = 2400.0  
HEATING-CAPACITY = -45000.0 ..

5TH\_COMPNY =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HEAT\_SET COOL-TEMP-SCH = S\_COOL\_SET  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL  
SIZING-OPTION = FROM-LOADS RATED-CFM = 3600.0  
HEATING-CAPACITY = -68484.0  
COOLING-CAPACITY = 68484.0 COOL-SH-CAP = 57094.0 ..

5-VALT =ZONE DESIGN-HEAT-T = 68.0 DESIGN-COOL-T = 80.0  
ZONE-TYPE = UNCONDITIONED SIZING-OPTION = FROM-LOADS ..

5EQUPMAN =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HEAT\_SET COOL-TEMP-SCH = S\_COOL\_SET  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL  
SIZING-OPTION = FROM-LOADS RATED-CFM = 2400.0  
HEATING-CAPACITY = -45000.0 ..

3-COMPNY =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HEAT\_SET COOL-TEMP-SCH = S\_COOL\_SET

ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL  
 SIZING-OPTION = FROM-LOADS RATED-CFM = 3600.0  
 HEATING-CAPACITY = -68484.0  
 COOLING-CAPACITY = 68484.0 COOL-SH-CAP = 57094.0 ..

3-VALT =ZONE DESIGN-HEAT-T = 68.0 DESIGN-COOL-T = 80.0  
 ZONE-TYPE = UNCONDITIONED SIZING-OPTION = FROM-LOADS ..

3-EQUIPMAN =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HEAT\_SET COOL-TEMP-SCH = S\_COOL\_SET  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL  
 SIZING-OPTION = FROM-LOADS RATED-CFM = 2400.0  
 HEATING-CAPACITY = -45000.0 ..

4-COMPNY =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HEAT\_SET COOL-TEMP-SCH = S\_COOL\_SET  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL  
 SIZING-OPTION = FROM-LOADS RATED-CFM = 3600.0  
 HEATING-CAPACITY = -68484.0  
 COOLING-CAPACITY = 68484.0 COOL-SH-CAP = 57094.0 ..

4-VALT =ZONE DESIGN-HEAT-T = 68.0 DESIGN-COOL-T = 80.0  
 ZONE-TYPE = UNCONDITIONED SIZING-OPTION = FROM-LOADS ..

4-EQUIPMAN =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HEAT\_SET COOL-TEMP-SCH = S\_COOL\_SET  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL  
 SIZING-OPTION = FROM-LOADS RATED-CFM = 2400.0  
 HEATING-CAPACITY = -45000.0 ..

\$ SYSTEM DESCRIPTION

2\_PIP\_F.C. =SYSTEM SYSTEM-TYPE = TPFC  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 50.0  
 HEATING-SCHEDULE = S\_HE\_SCHED  
 COOLING-SCHEDULE = S\_CL\_SCHED RATED-CFM = 18000.  
 MIN-OUTSIDE-AIR = 0.07 SUPPLY-DELTA-T = 0.2  
 SUPPLY-KW = 0.00007 NIGHT-CYCLE-CTRL = STAY-OFF  
 COOLING-CAPACITY = 342420. COOL-SH-CAP = 285470.  
 COOL-FT-MIN = 0. HEATING-CAPACITY = -1027260.  
 ZONE-NAMES = (1ST\_COMPNY, 1ARMS-VALT, 2-COMPNY,  
 2-VALT, 5TH\_COMPNY, 5-VALT, 3-COMPNY,  
 3-VALT, 4-COMPNY, 4-VALT) ..

H&V =SYSTEM SYSTEM-TYPE = HVSYS  
 MAX-SUPPLY-T = 120.0 HEATING-SCHEDULE = S\_HE\_SCHED  
 OA-CONTROL = FIXED SUPPLY-CFM = 12000.  
 MIN-AIR-SCH = S\_OA\_S\_VNT SUPPLY-DELTA-T = 2.4  
 SUPPLY-KW = 0.00078  
 MOTOR-PLACEMENT = OUTSIDE-AIRFLOW  
 NIGHT-CYCLE-CTRL = STAY-OFF NIGHT-VENT-DT = 0.0

```

HEATING-CAPACITY = -195000.
ZONE-NAMES = (1EQUPTMAIN, 2-EQUPTMAN, SEQUPTMAIN,
              3-EQUPTMAN, 4-EQUPTMAN) ..

```

## \$ HOURLY REPORT DESCRIPTION

```

FC_BLOCK  =REPORT-BLOCK VARIABLE-TYPE = 2_PIP_F.C.
              VARIABLE-LIST = (3,5,6,17) ..
H&V_BLOCK =REPORT-BLOCK VARIABLE-TYPE = H&V
              VARIABLE-LIST = (3,5,6,17,22) ..
OFFIC-BLK =REPORT-BLOCK VARIABLE-TYPE = 1ST_COMPNY
              VARIABLE-LIST = (17,18,7,6) ..
MAIN_BLOCK =REPORT-BLOCK VARIABLE-TYPE = 1EQUPTMAIN
              VARIABLE-LIST = (17,18,7,6) ..
AHU'S-RPT = HOURLY-REPORT REPORT-SCHEDULE = S_HRLY-RPT
              REPORT-BLOCK = (FC_BLOCK,H&V_BLOCK)
..
ZONE-HRLYS = HOURLY-REPORT REPORT-SCHEDULE = S_HRLY-RPT
              REPORT-BLOCK = (OFFIC-BLK,MAIN_BLOCK)
..
END ..
COMPUTE SYSTEMS ..

```

INPUT PLANT ..

```

$-----$
$ E Z - D O E   P L A N T S   I N P U T $
$-----$

```

## \$ GENERAL PROJECT DATA

```

TITLE LINE-1 *      EMC      ENGINEERS      INC.      *
LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
LINE-3 *      DENVER,      CO      80227      *

LINE-4 *BASELINE SIMULATION FOR BLDG. 8021      *
LINE-5 *ADM. & SUPPORT BLDG      * ..

```

```

ABORT          ERRORS ..
DIAGNOSTIC     WARNINGS ..
PLANT-REPORT   VERIFICATION=(PV-A)
               SUMMARY=(PS-B,BEPS)
               HOURLY-DATA-SAVE = YES ..

```

## \$ SCHEDULES

```

PD_heaton  =DAY-SCHEDULE (1,24) (1.) ..
Pd_heatoff =DAY-SCHEDULE (1,24) (0.) ..

PD_coolon  =DAY-SCHEDULE (1,24) (1.) ..
PD_cooloff =DAY-SCHEDULE (1,24) (0.) ..

```



PW\_heaton =WEEK-SCHEDULE (ALL) PD\_heaton ..  
 PW\_heatoff =WEEK-SCHEDULE (ALL) Pd\_heatoff ..  
 Pw\_coolon =WEEK-SCHEDULE (ALL) PD\_coolon ..  
 Pw\_cooloff =WEEK-SCHEDULE (ALL) PD\_cooloff ..

PHeat =SCHEDULE THRU MAY 15 PW\_heaton  
 THRU OCT 1 PW\_heatoff  
 THRU DEC 31 PW\_heaton ..

PCool =SCHEDULE THRU MAY 15 Pw\_cooloff  
 THRU OCT 1 Pw\_coolon  
 THRU DEC 31 Pw\_cooloff ..

## \$ EQUIPMENT DESCRIPTION

STM-PLANT =PLANT-EQUIPMENT TYPE = STM-BOILER  
 SIZE = -999. INSTALLED-NUMBER = 2  
 MAX-NUMBER-AVAIL = 2 ..

COOL\_PLANT =PLANT-EQUIPMENT TYPE = ABSOR1-CHLR  
 SIZE = -999. INSTALLED-NUMBER = 2  
 MAX-NUMBER-AVAIL = 2 ..

PLANT-PARAMETERS BOILER-FUEL = NATURAL-GAS CCIRC-MOTOR-EFF = 0.75  
 HCIRC-MOTOR-EFF = 0.75 HCIRC-DESIGN-T-DROP = 20.0 ..

PART-LOAD-RATIO TYPE = STM-BOILER  
 MIN-RATIO = 0.2500 MAX-RATIO = 1.0000  
 OPERATING-RATIO = 1.0000 ELEC-INPUT-RATIO = 0.0220 ..

ENERGY-RESOURCE RESOURCE = ELECTRICITY ..  
 ENERGY-RESOURCE RESOURCE = NATURAL-GAS ..

COOL\_SEASO =LOAD-ASSIGNMENT TYPE = COOLING  
 OPERATION-MODE = RUN-NEEDED  
 LOAD-RANGE = 0.000  
 PLANT-EQUIPMENT = COOL\_PLANT  
 NUMBER = 2 ..

HEAT\_SEASO =LOAD-ASSIGNMENT TYPE = HEATING  
 OPERATION-MODE = RUN-NEEDED  
 LOAD-RANGE = 0.000  
 PLANT-EQUIPMENT = STM-PLANT  
 NUMBER = 2 ..

NUMBER OF EXTERIOR SURFACES 29 RECTANGULAR 29 OTHER 0  
 (U-VALUE INCLUDES INSIDE AIR FILM PLUS OUTSIDE AIR FILM AT 7.5 MPH WINDSPEED )

SURFACE	SPACE	G L A S S		W A L L		R O O F		O T H E R	
		U-VALUE (BTU/HR-SQFT-F)	AREA (SQFT)	U-VALUE (BTU/HR-SQFT-F)	AREA (SQFT)	U-VALUE (BTU/HR-SQFT-F)	AREA (SQFT)	U-VALUE (BTU/HR-SQFT-F)	AREA (SQFT)
1ST COMPNY		0.000	0.00	0.096	420.00	0.096	420.00	0.096	420.00
1EQUPMAIN		0.000	0.00	0.096	767.00	0.096	767.00	0.096	767.00
1ST COMPNY		1.021	144.00	0.096	456.00	0.318	600.00	0.318	600.00
2-COMPNY		1.021	144.00	0.096	456.00	0.318	600.00	0.318	600.00
5TH COMPNY		1.021	144.00	0.096	456.00	0.318	600.00	0.318	600.00
3-COMPNY		1.021	144.00	0.096	456.00	0.318	600.00	0.318	600.00
4-COMPNY		1.021	144.00	0.096	456.00	0.318	600.00	0.318	600.00
5TH COMPNY		0.000	0.00	0.096	420.00	0.096	420.00	0.096	420.00
5EQUPMAIN		0.000	0.00	0.096	767.00	0.096	767.00	0.096	767.00
1EQUPMAIN		0.000	0.00	0.096	650.00	0.096	650.00	0.096	650.00
2-EQUPMAN		0.000	0.00	0.096	650.00	0.096	650.00	0.096	650.00
3-EQUPMAN		0.000	0.00	0.096	650.00	0.096	650.00	0.096	650.00
5EQUPMAIN		0.000	0.00	0.096	650.00	0.096	650.00	0.096	650.00
4-EQUPMAN		0.000	0.00	0.096	650.00	0.096	650.00	0.096	650.00
5TH COMPNY		0.000	0.00	0.020	1334.00	0.020	1334.00	0.020	1334.00
5-VALT		0.000	0.00	0.020	340.00	0.020	340.00	0.020	340.00
2-COMPNY		0.000	0.00	0.020	1334.00	0.020	1334.00	0.020	1334.00
2-VALT		0.000	0.00	0.020	340.00	0.020	340.00	0.020	340.00
5EQUPMAIN		0.000	0.00	0.127	2950.00	0.127	2950.00	0.127	2950.00
1ARMS-VALT		0.000	0.00	0.020	340.00	0.020	340.00	0.020	340.00
3-COMPNY		0.000	0.00	0.020	1334.00	0.020	1334.00	0.020	1334.00
3-VALT		0.000	0.00	0.020	340.00	0.020	340.00	0.020	340.00

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/16/1995 10: 7: 7 LDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. 8021 ADM. & SUPPORT BLDG  
 REPORT- LV-D DETAILS OF EXTERIOR SURFACES IN THE PROJECT TOPEKA, KS

	0.000	0.000	0.127	0.127	2950.00	0.127	2950.00	2950.00	ROOF
2-EQUIPMAN	0.000	0.000	0.127	0.127	2950.00	0.127	2950.00	2950.00	ROOF
3-EQUIPMAN	0.000	0.000	0.127	0.127	2950.00	0.127	2950.00	2950.00	ROOF
1EQUIPMAN	0.000	0.000	0.127	0.127	2950.00	0.127	2950.00	2950.00	ROOF
4-COMPNY	0.000	0.000	0.020	0.020	1334.00	0.020	1334.00	1334.00	ROOF
4-VALT	0.000	0.000	0.020	0.020	340.00	0.020	340.00	340.00	ROOF
1ST COMPNY	0.000	0.000	0.020	0.020	1334.00	0.020	1334.00	1334.00	ROOF
4-EQUIPMAN	0.000	0.000	0.127	0.127	2950.00	0.127	2950.00	2950.00	ROOF
1ST COMPNY	0.000	0.000	0.020	0.020	1334.00	0.020	1334.00	1334.00	UNDERGRND
1ARMS-VALT	0.000	0.000	0.020	0.020	340.00	0.020	340.00	340.00	UNDERGRND
1EQUIPMAN	0.000	0.000	0.020	0.020	2950.00	0.020	2950.00	2950.00	UNDERGRND
2-COMPNY	0.000	0.000	0.020	0.020	1334.00	0.020	1334.00	1334.00	UNDERGRND
2-VALT	0.000	0.000	0.020	0.020	340.00	0.020	340.00	340.00	UNDERGRND
2-EQUIPMAN	0.000	0.000	0.020	0.020	2950.00	0.020	2950.00	2950.00	UNDERGRND
5TH COMPNY	0.000	0.000	0.020	0.020	1334.00	0.020	1334.00	1334.00	UNDERGRND
5-VALT	0.000	0.000	0.020	0.020	340.00	0.020	340.00	340.00	UNDERGRND
5EQUIPMAN	0.000	0.000	0.020	0.020	2950.00	0.020	2950.00	2950.00	UNDERGRND
3-COMPNY	0.000	0.000	0.020	0.020	1334.00	0.020	1334.00	1334.00	UNDERGRND
3-VALT	0.000	0.000	0.020	0.020	340.00	0.020	340.00	340.00	UNDERGRND
3-EQUIPMAN	0.000	0.000	0.020	0.020	2950.00	0.020	2950.00	2950.00	UNDERGRND
4-COMPNY	0.000	0.000	0.020	0.020	1334.00	0.020	1334.00	1334.00	UNDERGRND
4-VALT	0.000	0.000	0.020	0.020	340.00	0.020	340.00	340.00	UNDERGRND
4-EQUIPMAN	0.000	0.000	0.020	0.020	2950.00	0.020	2950.00	2950.00	UNDERGRND

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/16/1995 10: 7: 7 LDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. 8021 ADM. & SUPPORT BLDG  
 REPORT- LV-D DETAILS OF EXTERIOR SURFACES IN THE PROJECT TOPEKA, KS

	AVERAGE U-VALUE WALLS+GLASS (BTU/HR-SQFT-F)	AVERAGE U-VALUE WALLS (BTU/HR-SQFT-F)	AVERAGE U-VALUE WALLS+GLASS (BTU/HR-SQFT-F)	GLASS AREA (SQFT)	OPAQUE AREA (SQFT)	GLASS+OPAQUE AREA (SQFT)
NORTH-EAST	0.000	0.096	0.096	0.00	1187.00	1187.00
SOUTH-EAST	1.021	0.096	0.318	720.00	2280.00	3000.00
SOUTH-WEST	0.000	0.096	0.096	0.00	1187.00	1187.00
NORTH-WEST	0.000	0.096	0.096	0.00	3250.00	3250.00
ROOF	0.000	0.088	0.088	0.00	23120.00	23120.00
ALL WALLS	1.021	0.096	0.174	720.00	7904.00	8624.00
WALLS+ROOFS	1.021	0.096	0.111	720.00	31024.00	31744.00
UNDERGRND	0.000	0.020	0.020	0.00	23120.00	23120.00
BUILDING	1.021	0.060	0.073	720.00	54144.00	54864.00

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/16/1995 10: 7: 7 LLDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. 8021 ADM. & SUPPORT BLDG  
 REPORT- LS-C BUILDING PEAK LOAD COMPONENTS TOPEKA, KS

\*\*\* BUILDING \*\*\*

FLOOR AREA 20818 SOFT 1934 SQMT  
 VOLUME 263970 CUFT 7476 CUMT

HEATING LOAD  
 JAN 4 3AM  
 8F -13C  
 7F -14C

COOLING LOAD  
 AUG 11 4PM  
 100F 38C  
 71F 22C

TIME  
 DRY-BULB TEMP  
 WET-BULB TEMP

	SENSIBLE (KBTU/H)	( KW )	LATENT (KBTU/H)	( KW )	SENSIBLE (KBTU/H)	( KW )
WALLS	20.057	5.874	0.000	0.000	-47.657	-13.958
ROOFS	76.283	22.341	0.000	0.000	-129.198	-37.839
GLASS CONDUCTION	14.119	4.135	0.000	0.000	-55.765	-16.332
GLASS SOLAR	53.275	15.603	0.000	0.000	1.383	0.405
DOOR	0.000	0.000	0.000	0.000	0.000	0.000
INTERNAL SURFACES	-5.695	-1.668	0.000	0.000	-5.695	-1.668
UNDERGROUND SURFACES	-2.027	-0.594	0.000	0.000	-12.300	-3.602
OCCUPANTS TO SPACE	41.902	12.272	65.945	19.314	2.716	0.795
LIGHT TO SPACE	102.646	30.062	0.000	0.000	10.228	2.996
EQUIPMENT TO SPACE	13.487	3.950	0.000	0.000	0.874	0.256
PROCESS TO SPACE	0.000	0.000	0.000	0.000	0.000	0.000
INFILTRATION	27.174	7.959	3.730	1.093	-147.891	-43.313
TOTAL	341.223	99.936	69.675	20.406	-383.304	-112.260
TOTAL LOAD	410.898	KBTU/H	120.342	KW	-112.260	KW
TOTAL LOAD / AREA	19.74	BTU/H.SQFT	62.224	W /SQMT	58.045	W /SQMT

\*\*\*\*\*  
 \* \* NOTE 1) THE ABOVE LOADS EXCLUDE OUTSIDE VENTILATION AIR \* \*  
 \* \* \* \* \*  
 \* \* \* \* \*  
 \* \* \* \* \*  
 \* \* \* \* \*  
 \* \* \* \* \*  
 \* \* \* \* \*  
 \* \* \* \* \*

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/16/1995 10: 7: 7 SDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. 8021 ADM. & SUPPORT BLDG  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR 2\_PIP\_F.C. TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC LOAD (KW)
JAN	0.00000				-34.494	15	9	-6.F	4297.	-135.616	19.586
FEB	0.00000				-23.329	3	6	-2.F	3887.	-121.064	19.586
MAR	0.00000				-14.772	14	6	13.F	4682.	-107.451	19.586
APR	0.00000				-2.034	5	6	31.F	4289.	-63.247	19.586
MAY	25.39890	16	2	62.F	-0.399	9	6	44.F	4297.	-19.714	19.586
JUN	57.86850	24	12	84.F	0.000				4481.	0.000	19.586
JUL	67.40594	1	16	86.F	0.000				4104.	0.000	19.586
AUG	71.34351	23	16	96.F	0.000				4682.	0.000	19.586
SEP	45.86646	7	15	92.F	0.000				4289.	0.000	19.586
OCT	0.68924	1	15	82.F	-2.136	2	6	53.F	4104.	-54.155	19.586
NOV	0.00000				-11.580	2	6	15.F	4096.	-93.824	19.586
DEC	0.00000				-31.279	12	6	3.F	4297.	-128.025	19.586
TOTAL	268.572				-120.022				51502.	-135.616	19.586
MAX											

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/16/1995 10: 7: 7 SDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. 8021 ADM. & SUPPORT BLDG  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR 2\_PIP\_F.C. TOPEKA, KS

MONTH	HOURS OF				HOURS				COINCIDENT LOADS				
	COOLING LOAD	HEATING LOAD	COOL-HEAT LOAD	COINCIDENT LOAD	HEATING AVAIL.	COOLING AVAIL.	FANS ON	FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)	FLOATING WHEN FANS ON	NIGHT VENTING	FANS ON
JAN	0	646	0	0	0	744	744	0	0	-11.914	98	0	0.344
FEB	0	556	0	0	0	672	672	0	0	-7.735	116	0	0.344
MAR	0	542	0	0	0	744	744	0	0	-17.510	202	0	0.344
APR	0	457	0	0	0	720	720	0	0	-1.914	263	0	0.344
MAY	350	227	0	0	384	744	744	0	0	0.000	167	0	0.344
JUN	699	0	0	0	720	720	720	0	0	0.000	21	0	19.586
JUL	744	0	0	0	744	744	744	0	0	0.000	0	0	19.586
AUG	743	0	0	0	744	744	744	0	0	0.000	1	0	19.586
SEP	612	0	0	0	720	720	720	0	0	0.000	108	0	19.586
OCT	17	474	0	0	24	744	744	0	0	0.000	253	0	0.344
NOV	0	530	0	0	0	720	720	0	0	0.000	190	0	0.344
DEC	0	643	0	0	0	744	744	0	0	-48.955	101	0	0.344
ANNUAL	3165	4075	0	0	3336	5424	8760	0	0	-85.856	1520	0	0.344

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/16/1995 10: 7: 7 SDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. 8021 ADM. & SUPPORT BLDG  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR H&V TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-62.477	16	7	12.F	9.F	-160.034	10994.
FEB	0.00000				-45.660	3	6	-1.F	-2.F	-124.666	9936.
MAR	0.00000				-33.283	3	5	15.F	13.F	-118.201	11378.
APR	0.00000				-8.176	5	6	31.F	28.F	-66.756	10770.
MAY	0.00000				-0.503	9	6	44.F	44.F	-18.344	10994.
JUN	0.00000				0.000					0.000	10961.
JUL	0.00000				0.000					0.000	10802.
AUG	0.00000				0.000					0.000	11378.
SEP	0.00000				0.000					0.000	10770.
OCT	0.00000				-4.335	2	2	64.F	59.F	-65.295	10802.
NOV	0.00000				-22.457	2	6	15.F	14.F	-84.963	10578.
DEC	0.00000				-53.419	12	6	3.F	2.F	-135.579	10994.
TOTAL	0.000				-230.310					-160.034	130357.
MAX											

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/16/1995 10: 7: 7 SDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. 8021 ADM. & SUPPORT BLDG  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR H&V TOPEKA, KS

MONTH	H O U R S				H O U R S				H O U R S				C O I N C I D E N T	
	HOURS COOLING LOAD	HOURS HEATING LOAD	HOURS COOL-HEAT LOAD	HOURS COINCIDENT LOAD	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.	HOURS FANS ON	HOURS FANS ON CYCLE	HOURS NIGHT VENTING	HOURS FLOTTING WHEN FANS ON	HOURS HEATING LOAD AT COOLING PEAK (KBTU/HR)	HOURS ELECTRIC LOAD AT COOLING PEAK (KW)	HOURS HEATING LOAD AT COOLING PEAK (KBTU/HR)	HOURS ELECTRIC LOAD AT COOLING PEAK (KW)
JAN	0	744	0	0	744	0	744	0	0	0	-62.952	9.360	-62.952	9.360
FEB	0	672	0	0	672	0	672	0	0	0	-62.644	9.360	-62.644	9.360
MAR	0	714	0	0	744	0	744	0	0	30	-60.989	9.360	-60.989	9.360
APR	0	545	0	0	720	0	720	0	0	175	-3.179	9.360	-3.179	9.360
MAY	0	206	0	0	360	0	744	0	0	538	0.000	9.360	0.000	9.360
JUN	0	0	0	0	720	0	720	0	0	720	0.000	9.360	0.000	9.360
JUL	0	0	0	0	744	0	744	0	0	744	0.000	9.360	0.000	9.360
AUG	0	0	0	0	744	0	744	0	0	744	0.000	9.360	0.000	9.360
SEP	0	0	0	0	720	0	720	0	0	720	0.000	9.360	0.000	9.360
OCT	0	491	0	0	720	0	744	0	0	253	-34.568	9.360	-34.568	9.360
NOV	0	631	0	0	720	0	744	0	0	89	-69.537	9.360	-69.537	9.360
DEC	0	744	0	0	744	0	744	0	0	0	-91.490	9.360	-91.490	9.360
ANNUAL	0	4747	0	0	5424	0	8760	0	0	4013				

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/16/1995 10: 7: 7 PDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. 8021 ADM. & SUPPORT BLDG  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY TOTAL (MBTU) PEAK (KBTU) DY/HR	NATURAL-GAS TOTAL (MBTU) PEAK (KBTU) DY/HR
JAN	56.659 170.784 31/ 9	170.784 51.137 170.784	144.201 372.445 16/ 6
FEB	51.137 170.784 28/10	170.784 57.955 170.784	107.814 331.575 3/ 6
MAR	57.955 170.784 31/ 8	170.784 52.399 170.784	78.037 304.178 14/ 6
APR	52.399 170.784 5/ 7	170.784 57.477 181.872	19.762 197.220 5/ 6
MAY	57.477 181.872 31/16	181.872 63.517 181.872	60.623 361.491 16/ 2
JUN	63.517 181.872 30/16	181.872 62.749 181.872	132.817 362.843 27/16
JUL	62.749 181.872 29/16	181.872 66.737 181.872	155.058 379.143 1/16
AUG	66.737 181.872 31/16	181.872 60.349 181.872	161.597 369.729 23/14
SEP	60.349 181.872 28/16	181.872 51.780 169.300	105.164 364.372 7/16
OCT	51.780 169.300 31/ 7	170.784 52.576 170.784	15.123 180.875 2/ 2
NOV	52.576 170.784 29/ 7	170.784 56.529 170.784	57.244 255.011 2/ 6
DEC	56.529 170.784 30/16	170.784 689.864 181.872	129.033 351.483 12/ 6
	ONE YEAR USE/PEAK		1166.474 379.143

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/16/1995 10: 7: 7 PDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. 8021 ADM. & SUPPORT BLDG  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE	ELECTRICITY	NATURAL-GAS
IN SITE MBTU -		
CATEGORY OF USE		
SPACE HEAT	20.08	552.10
SPACE COOL	41.11	614.37
HVAC AUX	297.96	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	293.72	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	36.98	0.00
TOTAL	689.85	1166.47

TOTAL SITE ENERGY 1856.34 MBTU 79.0 KBTU/SQFT-YR GROSS-AREA 89.2 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 3238.14 MBTU 137.9 KBTU/SQFT-YR GROSS-AREA 155.5 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 3.1  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.





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4-EQUIPMAN =SPACE   AREA = 2832.0  VOLUME = 36816.0
                    TEMPERATURE = (73.)  ZONE-TYPE = CONDITIONED
                    PEOPLE-SCHEDULE = L_7-4M-F  NUMBER-OF-PEOPLE = 10.0
                    PEOPLE-HEAT-GAIN = 1000.0  PEOPLE-HG-LAT = 625.0
                    PEOPLE-HG-SENS = 375.0  LIGHTING-TYPE = SUS-FLUOR
                    LIGHTING-KW = 3.84  LIGHT-TO-SPACE = 1.0
                    LIGHTING-SCHEDULE = L_7-4M-F
                    EQUIP-SCHEDULE = L_7-4M-F  FURN-WEIGHT = 1.
                    INF-METHOD = AIR-CHANGE  AIR-CHANGES/HR = 0.31  ..

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E-W   HEIGHT = 13.0  WIDTH = 50.0  CONS = EXWALL-1
      AZIMUTH = 315  ..

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ROOF  HEIGHT = 50.0  WIDTH = 59.0  CONS = ROOF-2
      TILT = 0  ..

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U-W   HEIGHT = 50.0  WIDTH = 59.0  CONS = FLOOR ..

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END ..
COMPUTE LOADS ..

```

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INPUT SYSTEMS ..

```

```

$-----$
$ E Z - D O E   S Y S T E M S   I N P U T $
$-----$

```

\$ GENERAL PROJECT DATA

```

TITLE  LINE-1 *   EMC   ENGINEERS   INC.   *
        LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
        LINE-3 *   DENVER,   CO   80227   *
        LINE-4 *RUN #1 NIGHT SETBACK FOR BLDG. 8021   *
        LINE-5 *ADM. & SUPPORT BLDG   * ..

```

```

ABORT      ERRORS ..
DIAGNOSTIC WARNINGS ..
SYSTEMS-REPORT  VERIFICATION=(SV-A)
                SUMMARY=(SS-A,SS-C,SS-K,SS-O)
                HOURLY-DATA-SAVE = YES  ..

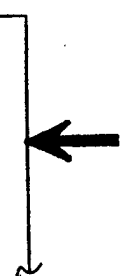
```

\$ SCHEDULES

```

SD_FULL    =DAY-SCHEDULE (1,24) (1.) ..
SD_WT_HT   =DAY-SCHEDULE (1,6) (55.)
                (7,16) (74.)
                (17,24) (55.) ..
SD_SM_CL   =DAY-SCHEDULE (1,6) (85.)
                (7,16) (72.)
                (17,24) (85.) ..
SD_OTAIR_% =DAY-SCHEDULE (1,24) (0.07) ..
SD_OFF     =DAY-SCHEDULE (1,24) (0.) ..
SD_OA%_WT  =DAY-SCHEDULE (1,24) (0.) ..

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SD_SM_HT =DAY-SCHEDULE (1,6) (83.)
              (7,16) (70.)
              (17,24) (83.) ..
SD_WT_CL =DAY-SCHEDULE (1,6) (57.)
              (7,16) (76.)
              (17,24) (57.) ..
SD_FAN_CYC =DAY-SCHEDULE (1,6) (-1.)
              (7,16) (1.)
              (17,24) (-1.) ..
SD_WT_HT_D =DAY-SCHEDULE (1,24) (55.) ..
SD_SM_CL_D =DAY-SCHEDULE (1,24) (85.) ..
SD_WT_CL_D =DAY-SCHEDULE (1,24) (57.) ..
SD_SM_HT_D =DAY-SCHEDULE (1,24) (83.) ..

SW_FULL_ON =WEEK-SCHEDULE (ALL) SD_FULL ..

SW_WT_HT =WEEK-SCHEDULE (WD) SD_WT_HT
              (WEH) SD_WT_HT_D ..

SW_SM_CL =WEEK-SCHEDULE (WD) SD_SM_CL
              (WEH) SD_SM_CL_D ..

SW_OTAIR_% =WEEK-SCHEDULE (ALL) SD_OTAIR_% ..

SW_off =WEEK-SCHEDULE (ALL) SD_OFF ..

SW_OA%_SM =WEEK-SCHEDULE (ALL) SD_OA%_WT ..

SW_SM_HT =WEEK-SCHEDULE (WD) SD_SM_HT
              (WEH) SD_SM_HT_D ..

SW_WT_CL =WEEK-SCHEDULE (WD) SD_WT_CL
              (WEH) SD_WT_CL_D ..

SW_FAN_CYC =WEEK-SCHEDULE (WD) SD_FAN_CYC
              (WEH) SD_OFF ..

S_FULL_ON =SCHEDULE THRU DEC 31 SW_FULL_ON ..

S_FULL_OFF =SCHEDULE THRU DEC 31 SW_off ..

S_HEAT_SET =SCHEDULE THRU MAY 15 SW_WT_HT
              THRU OCT 1 SW_SM_HT
              THRU DEC 31 SW_WT_HT ..

$ OUTSIDE_AIR_0.07%
S_OTSIDAIR =SCHEDULE THRU DEC 31 SW_OTAIR_% ..

S_HE_SCHED =SCHEDULE THRU MAY 15 SW_FULL_ON
              THRU OCT 1 SW_off
              THRU DEC 31 SW_FULL_ON ..

S_CL_SCHED =SCHEDULE THRU MAY 15 SW_off
              THRU OCT 1 SW_FULL_ON
              THRU DEC 31 SW_off ..

```

\$ %OA\_WINTER\_%OA\_SUM

S\_OA\_S\_VNT =SCHEDULE THRU MAY 15 SW\_OA%\_SM  
 THRU OCT 1 SW\_FULL\_ON  
 THRU DEC 31 SW\_OA%\_SM ..

S\_HRLY-RPT =SCHEDULE THRU JAN 13 SW\_off  
 THRU JAN 15 SW\_FULL\_ON  
 THRU AUG 20 SW\_off  
 THRU AUG 21 SW\_FULL\_ON  
 THRU AUG 22 SW\_off  
 THRU AUG 23 SW\_FULL\_ON  
 THRU DEC 31 SW\_off ..

S\_COOL\_SET =SCHEDULE THRU MAY 15 SW\_WT\_CL  
 THRU OCT 1 SW\_SM\_CL  
 THRU DEC 31 SW\_WT\_CL ..

S\_FAN\_CYC =SCHEDULE THRU DEC 31 SW\_FAN\_CYC ..

\$ ZONE DESCRIPTION

1ST\_COMPNY =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HEAT\_SET COOL-TEMP-SCH = S\_COOL\_SET  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL  
 SIZING-OPTION = FROM-LOADS RATED-CFM = 3600.0  
 HEATING-CAPACITY = -68484.0  
 COOLING-CAPACITY = 68484.0 COOL-SH-CAP = 57094.0 ..

1ARMS-VALT =ZONE DESIGN-HEAT-T = 68.0 DESIGN-COOL-T = 80.0  
 ZONE-TYPE = UNCONDITIONED SIZING-OPTION = FROM-LOADS ..

1EQUPMAIN =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HEAT\_SET COOL-TEMP-SCH = S\_COOL\_SET  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL  
 SIZING-OPTION = FROM-LOADS RATED-CFM = 2400.0  
 HEATING-CAPACITY = -45000.0 ..

2-COMPNY =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HEAT\_SET COOL-TEMP-SCH = S\_COOL\_SET  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL  
 SIZING-OPTION = FROM-LOADS RATED-CFM = 3600.0  
 HEATING-CAPACITY = -68484.0  
 COOLING-CAPACITY = 68484.0 COOL-SH-CAP = 57094.0 ..

2-VALT =ZONE DESIGN-HEAT-T = 68.0 DESIGN-COOL-T = 80.0  
 ZONE-TYPE = UNCONDITIONED SIZING-OPTION = FROM-LOADS ..

2-EQUPMAN =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HEAT\_SET COOL-TEMP-SCH = S\_COOL\_SET  
 ZONE-TYPE = CONDITIONED

THERMOSTAT-TYPE = PROPORTIONAL  
SIZING-OPTION = FROM-LOADS RATED-CFM = 2400.0  
HEATING-CAPACITY = -45000.0 ..

5TH\_COMPNY =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HEAT\_SET COOL-TEMP-SCH = S\_COOL\_SET  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL  
SIZING-OPTION = FROM-LOADS RATED-CFM = 3600.0  
HEATING-CAPACITY = -68484.0  
COOLING-CAPACITY = 68484.0 COOL-SH-CAP = 57094.0 ..

5-VALT =ZONE DESIGN-HEAT-T = 68.0 DESIGN-COOL-T = 80.0  
ZONE-TYPE = UNCONDITIONED SIZING-OPTION = FROM-LOADS ..

5EQUPMAN =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HEAT\_SET COOL-TEMP-SCH = S\_COOL\_SET  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL  
SIZING-OPTION = FROM-LOADS RATED-CFM = 2400.0  
HEATING-CAPACITY = -45000.0 ..

3-COMPNY =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HEAT\_SET COOL-TEMP-SCH = S\_COOL\_SET  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL  
SIZING-OPTION = FROM-LOADS RATED-CFM = 3600.0  
HEATING-CAPACITY = -68484.0  
COOLING-CAPACITY = 68484.0 COOL-SH-CAP = 57094.0 ..

3-VALT =ZONE DESIGN-HEAT-T = 68.0 DESIGN-COOL-T = 80.0  
ZONE-TYPE = UNCONDITIONED SIZING-OPTION = FROM-LOADS ..

3-EQUPMAN =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HEAT\_SET COOL-TEMP-SCH = S\_COOL\_SET  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL  
SIZING-OPTION = FROM-LOADS RATED-CFM = 2400.0  
HEATING-CAPACITY = -45000.0 ..

4-COMPNY =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HEAT\_SET COOL-TEMP-SCH = S\_COOL\_SET  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL  
SIZING-OPTION = FROM-LOADS RATED-CFM = 3600.0  
HEATING-CAPACITY = -68484.0  
COOLING-CAPACITY = 68484.0 COOL-SH-CAP = 57094.0 ..

4-VALT =ZONE DESIGN-HEAT-T = 68.0 DESIGN-COOL-T = 80.0  
ZONE-TYPE = UNCONDITIONED SIZING-OPTION = FROM-LOADS ..

4-EQUPMAN =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HEAT\_SET COOL-TEMP-SCH = S\_COOL\_SET  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL  
SIZING-OPTION = FROM-LOADS RATED-CFM = 2400.0

HEATING-CAPACITY = -45000.0 ..

\$ SYSTEM DESCRIPTION

2\_PIP\_F.C. =SYSTEM SYSTEM-TYPE = TPFC  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 50.0  
 HEATING-SCHEDULE = S\_HE\_SCHED  
 COOLING-SCHEDULE = S\_CL\_SCHED RATED-CFM = 18000.  
 MIN-OUTSIDE-AIR = 0.07 FAN-SCHEDULE = S\_FAN\_CYC  
 SUPPLY-DELTA-T = 0.2 SUPPLY-KW = 0.00007  
 NIGHT-CYCLE-CTRL = CYCLE-ON-ANY ←  
 COOLING-CAPACITY = 342420. COOL-SH-CAP = 285470.  
 COOL-FT-MIN = 0. HEATING-CAPACITY = -1027260.  
 ZONE-NAMES = (1ST\_COMPNY, 1ARMS-VALT, 2-COMPNY,  
 2-VALT, 5TH\_COMPNY, 5-VALT, 3-COMPNY,  
 3-VALT, 4-COMPNY, 4-VALT) ..

H&V =SYSTEM SYSTEM-TYPE = HVSYS  
 MAX-SUPPLY-T = 120.0 HEATING-SCHEDULE = S\_HE\_SCHED  
 OA-CONTROL = FIXED SUPPLY-CFM = 12000.  
 MIN-AIR-SCH = S\_OA\_S\_VNT FAN-SCHEDULE = S\_FAN\_CYC  
 SUPPLY-DELTA-T = 2.4 SUPPLY-KW = 0.00078  
 MOTOR-PLACEMENT = OUTSIDE-AIRFLOW  
 NIGHT-CYCLE-CTRL = CYCLE-ON-ANY NIGHT-VENT-DT = 0.0 ←  
 HEATING-CAPACITY = -195000.  
 ZONE-NAMES = (1EQUPTMAIN, 2-EQUPTMAN, 5EQUPTMAIN,  
 3-EQUPTMAN, 4-EQUPTMAN) ..

\$ HOURLY REPORT DESCRIPTION

FC\_BLOCK =REPORT-BLOCK VARIABLE-TYPE = 2\_PIP\_F.C.  
 VARIABLE-LIST = (3,5,6,17) ..  
 H&V\_BLOCK =REPORT-BLOCK VARIABLE-TYPE = H&V  
 VARIABLE-LIST = (3,5,6,17,22) ..  
 OFFIC-BLK =REPORT-BLOCK VARIABLE-TYPE = 1ST\_COMPNY  
 VARIABLE-LIST = (17,18,7,6) ..  
 MAIN\_BLOCK =REPORT-BLOCK VARIABLE-TYPE = 1EQUPTMAIN  
 VARIABLE-LIST = (17,18,7,6) ..  
 AHU'S-RPT = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (FC\_BLOCK,H&V\_BLOCK)  
 ..  
 ZONE-HRLYS = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (OFFIC-BLK,MAIN\_BLOCK)  
 ..  
 END ..  
 COMPUTE SYSTEMS ..  
 INPUT PLANT ..

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 \$ E Z - D O E P L A N T S I N P U T \$  
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EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/16/1995 10:47:48 SDL RUN 1												
DENVER, CO 80227 RUN #1 NIGHT SETBACK FOR BLDG. 8021 ADM. & SUPPORT BLDG												
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR 2_PIP_F.C. TOPEKA, KS												
MONTH	C O O L I N G				H E A T I N G				E L E C			
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC-TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)	
JAN	0.00000				-15.740	17	7	27.F	24.F	-267.956	4172.	19.586
FEB	0.00000				-9.221	7	7	26.F	25.F	-269.115	3789.	19.586
MAR	0.00000				-4.201	14	7	16.F	14.F	-213.156	4570.	19.586
APR	0.00000				-0.365	5	7	30.F	27.F	-43.832	4187.	19.586
MAY	16.41863	16	7	58.F	57.F	7	2	45.F	44.F	-4.841	4186.	19.586
JUN	36.29034	27	7	72.F	71.F					0.000	4349.	19.586
JUL	39.63266	18	7	76.F	72.F					0.000	3949.	19.586
AUG	43.48590	24	14	94.F	77.F					0.000	4529.	19.586
SEP	31.72237	6	7	75.F	71.F					0.000	4164.	19.586
OCT	0.05722	1	12	75.F	64.F	31	7	43.F	39.F	-45.669	4008.	19.586
NOV	0.00000				-2.215	14	7	32.F	32.F	-156.019	4000.	19.586
DEC	0.00000				-13.233	12	8	2.F	1.F	-302.088	4184.	19.586
TOTAL	167.607				-45.453					-302.088	50086.	19.586
MAX												

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/16/1995 10:47:48 SDL RUN 1										
DENVER, CO 80227 RUN #1 NIGHT SETBACK FOR BLDG. 8021 ADM. & SUPPORT BLDG										
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR 2_PIP_F.C. TOPEKA, KS										
MONTH	HOURS COINCIDENT COOL-HEAT LOAD				HOURS COINCIDENT HEATING LOAD AT COOLING PEAK				ELECTRIC LOAD AT COOLING PEAK	
	HOURS COOLING LOAD	HOURS HEATING LOAD	HOURS COINCIDENT COOL-HEAT LOAD	HOURS FLOATING LOAD	HOURS COOLING AVAIL.	HOURS HEATING AVAIL.	HOURS COINCIDENT HEATING LOAD AT COOLING PEAK	HOURS COINCIDENT HEATING LOAD AT COOLING PEAK	HEATING COOLING PEAK (KBTU/HR)	ELECTRIC COOLING PEAK (KW)
JAN	0	311	0	433	0	744	382	172	0.000	0.000
FEB	0	305	0	367	0	672	387	197	0.000	0.000
MAR	0	255	0	489	0	744	419	189	0.000	0.000
APR	0	164	0	556	0	720	426	216	-1.998	0.344
MAY	155	87	0	502	384	360	421	211	0.000	19.586
JUN	285	0	0	435	720	0	337	117	0.000	19.586
JUL	291	0	0	453	744	0	292	92	0.000	19.586
AUG	295	0	0	449	744	0	300	70	0.000	19.586
SEP	274	0	0	446	720	0	358	148	0.000	19.586
OCT	10	197	0	537	24	720	464	264	0.000	0.344
NOV	0	248	0	472	0	720	440	240	0.000	0.000
DEC	0	331	0	413	0	744	416	206	0.000	0.000
ANNUAL	1310	1898	0	5552	3336	5424	4642	2122	0	1434

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/16/1995 10:47:48 SDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SETBACK FOR BLDG. 8021 ADM. & SUPPORT BLDG  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR H&V TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-50.799	16 6	10.F	8.F	7840.	-194.500	28.552
FEB	0.00000				-41.954	2 10	14.F	12.F	7409.	-187.523	28.552
MAR	0.00000				-30.873	3 8	15.F	12.F	8355.	-185.558	28.552
APR	0.00000				-9.598	1 7	48.F	44.F	8018.	-148.208	28.552
MAY	0.00000				-0.651	5 7	44.F	40.F	8242.	-40.981	28.552
JUN	0.00000				0.000				7742.	0.000	28.552
JUL	0.00000				0.000				7068.	0.000	28.552
AUG	0.00000				0.000				7681.	0.000	28.552
SEP	0.00000				0.000				7990.	0.000	28.552
OCT	0.00000				-4.365	20 7	23.F	23.F	8181.	-99.787	28.552
NOV	0.00000				-22.519	3 7	19.F	17.F	7957.	-151.563	28.552
DEC	0.00000				-46.332	12 10	6.F	5.F	7999.	-192.839	28.552
TOTAL MAX	0.000				-207.090				94481.	-194.500	28.552

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/16/1995 10:47:48 SDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SETBACK FOR BLDG. 8021 ADM. & SUPPORT BLDG  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR H&V TOPEKA, KS

MONTH	N U M B E R O F H O U R S										C O I N C I D E N T L O A D S		
	HOURS COOLING LOAD	HOURS HEATING LOAD	HOURS COOL-HEAT LOAD	HOURS COINCIDENT COOL-HEAT LOAD	HOURS FLOATING	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.	HOURS FANS ON	HOURS FANS ON CYCLE	HOURS NIGHT VENTING	HOURS FLOATING WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)
JAN	0	407	0	0	337	744	0	407	197	0	0	0.000	0.000
FEB	0	402	0	0	270	672	0	402	212	0	0	0.000	0.000
MAR	0	418	0	0	326	744	0	421	191	0	3	0.000	0.000
APR	0	301	0	0	419	720	0	426	216	0	125	-2.866	9.360
MAY	0	89	0	0	655	360	0	450	240	0	376	0.000	0.000
JUN	0	0	0	0	720	0	0	376	156	0	345	0.000	0.000
JUL	0	0	0	0	744	0	0	345	145	0	349	0.000	9.360
AUG	0	0	0	0	744	0	0	349	119	0	423	0.000	0.000
SEP	0	0	0	0	720	0	0	423	213	0	214	0.000	0.000
OCT	0	250	0	0	494	720	0	464	264	0	52	0.000	0.000
NOV	0	388	0	0	332	720	0	440	240	0	0	0.000	0.000
DEC	0	424	0	0	320	744	0	424	214	0	0	0.000	9.360
ANNUAL	0	2679	0	0	6081	5424	0	4927	2407	0	2248	-113.233	9.360



EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC. DOE-2.1D 5/16/1995 10:47:48 PDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SETBACK FOR BLDG. 8021 ADM. & SUPPORT BLDG  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY TOTAL (MBTU) PEAK (KBTU) DY/HR	NATURAL-GAS TOTAL (MBTU) PEAK (KBTU) DY/HR
JAN	44.532 182.206 17/8	44.532 182.206 17/8	102.474 609.945 17/7
FEB	41.586 182.206 7/7	41.586 182.206 7/7	82.966 606.058 7/7
MAR	46.815 173.285 31/13	46.815 173.285 31/13	59.859 482.454 14/7
APR	42.660 173.285 15/7	42.660 173.285 15/7	19.346 272.746 5/7
MAY	45.254 185.343 31/16	45.254 185.343 31/16	39.220 377.043 31/16
JUN	46.657 185.343 30/16	46.657 185.343 30/16	81.847 410.019 27/7
JUL	43.428 185.343 29/16	43.428 185.343 29/16	90.241 431.037 18/7
AUG	47.675 185.343 31/16	47.675 185.343 31/16	97.448 428.984 24/14
SEP	46.542 185.343 28/16	46.542 185.343 28/16	71.403 428.653 6/7
OCT	42.240 173.285 31/7	42.240 173.285 31/7	10.705 215.634 31/7
NOV	42.981 173.285 30/10	42.981 173.285 30/10	44.263 362.394 10/7
DEC	45.053 182.206 12/10	45.053 182.206 12/10	93.786 688.539 12/8
	ONE YEAR USE/PEAK	535.423 185.343	793.558 688.539

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/16/1995 10:47:48 PDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SETBACK FOR BLDG. 8021 ADM. & SUPPORT BLDG  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE	ELECTRICITY	NATURAL-GAS
IN SITE MBTU -		
CATEGORY OF USE		
SPACE HEAT	16.80	415.20
SPACE COOL	21.55	378.36
HVAC AUX	166.38	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	293.72	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	36.98	0.00
TOTAL	535.43	793.56

TOTAL SITE ENERGY 1328.98 MBTU 56.6 KBTU/SQFT-YR GROSS-AREA 63.8 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 2401.44 MBTU 102.2 KBTU/SQFT-YR GROSS-AREA 115.4 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 17.1  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.



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4-EQUIPMAN =SPACE   AREA = 2832.0  VOLUME = 36816.0
                    TEMPERATURE = (73.)  ZONE-TYPE = CONDITIONED
                    PEOPLE-SCHEDULE = L_7-4M-F  NUMBER-OF-PEOPLE = 10.0
                    PEOPLE-HEAT-GAIN = 1000.0  PEOPLE-HG-LAT = 625.0
                    PEOPLE-HG-SENS = 375.0  LIGHTING-TYPE = SUS-FLUOR
                    LIGHTING-KW = 3.84  LIGHT-TO-SPACE = 1.0
                    LIGHTING-SCHEDULE = L_7-4M-F
                    EQUIP-SCHEDULE = L_7-4M-F  FURN-WEIGHT = 1.
                    INF-METHOD = AIR-CHANGE  AIR-CHANGES/HR = 0.31  ..

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E-W   HEIGHT = 13.0  WIDTH = 50.0  CONS = EXWALL-1
      AZIMUTH = 315  ..

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ROOF  HEIGHT = 50.0  WIDTH = 59.0  CONS = ROOF-2
      TILT = 0  ..

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U-W   HEIGHT = 50.0  WIDTH = 59.0  CONS = FLOOR  ..

```

END ..

COMPUTE LOADS ..

INPUT SYSTEMS ..

```

$-----$
$ E Z - D O E   S Y S T E M S   I N P U T $
$-----$

```

\$ GENERAL PROJECT DATA

```

TITLE  LINE-1 *   EMC      ENGINEERS      INC.      *
        LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
        LINE-3 *   DENVER,      CO      80227      *
        LINE-4 *RUN #2 DDC CONTROL FOR BLDG. 8021      *
        LINE-5 *ADM. & SUPPORT BLDG                      * ..

```

```

ABORT      ERRORS  ..
DIAGNOSTIC WARNINGS ..
SYSTEMS-REPORT  VERIFICATION=(SV-A)
                SUMMARY=(SS-A,SS-C,SS-K,SS-O)
                HOURLY-DATA-SAVE = YES  ..

```

\$ SCHEDULES

```

SD_FULL    =DAY-SCHEDULE (1,24) (1.)  ..
SD_WT_HT   =DAY-SCHEDULE (1,24) (70.)  ..
SD_SM_CL   =DAY-SCHEDULE (1,24) (76.)  ..
SD_OTAIR_% =DAY-SCHEDULE (1,24) (0.07) ..
SD_OFF     =DAY-SCHEDULE (1,24) (0.)  ..
SD_OA%_WT  =DAY-SCHEDULE (1,24) (0.)  ..
SD_SM_HT   =DAY-SCHEDULE (1,24) (74.)  ..
SD_WT_CL   =DAY-SCHEDULE (1,24) (72.)  ..

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```

SW_FULL_ON =WEEK-SCHEDULE (ALL) SD_FULL  ..

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```

SW_WT_HT =WEEK-SCHEDULE (ALL) SD_WT_HT ..
SW_SM_CL =WEEK-SCHEDULE (ALL) SD_SM_CL ..
SW_OTAIR_% =WEEK-SCHEDULE (ALL) SD_OTAIR_% ..
SW_off =WEEK-SCHEDULE (ALL) SD_OFF ..
SW_OA%_SM =WEEK-SCHEDULE (ALL) SD_OA%_WT ..
SW_SM_HT =WEEK-SCHEDULE (ALL) SD_SM_HT ..
SW_WT_CL =WEEK-SCHEDULE (ALL) SD_WT_CL ..

S_FULL_ON =SCHEDULE THRU DEC 31 SW_FULL_ON ..
S_FULL_OFF =SCHEDULE THRU DEC 31 SW_off ..
S_HEAT_SET =SCHEDULE THRU MAY 15 SW_WT_HT
              THRU OCT 1 SW_SM_HT
              THRU DEC 31 SW_WT_HT ..

$ OUTSIDE_AIR_0.07%
S_OTSIDAIR =SCHEDULE THRU DEC 31 SW_OTAIR_% ..

S_HE_SCHED =SCHEDULE THRU MAY 15 SW_FULL_ON
              THRU OCT 1 SW_off
              THRU DEC 31 SW_FULL_ON ..

S_CL_SCHED =SCHEDULE THRU MAY 15 SW_off
              THRU OCT 1 SW_FULL_ON
              THRU DEC 31 SW_off ..

$ %OA_WINTER_%OA_SUM
S_OA_S_VNT =SCHEDULE THRU MAY 15 SW_OA%_SM
              THRU OCT 1 SW_FULL_ON
              THRU DEC 31 SW_OA%_SM ..

S_HRLY-RPT =SCHEDULE THRU JAN 13 SW_off
              THRU JAN 15 SW_FULL_ON
              THRU AUG 20 SW_off
              THRU AUG 21 SW_FULL_ON
              THRU AUG 22 SW_off
              THRU AUG 23 SW_FULL_ON
              THRU DEC 31 SW_off ..

S_COOL_SET =SCHEDULE THRU MAY 15 SW_WT_CL
              THRU OCT 1 SW_SM_CL
              THRU DEC 31 SW_WT_CL ..

```

\$ ZONE DESCRIPTION

1ST\_COMPNY =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HEAT\_SET COOL-TEMP-SCH = S\_COOL\_SET  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL  
SIZING-OPTION = FROM-LOADS RATED-CFM = 3600.0  
HEATING-CAPACITY = -68484.0  
COOLING-CAPACITY = 68484.0 COOL-SH-CAP = 57094.0 ..

1ARMS-VALT =ZONE DESIGN-HEAT-T = 68.0 DESIGN-COOL-T = 80.0  
ZONE-TYPE = UNCONDITIONED SIZING-OPTION = FROM-LOADS ..

1EQUPMAN =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HEAT\_SET COOL-TEMP-SCH = S\_COOL\_SET  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL  
SIZING-OPTION = FROM-LOADS RATED-CFM = 2400.0  
HEATING-CAPACITY = -45000.0 ..

2-COMPNY =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HEAT\_SET COOL-TEMP-SCH = S\_COOL\_SET  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL  
SIZING-OPTION = FROM-LOADS RATED-CFM = 3600.0  
HEATING-CAPACITY = -68484.0  
COOLING-CAPACITY = 68484.0 COOL-SH-CAP = 57094.0 ..

2-VALT =ZONE DESIGN-HEAT-T = 68.0 DESIGN-COOL-T = 80.0  
ZONE-TYPE = UNCONDITIONED SIZING-OPTION = FROM-LOADS ..

2-EQUPMAN =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HEAT\_SET COOL-TEMP-SCH = S\_COOL\_SET  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL  
SIZING-OPTION = FROM-LOADS RATED-CFM = 2400.0  
HEATING-CAPACITY = -45000.0 ..

5TH\_COMPNY =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HEAT\_SET COOL-TEMP-SCH = S\_COOL\_SET  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL  
SIZING-OPTION = FROM-LOADS RATED-CFM = 3600.0  
HEATING-CAPACITY = -68484.0  
COOLING-CAPACITY = 68484.0 COOL-SH-CAP = 57094.0 ..

5-VALT =ZONE DESIGN-HEAT-T = 68.0 DESIGN-COOL-T = 80.0  
ZONE-TYPE = UNCONDITIONED SIZING-OPTION = FROM-LOADS ..

5EQUPMAN =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HEAT\_SET COOL-TEMP-SCH = S\_COOL\_SET  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL  
SIZING-OPTION = FROM-LOADS RATED-CFM = 2400.0  
HEATING-CAPACITY = -45000.0 ..

3-COMPNY =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HEAT\_SET COOL-TEMP-SCH = S\_COOL\_SET

ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL  
 SIZING-OPTION = FROM-LOADS RATED-CFM = 3600.0  
 HEATING-CAPACITY = -68484.0  
 COOLING-CAPACITY = 68484.0 COOL-SH-CAP = 57094.0 ..

3-VALT =ZONE DESIGN-HEAT-T = 68.0 DESIGN-COOL-T = 80.0  
 ZONE-TYPE = UNCONDITIONED SIZING-OPTION = FROM-LOADS ..

3-EQUIPMAN =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HEAT\_SET COOL-TEMP-SCH = S\_COOL\_SET  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL  
 SIZING-OPTION = FROM-LOADS RATED-CFM = 2400.0  
 HEATING-CAPACITY = -45000.0 ..

4-COMPNY =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HEAT\_SET COOL-TEMP-SCH = S\_COOL\_SET  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL  
 SIZING-OPTION = FROM-LOADS RATED-CFM = 3600.0  
 HEATING-CAPACITY = -68484.0  
 COOLING-CAPACITY = 68484.0 COOL-SH-CAP = 57094.0 ..

4-VALT =ZONE DESIGN-HEAT-T = 68.0 DESIGN-COOL-T = 80.0  
 ZONE-TYPE = UNCONDITIONED SIZING-OPTION = FROM-LOADS ..

4-EQUIPMAN =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HEAT\_SET COOL-TEMP-SCH = S\_COOL\_SET  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL  
 SIZING-OPTION = FROM-LOADS RATED-CFM = 2400.0  
 HEATING-CAPACITY = -45000.0 ..

#### \$ SYSTEM DESCRIPTION

2\_PIP\_F.C. =SYSTEM SYSTEM-TYPE = TPFC  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 50.0  
 HEATING-SCHEDULE = S\_HE\_SCHED  
 COOLING-SCHEDULE = S\_CL\_SCHED RATED-CFM = 18000.  
 MIN-OUTSIDE-AIR = 0.07 SUPPLY-DELTA-T = 0.2  
 SUPPLY-KW = 0.00007 NIGHT-CYCLE-CTRL = STAY-OFF  
 COOLING-CAPACITY = 342420. COOL-SH-CAP = 285470.  
 COOL-FT-MIN = 0. HEATING-CAPACITY = -1027260.  
 ZONE-NAMES = (1ST\_COMPNY, 1ARMS-VALT, 2-COMPNY,  
 2-VALT, 5TH\_COMPNY, 5-VALT, 3-COMPNY,  
 3-VALT, 4-COMPNY, 4-VALT) ..

H&V =SYSTEM SYSTEM-TYPE = HVSYS  
 MAX-SUPPLY-T = 120.0 HEATING-SCHEDULE = S\_HE\_SCHED  
 OA-CONTROL = FIXED SUPPLY-CFM = 12000.  
 MIN-AIR-SCH = S\_OA\_S\_VNT SUPPLY-DELTA-T = 2.4  
 SUPPLY-KW = 0.00078  
 MOTOR-PLACEMENT = OUTSIDE-AIRFLOW  
 NIGHT-CYCLE-CTRL = STAY-OFF NIGHT-VENT-DT = 0.0

HEATING-CAPACITY = -195000.  
ZONE-NAMES = (1EQUPTMAIN, 2-EQUPTMAN, 5EQUPTMAIN,  
3-EQUPTMAN, 4-EQUPTMAN) ..

\$ HOURLY REPORT DESCRIPTION

FC\_BLOCK =REPORT-BLOCK VARIABLE-TYPE = 2\_PIP\_F.C.  
VARIABLE-LIST = (3,5,6,17) ..  
H&V\_BLOCK =REPORT-BLOCK VARIABLE-TYPE = H&V  
VARIABLE-LIST = (3,5,6,17,22) ..  
OFFIC-BLK =REPORT-BLOCK VARIABLE-TYPE = 1ST\_COMPNY  
VARIABLE-LIST = (17,18,7,6) ..  
MAIN\_BLOCK =REPORT-BLOCK VARIABLE-TYPE = 1EQUPTMAIN  
VARIABLE-LIST = (17,18,7,6) ..  
AHU'S-RPT = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
REPORT-BLOCK = (FC\_BLOCK,H&V\_BLOCK)  
..  
ZONE-HRLYS = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
REPORT-BLOCK = (OFFIC-BLK,MAIN\_BLOCK)  
..  
END ..  
COMPUTE SYSTEMS ..  
  
INPUT PLANT ..

\$-----\$  
\$ E Z - D O E P L A N T S I N P U T \$  
\$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
LINE-3 \* DENVER, CO 80227 \*  
  
LINE-4 \*RUN #2 DDC CONTROL FOR BLDG. 8021 \*  
LINE-5 \*ADM. & SUPPORT BLDG \* ..

ABORT ERRORS ..  
DIAGNOSTIC WARNINGS ..  
PLANT-REPORT VERIFICATION=(PV-A)  
SUMMARY=(PS-B,BEPS)  
HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

PD\_heaton =DAY-SCHEDULE (1,24) (1.) ..  
Pd\_heatoff =DAY-SCHEDULE (1,24) (0.) ..  
PD\_coolon =DAY-SCHEDULE (1,24) (1.) ..  
PD\_cooloff =DAY-SCHEDULE (1,24) (0.) ..



EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/16/1995 11: 0:59 SDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. 8021 ADM. & SUPPORT BLDG  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR 2\_PIP\_F.C. TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC LOAD (KW)
JAN	0.00000				-29.066	15	8	-6.F	-7.F	-127.838	4297.
FEB	0.00000				-18.482	3	6	-1.F	-2.F	-112.392	3887.
MAR	0.00000				-10.596	14	6	15.F	13.F	-98.073	4682.
APR	0.00000				-1.093	5	6	31.F	28.F	-45.544	4289.
MAY	21.31055	16	2	62.F	-0.352	3	17	69.F	63.F	-6.690	4297.
JUN	50.54285	28	14	89.F	0.000					0.000	4481.
JUL	59.61588	13	13	90.F	0.000					0.000	4104.
AUG	64.02199	23	14	94.F	0.000					0.000	4682.
SEP	39.25426	7	15	92.F	0.000					0.000	4289.
OCT	0.43014	1	15	82.F	-1.053	31	6	44.F	39.F	-37.126	4104.
NOV	0.00000				-7.809	2	6	15.F	14.F	-82.734	4096.
DEC	0.00000				-25.721	12	6	3.F	2.F	-120.030	4297.
TOTAL MAX	235.175				-94.173					-127.838	51502.

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/16/1995 11: 0:59 SDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. 8021 ADM. & SUPPORT BLDG  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR 2\_PIP\_F.C. TOPEKA, KS

MONTH	HOURS OF HOURS				HOURS OF HOURS				COINCIDENT LOADS			
	HOURS COOLING LOAD	HOURS HEATING LOAD	HOURS COINCIDENT COOL-HEAT LOAD	HOURS FLOATING	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.	HOURS FANS ON	HOURS FANS ON	HOURS NIGHT VENTING	HOURS FLOATING WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)
JAN	0	616	0	128	744	0	744	0	0	128	-2.504	0.344
FEB	0	522	0	150	672	0	672	0	0	150	-1.811	0.344
MAR	0	520	0	224	744	0	744	0	0	224	-4.553	0.344
APR	0	448	0	272	720	0	720	0	0	272	-1.913	0.344
MAY	321	227	0	196	360	384	744	0	0	196	0.000	0.344
JUN	667	0	0	53	0	720	720	0	0	53	0.000	19.586
JUL	731	0	0	13	0	744	744	0	0	13	0.000	19.586
AUG	731	0	0	13	0	744	744	0	0	13	0.000	19.586
SEP	569	0	0	151	0	720	744	0	0	151	0.000	19.586
OCT	14	468	0	262	24	24	744	0	0	262	0.000	0.344
NOV	0	503	0	217	720	0	744	0	0	217	-32.089	0.344
DEC	0	622	0	122	744	0	744	0	0	122	-78.018	0.344
ANNUAL	3033	3926	0	1801	5424	3336	8760	0	0	1801		

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/16/1995 11: 0:59 SDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. 8021 ADM. & SUPPORT BLDG  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR H&V TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C			
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	MAXIMUM COOLING LOAD (KBTU/HR)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-62.939	16	7	12.F	9.F	-160.677	10994.	28.552
FEB	0.00000				-46.066	3	6	-1.F	-2.F	-125.314	9936.	28.552
MAR	0.00000				-33.621	3	5	15.F	13.F	-118.745	11378.	28.552
APR	0.00000				-8.261	5	6	31.F	28.F	-67.165	10770.	28.552
MAY	0.00000				-0.503	9	6	44.F	44.F	-18.356	10994.	28.552
JUN	0.00000				0.000					0.000	10961.	28.552
JUL	0.00000				0.000					0.000	10802.	28.552
AUG	0.00000				0.000					0.000	11378.	28.552
SEP	0.00000				0.000					0.000	10770.	28.552
OCT	0.00000				-4.339	2	2	64.F	59.F	-64.716	10802.	28.552
NOV	0.00000				-22.721	2	6	15.F	14.F	-85.450	10578.	28.552
DEC	0.00000				-53.870	12	6	3.F	2.F	-136.248	10994.	28.552
TOTAL	0.000				-232.320					-160.677	130357.	28.552
MAX												

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/16/1995 11: 0:59 SDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. 8021 ADM. & SUPPORT BLDG  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR H&V TOPEKA, KS

MONTH	HOURS				HOURS				HOURS				COINCIDENT LOADS			
	COOLING LOAD	HEATING LOAD	COOL-HEAT LOAD	FLOATING	HEATING AVAIL.	COOLING AVAIL.	FANS ON	CYCLE ON	FANS ON	NIGHT VENTING	FLOATING WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)			
JAN	0	744	0	0	744	0	744	0	0	0	0	-63.565	9.360			
FEB	0	672	0	0	672	0	744	0	0	0	0	-63.217	9.360			
MAR	0	715	0	29	744	0	744	0	0	29	0	-61.544	9.360			
APR	0	545	0	175	720	0	720	0	0	175	0	-3.179	9.360			
MAY	0	206	0	538	360	0	744	0	0	538	0	0.000	9.360			
JUN	0	0	0	720	0	0	720	0	0	720	0	0.000	9.360			
JUL	0	0	0	744	0	0	744	0	0	744	0	0.000	9.360			
AUG	0	0	0	744	0	0	744	0	0	744	0	0.000	9.360			
SEP	0	0	0	720	0	0	720	0	0	720	0	0.000	9.360			
OCT	0	491	0	253	720	0	744	0	0	253	0	-34.899	9.360			
NOV	0	632	0	88	720	0	744	0	0	88	0	-70.056	9.360			
DEC	0	744	0	0	744	0	744	0	0	0	0	-92.145	9.360			
ANNUAL	0	4749	0	4011	5424	0	8760	0	0	4011	0					

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY 56.551 170.629 31/10 51.043 170.629 28/11 57.843 170.629 31/ 9 52.355 170.291 5/ 7 56.847 181.470 31/16 62.553 181.470 30/16 62.092 187.734 22/16 66.065 187.734 24/16 59.301 187.734 7/16 51.667 168.870 31/ 7 52.450 170.629 28/ 8 56.413 170.629 30/16	NATURAL-GAS 137.562 362.515 16/ 6 101.859 321.210 3/ 6 72.705 292.725 14/ 6 18.426 175.358 5/ 6 51.790 353.541 16/ 2 117.237 366.755 24/13 139.811 430.841 12/16 147.056 422.275 23/14 91.043 416.121 7/16 12.828 148.896 31/ 6 52.216 241.486 2/ 6 122.153 341.914 12/ 6
JAN	TOTAL (MBTU) PEAK (KBTU) DY/HR	56.551 170.629 31/10	137.562 362.515 16/ 6
FEB	TOTAL (MBTU) PEAK (KBTU) DY/HR	51.043 170.629 28/11	101.859 321.210 3/ 6
MAR	TOTAL (MBTU) PEAK (KBTU) DY/HR	57.843 170.629 31/ 9	72.705 292.725 14/ 6
APR	TOTAL (MBTU) PEAK (KBTU) DY/HR	52.355 170.291 5/ 7	18.426 175.358 5/ 6
MAY	TOTAL (MBTU) PEAK (KBTU) DY/HR	56.847 181.470 31/16	51.790 353.541 16/ 2
JUN	TOTAL (MBTU) PEAK (KBTU) DY/HR	62.553 181.470 30/16	117.237 366.755 24/13
JUL	TOTAL (MBTU) PEAK (KBTU) DY/HR	62.092 187.734 22/16	139.811 430.841 12/16
AUG	TOTAL (MBTU) PEAK (KBTU) DY/HR	66.065 187.734 24/16	147.056 422.275 23/14
SEP	TOTAL (MBTU) PEAK (KBTU) DY/HR	59.301 187.734 7/16	91.043 416.121 7/16
OCT	TOTAL (MBTU) PEAK (KBTU) DY/HR	51.667 168.870 31/ 7	12.828 148.896 31/ 6
NOV	TOTAL (MBTU) PEAK (KBTU) DY/HR	52.450 170.629 28/ 8	52.216 241.486 2/ 6
DEC	TOTAL (MBTU) PEAK (KBTU) DY/HR	56.413 170.629 30/16	122.153 341.914 12/ 6
	ONE YEAR USE/PEAK	685.181 187.734	1064.687 430.841

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/16/1995 11: 0:59 PDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. 8021 ADM. & SUPPORT BLDG  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE	ELECTRICITY	NATURAL-GAS
IN SITE MBTU -		
CATEGORY OF USE		
SPACE HEAT	19.41	519.10
SPACE COOL	37.57	545.58
HVAC AUX	297.47	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	293.71	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	36.98	0.00
TOTAL	685.15	1064.69

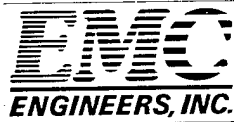
TOTAL SITE ENERGY 1749.87 MBTU 74.5 KBTU/SQFT-YR GROSS-AREA 84.1 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 3122.29 MBTU 132.9 KBTU/SQFT-YR GROSS-AREA 150.0 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 1.3  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.



**COMPUTER ENERGY SIMULATIONS**

**BLDG. 406**

**ADMINISTRATION BLOCK-TYPE BUILDINGS**



DENVER - ATLANTA

PROJECT: FEASIBILITY STUDY FOR  
 INSTALLATION OF UMCS  
 LOCATION: FORT RILEY, KANSAS

BUILDING NO.: 406  
 BLDG. TYPE: CID BUILDING

EMC NO: 1406-001  
 CALC. BY: AJN  
 CHECKED BY: CEL  
 DATE: 05-Jul-95

**ENERGY CONSTANT CALCULATIONS**

	BASERUN	RUN1	RUN2	RUN3	RUN4	RUN5
HEATING (MBtu)	782.9	397.9	655.8	500.9	510.7	615.0
COOLING (kWH)	153,012	129,127	146,185	128,731	166,742	149,367

SUPPLY AIR FAN	6,375 CFM
FLOOR AREA	4,644 FT <sup>2</sup>
CFM/F	1594 CFM
UA	2950 BTU/HR-°F
BLDG CONSTR.	2 (1 FOR LIGHT ) (2 FOR HEAVY)

EZDOE COMPUTER RUN DEFINITION:	
BASERUN	EXISTING OPERATION
RUN1	NIGHT SETBACK
RUN2	DDC CONTROL
RUN3	ECONOMIZER
RUN4	NIGHTTIME INFILTRATION (OA)
RUN5	DAYTIME INFILTRATION (OA)

HOURS OF OCCUPANCY			ANNUAL HEATING & COOLING HOURS		
M-F	700	1700	50 HR	HR. ON HEATING	1621 HR/YR
SAT.	0	0	0 HR	HR. ON COOLING	986 HR/YR
SUN.	0	0	0 HR	HR. OFF HEATING	3827 HR/YR
	TOTAL OCCUPY HR.		50 HR/WK	HR. OFF COOLING	2326 HR/YR
	TOTAL UNOCC. HR.		118 HR/WK		
	ANNUAL OCCUPY HR.		2607 HR/YR		
	ANNUAL UNOCC. HR.		6153 HR/YR		

PRESENT HR. OF OPERATION FOR SYS. WITH HEATING AND COOLING 8760 HR/YR  
 PRESENT HR. OF OPERATION FOR SYS. WITH HEATING ONLY 5448 HR/YR  
 PRESENT HR. OF OPERATION FOR SYS. WITH COOLING ONLY 3312 HR/YR  
 HRS SAVED (HTG ONLY) 5448 - 1621 = 3827 HR/YR  
 HRS SAVED (CLG ONLY) 3312 - 986 = 2326 HR/YR

HOAUHC	782.87 MBtu	-	510.71 MBtu	=	2.78E+01 Btu/CFM-HR	
	1593.75 CFM	x	6153 HR/YR			
HOAUH	782.87 MBtu	-	510.71 MBtu	=	4.46E+01 Btu/CFM-HR	
	1593.75 CFM	x	3827 HR/YR			
COAUHC	153,012.0 kWH	-	166,741.9 kWH	=	0.00E+00 kWH/CFM-HR	
	1593.75 CFM	x	6153 HR/YR			
COAUC	153,012.0 kWH	-	166,741.9 kWH	=	0.00E+00 kWH/CFM-HR	
	1593.75 CFM	x	2326 HR/YR			
HOAOHC	782.87 MBtu	-	614.97 MBtu	=	4.04E+01 Btu/CFM-HR	
	1593.75 CFM	x	2607 HR/YR			
HOAOH	782.87 MBtu	-	614.97 MBtu	=	6.50E+01 Btu/CFM-HR	
	1593.75 CFM	x	1621 HR/YR			
COAOHC	153,012.0 kWH	-	149,367.1 kWH	=	8.77E-04 kWH/CFM-HR	
	1593.75 CFM	x	2607 HR/YR			
COAOC	153,012.0 kWH	-	149,367.1 kWH	=	2.32E-03 kWH/CFM-HR	
	1593.75 CFM	x	986 HR/YR			
DC DUTY	1 / 6 (10 MINUTES PER HOUR)			=	0.17	
DC DEMAND	1 / 6 (10 MINUTES PER HOUR)			=	0.17	
ECC	129,126.9 kWH	-	128,731.3 kWH	=	6.29E-05 kWH/CFM-HR	
	6375 CFM	x	986 HR/YR			
ECHC	129,126.9 kWH	-	128,731.3 kWH	=	2.38E-05 kWH/CFM-HR	
	6375 CFM	x	2607 HR/YR			
NSUCHC	153,012.0 kWH	-	129,126.9 kWH	=	6.09E-04 kWH/CFM-HR	
	6375 CFM	x	6153 HR/YR			
NSUCC	153,012.0 kWH	-	129,126.9 kWH	=	1.61E-03 kWH/CFM-HR	
	6375 CFM	x	2326 HR/YR			
DDCCHC	153,012.0 kWH	-	146,185.2 kWH	=	4.11E-04 kWH/CFM-HR	
	6375 CFM	x	2607 HR/YR			
DDCCC	153,012.0 kWH	-	146,185.2 kWH	=	1.09E-03 kWH/CFM-HR	
	6375 CFM	x	986 HR/YR			
NSC	782.87 MBtu	-	397.91 MBtu	=	1.31E+05 Btu/UA	
	2949.7362 UA					
DDCH	782.87 MBtu	-	655.81 MBtu	=	4.31E+04 Btu/UA	
	2949.7362 UA					
OPT	( 2 HR/DAY X 240 DAY/YR )		-	175 HR/YR	=	305 HR/YR
CHWR	(1.10 kW X 0.012 Eff. X 664 HRS X 2 Degrees of Reset)			=	17.5 kWH/TON	
OAR	567 HR/YR	x	0.01	=	5.67 HR/YR	





INPUT LOADS ..

```

$-----$
$ E Z - D O E   L O A D S   I N P U T $
$-----$

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\$ GENERAL PROJECT DATA

```

TITLE LINE-1 *   EMC       ENGINEERS   INC.   *
LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
LINE-3 *   DENVER,     CO       80227   *

LINE-4 *BASELINE SIMULATION FOR BLDG #406   *
LINE-5 *CID BLDG                               * ..

```

```

ABORT          ERRORS ..
DIAGNOSTIC     WARNINGS ..
LOADS-REPORT   VERIFICATION=(LV-D)
               SUMMARY=(LS-C,LS-D)
               HOURLY-DATA-SAVE = YES ..
BUILDING-LOCATION LATITUDE = 39.0
                LONGITUDE = 96.5
                ALTITUDE = 1065.
                TIME-ZONE = 6
                GROSS-AREA = 10219
                SHIELDING-COEF = 0.29
                X-REF = 0.0
                Y-REF = 0.0 ..
RUN-PERIOD     JAN 1 1994 THRU DEC 31 1994 ..

```

\$ SCHEDULES

LD\_ON =DAY-SCHEDULE (1,24) (1.) ..

LD\_OFF =DAY-SCHEDULE (1,24) (0.) ..

```

LD_PEOPLE =DAY-SCHEDULE (1,6) (0.)
              (7) (0.5)
              (8,11) (1.)
              (12) (0.5)
              (13,17) (1.)
              (18,24) (0.) ..

```

```

LD_LIT/EQP =DAY-SCHEDULE (1,6) (0.1)
              (7) (0.5)
              (8,17) (1.)
              (18,24) (0.1) ..

```

LW\_ON =WEEK-SCHEDULE (ALL) LD\_ON ..

LW\_OFF =WEEK-SCHEDULE (ALL) LD\_OFF ..

LW\_PEOPLE =WEEK-SCHEDULE (WD) LD\_PEOPLE  
(WEH) LD\_OFF ..

LW\_LIT/EQP =WEEK-SCHEDULE (WD) LD\_LIT/EQP  
(WEH) LD\_OFF ..

## \$ ON 100% LOADS

L\_ON =SCHEDULE THRU DEC 31 LW\_ON ..

## \$ OFF 100% LOADS

L\_OFF =SCHEDULE THRU DEC 31 LW\_OFF ..

## \$ PEOPLE LOAD

L\_PEOPLE =SCHEDULE THRU DEC 31 LW\_PEOPLE ..

## \$ LIGHTS AND EQUIPMENT

L\_EQUI/LIG =SCHEDULE THRU DEC 31 LW\_LIT/EQP ..

## \$ CONSTRUCTION TYPES

## \$ SAND-BLOCK, AIRSPACE, GYP

EXWALL-1 =LAYERS MATERIAL=(CB17,CB07,AL21,GP01)  
THICKNESS=(1.000,0.500,0.000,0.042) ..  
EXWALL =CONSTRUCTION LAYERS = EXWALL-1  
ABSORPTANCE = 0.820  
ROUGHNESS = 2 ..

## \$ SLAB FLOOR

FLOOR =CONSTRUCTION U-VALUE = 0.020  
ABSORPTANCE = 0.610  
ROUGHNESS = 5 ..

## \$ STANDARD METAL DOOR

DOOR-STD =LAYERS MATERIAL=(WD01,IN31,WD01) I-F-R= 0.6100  
THICKNESS=(0.063,0.042,0.063) ..  
DOOR-WOD =CONSTRUCTION LAYERS = DOOR-STD  
ABSORPTANCE = 0.860  
ROUGHNESS = 5 ..

## \$ SHINGLED ROOF

ROOFMAIN =LAYERS MATERIAL=(AR02,PW05,IN02,HF-E1,HF-E4,AC02)  
THICKNESS=(0.000,0.063,0.296,0.063,0.000,0.042) ..  
MAINROOF =CONSTRUCTION LAYERS = ROOFMAIN  
ABSORPTANCE = 0.890 ..

## \$ BUILT-UP ROOF ON THE 1-STORY WING

ROOF-ADD =LAYERS MATERIAL=(RG02,IN23,HF-A3,HF-E4,AC02)  
THICKNESS=(0.083,0.167,0.005,0.000,0.042) ..  
ROOF-2 =CONSTRUCTION LAYERS = ROOF-ADD  
ABSORPTANCE = 0.870

ROUGHNESS = 1 ..

SG-PN-SW =GLASS-TYPE GLASS-TYPE-CODE = 2  
 PANES = 2 ..

## \$ SPACE DESCRIPTION

SPACE\_1 =SPACE AREA = 1856.0 VOLUME = 24128.0  
 TEMPERATURE = (73.) ZONE-TYPE = CONDITIONED  
 PEOPLE-SCHEDULE = L\_PEOPLE AREA/PERSON = 319.3  
 PEOPLE-HG-LAT = 625.0 PEOPLE-HG-SENS = 375.0  
 LIGHTING-TYPE = SUS-FLUOR LIGHTING-KW = 3.73  
 LIGHT-TO-SPACE = 1.0 LIGHTING-SCHEDULE = L\_EQUI/LIG  
 EQUIP-SCHEDULE = L\_EQUI/LIG EQUIPMENT-W/SQFT = 1.21  
 FURN-WEIGHT = 0.8 INF-METHOD = NONE ..

E-W HEIGHT = 15.0 WIDTH = 33.0 CONS = EXWALL  
 AZIMUTH = 135 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 15.0 WIDTH = 53.5 CONS = EXWALL  
 AZIMUTH = 45 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 5.0 WIDTH = 3.0 G-T = SG-PN-SW  
 MULTIPLIER = 3.0 SETBACK = 0.8  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5  
 OVERHANG-A = 10. OVERHANG-W = 30.  
 OVERHANG-D = 2.5 ..

DOOR HEIGHT = 7.5 WIDTH = 3.5 CONS = DOOR-WOD  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 15.0 WIDTH = 53.5 CONS = EXWALL  
 AZIMUTH = 225 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 5.0 WIDTH = 3.0 G-T = SG-PN-SW  
 MULTIPLIER = 4.0 SETBACK = 0.8  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5  
 OVERHANG-A = 10. OVERHANG-W = 30.  
 OVERHANG-D = 2.5 ..

DOOR HEIGHT = 7.5 WIDTH = 3.5 CONS = DOOR-WOD  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

ROOF HEIGHT = 33.0 WIDTH = 58.0 CONS = ROOF-2  
 TILT = 0 SKY-FORM-FACTOR = 0.75  
 GND-FORM-FACTOR = 0.25 ..

U-W HEIGHT = 33.0 WIDTH = 58.0 CONS = FLOOR ..

SPACE\_2 =SPACE AREA = 1393.8 VOLUME = 48086.0  
TEMPERATURE = (73.) ZONE-TYPE = CONDITIONED  
PEOPLE-SCHEDULE = L\_PEOPLE AREA/PERSON = 106.4  
PEOPLE-HG-LAT = 625.0 PEOPLE-HG-SENS = 375.0  
LIGHTING-TYPE = SUS-FLUOR LIGHTING-KW = 4.79  
LIGHT-TO-SPACE = 1.0 LIGHTING-SCHEDULE = L\_EQUI/LIG  
EQUIP-SCHEDULE = L\_EQUI/LIG EQUIPMENT-W/SQFT = 3.63  
FURN-WEIGHT = 0.8 INF-METHOD = NONE ..

E-W HEIGHT = 28.5 WIDTH = 77.0 CONS = EXWALL  
AZIMUTH = 135 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 5.0 WIDTH = 3.0 G-T = SG-PN-SW  
MULTIPLIER = 10.0 SETBACK = 0.8  
SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5  
OVERHANG-A = 10. OVERHANG-W = 30.  
OVERHANG-D = 2.5 ..

WINDOW HEIGHT = 5.0 WIDTH = 3.0 G-T = SG-PN-SW  
MULTIPLIER = 2.0 SETBACK = 0.8  
SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5  
OVERHANG-A = 2. OVERHANG-B = 2. OVERHANG-W = 8.  
OVERHANG-D = 2.5 ..

DOOR HEIGHT = 7.5 WIDTH = 3.5 CONS = DOOR-WOD  
SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 31.0 WIDTH = 19.5 CONS = EXWALL  
AZIMUTH = 225 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 5.0 WIDTH = 3.0 G-T = SG-PN-SW  
MULTIPLIER = 3.5 SETBACK = 0.8  
SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5  
OVERHANG-A = 10. OVERHANG-W = 30.  
OVERHANG-D = 2.5 ..

E-W HEIGHT = 31.0 WIDTH = 19.5 CONS = EXWALL  
AZIMUTH = 45 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 5.0 WIDTH = 3.0 G-T = SG-PN-SW  
MULTIPLIER = 3.5 SETBACK = 0.8  
SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5  
OVERHANG-A = 10. OVERHANG-W = 30.  
OVERHANG-D = 2.5 ..

ROOF HEIGHT = 17.2 WIDTH = 46.0 CONS = MAINROOF  
AZIMUTH = 135 TILT = 32 SKY-FORM-FACTOR = 0.75  
GND-FORM-FACTOR = 0.25 ..

ROOF HEIGHT = 30.0 WIDTH = 19.5 CONS = MAINROOF  
AZIMUTH = 225 TILT = 37 SKY-FORM-FACTOR = 0.75  
GND-FORM-FACTOR = 0.25 ..

ROOF HEIGHT = 30.0 WIDTH = 19.5 CONS = MAINROOF  
 AZIMUTH = 135 TILT = 37 SKY-FORM-FACTOR = 0.75  
 GND-FORM-FACTOR = 0.25 ..

U-W HEIGHT = 24.0 WIDTH = 88.0 CONS = FLOOR ..

SPACE\_3 =SPACE AREA = 1393.8 VOLUME = 48086.0  
 TEMPERATURE = (73.) ZONE-TYPE = CONDITIONED  
 PEOPLE-SCHEDULE = L\_PEOPLE AREA/PERSON = 106.4  
 PEOPLE-HG-LAT = 625.0 PEOPLE-HG-SENS = 375.0  
 LIGHTING-TYPE = SUS-FLUOR LIGHTING-KW = 5.34  
 LIGHT-TO-SPACE = 1.0 LIGHTING-SCHEDULE = L\_EQUI/LIG  
 EQUIP-SCHEDULE = L\_EQUI/LIG EQUIPMENT-W/SQFT = 3.63  
 FURN-WEIGHT = 0.8 INF-METHOD = NONE ..

E-W HEIGHT = 32.0 WIDTH = 84.0 CONS = EXWALL  
 AZIMUTH = 315 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 5.0 WIDTH = 3.0 G-T = SG-PN-SW  
 MULTIPLIER = 16.5 SETBACK = 0.8  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5  
 OVERHANG-A = 10. OVERHANG-W = 30.  
 OVERHANG-D = 2.5 ..

DOOR HEIGHT = 7.5 WIDTH = 3.5 CONS = DOOR-WOD  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 31.0 WIDTH = 19.5 CONS = EXWALL  
 AZIMUTH = 45 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 5.0 WIDTH = 3.0 G-T = SG-PN-SW  
 MULTIPLIER = 3.0 SETBACK = 0.8  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5  
 OVERHANG-A = 10. OVERHANG-W = 30.  
 OVERHANG-D = 2.5 ..

DOOR HEIGHT = 7.5 WIDTH = 3.5 CONS = DOOR-WOD  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 31.0 WIDTH = 19.5 CONS = EXWALL  
 AZIMUTH = 225 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 5.0 WIDTH = 3.0 G-T = SG-PN-SW  
 MULTIPLIER = 3.0 SETBACK = 0.8  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5  
 OVERHANG-A = 10. OVERHANG-W = 30.  
 OVERHANG-D = 2.5 ..

DOOR HEIGHT = 7.5 WIDTH = 3.5 CONS = DOOR-WOD  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

ROOF HEIGHT = 17.2 WIDTH = 46.0 CONS = MAINROOF

AZIMUTH = 315 TILT = 32 SKY-FORM-FACTOR = 0.75  
GND-FORM-FACTOR = 0.25 ..

ROOF HEIGHT = 30.0 WIDTH = 19.5 CONS = MAINROOF  
AZIMUTH = 45 TILT = 37 SKY-FORM-FACTOR = 0.75  
GND-FORM-FACTOR = 0.25 ..

ROOF HEIGHT = 30.0 WIDTH = 19.5 CONS = MAINROOF  
AZIMUTH = 315 TILT = 37 SKY-FORM-FACTOR = 0.75  
GND-FORM-FACTOR = 0.25 ..

U-W HEIGHT = 24.0 WIDTH = 88.0 CONS = FLOOR ..

END ..  
COMPUTE LOADS ..  
INPUT SYSTEMS ..

-----\$  
\$ E Z - D O E S Y S T E M S I N P U T \$  
-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
LINE-3 \* DENVER, CO 80227 \*  
  
LINE-4 \*BASELINE SIMULATION FOR BLDG #406 \*  
LINE-5 \*CID BLDG \* ..  
ABORT ERRORS ..  
DIAGNOSTIC WARNINGS ..  
SYSTEMS-REPORT VERIFICATION=(SV-A)  
SUMMARY=(SS-A,SS-C,SS-K,SS-O)  
HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

SD\_ON =DAY-SCHEDULE (1,24) (1.) ..  
SD\_OFF =DAY-SCHEDULE (1,24) (0.) ..  
SD\_WT\_HT =DAY-SCHEDULE (1,24) (74.) ..  
SD\_SM\_CL =DAY-SCHEDULE (1,24) (72.) ..  
SD\_WT\_CL =DAY-SCHEDULE (1,24) (74.2) ..  
SD\_SM\_HT =DAY-SCHEDULE (1,24) (71.8) ..  
SD\_OA\_# =DAY-SCHEDULE (1,24) (0.25) ..  
  
SW\_ON =WEEK-SCHEDULE (ALL) SD\_ON ..  
SW\_OFF =WEEK-SCHEDULE (ALL) SD\_OFF ..  
SW\_WT\_HT =WEEK-SCHEDULE (ALL) SD\_WT\_HT ..  
SW\_SM\_CL =WEEK-SCHEDULE (ALL) SD\_SM\_CL ..

```

SW_WT_CL  =WEEK-SCHEDULE (ALL) SD_WT_CL  ..
SW_SM_HT  =WEEK-SCHEDULE (ALL) SD_SM_HT  ..
SW_OA_#   =WEEK-SCHEDULE (ALL) SD_OA_#   ..

```

## \$ FULL ON SYSTEM

```
S_ON      =SCHEDULE THRU DEC 31 SW_ON  ..
```

## \$ FULL OFF SYSTEM

```
S_OFF     =SCHEDULE THRU DEC 31 SW_OFF ..
```

## \$ HEATING SEASON

```
S_HE-SCHED =SCHEDULE THRU MAY 15 SW_ON
              THRU OCT  1 SW_OFF
              THRU DEC 31 SW_ON  ..
```

## \$ COOLING SEASON

```
S_CL_SCHED =SCHEDULE THRU MAY 15 SW_OFF
              THRU OCT  1 SW_ON
              THRU DEC 31 SW_OFF  ..
```

## \$ HEATING SET TEMP

```
S_HT_SET_F =SCHEDULE THRU MAY 15 SW_WT_HT
              THRU OCT  1 SW_SM_HT
              THRU DEC 31 SW_WT_HT  ..
```

## \$ COOLING SET TEMP

```
S_CL_SET_F =SCHEDULE THRU MAY 15 SW_WT_CL
              THRU OCT  1 SW_SM_CL
              THRU DEC 31 SW_WT_CL  ..
```

## \$ OUTSIDE AIR FRACTION

```
S_OA_#     =SCHEDULE THRU DEC 31 SW_OA_#  ..
```

```
S_HRLY     =SCHEDULE THRU JAN 14 SW_OFF
              THRU JAN 15 SW_ON
              THRU AUG 21 SW_OFF
              THRU AUG 22 SW_ON
              THRU DEC 31 SW_OFF  ..
```

## \$ ZONE DESCRIPTION

```
SPACE_1    =ZONE  DESIGN-HEAT-T = 74.0  DESIGN-COOL-T = 72.0
              HEAT-TEMP-SCH = S_HT_SET_F  COOL-TEMP-SCH = S_CL_SET_F
              ZONE-TYPE = CONDITIONED
              THERMOSTAT-TYPE = PROPORTIONAL  THROTTLING-RANGE = 0.2
              SIZING-OPTION = FROM-LOADS  ..
```

```
SPACE_2    =ZONE  DESIGN-HEAT-T = 74.0  DESIGN-COOL-T = 72.0
              HEAT-TEMP-SCH = S_HT_SET_F  COOL-TEMP-SCH = S_CL_SET_F
              ZONE-TYPE = CONDITIONED
              THERMOSTAT-TYPE = PROPORTIONAL  THROTTLING-RANGE = 0.2
```

SIZING-OPTION = FROM-LOADS ..

SPACE\_3 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F
ZONE-TYPE = CONDITIONED
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2
SIZING-OPTION = FROM-LOADS ..

\$ SYSTEM DESCRIPTION

MZ\_W/\_DX =SYSTEM SYSTEM-TYPE = PMZS
MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0
HEATING-SCHEDULE = S\_HE-SCHED
COOLING-SCHEDULE = S\_CL\_SCHED OA-CONTROL = FIXED
SUPPLY-CFM = 6130. RATED-CFM = 6130.
MIN-OUTSIDE-AIR = 0.25 MIN-AIR-SCH = S\_OA\_#
MAX-OA-FRACTION = 0.25 FAN-SCHEDULE = S\_ON
SUPPLY-STATIC = 4.5 SUPPLY-EFF = 0.78
NIGHT-CYCLE-CTRL = STAY-OFF MIN-CFM-RATIO = 1.0
COOLING-CAPACITY = 217000. COOL-SH-CAP = 134000.
COIL-BF = 0.07 HEATING-CAPACITY = -520000.
CRANKCASE-MAX-T = 0. OUTSIDE-FAN-T = 45.
HEAT-SOURCE = HOT-WATER
ZONE-NAMES = (SPACE\_1, SPACE\_2, SPACE\_3) ..

\$ HOURLY REPORT DESCRIPTION

AHU-BLOCK =REPORT-BLOCK VARIABLE-TYPE = MZ\_W/\_DX
VARIABLE-LIST = (3,5,6,17,18,19) ..
ZONE-BLOCK =REPORT-BLOCK VARIABLE-TYPE = SPACE\_2
VARIABLE-LIST = (17,18,7,6) ..
AHU-HRLY = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY
REPORT-BLOCK = (AHU-BLOCK)
..
ZONE-HRLY = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY
REPORT-BLOCK = (ZONE-BLOCK)
..
END ..
COMPUTE SYSTEMS ..

INPUT PLANT ..

\$-----\$
\$ E Z - D O E P L A N T S I N P U T \$
\$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*
LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*
LINE-3 \* DENVER, CO 80227 \*
LINE-4 \*BASELINE SIMULATION FOR BLDG #406 \*



LINE-5 \*CID BLDG

\* ..

ABORT ERRORS ..  
 DIAGNOSTIC WARNINGS ..  
 PLANT-REPORT VERIFICATION=(PV-A)  
 SUMMARY=(PS-B,BEPS)  
 HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

PD\_ON =DAY-SCHEDULE (1,24) (1.) ..

PD\_OFF =DAY-SCHEDULE (1,24) (0.) ..

PW\_OFF =WEEK-SCHEDULE (ALL) PD\_OFF ..

PW\_ON =WEEK-SCHEDULE (ALL) PD\_ON ..

\$ HEATING SEASON

P\_HEAT =SCHEDULE THRU MAY 15 PW\_ON  
 THRU OCT 1 PW\_OFF  
 THRU DEC 31 PW\_ON ..

\$ COOLING SEASON

P\_COOL =SCHEDULE THRU MAY 15 PW\_OFF  
 THRU OCT 1 PW\_ON  
 THRU DEC 31 PW\_OFF ..

\$ EQUIPMENT DESCRIPTION

BOILER-STM =PLANT-EQUIPMENT TYPE = STM-BOILER  
 SIZE = -999. ..

DX-CHILLER =PLANT-EQUIPMENT TYPE = HERM-REC-CHLR  
 SIZE = -999. ..

PLANT-PARAMETERS BOILER-FUEL = NATURAL-GAS HERM-REC-COND-TYPE = AIR  
 CCIRC-HEAD = 0.0 HCIRC-HEAD = 0.0 ..

ENERGY-RESOURCE RESOURCE = ELECTRICITY ..  
 ENERGY-RESOURCE RESOURCE = NATURAL-GAS ..

HEAT-SEASO =LOAD-ASSIGNMENT TYPE = HEATING  
 OPERATION-MODE = RUN-NEEDED  
  
 LOAD-RANGE = 0.000  
 PLANT-EQUIPMENT = BOILER-STM  
 NUMBER = 1 ..

COOL-SEASO =LOAD-ASSIGNMENT TYPE = COOLING  
 OPERATION-MODE = RUN-NEEDED

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File: MOD406 .INP 19,518 .a.. 5-05-95 14:37:52

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LOAD-RANGE = 0.000  
PLANT-EQUIPMENT = DX-CHILLER  
NUMBER = 1 ..

END ..  
COMPUTE PLANT ..  
STOP ..

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 5/1995 14:37:58 LDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG #406 CID BLDG TOPEKA, KS  
 REPORT- LV-D DETAILS OF EXTERIOR SURFACES IN THE PROJECT

NUMBER OF EXTERIOR SURFACES 16 RECTANGULAR 16 OTHER 0  
 (U-VALUE INCLUDES INSIDE AIR FILM PLUS OUTSIDE AIR FILM AT 7.5 MPH WINDSPEED )

SURFACE	SPACE	U-VALUE (BTU/HR-SQFT-F)	AREA (SQFT)	U-VALUE (BTU/HR-SQFT-F)	AREA (SQFT)	U-VALUE (BTU/HR-SQFT-F)	AREA (SQFT)	W A L L + G L A S S - U-VALUE (BTU/HR-SQFT-F)	AREA (SQFT)	AZIMUTH
SPACE_1		0.490	45.00	0.237	757.50	0.251	802.50		802.50	NORTH-EAST
SPACE_2		0.490	52.50	0.237	552.00	0.259	604.50		604.50	NORTH-EAST
SPACE_3		0.490	45.00	0.237	559.50	0.256	604.50		604.50	NORTH-EAST
SPACE_1		0.000	0.00	0.237	495.00	0.237	495.00		495.00	SOUTH-EAST
SPACE_2		0.490	180.00	0.237	2014.50	0.258	2194.50		2194.50	SOUTH-EAST
SPACE_1		0.490	60.00	0.237	742.50	0.256	802.50		802.50	SOUTH-WEST
SPACE_2		0.490	52.50	0.237	552.00	0.259	604.50		604.50	SOUTH-WEST
SPACE_3		0.490	45.00	0.237	559.50	0.256	604.50		604.50	SOUTH-WEST
SPACE_3		0.490	247.50	0.237	2440.50	0.260	2688.00		2688.00	NORTH-WEST
SPACE_2		0.000	0.00	0.060	585.00	0.060	585.00		585.00	ROOF
SPACE_1		0.000	0.00	0.098	1914.00	0.098	1914.00		1914.00	ROOF
SPACE_2		0.000	0.00	0.060	791.20	0.060	791.20		791.20	ROOF
SPACE_2		0.000	0.00	0.060	585.00	0.060	585.00		585.00	ROOF
SPACE_3		0.000	0.00	0.060	585.00	0.060	791.20		791.20	ROOF
SPACE_3		0.000	0.00	0.060	585.00	0.060	585.00		585.00	ROOF
SPACE_3		0.000	0.00	0.060	585.00	0.060	585.00		585.00	ROOF
SPACE_1		0.000	0.00	0.020	1914.00	0.020	1914.00		1914.00	UNDERGRND
SPACE_2		0.000	0.00	0.020	2112.00	0.020	2112.00		2112.00	UNDERGRND
SPACE_3		0.000	0.00	0.020	2112.00	0.020	2112.00		2112.00	UNDERGRND

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 5/1995 14:37:58 LDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG #406 CID BLDG TOPEKA, KS  
 REPORT- LV-D DETAILS OF EXTERIOR SURFACES IN THE PROJECT

NORTH-EAST	SOUTH-EAST	SOUTH-WEST	NORTH-WEST	ROOF	ALL WALLS	WALLS+ROOFS	UNDERGRND	BUILDING	AVERAGE U-VALUE/GLASS (BTU/HR-SQFT-F)	AVERAGE U-VALUE/WALLS (BTU/HR-SQFT-F)	AVERAGE U-VALUE WALLS+GLASS (BTU/HR-SQFT-F)	GLASS AREA (SQFT)	OPAQUE AREA (SQFT)	GLASS+OPAQUE AREA (SQFT)
									0.490	0.237	0.255	142.50	1869.00	2011.50
									0.490	0.237	0.254	180.00	2509.50	2689.50
									0.490	0.237	0.257	157.50	1854.00	2011.50
									0.490	0.237	0.260	247.50	2440.50	2688.00
									0.000	0.073	0.073	0.00	5836.40	5836.40
									0.490	0.237	0.257	727.50	8673.00	9400.50
									0.490	0.171	0.186	727.50	14509.40	15236.90
									0.000	0.020	0.020	0.00	6138.00	6138.00
									0.490	0.126	0.138	727.50	20647.40	21374.90

\*\*\* BUILDING \*\*\*

FLOOR AREA 4644 SQFT 431 SQMT  
 VOLUME 120300 CUFT 3407 CUMT

COOLING LOAD

TIME AUG 11 5PM  
 DRY-BULB TEMP 98F 37C  
 WET-BULB TEMP 71F 22C

HEATING LOAD

JAN 16 5AM  
 8F -13C  
 6F -14C

	SENSIBLE (KBTU/H)	( KW )	LATENT (KBTU/H)	( KW )	SENSIBLE (KBTU/H)	( KW )
WALLS	23.443	6.866	0.000	0.000	-138.885	-40.676
ROOFS	21.481	6.291	0.000	0.000	-30.269	-8.865
GLASS CONDUCTION	7.897	2.313	0.000	0.000	-25.729	-7.535
GLASS SOLAR	20.266	5.935	0.000	0.000	2.430	0.712
DOOR	1.013	0.297	0.000	0.000	-2.268	-0.664
INTERNAL SURFACES	0.000	0.000	0.000	0.000	0.000	0.000
UNDERGROUND SURFACES	-0.581	-0.170	0.000	0.000	-3.525	-1.032
OCCUPANTS TO SPACE	10.958	3.209	20.007	5.860	0.022	0.007
LIGHT TO SPACE	42.566	12.467	0.000	0.000	0.166	0.049
EQUIPMENT TO SPACE	39.332	11.519	0.000	0.000	0.101	0.030
PROCESS TO SPACE	0.000	0.000	0.000	0.000	0.000	0.000
INFILTRATION	0.000	0.000	0.000	0.000	0.000	0.000
TOTAL	166.375	48.727	20.007	5.860	-197.957	-57.977
TOTAL LOAD	186.383	KBTU/H	54.587	KW	-197.957	KBTU/H
TOTAL LOAD / AREA	40.14	BTU/H.SQFT	126.533	W /SQMT	42.630	BTU/H.SQFT

\*\*\*\*\*  
 \* NOTE 1) THE ABOVE LOADS EXCLUDE OUTSIDE VENTILATION AIR \*  
 \* LOADS \*  
 \* 2) TIMES GIVEN IN STANDARD TIME FOR THE LOCATION \*  
 \* IN CONSIDERATION \*  
 \*\*\*\*\*

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 5/1995 14:37:58 SDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG #406 CID BLDG TOPEKA, KS  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR MZ\_W/\_DX

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-125.109	15	-6.F	-7.F	9589.	-319.861	30.465
FEB	0.00000				-92.922	3	-1.F	-2.F	8667.	-272.156	30.465
MAR	0.00000				-69.375	4	14.F	12.F	10203.	-219.964	30.365
APR	0.00000				-22.387	1	32.F	29.F	9484.	-145.275	30.365
MAY	22.73035	31	16	88.F 75.F	-4.692	1	38.F	36.F	11735.	-91.021	49.140
JUN	71.02290	30	10	82.F 75.F	0.000				16509.	0.000	49.063
JUL	92.81859	1	16	86.F 80.F	0.000				18099.	0.000	50.182
AUG	91.01701	23	13	93.F 77.F	0.000				19150.	0.000	50.394
SEP	43.21564	1	13	78.F 73.F	0.000				13597.	0.000	49.619
OCT	0.00000				-20.038	20	24.F	23.F	9275.	-146.760	30.365
NOV	0.00000				-59.799	3	13.F	12.F	9175.	-209.583	30.365
DEC	0.00000				-111.451	13	2.F	1.F	9584.	-277.072	30.465
TOTAL	320.805				-505.770				145063.		
MAX										-319.861	50.394

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 5/1995 14:37:58 SDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG #406 CID BLDG TOPEKA, KS  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR MZ\_W/\_DX

MONTH	C O O L I N G				H E A T I N G				E L E C			
	HOURS COOLING LOAD	HOURS HEATING LOAD	HOURS COINCIDENT COOL-HEAT LOAD	HOURS FLOATING	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.	HOURS FANS ON	HOURS FANS ON CYCLE ON	HOURS NIGHT VENTING	HOURS FLOATING WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)
JAN	0	744	0	0	744	0	744	0	0	0	-155.612	6.772
FEB	0	672	0	0	672	0	672	0	0	0	-149.009	6.772
MAR	0	744	0	0	744	0	744	0	0	0	-143.778	6.772
APR	0	720	0	0	720	0	720	0	0	0	-52.678	4.151
MAY	272	360	0	112	384	0	744	0	0	112	0.000	49.140
JUN	647	0	0	73	720	720	744	0	0	73	0.000	48.602
JUL	734	0	0	10	744	744	744	0	0	10	0.000	50.182
AUG	723	0	0	21	744	744	744	0	0	21	0.000	50.325
SEP	458	0	0	262	720	720	744	0	0	262	0.000	47.916
OCT	0	720	0	24	744	24	744	0	0	24	-92.602	6.772
NOV	0	720	0	0	744	0	744	0	0	0	-160.730	6.772
DEC	0	744	0	0	744	0	744	0	0	0	-205.376	4.151
ANNUAL	2834	5424	0	502	5424	3336	8760	0	0	502		

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY 37.856 111.127 28/ 9	NATURAL-GAS 182.168 419.978 15/ 8
JAN	TOTAL (MBTU) PEAK (KBTU) DY/HR	37.856 111.127 28/ 9	182.168 419.978 15/ 8
FEB	TOTAL (MBTU) PEAK (KBTU) DY/HR	34.153 111.127 3/ 8	140.576 367.279 3/ 6
MAR	TOTAL (MBTU) PEAK (KBTU) DY/HR	39.032 110.785 31/10	110.381 307.958 4/ 6
APR	TOTAL (MBTU) PEAK (KBTU) DY/HR	34.319 110.462 5/ 8	40.701 220.040 1/ 1
MAY	TOTAL (MBTU) PEAK (KBTU) DY/HR	40.580 167.783 31/16	9.913 153.943 1/ 7
JUN	TOTAL (MBTU) PEAK (KBTU) DY/HR	56.367 167.522 27/15	0.000 0.000 30/ 1
JUL	TOTAL (MBTU) PEAK (KBTU) DY/HR	61.796 171.342 1/16	0.000 0.000 31/ 1
AUG	TOTAL (MBTU) PEAK (KBTU) DY/HR	65.386 172.066 22/13	0.000 0.000 31/ 1
SEP	TOTAL (MBTU) PEAK (KBTU) DY/HR	46.425 169.419 7/15	0.000 0.000 30/ 1
OCT	TOTAL (MBTU) PEAK (KBTU) DY/HR	33.514 110.785 20/ 9	37.335 221.823 20/ 6
NOV	TOTAL (MBTU) PEAK (KBTU) DY/HR	35.036 110.785 30/12	96.006 295.951 3/ 6
DEC	TOTAL (MBTU) PEAK (KBTU) DY/HR	37.773 111.127 13/ 8	165.790 372.776 13/ 6
	ONE YEAR USE/PEAK	522.237 172.066	782.871 419.978

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 5/1995 14:37:58 PDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG #406 CID BLDG TOPEKA, KS  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE

ENERGY TYPE	ELECTRICITY	NATURAL-GAS
IN SITE MBTU -		
CATEGORY OF USE		
SPACE HEAT	26.92	782.87
SPACE COOL	105.01	0.00
HVAC AUX	124.15	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	140.66	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	125.49	0.00
TOTAL	522.23	782.87

TOTAL SITE ENERGY 1305.11 MBTU 127.7 KBTU/SQFT-YR GROSS-AREA 281.1 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 2351.15 MBTU 230.1 KBTU/SQFT-YR GROSS-AREA 506.3 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 3.6  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.





AZIMUTH = 315 TILT = 32 SKY-FORM-FACTOR = 0.75  
GND-FORM-FACTOR = 0.25 ..

ROOF HEIGHT = 30.0 WIDTH = 19.5 CONS = MAINROOF  
AZIMUTH = 45 TILT = 37 SKY-FORM-FACTOR = 0.75  
GND-FORM-FACTOR = 0.25 ..

ROOF HEIGHT = 30.0 WIDTH = 19.5 CONS = MAINROOF  
AZIMUTH = 315 TILT = 37 SKY-FORM-FACTOR = 0.75  
GND-FORM-FACTOR = 0.25 ..

U-W HEIGHT = 24.0 WIDTH = 88.0 CONS = FLOOR ..

END ..

COMPUTE LOADS ..

INPUT SYSTEMS ..

\$-----\$  
\$ E Z - D O E S Y S T E M S I N P U T \$  
\$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
LINE-3 \* DENVER, CO 80227 \*  
  
LINE-4 \*RUN #1 NIGHT SET BACK FOR BLDG #406 \*  
LINE-5 \*CID BLDG \* ..  
  
ABORT ERRORS ..  
DIAGNOSTIC WARNINGS ..  
SYSTEMS-REPORT VERIFICATION=(SV-A)  
SUMMARY=(SS-A,SS-C,SS-K,SS-O)  
HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

SD\_ON =DAY-SCHEDULE (1,24) (1.) ..  
SD\_OFF =DAY-SCHEDULE (1,24) (0.) ..  
SD\_WT\_HT =DAY-SCHEDULE (1,6) (55.)  
(7,17) (74.)  
(18,24) (55.) ..  
SD\_SM\_CL =DAY-SCHEDULE (1,6) (85.)  
(7,17) (72.)  
(18,24) (85.) ..  
SD\_WT\_CL =DAY-SCHEDULE (1,6) (58.)  
(7,17) (76.)  
(18,24) (58.) ..  
SD\_SM\_HT =DAY-SCHEDULE (1,6) (83.)  
(7,17) (70.)  
(18,24) (83.) ..  
SD\_OA\_\* =DAY-SCHEDULE (1,24) (0.25) ..  
SD\_FAN\_CYC =DAY-SCHEDULE (1,6) (0.)



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(7,17) (1.)
(18,24) (0.) ..
SD_WT_HT_D =DAY-SCHEDULE (1,24) (55.) ..
SD_SM_CL_D =DAY-SCHEDULE (1,24) (85.) ..
SD_WT_CL_D =DAY-SCHEDULE (1,24) (57.) ..
SD_SM_HT_D =DAY-SCHEDULE (1,24) (83.) ..

SW_ON      =WEEK-SCHEDULE (ALL) SD_ON ..

SW_OFF     =WEEK-SCHEDULE (ALL) SD_OFF ..

SW_WT_HT   =WEEK-SCHEDULE (WD) SD_WT_HT
            (WEH) SD_WT_HT_D ..

SW_SM_CL   =WEEK-SCHEDULE (WD) SD_SM_CL
            (WEH) SD_SM_CL_D ..

SW_WT_CL   =WEEK-SCHEDULE (WD) SD_WT_CL
            (WEH) SD_WT_CL_D ..

SW_SM_HT   =WEEK-SCHEDULE (WD) SD_SM_HT
            (WEH) SD_SM_HT_D ..

SW_OA_%    =WEEK-SCHEDULE (ALL) SD_OA_% ..

SW_FAN_CYC =WEEK-SCHEDULE (WD) SD_FAN_CYC
            (WEH) SD_OFF ..

```

\$ FULL ON SYSTEM

S\_ON =SCHEDULE THRU DEC 31 SW\_ON ..

\$ FULL OFF SYSTEM

S\_OFF =SCHEDULE THRU DEC 31 SW\_OFF ..

\$ HEATING SEASON

```

S_HE-SCHED =SCHEDULE THRU MAY 15 SW_ON
            THRU OCT  1 SW_OFF
            THRU DEC 31 SW_ON ..

```

\$ COOLING SEASON

```

S_CL_SCHED =SCHEDULE THRU MAY 15 SW_OFF
            THRU OCT  1 SW_ON
            THRU DEC 31 SW_OFF ..

```

\$ HEATING SET TEMP

```

S_HT_SET_F =SCHEDULE THRU MAY 15 SW_WT_HT
            THRU OCT  1 SW_SM_HT
            THRU DEC 31 SW_WT_HT ..

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\$ COOLING SET TEMP

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S_CL_SET_F =SCHEDULE THRU MAY 15 SW_WT_CL
            THRU OCT  1 SW_SM_CL
            THRU DEC 31 SW_WT_CL ..

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\$ OUTSIDE AIR FRACTION

S\_OA\_% =SCHEDULE THRU DEC 31 SW\_OA\_% ..

S\_HRLY =SCHEDULE THRU JAN 14 SW\_OFF  
 THRU JAN 15 SW\_ON  
 THRU JAN 16 SW\_OFF  
 THRU JAN 17 SW\_ON  
 THRU AUG 20 SW\_OFF  
 THRU AUG 22 SW\_ON  
 THRU DEC 31 SW\_OFF ..

S\_FAN\_CYC =SCHEDULE THRU DEC 31 SW\_FAN\_CYC ..

\$ ZONE DESCRIPTION

SPACE\_1 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL  
 SIZING-OPTION = FROM-LOADS ..

SPACE\_2 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL  
 SIZING-OPTION = FROM-LOADS ..

SPACE\_3 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL  
 SIZING-OPTION = FROM-LOADS ..

\$ SYSTEM DESCRIPTION

MZ\_W/DX =SYSTEM SYSTEM-TYPE = PMZS  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_HE-SCHED  
 COOLING-SCHEDULE = S\_CL\_SCHED  
 HEAT-CONTROL = COLDEST COOL-CONTROL = WARMEST  
 OA-CONTROL = FIXED SUPPLY-CFM = 6130.  
 RATED-CFM = 6130. MIN-OUTSIDE-AIR = 0.25  
 MIN-AIR-SCH = S\_OA\_% MAX-OA-FRACTION = 0.25  
 FAN-SCHEDULE = S\_FAN\_CYC SUPPLY-STATIC = 4.5  
 SUPPLY-EFF = 0.78 NIGHT-CYCLE-CTRL = CYCLE-ON-ANY ←  
 MIN-CFM-RATIO = 1.0 COOLING-CAPACITY = 217000.  
 COOL-SH-CAP = 134000. COIL-BF = 0.07  
 HEATING-CAPACITY = -520000. CRANKCASE-MAX-T = 0.  
 OUTSIDE-FAN-T = 45. HEAT-SOURCE = HOT-WATER  
 ZONE-NAMES = (SPACE\_1, SPACE\_2, SPACE\_3) ..

\$ HOURLY REPORT DESCRIPTION

```

AHU-BLOCK =REPORT-BLOCK VARIABLE-TYPE = MZ_W/_DX
          VARIABLE-LIST = (3,5,6,17,18,19) ..
ZONE-BLOCK =REPORT-BLOCK VARIABLE-TYPE = SPACE_2
          VARIABLE-LIST = (17,18,7,31) ..
AHU-HRLY   = HOURLY-REPORT REPORT-SCHEDULE = S_HRLY
          REPORT-BLOCK = (AHU-BLOCK)
..
ZONE-HRLY  = HOURLY-REPORT REPORT-SCHEDULE = S_HRLY
          REPORT-BLOCK = (ZONE-BLOCK)
..
END ..
COMPUTE SYSTEMS ..

INPUT PLANT ..

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$-----$
$ E Z - D O E   P L A N T S   I N P U T $
$-----$

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\$ GENERAL PROJECT DATA

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TITLE LINE-1 *   EMC      ENGINEERS      INC.      *
LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
LINE-3 *   DENVER,      CO      80227      *

LINE-4 *RUN #1 NIGHT SET BACK FOR BLDG #406      *
LINE-5 *CID BLDG                                  * ..

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ABORT      ERRORS ..
DIAGNOSTIC WARNINGS ..
PLANT-REPORT VERIFICATION=(PV-A)
            SUMMARY=(PS-B,BEPS)
            HOURLY-DATA-SAVE = YES ..

```

\$ SCHEDULES

```

PD_ON      =DAY-SCHEDULE (1,24) (1.) ..
PD_OFF     =DAY-SCHEDULE (1,24) (0.) ..

PW_OFF     =WEEK-SCHEDULE (ALL) PD_OFF ..
PW_ON      =WEEK-SCHEDULE (ALL) PD_ON ..

```

\$ HEATING SEASON

```

P_HEAT     =SCHEDULE THRU MAY 15 PW_ON
            THRU OCT  1 PW_OFF
            THRU DEC 31 PW_ON ..

```

\$ COOLING SEASON

```

P_COOL     =SCHEDULE THRU MAY 15 PW_OFF
            THRU OCT  1 PW_ON
            THRU DEC 31 PW_OFF ..

```

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 8/1995 8:55:28 SDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SET BACK FOR BLDG #406 CID BLDG TOPEKA, KS  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR MZ\_W/\_DX

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC- TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-68.448	28	-1.1.F	-3.F	-404.079	8684.	30.465
FEB	0.00000				-46.951	3	-5.1.F	-6.F	-381.993	7920.	30.465
MAR	0.00000				-31.893	14	16.F	14.F	-342.696	9713.	30.365
APR	0.00000				-6.659	5	30.F	27.F	-203.601	9430.	30.365
MAY	15.61987	31	16	88.F 75.F	-1.042	9	43.F	43.F	-134.071	11011.	49.305
JUN	40.18599	30	10	82.F 75.F	0.000				0.000	13106.	49.383
JUL	43.89425	1	16	86.F 80.F	0.000				0.000	12237.	50.447
AUG	48.86752	23	13	93.F 77.F	0.000				0.000	13919.	50.752
SEP	27.80221	1	13	78.F 73.F	0.000				0.000	11944.	49.894
OCT	0.00000				-5.617	20	23.F	23.F	-209.355	9242.	30.365
NOV	0.00000				-23.700	14	32.F	32.F	-299.824	8640.	30.365
DEC	0.00000				-57.670	12	2.F	1.F	-401.139	8717.	30.465
TOTAL	176.370				-241.981				-404.079	124564.	50.752
MAX											

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 8/1995 8:55:28 SDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SET BACK FOR BLDG #406 CID BLDG TOPEKA, KS  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR MZ\_W/\_DX

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING LOAD	HOURS HEATING LOAD	HOURS COINCIDENT COOL-HEAT LOAD	HOURS FLOATING	HOURS COOLING AVAIL.	HOURS HEATING AVAIL.	HOURS FANS ON CYCLE	HOURS NIGHT VENTING	HOURS FLOATING WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)
JAN	0	526	0	218	0	744	295	0	0	-13.029	6.772
FEB	0	489	0	183	0	672	283	0	3	0.000	2.621
MAR	0	607	0	137	0	744	373	0	19	-5.345	6.772
APR	0	501	0	219	0	720	476	0	206	-2.373	4.151
MAY	139	223	0	382	384	360	511	0	380	0.000	49.305
JUN	335	0	0	385	720	611	369	0	276	0.000	48.787
JUL	380	0	0	364	744	447	227	0	67	0.000	50.447
AUG	395	0	0	448	744	474	221	0	79	0.000	50.636
SEP	272	0	0	448	720	683	452	0	411	0.000	48.225
OCT	0	506	0	238	24	720	516	0	230	-1.920	6.772
NOV	0	553	0	167	0	720	371	0	38	0.000	2.621
DEC	0	535	0	209	0	744	304	0	0	-147.505	4.151
ANNUAL	1521	3940	0	3299	3336	5424	4398	0	1709		

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 8/1995 8:55:28 PDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SET BACK FOR BLDG #406 CID BLDG TOPEKA, KS  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY TOTAL (MBTU) PEAK (KBTU) DY/HR	NATURAL-GAS TOTAL (MBTU) PEAK (KBTU) DY/HR
JAN	112.998 28/ 9	33.267 112.998 28/ 9	105.465 530.555 28/ 7
FEB	112.998 3/ 8	29.960 112.998 3/ 8	75.480 506.371 3/ 7
MAR	112.657 31/13	35.440 112.657 31/13	54.267 462.730 14/ 7
APR	32.884 112.657 18/ 8	32.884 112.657 18/ 8	14.330 301.984 5/ 7
MAY	37.763 168.347 31/16	37.763 168.347 31/16	3.286 217.964 9/ 7
JUN	44.751 168.613 27/15	44.751 168.613 27/15	0.000 0.000 30/ 1
JUL	41.782 172.247 1/16	41.782 172.247 1/16	0.000 0.000 31/ 1
AUG	47.524 173.290 22/13	47.524 173.290 22/13	0.000 0.000 31/ 1
SEP	40.783 170.361 7/15	40.783 170.361 7/15	0.000 0.000 30/ 1
OCT	32.171 112.657 31/10	32.171 112.657 31/10	12.711 308.828 20/ 7
NOV	31.342 112.657 30/14	31.342 112.657 30/14	41.669 414.227 14/ 7
DEC	33.058 112.998 13/ 8	33.058 112.998 13/ 8	90.708 527.350 12/ 7
	ONE YEAR USE/PEAK	440.725 173.290	397.915 530.555

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 8/1995 8:55:28 PDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SET BACK FOR BLDG #406 CID BLDG TOPEKA, KS  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE

ENERGY TYPE	ELECTRICITY	NATURAL-GAS
IN SITE MBTU -		
CATEGORY OF USE		
SPACE HEAT	15.42	397.91
SPACE COOL	57.53	0.00
HVAC AUX	101.61	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	140.66	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	125.49	0.00
TOTAL	440.71	397.91

TOTAL SITE ENERGY 838.64 MBTU 82.1 KBTU/SQFT-YR GROSS-AREA 180.6 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 1721.41 MBTU 168.5 KBTU/SQFT-YR GROSS-AREA 370.7 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 14.4  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.





AZIMUTH = 315 TILT = 32 SKY-FORM-FACTOR = 0.75  
GND-FORM-FACTOR = 0.25 ..

ROOF HEIGHT = 30.0 WIDTH = 19.5 CONS = MAINROOF  
AZIMUTH = 45 TILT = 37 SKY-FORM-FACTOR = 0.75  
GND-FORM-FACTOR = 0.25 ..

ROOF HEIGHT = 30.0 WIDTH = 19.5 CONS = MAINROOF  
AZIMUTH = 315 TILT = 37 SKY-FORM-FACTOR = 0.75  
GND-FORM-FACTOR = 0.25 ..

U-W HEIGHT = 24.0 WIDTH = 88.0 CONS = FLOOR ..

END ..

COMPUTE LOADS ..

INPUT SYSTEMS ..

-----\$  
\$ E Z - D O E S Y S T E M S I N P U T \$  
-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
LINE-3 \* DENVER, CO 80227 \*  
  
LINE-4 \*RUN #2 DDC CONTROL FOR BLDG #406 \*  
LINE-5 \*CID BLDG \* ..

ABORT ERRORS ..  
DIAGNOSTIC WARNINGS ..  
SYSTEMS-REPORT VERIFICATION=(SV-A)  
SUMMARY=(SS-A,SS-C,SS-K,SS-O)  
HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

SD\_ON =DAY-SCHEDULE (1,24) (1.) ..  
SD\_OFF =DAY-SCHEDULE (1,24) (0.) ..  
SD\_WT\_HT =DAY-SCHEDULE (1,24) (70.) ..  
SD\_SM\_CL =DAY-SCHEDULE (1,24) (76.) ..  
SD\_WT\_CL =DAY-SCHEDULE (1,24) (70.2) ..  
SD\_SM\_HT =DAY-SCHEDULE (1,24) (75.8) ..  
SD\_OA % =DAY-SCHEDULE (1,24) (0.25) ..  
SD\_FAN\_CYC =DAY-SCHEDULE (1,6) (0.)  
(7,17) (1.)  
(18,24) (0.) ..

SW\_ON =WEEK-SCHEDULE (ALL) SD\_ON ..  
SW\_OFF =WEEK-SCHEDULE (ALL) SD\_OFF ..  
SW\_WT\_HT =WEEK-SCHEDULE (ALL) SD\_WT\_HT ..

SW\_SM\_CL =WEEK-SCHEDULE (ALL) SD\_SM\_CL ..  
 SW\_WT\_CL =WEEK-SCHEDULE (ALL) SD\_WT\_CL ..  
 SW\_SM\_HT =WEEK-SCHEDULE (ALL) SD\_SM\_HT ..  
 SW\_OA\_% =WEEK-SCHEDULE (ALL) SD\_OA\_% ..  
 SW\_FAN\_CYC =WEEK-SCHEDULE (ALL) SD\_FAN\_CYC ..

## \$ FULL ON SYSTEM

S\_ON =SCHEDULE THRU DEC 31 SW\_ON ..

## \$ FULL OFF SYSTEM

S\_OFF =SCHEDULE THRU DEC 31 SW\_OFF ..

## \$ HEATING SEASON

S\_HE-SCHED =SCHEDULE THRU MAY 15 SW\_ON  
 THRU OCT 1 SW\_OFF  
 THRU DEC 31 SW\_ON ..

## \$ COOLING SEASON

S\_CL\_SCHED =SCHEDULE THRU MAY 15 SW\_OFF  
 THRU OCT 1 SW\_ON  
 THRU DEC 31 SW\_OFF ..

## \$ HEATING SET TEMP

S\_HT\_SET\_F =SCHEDULE THRU MAY 15 SW\_WT\_HT  
 THRU OCT 1 SW\_SM\_HT  
 THRU DEC 31 SW\_WT\_HT ..

## \$ COOLING SET TEMP

S\_CL\_SET\_F =SCHEDULE THRU MAY 15 SW\_WT\_CL  
 THRU OCT 1 SW\_SM\_CL  
 THRU DEC 31 SW\_WT\_CL ..

## \$ OUTSIDE AIR FRACTION

S\_OA\_% =SCHEDULE THRU DEC 31 SW\_OA\_% ..

S\_HRLY =SCHEDULE THRU JAN 14 SW\_OFF  
 THRU JAN 15 SW\_ON  
 THRU AUG 21 SW\_OFF  
 THRU AUG 22 SW\_ON  
 THRU DEC 31 SW\_OFF ..

S\_FAN\_CYCL =SCHEDULE THRU DEC 31 SW\_FAN\_CYC ..

## \$ ZONE DESCRIPTION

SPACE\_1 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED

THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

SPACE\_2 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

SPACE\_3 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

\$ SYSTEM DESCRIPTION

MZ\_W/DX =SYSTEM SYSTEM-TYPE = PMZS  
MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
HEATING-SCHEDULE = S\_HE-SCHED  
COOLING-SCHEDULE = S\_CL-SCHED  
HEAT-CONTROL = COLDEST COOL-CONTROL = WARMEST  
OA-CONTROL = FIXED SUPPLY-CFM = 6130.  
RATED-CFM = 6130. MIN-OUTSIDE-AIR = 0.25  
MIN-AIR-SCH = S\_OA\_% MAX-OA-FRACTION = 0.25  
FAN-SCHEDULE = S\_ON SUPPLY-STATIC = 4.5  
SUPPLY-EFF = 0.78 NIGHT-CYCLE-CTRL = CYCLE-ON-ANY  
MIN-CFM-RATIO = 1.0 COOLING-CAPACITY = 217000.  
COOL-SH-CAP = 134000. COIL-BF = 0.07  
HEATING-CAPACITY = -520000. CRANKCASE-MAX-T = 0.  
OUTSIDE-FAN-T = 45. HEAT-SOURCE = HOT-WATER  
ZONE-NAMES = (SPACE\_1, SPACE\_2, SPACE\_3) ..

\$ HOURLY REPORT DESCRIPTION

AHU-BLOCK =REPORT-BLOCK VARIABLE-TYPE = MZ\_W/DX  
VARIABLE-LIST = (3,5,6,17,18,19) ..

ZONE-BLOCK =REPORT-BLOCK VARIABLE-TYPE = SPACE\_2  
VARIABLE-LIST = (17,18,7,6) ..

AHU-HRLY = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY  
REPORT-BLOCK = (AHU-BLOCK)

..  
ZONE-HRLY = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY  
REPORT-BLOCK = (ZONE-BLOCK)

..  
END ..  
COMPUTE SYSTEMS ..

INPUT PLANT ..

\$-----\$  
\$ E Z - D O E P L A N T S I N P U T \$  
\$-----\$

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 8/1995 8:59:59 SDL RUN 1										
DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG #406 CID BLDG TOPEKA, KS										
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR MZ_W/_DX										
C O O L I N G										
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)
JAN	0.00000				0.000	-111.220	15	8	-7. F	-301.864
FEB	0.00000				0.000	-80.400	3	6	-2. F	-253.887
MAR	0.00000				0.000	-56.335	4	6	14. F	-201.509
APR	0.00000				0.000	-14.520	1	1	32. F	-126.430
MAY	16.94104	31	16	75. F	184.568	-2.315	1	7	38. F	-65.235
JUN	56.28429	20	13	86. F	186.971	0.000				0.000
JUL	76.40015	1	16	86. F	203.295	0.000				0.000
AUG	76.55418	23	13	93. F	188.650	0.000				0.000
SEP	32.22479	6	13	88. F	185.167	0.000				0.000
OCT	0.00000				0.000	-12.013	20	6	24. F	-126.694
NOV	0.00000				0.000	-48.053	3	6	13. F	-191.837
DEC	0.00000				0.000	-97.448	13	6	2. F	-258.871
TOTAL	258.405				203.295	-422.306				-301.864
MAX										

E L E C									
MONTH	TRICAL ENERGY (KWH)	ELFC-LOAD (KW)	MAXIMUM HEATING LOAD (KBTU/HR)	ELFC-LOAD (KW)					
JAN	9589.	30.465	-301.864	30.465					
FEB	8667.	30.465	-253.887	30.465					
MAR	10203.	30.365	-201.509	30.365					
APR	9484.	30.365	-126.430	30.365					
MAY	11212.	49.224	-65.235	49.224					
JUN	15189.	49.173	0.000	49.173					
JUL	16618.	50.260	0.000	50.260					
AUG	17821.	50.494	0.000	50.494					
SEP	12601.	49.711	0.000	49.711					
OCT	9275.	30.365	-126.694	30.365					
NOV	9175.	30.365	-191.837	30.365					
DEC	9584.	30.465	-258.871	30.465					
TOTAL	139416.								
MAX									

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 8/1995 8:59:59 SDL RUN 1										
DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG #406 CID BLDG TOPEKA, KS										
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR MZ_W/_DX										
H O U R S										
MONTH	HOURS COOLING LOAD	HOURS HEATING LOAD	HOURS COINCIDENT COOL-HEAT LOAD	HOURS FLOATING	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.	HOURS FANS ON	HOURS NIGHT VENTING	HOURS FLOATING WHEN FANS ON	COINCIDENT LOADS-- HEATING COOLING PEAK (KBTU/HR)
JAN	0	743	0	1	744	0	744	0	1	-136.743
FEB	0	667	0	5	672	0	672	0	5	-129.556
MAR	0	676	0	68	744	0	744	0	68	-124.822
APR	0	513	0	207	720	0	720	0	207	-14.946
MAY	278	223	0	243	360	384	744	0	243	0.000
JUN	641	0	0	79	0	720	720	0	79	0.000
JUL	742	0	0	2	744	744	744	0	2	0.000
AUG	739	0	0	5	0	744	744	0	5	0.000
SEP	431	0	0	289	0	720	720	0	289	0.000
OCT	0	505	0	239	720	24	744	0	239	-70.399
NOV	0	634	0	86	720	0	744	0	86	-141.949
DEC	0	740	0	4	744	0	744	0	4	-186.964
ANNUAL	2831	4701	0	1228	5424	3336	8760	0	1228	

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOB-2.1D 5/ 8/1995 8:59:59 PDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG #406 CID BLDG TOPEKA, KS  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY 37.463 110.727 28/ 9	NATURAL-GAS 163.133 396.347 15/ 8
JAN	TOTAL (MBTU) PEAK (KBTU) DY/HR	37.463 110.727 28/ 9	163.133 396.347 15/ 8
FEB	TOTAL (MBTU) PEAK (KBTU) DY/HR	33.758 110.727 3/ 6	123.085 343.299 3/ 6
MAR	TOTAL (MBTU) PEAK (KBTU) DY/HR	38.399 110.385 31/ 9	90.631 283.607 4/ 6
APR	TOTAL (MBTU) PEAK (KBTU) DY/HR	33.682 108.719 5/ 8	26.696 194.805 1/ 1
MAY	TOTAL (MBTU) PEAK (KBTU) DY/HR	38.545 168.071 31/16	5.078 115.998 1/ 7
JUN	TOTAL (MBTU) PEAK (KBTU) DY/HR	51.863 167.897 27/15	0.000 0.000 30/ 1
JUL	TOTAL (MBTU) PEAK (KBTU) DY/HR	56.740 171.608 1/16	0.000 0.000 31/ 1
AUG	TOTAL (MBTU) PEAK (KBTU) DY/HR	60.848 172.406 22/13	0.000 0.000 31/ 1
SEP	TOTAL (MBTU) PEAK (KBTU) DY/HR	43.025 169.733 7/15	0.000 0.000 30/ 1
OCT	TOTAL (MBTU) PEAK (KBTU) DY/HR	32.820 110.385 20/ 8	22.799 195.125 20/ 6
NOV	TOTAL (MBTU) PEAK (KBTU) DY/HR	34.436 110.385 30/ 9	77.944 272.381 3/ 6
DEC	TOTAL (MBTU) PEAK (KBTU) DY/HR	37.362 110.727 13/ 8	146.446 348.883 13/ 6
	ONE YEAR USE/PEAK	498.939 172.406	655.813 396.347

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 8/1995 8:59:59 PDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG #406 CID BLDG TOPEKA, KS  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE

ENERGY TYPE	ELECTRICITY	NATURAL-GAS
IN SITE MBTU -		
CATEGORY OF USE		
SPACE HEAT	22.91	655.81
SPACE COOL	85.72	0.00
HVAC AUX	124.15	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	140.66	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	125.49	0.00
TOTAL	498.93	655.81

TOTAL SITE ENERGY 1154.75 MBTU 113.0 KBTU/SQFT-YR GROSS-AREA 248.7 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 2154.13 MBTU 210.8 KBTU/SQFT-YR GROSS-AREA 463.9 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 6.5  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

AZIMUTH = 315 TILT = 32 SKY-FORM-FACTOR = 0.75  
GND-FORM-FACTOR = 0.25 ..

ROOF HEIGHT = 30.0 WIDTH = 19.5 CONS = MAINROOF  
AZIMUTH = 45 TILT = 37 SKY-FORM-FACTOR = 0.75  
GND-FORM-FACTOR = 0.25 ..

ROOF HEIGHT = 30.0 WIDTH = 19.5 CONS = MAINROOF  
AZIMUTH = 315 TILT = 37 SKY-FORM-FACTOR = 0.75  
GND-FORM-FACTOR = 0.25 ..

U-W HEIGHT = 24.0 WIDTH = 88.0 CONS = FLOOR ..

END ..  
COMPUTE LOADS ..  
INPUT SYSTEMS ..

\$-----\$  
\$ E Z - D O E S Y S T E M S I N P U T \$  
\$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
LINE-3 \* DENVER, CO 80227 \*  
LINE-4 \*RUN #3 ECONOMIZER FOR BLDG #406 \*  
LINE-5 \*CID BLDG \* ..

ABORT ERRORS ..  
DIAGNOSTIC WARNINGS ..  
SYSTEMS-REPORT VERIFICATION=(SV-A)  
SUMMARY=(SS-A,SS-C,SS-K,SS-O)  
HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

SD\_ON =DAY-SCHEDULE (1,24) (1.) ..  
SD\_OFF =DAY-SCHEDULE (1,24) (0.) ..  
SD\_WT\_HT =DAY-SCHEDULE (1,6) (55.)  
(7,17) (74.)  
(18,24) (55.) ..  
SD\_SM\_CL =DAY-SCHEDULE (1,6) (85.)  
(7,17) (72.)  
(18,24) (85.) ..  
SD\_WT\_CL =DAY-SCHEDULE (1,6) (58.)  
(7,17) (76.)  
(18,24) (58.) ..  
SD\_SM\_HT =DAY-SCHEDULE (1,6) (83.)  
(7,17) (70.)  
(18,24) (83.) ..  
SD\_OA\_# =DAY-SCHEDULE (1,24) (0.25) ..  
SD\_FAN\_CYC =DAY-SCHEDULE (1,6) (0.)

```

                (7,17) (1.)
                (18,24) (0.) ..
SD_WT_HT_D =DAY-SCHEDULE (1,24) (55.) ..
SD_SM_CL_D =DAY-SCHEDULE (1,24) (85.) ..
SD_WT_CL_D =DAY-SCHEDULE (1,24) (57.) ..
SD_SM_HT_D =DAY-SCHEDULE (1,24) (83.) ..

SW_ON      =WEEK-SCHEDULE (ALL) SD_ON ..

SW_OFF     =WEEK-SCHEDULE (ALL) SD_OFF ..

SW_WT_HT   =WEEK-SCHEDULE (WD) SD_WT_HT
            (WEH) SD_WT_HT_D ..

SW_SM_CL   =WEEK-SCHEDULE (WD) SD_SM_CL
            (WEH) SD_SM_CL_D ..

SW_WT_CL   =WEEK-SCHEDULE (WD) SD_WT_CL
            (WEH) SD_WT_CL_D ..

SW_SM_HT   =WEEK-SCHEDULE (WD) SD_SM_HT
            (WEH) SD_SM_HT_D ..

SW_OA_%    =WEEK-SCHEDULE (ALL) SD_OA_% ..

SW_FAN_CYC =WEEK-SCHEDULE (WD) SD_FAN_CYC
            (WEH) SD_OFF ..

```

## \$ FULL ON SYSTEM

```
S_ON      =SCHEDULE THRU DEC 31 SW_ON ..
```

## \$ FULL OFF SYSTEM

```
S_OFF     =SCHEDULE THRU DEC 31 SW_OFF ..
```

## \$ HEATING SEASON

```
S_HE-SCHED =SCHEDULE THRU MAY 15 SW_ON
            THRU OCT 1 SW_OFF
            THRU DEC 31 SW_ON ..
```

## \$ COOLING SEASON

```
S_CL_SCHED =SCHEDULE THRU MAY 15 SW_OFF
            THRU OCT 1 SW_ON
            THRU DEC 31 SW_OFF ..
```

## \$ HEATING SET TEMP

```
S_HT_SET_F =SCHEDULE THRU MAY 15 SW_WT_HT
            THRU OCT 1 SW_SM_HT
            THRU DEC 31 SW_WT_HT ..
```

## \$ COOLING SET TEMP

```
S_CL_SET_F =SCHEDULE THRU MAY 15 SW_WT_CL
            THRU OCT 1 SW_SM_CL
            THRU DEC 31 SW_WT_CL ..
```

## \$ OUTSIDE AIR FRACTION



S\_OA\_% =SCHEDULE THRU DEC 31 SW\_OA\_% ..  
 S\_HRLY =SCHEDULE THRU JAN 14 SW\_OFF  
 THRU JAN 15 SW\_ON  
 THRU JAN 16 SW\_OFF  
 THRU JAN 17 SW\_ON  
 THRU AUG 20 SW\_OFF  
 THRU AUG 22 SW\_ON  
 THRU DEC 31 SW\_OFF ..  
 S\_FAN\_CYC =SCHEDULE THRU DEC 31 SW\_FAN\_CYC ..

## \$ ZONE DESCRIPTION

SPACE\_1 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL  
 SIZING-OPTION = FROM-LOADS ..  
 SPACE\_2 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL  
 SIZING-OPTION = FROM-LOADS ..  
 SPACE\_3 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL  
 SIZING-OPTION = FROM-LOADS ..

## \$ SYSTEM DESCRIPTION

MZ\_W/\_DX =SYSTEM SYSTEM-TYPE = PMZS  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_HE\_SCHED  
 COOLING-SCHEDULE = S\_CL\_SCHED ECONO-LIMIT-T = 70.0 ←  
 HEAT-CONTROL = COLDEST COOL-CONTROL = WARMEST  
 SUPPLY-CFM = 6130. RATED-CFM = 6130.  
 MIN-OUTSIDE-AIR = 0.25 FAN-SCHEDULE = S\_FAN\_CYC  
 SUPPLY-STATIC = 4.5 SUPPLY-EFF = 0.78  
 NIGHT-CYCLE-CTRL = CYCLE-ON-ANY MIN-CFM-RATIO = 1.0  
 COOLING-CAPACITY = 217000. COOL-SH-CAP = 134000.  
 COIL-BF = 0.07 HEATING-CAPACITY = -520000.  
 CRANKCASE-MAX-T = 0. OUTSIDE-FAN-T = 45.  
 HEAT-SOURCE = HOT-WATER  
 ZONE-NAMES = (SPACE\_1, SPACE\_2, SPACE\_3) ..

## \$ HOURLY REPORT DESCRIPTION

AHU-BLOCK =REPORT-BLOCK VARIABLE-TYPE = MZ\_W/\_DX

```

VARIABLE-LIST = (3,5,6,17,18,19) ..
ZONE-BLOCK =REPORT-BLOCK VARIABLE-TYPE = SPACE_2
VARIABLE-LIST = (17,18,7,31) ..
AHU-HRLY = HOURLY-REPORT REPORT-SCHEDULE = S_HRLY
REPORT-BLOCK = (AHU-BLOCK)
..
ZONE-HRLY = HOURLY-REPORT REPORT-SCHEDULE = S_HRLY
REPORT-BLOCK = (ZONE-BLOCK)
..
END ..
COMPUTE SYSTEMS ..

INPUT PLANT ..

```

```

$-----$
$ E Z - D O E   P L A N T S   I N P U T $
$-----$

```

\$ GENERAL PROJECT DATA

```

TITLE LINE-1 *   EMC       ENGINEERS   INC.   *
LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
LINE-3 *   DENVER,   CO       80227   *

LINE-4 *RUN #3 ECONOMIZER FOR BLDG #406   *
LINE-5 *CID BLDG                               * ..

```

```

ABORT          ERRORS ..
DIAGNOSTIC     WARNINGS ..
PLANT-REPORT   VERIFICATION=(PV-A)
               SUMMARY=(PS-B,BEPS)
               HOURLY-DATA-SAVE = YES ..

```

\$ SCHEDULES

```

PD_ON      =DAY-SCHEDULE (1,24) (1.) ..
PD_OFF     =DAY-SCHEDULE (1,24) (0.) ..

PW_OFF     =WEEK-SCHEDULE (ALL) PD_OFF ..
PW_ON      =WEEK-SCHEDULE (ALL) PD_ON  ..

```

\$ HEATING SEASON

```

P_HEAT     =SCHEDULE THRU MAY 15 PW_ON
           THRU OCT  1 PW_OFF
           THRU DEC 31 PW_ON ..

```

\$ COOLING SEASON

```

P_COOL     =SCHEDULE THRU MAY 15 PW_OFF
           THRU OCT  1 PW_ON
           THRU DEC 31 PW_OFF ..

```

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 8/1995 9: 5:17 SDL RUN 1  
 DENVER, CO 80227 RUN #3 ECONOMIZER FOR BLDG #406 CID BLDG TOPEKA, KS  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR MZ\_W/\_DX

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	ELEC- TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)	
JAN	0.00000				-85.770	14	7	-1.1 F	-2. F	8605.	30.465
FEB	0.00000				-59.386	3	7	-5.1 F	-6. F	7816.	30.465
MAR	0.00000				-42.445	4	7	14.1 F	12. F	9464.	30.365
APR	0.00000				-10.741	5	7	30.1 F	27. F	9248.	30.365
MAY	13.00987	31	16	88. F	-2.444	9	7	43.1 F	43. F	10760.	50.089
JUN	38.45084	30	10	82. F	0.000					12983.	49.905
JUL	44.77910	1	16	86. F	0.000					12362.	51.278
AUG	49.48270	16	8	69. F	0.000					14077.	51.290
SEP	25.91281	23	16	69. F	0.000					11786.	50.416
OCT	0.00000				-9.914	20	7	23.1 F	23. F	9067.	30.365
NOV	0.00000				-32.096	3	7	19.1 F	17. F	8453.	30.365
DEC	0.00000				-72.542	13	7	2.1 F	1. F	8600.	30.465
TOTAL	171.635				-315.337					123223.	
MAX											51.290
											-463.837
											218.906

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 8/1995 9: 5:17 SDL RUN 1  
 DENVER, CO 80227 RUN #3 ECONOMIZER FOR BLDG #406 CID BLDG TOPEKA, KS  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR MZ\_W/\_DX

MONTH	HOURS				HOURS				HOURS				HOURS			
	COOLING LOAD	HEATING LOAD	COINCIDENT COOL-HEAT LOAD	FLOATING	HEATING AVAIL.	COOLING AVAIL.	FANS ON	FANS ON CYCLE ON	NIGHT VENTING	FLOATING WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)		
JAN	0	497	0	247	744	0	507	276	0	10	-21.738	6.772	-21.738	6.772		
FEB	0	444	0	228	672	0	467	258	0	23	-18.663	6.772	-18.663	6.772		
MAR	0	422	0	322	744	0	566	313	0	144	0.000	2.621	0.000	2.621		
APR	0	242	0	478	720	0	663	432	0	421	0.000	4.151	0.000	4.151		
MAY	123	98	0	523	360	384	734	503	0	513	0.000	50.089	0.000	50.089		
JUN	320	0	0	400	0	720	619	377	0	299	0.000	49.603	0.000	49.603		
JUL	368	0	0	376	0	744	463	243	0	95	0.000	51.278	0.000	51.278		
AUG	389	0	0	355	0	744	502	249	0	113	0.000	48.106	0.000	48.106		
SEP	241	0	0	479	0	720	686	455	0	445	0.000	48.176	0.000	48.176		
OCT	0	210	0	534	720	24	694	474	0	484	0.000	6.772	0.000	6.772		
NOV	0	387	0	333	720	0	546	326	0	159	-23.835	6.772	0.000	6.772		
DEC	0	491	0	253	744	0	507	276	0	16	0.000	0.000	0.000	0.000		
ANNUAL	1441	2791	0	4528	5424	3336	6954	4182	0	2722						

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 8/1995 9: 5:17 PDL RUN 1  
 DENVER, CO 80227 RUN #3 ECONOMIZER FOR BLDG #406 CID BLDG TOPEKA, KS  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY 33.640 114.326 28/ 9	NATURAL-GAS 130.107 602.298 14/ 7
JAN	TOTAL (MBTU) PEAK (KBTU) DY/HR	30.173 114.326 3/ 8	93.765 609.018 3/ 7
FEB	TOTAL (MBTU) PEAK (KBTU) DY/HR	35.089 113.984 31/13	69.217 555.970 4/ 7
MAR	TOTAL (MBTU) PEAK (KBTU) DY/HR	32.447 113.984 18/ 8	19.227 403.326 5/ 7
APR	TOTAL (MBTU) PEAK (KBTU) DY/HR	36.976 171.026 31/16	4.826 312.941 9/ 7
MAY	TOTAL (MBTU) PEAK (KBTU) DY/HR	44.329 170.397 27/15	0.000 0.000 30/ 1
JUN	TOTAL (MBTU) PEAK (KBTU) DY/HR	42.208 175.083 1/16	0.000 0.000 31/ 1
JUL	TOTAL (MBTU) PEAK (KBTU) DY/HR	48.064 175.127 22/13	0.000 0.000 31/ 1
AUG	TOTAL (MBTU) PEAK (KBTU) DY/HR	40.243 172.142 7/15	0.000 0.000 30/ 1
SEP	TOTAL (MBTU) PEAK (KBTU) DY/HR	31.764 113.984 31/11	17.675 421.253 20/ 7
OCT	TOTAL (MBTU) PEAK (KBTU) DY/HR	31.154 113.984 30/17	53.809 509.243 3/ 7
NOV	TOTAL (MBTU) PEAK (KBTU) DY/HR	33.293 114.326 13/ 8	112.304 597.183 13/ 7
DEC	TOTAL (MBTU) PEAK (KBTU) DY/HR	439.378 175.127	500.930 609.018
	ONE YEAR USE/PEAK		

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 8/1995 9: 5:17 PDL RUN 1  
 DENVER, CO 80227 RUN #3 ECONOMIZER FOR BLDG #406 CID BLDG TOPEKA, KS  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
SPACE HEAT	18.65	500.93
SPACE COOL	56.01	0.00
HVAC AUX	98.55	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	140.66	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	125.49	0.00
TOTAL	439.36	500.93

TOTAL SITE ENERGY 940.31 MBTU 92.0 KBTU/SQFT-YR GROSS-AREA 202.5 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 1820.38 MBTU 178.1 KBTU/SQFT-YR GROSS-AREA 392.0 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 16.9  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.



AZIMUTH = 315 TILT = 32 SKY-FORM-FACTOR = 0.75  
GND-FORM-FACTOR = 0.25 ..

ROOF HEIGHT = 30.0 WIDTH = 19.5 CONS = MAINROOF  
AZIMUTH = 45 TILT = 37 SKY-FORM-FACTOR = 0.75  
GND-FORM-FACTOR = 0.25 ..

ROOF HEIGHT = 30.0 WIDTH = 19.5 CONS = MAINROOF  
AZIMUTH = 315 TILT = 37 SKY-FORM-FACTOR = 0.75  
GND-FORM-FACTOR = 0.25 ..

U-W HEIGHT = 24.0 WIDTH = 88.0 CONS = FLOOR ..

END ..  
COMPUTE LOADS ..

INPUT SYSTEMS ..

\$-----\$  
\$ E Z - D O E S Y S T E M S I N P U T \$  
\$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
LINE-3 \* DENVER, CO 80227 \*

LINE-4 \*RUN #4 NIGHT INFILTRATION FOR BLDG #406 \*  
LINE-5 \*CID BLDG \* ..

ABORT ERRORS ..  
DIAGNOSTIC WARNINGS ..  
SYSTEMS-REPORT VERIFICATION=(SV-A)  
SUMMARY=(SS-A,SS-C,SS-K,SS-O)  
HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

SD\_ON =DAY-SCHEDULE (1,24) (1.) ..  
SD\_OFF =DAY-SCHEDULE (1,24) (0.) ..  
SD\_WT\_HT =DAY-SCHEDULE (1,24) (74.) ..  
SD\_SM\_CL =DAY-SCHEDULE (1,24) (72.) ..  
SD\_WT\_CL =DAY-SCHEDULE (1,24) (74.2) ..  
SD\_SM\_HT =DAY-SCHEDULE (1,24) (71.8) ..  
SD\_OA\_# =DAY-SCHEDULE (1,6) (0.)  
(7,17) (0.25)  
(18,24) (0.) ..



SW\_ON =WEEK-SCHEDULE (ALL) SD\_ON ..  
SW\_OFF =WEEK-SCHEDULE (ALL) SD\_OFF ..  
SW\_WT\_HT =WEEK-SCHEDULE (ALL) SD\_WT\_HT ..

SW\_SM\_CL =WEEK-SCHEDULE (ALL) SD\_SM\_CL ..  
 SW\_WT\_CL =WEEK-SCHEDULE (ALL) SD\_WT\_CL ..  
 SW\_SM\_HT =WEEK-SCHEDULE (ALL) SD\_SM\_HT ..  
 SW\_OA\_% =WEEK-SCHEDULE (ALL) SD\_OA\_% ..

\$ FULL ON SYSTEM

S\_ON =SCHEDULE THRU DEC 31 SW\_ON ..

\$ FULL OFF SYSTEM

S\_OFF =SCHEDULE THRU DEC 31 SW\_OFF ..

\$ HEATING SEASON

S\_HE-SCHED =SCHEDULE THRU MAY 15 SW\_ON  
 THRU OCT 1 SW\_OFF  
 THRU DEC 31 SW\_ON ..

\$ COOLING SEASON

S\_CL\_SCHED =SCHEDULE THRU MAY 15 SW\_OFF  
 THRU OCT 1 SW\_ON  
 THRU DEC 31 SW\_OFF ..

\$ HEATING SET TEMP

S\_HT\_SET\_F =SCHEDULE THRU MAY 15 SW\_WT\_HT  
 THRU OCT 1 SW\_SM\_HT  
 THRU DEC 31 SW\_WT\_HT ..

\$ COOLING SET TEMP

S\_CL\_SET\_F =SCHEDULE THRU MAY 15 SW\_WT\_CL  
 THRU OCT 1 SW\_SM\_CL  
 THRU DEC 31 SW\_WT\_CL ..

\$ OUTSIDE AIR FRACTION

S\_OA\_% =SCHEDULE THRU DEC 31 SW\_OA\_% ..

S\_HRLY

=SCHEDULE THRU JAN 14 SW\_OFF  
 THRU JAN 15 SW\_ON  
 THRU AUG 21 SW\_OFF  
 THRU AUG 22 SW\_ON  
 THRU DEC 31 SW\_OFF ..

\$ ZONE DESCRIPTION

SPACE\_1 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
 SIZING-OPTION = FROM-LOADS ..

SPACE\_2 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F



ZONE-TYPE = CONDITIONED
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2
SIZING-OPTION = FROM-LOADS ..

SPACE\_3 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F
ZONE-TYPE = CONDITIONED
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2
SIZING-OPTION = FROM-LOADS ..

\$ SYSTEM DESCRIPTION

MZ\_W/\_DX =SYSTEM SYSTEM-TYPE = PMZS
MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0
HEATING-SCHEDULE = S\_HE-SCHED
COOLING-SCHEDULE = S\_CL\_SCHED OA-CONTROL = FIXED
SUPPLY-CFM = 6130. RATED-CFM = 6130.
MIN-OUTSIDE-AIR = 0.25 MIN-AIR-SCH = S\_OA %
MAX-OA-FRACTION = 0.25 FAN-SCHEDULE = S\_ON
SUPPLY-STATIC = 4.5 SUPPLY-EFF = 0.78
NIGHT-CYCLE-CTRL = STAY-OFF MIN-CFM-RATIO = 1.0
COOLING-CAPACITY = 217000. COOL-SH-CAP = 134000.
COIL-BF = 0.07 HEATING-CAPACITY = -520000.
CRANKCASE-MAX-T = 0. OUTSIDE-FAN-T = 45.
HEAT-SOURCE = HOT-WATER
ZONE-NAMES = (SPACE\_1, SPACE\_2, SPACE\_3) ..

\$ HOURLY REPORT DESCRIPTION

AHU-BLOCK =REPORT-BLOCK VARIABLE-TYPE = MZ\_W/\_DX
VARIABLE-LIST = (3,5,6,17,18,19) ..
ZONE-BLOCK =REPORT-BLOCK VARIABLE-TYPE = SPACE\_2
VARIABLE-LIST = (17,18,7,6) ..
AHU-HRLY = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY
REPORT-BLOCK = (AHU-BLOCK)
..
ZONE-HRLY = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY
REPORT-BLOCK = (ZONE-BLOCK)
..

END ..

COMPUTE SYSTEMS ..

INPUT PLANT ..

\$-----\$
\$ E Z - D O E P L A N T S I N P U T \$
\$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*
LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*
LINE-3 \* DENVER, CO 80227 \*

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 8/1995 9:12:40 SDL RUN 1  
 DENVER, CO 80227 RUN #4 NIGHT INFILTRATION FOR BLDG #406 CID BLDG TOPEKA, KS  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR MZ\_W/DX

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC-TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-90.732	15	-7.F	-8.F	-325.757	9589.	30.465
FEB	0.00000				-65.501	3	-5.F	-6.F	-259.752	8667.	30.465
MAR	0.00000				-44.605	6	19.F	18.F	-218.430	10203.	30.365
APR	0.00000				-11.860	17	35.F	31.F	-127.868	9484.	30.365
MAY	24.35596	31	88.F	75.F	-1.768	1	38.F	36.F	-81.905	11896.	49.139
JUN	65.14420	30	82.F	75.F	0.000				0.000	16008.	49.063
JUL	79.40778	1	86.F	80.F	0.000				0.000	16921.	50.176
AUG	81.15347	23	93.F	77.F	0.000				0.000	18253.	50.405
SEP	42.64534	1	78.F	73.F	0.000				0.000	13568.	49.615
OCT	0.00717	1	85.F	68.F	-10.084	20	23.F	23.F	-125.685	9276.	30.365
NOV	0.00000				-38.403	12	21.F	20.F	-193.500	9175.	30.365
DEC	0.00000				-79.959	13	2.F	1.F	-257.308	9584.	30.465
TOTAL	292.714				-342.913				-325.757	142623.	50.405
MAX											

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 8/1995 9:12:40 SDL RUN 1  
 DENVER, CO 80227 RUN #4 NIGHT INFILTRATION FOR BLDG #406 CID BLDG TOPEKA, KS  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR MZ\_W/DX

MONTH	HOURS OF HOURS				COINCIDENT LOADS						
	HOURS COOLING LOAD	HOURS HEATING LOAD	HOURS COOL-HEAT LOAD	HOURS FLOATING	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.	HOURS FANS ON CYCLE	HOURS NIGHT VENTING	HOURS FLOATING WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)
JAN	0	744	0	0	0	0	0	0	0	-84.557	6.772
FEB	0	672	0	0	0	0	0	0	0	-76.574	6.772
MAR	0	744	0	0	0	0	0	0	0	-73.037	6.772
APR	0	720	0	0	0	0	0	0	0	-1.563	4.151
MAY	351	360	0	33	384	0	0	0	33	0.000	49.139
JUN	699	0	0	21	0	0	0	0	21	0.000	48.627
JUL	741	0	0	3	744	0	0	0	3	0.000	50.176
AUG	739	0	0	5	744	0	0	0	5	0.000	50.312
SEP	592	0	0	128	720	0	0	0	128	0.000	47.913
OCT	2	720	0	22	24	0	0	0	22	0.000	4.784
NOV	0	720	0	0	0	0	0	0	0	-78.823	6.772
DEC	0	744	0	0	0	0	0	0	0	-128.062	4.151
ANNUAL	3124	5424	0	212	3336	0	0	0	212		

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 8/1995 9:12:40 PDL RUN 1  
 DENVER, CO 80227 RUN #4 NIGHT INFILTRATION FOR BLDG #406 CID BLDG TOPEKA, KS  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY 37.837 111.258 28/ 9	NATURAL-GAS 141.184 427.719 15/ 7
JAN	TOTAL (MBTU) PEAK (KBTU) DY/HR	34.065 111.258 3/ 8	107.004 354.443 3/ 7
FEB	TOTAL (MBTU) PEAK (KBTU) DY/HR	38.354 110.916 31/10	76.584 307.179 6/ 7
MAR	TOTAL (MBTU) PEAK (KBTU) DY/HR	33.597 110.452 5/ 8	23.949 199.849 17/ 7
APR	TOTAL (MBTU) PEAK (KBTU) DY/HR	40.876 167.782 31/16	4.996 143.407 1/ 7
MAY	TOTAL (MBTU) PEAK (KBTU) DY/HR	54.658 167.523 27/15	0.000 0.000 30/ 1
JUN	TOTAL (MBTU) PEAK (KBTU) DY/HR	57.777 171.324 1/16	0.000 0.000 31/ 1
JUL	TOTAL (MBTU) PEAK (KBTU) DY/HR	62.324 172.103 22/13	0.000 0.000 31/ 1
AUG	TOTAL (MBTU) PEAK (KBTU) DY/HR	46.328 169.407 7/15	0.000 0.000 30/ 1
SEP	TOTAL (MBTU) PEAK (KBTU) DY/HR	32.747 110.916 20/ 8	21.036 197.197 20/ 7
OCT	TOTAL (MBTU) PEAK (KBTU) DY/HR	34.437 110.916 30/12	66.697 278.146 12/ 7
NOV	TOTAL (MBTU) PEAK (KBTU) DY/HR	37.707 111.258 13/ 8	127.642 351.677 13/ 7
DEC	TOTAL (MBTU) PEAK (KBTU) DY/HR	510.709 172.103	569.091 427.719
	ONE YEAR USE/PEAK		

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 8/1995 9:12:40 PDL RUN 1  
 DENVER, CO 80227 RUN #4 NIGHT INFILTRATION FOR BLDG #406 CID BLDG  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
SPACE HEAT	23.73	569.09
SPACE COOL	96.67	0.00
HVAC AUX	124.15	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	140.66	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	125.49	0.00
TOTAL	510.71	569.09

TOTAL SITE ENERGY 1079.80 MBTU 105.7 KBTU/SQFT-YR GROSS-AREA 232.5 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 2102.75 MBTU 205.8 KBTU/SQFT-YR GROSS-AREA 452.8 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 1.9  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

AZIMUTH = 315 TILT = 32 SKY-FORM-FACTOR = 0.75  
GND-FORM-FACTOR = 0.25 ..

ROOF HEIGHT = 30.0 WIDTH = 19.5 CONS = MAINROOF  
AZIMUTH = 45 TILT = 37 SKY-FORM-FACTOR = 0.75  
GND-FORM-FACTOR = 0.25 ..

ROOF HEIGHT = 30.0 WIDTH = 19.5 CONS = MAINROOF  
AZIMUTH = 315 TILT = 37 SKY-FORM-FACTOR = 0.75  
GND-FORM-FACTOR = 0.25 ..

U-W HEIGHT = 24.0 WIDTH = 88.0 CONS = FLOOR ..

END ..  
COMPUTE LOADS ..  
INPUT SYSTEMS ..

\$-----\$  
\$ E Z - D O E S Y S T E M S I N P U T \$  
\$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
LINE-3 \* DENVER, CO 80227 \*  
LINE-4 \*RUN #5 DAY INFILTRATION FOR BLDG #406 \*  
LINE-5 \*CID BLDG \* ..

ABORT ERRORS ..  
DIAGNOSTIC WARNINGS ..  
SYSTEMS-REPORT VERIFICATION=(SV-A)  
SUMMARY=(SS-A,SS-C,SS-K,SS-O)  
HOURLY-DATA-SAVE = YES ...

\$ SCHEDULES

SD\_ON =DAY-SCHEDULE (1,24) (1.) ..  
SD\_OFF =DAY-SCHEDULE (1,24) (0.) ..  
SD\_WT\_HT =DAY-SCHEDULE (1,24) (74.) ..  
SD\_SM\_CL =DAY-SCHEDULE (1,24) (72.) ..  
SD\_WT\_CL =DAY-SCHEDULE (1,24) (74.2) ..  
SD\_SM\_HT =DAY-SCHEDULE (1,24) (71.8) ..  
SD\_OA\_\* =DAY-SCHEDULE (1,6) (0.25)  
(7,17) (0.)  
(18,24) (0.25) ..



SW\_ON =WEEK-SCHEDULE (ALL) SD\_ON ..  
SW\_OFF =WEEK-SCHEDULE (ALL) SD\_OFF ..  
SW\_WT\_HT =WEEK-SCHEDULE (ALL) SD\_WT\_HT ..

```

SW_SM_CL =WEEK-SCHEDULE (ALL) SD_SM_CL ..
SW_WT_CL =WEEK-SCHEDULE (ALL) SD_WT_CL ..
SW_SM_HT =WEEK-SCHEDULE (ALL) SD_SM_HT ..
SW_OA_% =WEEK-SCHEDULE (ALL) SD_OA_% ..

```

## \$ FULL ON SYSTEM

```
S_ON =SCHEDULE THRU DEC 31 SW_ON ..
```

## \$ FULL OFF SYSTEM

```
S_OFF =SCHEDULE THRU DEC 31 SW_OFF ..
```

## \$ HEATING SEASON

```

S_HE-SCHED =SCHEDULE THRU MAY 15 SW_ON
              THRU OCT 1 SW_OFF
              THRU DEC 31 SW_ON ..

```

## \$ COOLING SEASON

```

S_CL_SCHED =SCHEDULE THRU MAY 15 SW_OFF
              THRU OCT 1 SW_ON
              THRU DEC 31 SW_OFF ..

```

## \$ HEATING SET TEMP

```

S_HT_SET_F =SCHEDULE THRU MAY 15 SW_WT_HT
              THRU OCT 1 SW_SM_HT
              THRU DEC 31 SW_WT_HT ..

```

## \$ COOLING SET TEMP

```

S_CL_SET_F =SCHEDULE THRU MAY 15 SW_WT_CL
              THRU OCT 1 SW_SM_CL
              THRU DEC 31 SW_WT_CL ..

```

## \$ OUTSIDE AIR FRACTION

```
S_OA_% =SCHEDULE THRU DEC 31 SW_OA_% ..
```

```

S_HRLY =SCHEDULE THRU JAN 14 SW_OFF
              THRU JAN 15 SW_ON
              THRU AUG 21 SW_OFF
              THRU AUG 22 SW_ON
              THRU DEC 31 SW_OFF ..

```

## \$ ZONE DESCRIPTION

```

SPACE_1 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0
          HEAT-TEMP-SCH = S_HT_SET_F COOL-TEMP-SCH = S_CL_SET_F
          ZONE-TYPE = CONDITIONED
          THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2
          SIZING-OPTION = FROM-LOADS ..

```

```

SPACE_2 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0
          HEAT-TEMP-SCH = S_HT_SET_F COOL-TEMP-SCH = S_CL_SET_F

```

ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

SPACE\_3 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

\$ SYSTEM DESCRIPTION

MZ\_W/\_DX =SYSTEM SYSTEM-TYPE = PMZS  
MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
HEATING-SCHEDULE = S\_HE\_SCHD  
COOLING-SCHEDULE = S\_CL\_SCHD OA-CONTROL = FIXED  
SUPPLY-CFM = 6130. RATED-CFM = 6130.  
MIN-OUTSIDE-AIR = 0.25 MIN-AIR-SCH = S\_OA % ←  
MAX-OA-FRACTION = 0.25 FAN-SCHEDULE = S\_ON  
SUPPLY-STATIC = 4.5 SUPPLY-EFF = 0.78  
NIGHT-CYCLE-CTRL = STAY-OFF MIN-CFM-RATIO = 1.0  
COOLING-CAPACITY = 217000. COOL-SH-CAP = 134000.  
COIL-BF = 0.07 HEATING-CAPACITY = -520000.  
CRANKCASE-MAX-T = 0. OUTSIDE-FAN-T = 45.  
HEAT-SOURCE = HOT-WATER  
ZONE-NAMES = (SPACE\_1, SPACE\_2, SPACE\_3) ..

\$ HOURLY REPORT DESCRIPTION

AHU-BLOCK =REPORT-BLOCK VARIABLE-TYPE = MZ\_W/\_DX  
VARIABLE-LIST = (3,5,6,17,18,19) ..  
ZONE-BLOCK =REPORT-BLOCK VARIABLE-TYPE = SPACE\_2  
VARIABLE-LIST = (17,18,7,6) ..  
AHU-HRLY = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY  
REPORT-BLOCK = (AHU-BLOCK)  
..  
ZONE-HRLY = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY  
REPORT-BLOCK = (ZONE-BLOCK)  
..  
END ..  
COMPUTE SYSTEMS ..  
  
INPUT PLANT ..

\$-----\$  
\$ E Z - D O E P L A N T S I N P U T \$  
\$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
LINE-3 \* DENVER, CO 80227 \*

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 8/1995 9:22:49 SDL RUN 1  
DENVER, CO 80227 RUN #5 DAY INFILTRATION FOR BLDG #406 CID BLDG  
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR MZ\_W/\_DX TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C			
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC- TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-97.958	15	6	-8. F	-9. F	-318.149	9589.	30.465
FEB	0.00000				-71.810	3	6	-1. F	-2. F	-272.115	8667.	30.465
MAR	0.00000				-52.842	4	6	14. F	12. F	-219.661	10203.	30.365
APR	0.00000				-16.847	1	1	32. F	29. F	-143.026	9484.	30.365
MAY	24.18091	31	18	90. F	-3.292	1	6	37. F	37. F	-84.753	11858.	46.592
JUN	65.55560	27	18	88. F	0.000					0.000	16037.	47.111
JUL	81.51467	1	18	87. F	0.000					0.000	17113.	47.585
AUG	81.84739	22	18	93. F	0.000					0.000	18350.	48.754
SEP	42.60931	22	18	85. F	-14.769	20	6	24. F	23. F	-139.971	13548.	47.425
OCT	0.00000				-45.894	3	6	13. F	12. F	-208.658	9275.	30.365
NOV	0.00000				-86.720	13	6	2. F	1. F	-277.031	9175.	30.365
DEC	0.00000				-390.130						9584.	30.465
TOTAL	295.708										142881.	
MAX												48.754

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 8/1995 9:22:49 SDL RUN 1  
DENVER, CO 80227 RUN #5 DAY INFILTRATION FOR BLDG #406 CID BLDG  
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR MZ\_W/\_DX TOPEKA, KS

MONTH	HOURS				HOURS				HOURS				COINCIDENT LOADS		
	COOLING LOAD	HEATING LOAD	COOL-HEAT LOAD	FLOATING	HEATING AVAIL.	COOLING AVAIL.	FANS ON CYCLE	FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)	FLOATING WHEN FANS ON	NIGHT VENTING	FANS ON
JAN	0	744	0	0	744	0	0	0	0	-154.527	6.772	0	0	0	6.772
FEB	0	672	0	0	672	0	0	0	0	-146.773	6.772	0	0	0	6.772
MAR	0	744	0	0	744	0	0	0	0	-141.194	6.772	0	0	0	6.772
APR	0	720	0	0	720	0	0	0	0	-41.135	4.151	0	0	0	4.151
MAY	308	360	0	76	384	0	0	0	0	0.000	26.916	76	0	0	26.916
JUN	667	0	0	53	720	0	0	0	0	0.000	26.514	53	0	0	26.514
JUL	737	0	0	7	744	0	0	0	0	0.000	0.000	7	0	0	27.954
AUG	729	0	0	15	744	0	0	0	0	0.000	0.000	15	0	0	26.841
SEP	514	0	0	206	720	0	0	0	0	0.000	0.000	206	0	0	25.825
OCT	0	720	0	24	24	0	0	0	0	-83.578	6.772	24	0	0	6.772
NOV	0	720	0	0	720	0	0	0	0	-158.688	6.772	0	0	0	6.772
DEC	0	744	0	0	744	0	0	0	0	-205.313	4.151	0	0	0	4.151
ANNUAL	2955	5424	0	381	5424	3336	8760	0	0			381	0	0	



EMC ENGINEERS INC. E2DOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 8/1995 9:22:49 PDL RUN 1  
 DENVER, CO 80227 RUN #5 DAY INFILTRATION FOR BLDG #406 CID BLDG TOPEKA, KS  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY TOTAL (MBTU) PEAK (KBTU) DY/HR	NATURAL-GAS TOTAL (MBTU) PEAK (KBTU) DY/HR
JAN	111.089 28/ 9	37.131 111.089	145.418 417.730
FEB	111.089 3/ 8	33.302 111.089	110.201 366.897
MAR	109.125 4/ 8	38.116 109.125	85.188 307.317
APR	33.902 1/ 8	33.902 105.435	31.643 217.094
MAY	40.878 1/ 6	40.878 159.085	7.535 145.965
JUN	54.758 1/ 6	31.117 54.758	0.000 0.000
JUL	162.474 22/16	162.474 22/16	30/ 1 0.000
AUG	62.655 11/16	62.655 166.467	0.000 0.000
SEP	46.259 7/16	46.259 161.930	0.000 0.000
OCT	33.088 20/ 8	33.088 104.580	28.566 213.420
NOV	34.286 3/ 8	34.286 108.061	74.918 294.595
DEC	36.999 13/ 8	36.999 111.089	131.501 372.391
	ONE YEAR USE/PEAK	509.802 166.467	614.970 417.730

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 8/1995 9:22:49 PDL RUN 1  
 DENVER, CO 80227 RUN #5 DAY INFILTRATION FOR BLDG #406 CID BLDG TOPEKA, KS  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
SPACE HEAT	21.94	614.97
SPACE COOL	97.55	0.00
HVAC AUX	124.15	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	140.66	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	125.49	0.00
TOTAL	509.79	614.97

TOTAL SITE ENERGY 1124.77 MBTU 110.1 KBTU/SQFT-YR GROSS-AREA 242.2 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 2145.91 MBTU 210.0 KBTU/SQFT-YR GROSS-AREA 462.1 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 3.1  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

**COMPUTER ENERGY SIMULATIONS**

**BLDG. 7618  
BARRACKS BUILDINGS**



DENVER - ATLANTA

PROJECT: FEASIBILITY STUDY FOR  
 INSTALLATION OF UMCS  
 LOCATION: FORT RILEY, KANSAS

BUILDING NO.: 7618  
 BLDG. TYPE: ENL BARRACKS W/O DINING

EMC NO.: 1406-001  
 CALC. BY: AJN  
 CHECKED BY: CEL  
 DATE: 05-Jul-95

**ENERGY CONSTANT CALCULATIONS**

	BASERUN	RUN1	RUN2	RUN3	RUN4	RUN5
HEATING (MBtu)	995.9	846.7	743.5	0.0	0.0	0.0
COOLING (kWH)	781,998	777,970	764,799	0	0	0

SUPPLY AIR FAN	35,335 CFM
FLOOR AREA	41,874 FT <sup>2</sup>
CFMI	0 CFM
UA	7447 BTU/HR-°F
BLDG CONSTR.	2 (1 FOR LIGHT ) (2 FOR HEAVY)

EZDOE COMPUTER RUN DEFINITION:	
BASERUN	EXISTING OPERATION
RUN1	NIGHT SETBACK
RUN2	DDC CONTROL
RUN3	ECONOMIZER
RUN4	NIGHTTIME INFILTRATION (OA)
RUN5	DAYTIME INFILTRATION (OA)

HOURS OF OCCUPANCY			ANNUAL HEATING & COOLING HOURS	
M-F	0	2400	120 HR	HR. ON HEATING 5448 HR/YR
SAT.	0	2400	24 HR	HR. ON COOLING 3312 HR/YR
SUN.	0	2400	24 HR	HR. OFF HEATING 0 HR/YR
	TOTAL OCCUPY HR.		168 HR/WK	HR. OFF COOLING 0 HR/YR
	TOTAL UNOCC. HR.		0 HR/WK	
	ANNUAL OCCUPY HR.		8760 HR/YR	
	ANNUAL UNOCC. HR.		0 HR/YR	

PRESENT HR. OF OPERATION FOR SYS. WITH HEATING AND COOLING 8760 HR/YR  
 PRESENT HR. OF OPERATION FOR SYS. WITH HEATING ONLY 5448 HR/YR  
 PRESENT HR. OF OPERATION FOR SYS. WITH COOLING ONLY 3312 HR/YR  
 HRS SAVED (HTG ONLY) 5448 - 5448 = 0 HR/YR  
 HRS SAVED (CLG ONLY) 3312 - 3312 = 0 HR/YR

HOAUHC	995.86 MBtu	-	0 MBtu	=	0.00E+00 Btu/CFM-HR
	0 CFM	x	0 HR/YR		
HOAUH	995.86 MBtu	-	0 MBtu	=	0.00E+00 Btu/CFM-HR
	0 CFM	x	0 HR/YR		
COAUHC	781,998.2 kWH	-	0.0 kWH	=	0.00E+00 kWH/CFM-HR
	0 CFM	x	0 HR/YR		
COAUC	781,998.2 kWH	-	0.0 kWH	=	0.00E+00 kWH/CFM-HR
	0 CFM	x	0 HR/YR		
HOAOHC	995.86 MBtu	-	0 MBtu	=	0.00E+00 Btu/CFM-HR #DIV/0!
	0 CFM	x	8760 HR/YR		
HOAOH	995.86 MBtu	-	0 MBtu	=	0.00E+00 Btu/CFM-HR #DIV/0!
	0 CFM	x	5448 HR/YR		
COAOHC	781,998.2 kWH	-	0.0 kWH	=	0.00E+00 kWH/CFM-HR #DIV/0!
	0 CFM	x	8760 HR/YR		
COAOC	781,998.2 kWH	-	0.0 kWH	=	0.00E+00 kWH/CFM-HR #DIV/0!
	0 CFM	x	3312 HR/YR		
DC DUTY	1 / 6 (10 MINUTES PER HOUR)			=	0.17
DC DEMAND	1 / 6 (10 MINUTES PER HOUR)			=	0.17
ECC	777,969.5 kWH	-	0.0 kWH	=	0.00E+00 kWH/CFM-HR
	35335.04 CFM	x	3312 HR/YR		
ECHC	777,969.5 kWH	-	0.0 kWH	=	0.00E+00 kWH/CFM-HR
	35335.04 CFM	x	8760 HR/YR		
NSUCHC	781,998.2 kWH	-	777,969.5 kWH	=	0.00E+00 kWH/CFM-HR
	35335.04 CFM	x	0 HR/YR		
NSUCC	781,998.2 kWH	-	777,969.5 kWH	=	0.00E+00 kWH/CFM-HR
	35335.04 CFM	x	0 HR/YR		
DDCCHC	781,998.2 kWH	-	764,799.3 kWH	=	5.56E-05 kWH/CFM-HR
	35335.04 CFM	x	8760 HR/YR		
DDCCC	781,998.2 kWH	-	764,799.3 kWH	=	1.47E-04 kWH/CFM-HR
	35335.04 CFM	x	3312 HR/YR		
NSC	995.86 MBtu	-	846.71 MBtu	=	2.00E+04 Btu/UA
	7447.132 UA				
DDCH	995.86 MBtu	-	743.46 MBtu	=	3.39E+04 Btu/UA
	7447.132 UA				
OPT	(2 HR/DAY X 240 DAY/YR)		175 HR/YR	=	0 HR/YR
CHWR	(1.10 kW X 0.012 Eff. X 664 HRS X 2 Degrees of Reset)			=	17.5 kWH/TON
OAR	567 HR/YR	x	0.01	=	5.67 HR/YR



INPUT LOADS ..

\$-----\$  
\$ E Z - D O E L O A D S I N P U T \$  
\$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
LINE-3 \* DENVER, CO 80227 \*  
  
LINE-4 \*BASELINE SIMULATION OF BLDG. 7618 \*  
LINE-5 \*ENL MEN BARRACKS W/O DIN \* ..

ABORT ERRORS ..  
DIAGNOSTIC WARNINGS ..  
LOADS-REPORT VERIFICATION=(LV-D)  
SUMMARY=(LS-C,LS-D)  
HOURLY-DATA-SAVE = YES ..  
BUILDING-LOCATION LATITUDE = 39.0  
LONGITUDE = 96.5  
ALTITUDE = 1065.  
TIME-ZONE = 6  
GROSS-AREA = 41892  
SHIELDING-COEF = 0.29  
X-REF = 0.0  
Y-REF = 0.0 ..  
RUN-PERIOD JAN 1 1994 THRU DEC 31 1994 ..

\$ SCHEDULES

LD\_LITES =DAY-SCHEDULE (1,4) (0.1)  
(5,6) (0.75)  
(7,9) (1.)  
(10,17) (0.5)  
(18,20) (1.)  
(21,22) (0.75,0.25)  
(23,24) (0.1) ..  
  
LD\_EQUIP =DAY-SCHEDULE (1,5) (0.)  
(6,7) (0.5,0.75)  
(8,9) (1.)  
(10,13) (0.5,0.75,1.,0.75)  
(14,16) (0.5)  
(17,21) (1.)  
(22) (0.25)  
(23,24) (0.) ..  
  
LD\_ON =DAY-SCHEDULE (1,24) (1.) ..  
  
LD\_OFF =DAY-SCHEDULE (1,24) (0.) ..

LD\_WEEK\_PE =DAY-SCHEDULE (1,5) (1.)  
 (6,7) (0.5)  
 (8,10) (0.1)  
 (11,13) (0.75)  
 (14,17) (0.1)  
 (18) (0.75)  
 (19,20) (0.5)  
 (21,24) (1.) ..

LD\_WEND\_PE =DAY-SCHEDULE (1,8) (1.)  
 (9,13) (0.75)  
 (14,18) (0.5)  
 (19,23) (0.75)  
 (24) (1.) ..

LW\_ON =WEEK-SCHEDULE (ALL) LD\_ON ..

LW\_OFF =WEEK-SCHEDULE (ALL) LD\_OFF ..

LW\_WEEK\_PE =WEEK-SCHEDULE (WD) LD\_WEEK\_PE  
 (WEH) LD\_WEND\_PE ..

LW\_LITES =WEEK-SCHEDULE (ALL) LD\_LITES ..

LW\_EQUIP =WEEK-SCHEDULE (ALL) LD\_EQUIP ..

\$ ON 100% LOADS

L\_ON =SCHEDULE THRU DEC 31 LW\_ON ..

\$ OFF 100% LOADS

L\_OFF =SCHEDULE THRU DEC 31 LW\_OFF ..

\$ PEOPLE LOAD FOR BARRACK

L\_PEOPLE =SCHEDULE THRU DEC 31 LW\_WEEK\_PE ..

\$ EQUIPMENT LOAD BARRACKS

L\_EQUP =SCHEDULE THRU DEC 31 LW\_EQUIP ..

\$ LIGHTING SCHED BARRACKS

L\_LITES =SCHEDULE THRU DEC 31 LW\_LITES ..

\$ CONSTRUCTION TYPES

\$ EXTERIOR WALL BRICK, INSL, BRICK

WALL-1 =LAYERS MATERIAL=(BK01,AL11,IN35,CB06,GP01) I-F-R= 0.6100  
 THICKNESS=(0.333,0.000,0.167,0.500,0.042) ..  
 EXWALL-1 =CONSTRUCTION LAYERS = WALL-1  
 ABSORPTANCE = 0.880  
 ROUGHNESS = 2 ..

## \$ SLAB FLOOR

FLOOR =CONSTRUCTION U-VALUE = 0.020  
 ABSORPTANCE = 0.610  
 ROUGHNESS = 5 ..

## \$ BUILT-UP ROOF W/INSL&amp; NO CEILING

BLT-ROOF =LAYERS MATERIAL=(HF-E2,HF-E3,HF-A3,IN02)  
 THICKNESS=(0.042,0.031,0.005,0.296) ..  
 ROOF-1 =CONSTRUCTION LAYERS = BLT-ROOF  
 ABSORPTANCE = 0.800  
 ROUGHNESS = 1 ..

## \$ CONCRETE CEILING BETW KIT &amp; MEZZ

CONC-CEL =LAYERS MATERIAL=(CC24)  
 THICKNESS=(0.333) ..  
 IN-WALL1 =CONSTRUCTION LAYERS = CONC-CEL  
 ABSORPTANCE = 0.650  
 ROUGHNESS = 5 ..

## \$ STANDARD METAL DOOR

DOOR-MET =CONSTRUCTION U-VALUE = 0.020  
 ABSORPTANCE = 0.860  
 ROUGHNESS = 5 ..

## \$ EXTERIOR WALL BRICK,AIR,BRICK

WALL-2 =LAYERS MATERIAL=(BK01,AL11,CB06,GP01) I-F-R= 0.6100  
 THICKNESS=(0.333,0.000,0.500,0.042) ..  
 EXWALL-2 =CONSTRUCTION LAYERS = WALL-2  
 ABSORPTANCE = 0.880  
 ROUGHNESS = 2 ..

## \$ BUILT-UP ROOF W/INSL &amp; CONCRETE

ROOFW/IN =LAYERS MATERIAL=(HF-E2,HF-E3,HF-A3,IN23,CC35,AL33)  
 THICKNESS=(0.042,0.031,0.005,0.167,0.500,0.000) ..  
 ROOF-2 =CONSTRUCTION LAYERS = ROOFW/IN  
 ABSORPTANCE = 0.800  
 ROUGHNESS = 1 ..

1\_PN\_STD =GLASS-TYPE GLASS-TYPE-CODE = 1  
 PANES = 1 ..  
 SG-W/STM =GLASS-TYPE GLASS-TYPE-CODE = 1  
 PANES = 2  
 GLASS-CONDUCTANCE = 0.570 ..

## \$ SPACE DESCRIPTION

inter-zone =SPACE AREA = 2802.8 VOLUME = 84084.0  
 TEMPERATURE = (73.) ZONE-TYPE = CONDITIONED  
 PEOPLE-SCHEDULE = L\_PEOPLE NUMBER-OF-PEOPLE = 15.0  
 PEOPLE-HG-LAT = 625.0 PEOPLE-HG-SENS = 375.0  
 LIGHTING-TYPE = SUS-FLUOR LIGHTING-W/SQFT = 3.0  
 LIGHT-TO-SPACE = 1.0 LIGHTING-SCHEDULE = L\_LITES



FURN-WEIGHT = 1. INF-METHOD = NONE ..

U-W HEIGHT = 5.0 WIDTH = 560.6 CONS = FLOOR ..

ROOF HEIGHT = 5.0 WIDTH = 560.6 CONS = ROOF-2  
TILT = 0 SKY-FORM-FACTOR = 1.0 ..

EXTER-N =SPACE AREA = 4560.0 VOLUME = 136800.0  
TEMPERATURE = (73.) ZONE-TYPE = CONDITIONED  
PEOPLE-SCHEDULE = L\_PEOPLE NUMBER-OF-PEOPLE = 57.0  
PEOPLE-HG-LAT = 625.0 PEOPLE-HG-SENS = 375.0  
LIGHTING-TYPE = SUS-FLUOR LIGHTING-W/SQFT = 2.61  
LIGHT-TO-SPACE = 1.0 LIGHTING-SCHEDULE = L\_LITES  
EQUIP-SCHEDULE = L\_EQUP EQUIPMENT-KW = 12.9  
FURN-WEIGHT = 1. INF-METHOD = AIR-CHANGE  
AIR-CHANGES/HR = 0.76 ..

E-W HEIGHT = 30.0 WIDTH = 284.0 CONS = EXWALL-2  
AZIMUTH = 0 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 5.0 WIDTH = 10.5 G-T = SG-W/STM  
MULTIPLIER = 42.0 SETBACK = 0.3  
SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5  
OVERHANG-A = 10. OVERHANG-W = 30.  
OVERHANG-D = 2.5 ..

U-W HEIGHT = 10.0 WIDTH = 456.0 CONS = FLOOR ..

ROOF HEIGHT = 10.0 WIDTH = 456.0 CONS = ROOF-2  
TILT = 0 SKY-FORM-FACTOR = 1.0 ..

EXTER-S =SPACE AREA = 4985.0 VOLUME = 149550.0  
TEMPERATURE = (73.) ZONE-TYPE = CONDITIONED  
PEOPLE-SCHEDULE = L\_PEOPLE NUMBER-OF-PEOPLE = 58.0  
PEOPLE-HG-LAT = 625.0 PEOPLE-HG-SENS = 375.0  
LIGHTING-TYPE = SUS-FLUOR LIGHTING-W/SQFT = 2.61  
LIGHT-TO-SPACE = 1.0 LIGHTING-SCHEDULE = L\_LITES  
EQUIP-SCHEDULE = L\_EQUP EQUIPMENT-KW = 14.1  
FURN-WEIGHT = 1. INF-METHOD = AIR-CHANGE  
AIR-CHANGES/HR = 0.76 ..

E-W HEIGHT = 30.0 WIDTH = 284.0 CONS = EXWALL-2  
AZIMUTH = 180 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 5.0 WIDTH = 10.5 G-T = SG-W/STM  
MULTIPLIER = 42.0 SETBACK = 0.3  
SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5  
OVERHANG-A = 10. OVERHANG-W = 30.  
OVERHANG-D = 2.5 ..

U-W HEIGHT = 10.0 WIDTH = 498.5 CONS = FLOOR ..

ROOF HEIGHT = 10.0 WIDTH = 498.5 CONS = ROOF-2  
TILT = 0 SKY-FORM-FACTOR = 1.0 ..

EXTER-E =SPACE AREA = 805.0 VOLUME = 24150.0  
TEMPERATURE = (73.) ZONE-TYPE = CONDITIONED  
PEOPLE-SCHEDULE = L\_PEOPLE NUMBER-OF-PEOPLE = 10.0  
PEOPLE-HG-LAT = 625.0 PEOPLE-HG-SENS = 375.0  
LIGHTING-TYPE = SUS-FLUOR LIGHTING-W/SQFT = 2.61  
LIGHT-TO-SPACE = 1.0 LIGHTING-SCHEDULE = L\_LITES  
EQUIP-SCHEDULE = L\_EQUP EQUIPMENT-KW = 2.28  
FURN-WEIGHT = 1. INF-METHOD = AIR-CHANGE  
AIR-CHANGES/HR = 0.76 ..

E-W HEIGHT = 30.0 WIDTH = 56.7 CONS = EXWALL-2  
AZIMUTH = 90 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 4.5 WIDTH = 7.8 G-T = SG-W/STM  
SETBACK = 0.3 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 OVERHANG-A = 10.  
OVERHANG-W = 30. OVERHANG-D = 2.5 ..

U-W HEIGHT = 10.0 WIDTH = 80.5 CONS = FLOOR ..

ROOF HEIGHT = 10.0 WIDTH = 80.5 CONS = ROOF-2  
TILT = 0 SKY-FORM-FACTOR = 1.0 ..

EXTER-W =SPACE AREA = 805.0 VOLUME = 24150.0  
TEMPERATURE = (73.) ZONE-TYPE = CONDITIONED  
PEOPLE-SCHEDULE = L\_PEOPLE NUMBER-OF-PEOPLE = 10.0  
PEOPLE-HG-LAT = 625.0 PEOPLE-HG-SENS = 375.0  
LIGHTING-TYPE = SUS-FLUOR LIGHTING-W/SQFT = 2.61  
LIGHT-TO-SPACE = 1.0 LIGHTING-SCHEDULE = L\_LITES  
EQUIP-SCHEDULE = L\_EQUP EQUIPMENT-KW = 2.28  
FURN-WEIGHT = 1. INF-METHOD = AIR-CHANGE  
AIR-CHANGES/HR = 0.76 ..

E-W HEIGHT = 30.0 WIDTH = 56.7 CONS = EXWALL-2  
AZIMUTH = 270 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 4.5 WIDTH = 7.8 G-T = SG-W/STM  
SETBACK = 0.3 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 OVERHANG-A = 10.  
OVERHANG-W = 30. OVERHANG-D = 2.5 ..

U-W HEIGHT = 10.0 WIDTH = 80.5 CONS = FLOOR ..

ROOF HEIGHT = 10.0 WIDTH = 80.5 CONS = ROOF-2  
TILT = 0 SKY-FORM-FACTOR = 1.0 ..

END ..  
COMPUTE LOADS ..

INPUT SYSTEMS ..

```

$-----$
$ E Z - D O E   S Y S T E M S   I N P U T $
$-----$

```

## \$ GENERAL PROJECT DATA

```

TITLE LINE-1 *   EMC       ENGINEERS   INC.   *
LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
LINE-3 *   DENVER,      CO       80227   *

LINE-4 *BASELINE SIMULATION OF BLDG. 7618   *
LINE-5 *ENL MEN BARRACKS W/O DIN           * ..

ABORT      ERRORS ..
DIAGNOSTIC WARNINGS ..
SYSTEMS-REPORT VERIFICATION=(SV-A)
            SUMMARY=(SS-A,SS-C,SS-K,SS-O)
            HOURLY-DATA-SAVE = YES ..

```

## \$ SCHEDULES

```

SD_ON      =DAY-SCHEDULE (1,24) (1.) ..
SD_OFF     =DAY-SCHEDULE (1,24) (0.) ..
SD_W_HT_F  =DAY-SCHEDULE (1,24) (74.) ..
SD_S_CL_F  =DAY-SCHEDULE (1,24) (72.) ..
SD_W_CL_F  =DAY-SCHEDULE (1,24) (75.) ..
SD_S_HT_F  =DAY-SCHEDULE (1,24) (71.) ..

SW_ON      =WEEK-SCHEDULE (ALL) SD_ON ..

SW_OFF     =WEEK-SCHEDULE (ALL) SD_OFF ..

SW_W_HT_F  =WEEK-SCHEDULE (ALL) SD_W_HT_F ..

SW_S_CL_F  =WEEK-SCHEDULE (ALL) SD_S_CL_F ..

SW_W_CL_F  =WEEK-SCHEDULE (ALL) SD_W_CL_F ..

SW_S_HT_F  =WEEK-SCHEDULE (ALL) SD_S_HT_F ..

```

## \$ FULL ON SYSTEM

```
S_ON      =SCHEDULE THRU DEC 31 SW_ON ..
```

## \$ FULL OFF SYSTEM

```
S_OFF     =SCHEDULE THRU DEC 31 SW_OFF ..
```

## \$ COOLING SEASON

```
S_CL_SCHED =SCHEDULE THRU MAY 15 SW_OFF
            THRU OCT 1 SW_ON
            THRU DEC 31 SW_OFF ..
```

## \$ HEATING SET TEMP

```
S_HT_SET_F =SCHEDULE THRU MAY 15 SW_W_HT_F
              THRU OCT  1 SW_S_HT_F
              THRU DEC 31 SW_W_HT_F ..
```

## \$ COOLING SET TEMP

```
S_CL_SET_F =SCHEDULE THRU MAY 15 SW_W_CL_F
              THRU OCT  1 SW_S_CL_F
              THRU DEC 31 SW_W_CL_F ..
```

## \$ HEATING SEASON

```
S_HT_SCHD =SCHEDULE THRU MAY 15 SW_ON
              THRU OCT  1 SW_OFF
              THRU DEC 31 SW_ON ..
```

```
S_HRLY-RPT =SCHEDULE THRU JAN 10 SW_OFF
              THRU JAN 11 SW_ON
              THRU JUN 17 SW_OFF
              THRU JUN 18 SW_ON
              THRU DEC 31 SW_OFF ..
```

## \$ ZONE DESCRIPTION

```
inter-zone =ZONE  DESIGN-HEAT-T = 74.0  DESIGN-COOL-T = 72.0
                   HEAT-TEMP-SCH = S_HT_SET_F  COOL-TEMP-SCH = S_CL_SET_F
                   ZONE-TYPE = CONDITIONED
                   THERMOSTAT-TYPE = PROPORTIONAL  THROTTLING-RANGE = 1.0
                   SIZING-OPTION = FROM-LOADS ..
```

```
EXTER-N   =ZONE  DESIGN-HEAT-T = 74.0  DESIGN-COOL-T = 72.0
                   HEAT-TEMP-SCH = S_HT_SET_F  COOL-TEMP-SCH = S_CL_SET_F
                   ZONE-TYPE = CONDITIONED
                   THERMOSTAT-TYPE = PROPORTIONAL  THROTTLING-RANGE = 1.0
                   SIZING-OPTION = FROM-LOADS ..
```

```
EXTER-S   =ZONE  DESIGN-HEAT-T = 74.0  DESIGN-COOL-T = 72.0
                   HEAT-TEMP-SCH = S_HT_SET_F  COOL-TEMP-SCH = S_CL_SET_F
                   ZONE-TYPE = CONDITIONED
                   THERMOSTAT-TYPE = PROPORTIONAL  THROTTLING-RANGE = 1.0
                   SIZING-OPTION = FROM-LOADS ..
```

```
EXTER-E   =ZONE  DESIGN-HEAT-T = 74.0  DESIGN-COOL-T = 72.0
                   HEAT-TEMP-SCH = S_HT_SET_F  COOL-TEMP-SCH = S_CL_SET_F
                   ZONE-TYPE = CONDITIONED
                   THERMOSTAT-TYPE = PROPORTIONAL  THROTTLING-RANGE = 1.0
                   SIZING-OPTION = FROM-LOADS ..
```

```
EXTER-W   =ZONE  DESIGN-HEAT-T = 74.0  DESIGN-COOL-T = 72.0
                   HEAT-TEMP-SCH = S_HT_SET_F  COOL-TEMP-SCH = S_CL_SET_F
                   ZONE-TYPE = CONDITIONED
                   THERMOSTAT-TYPE = PROPORTIONAL  THROTTLING-RANGE = 1.0
                   SIZING-OPTION = FROM-LOADS ..
```

## \$ SYSTEM DESCRIPTION

```

MULTIZONE =SYSTEM      SYSTEM-TYPE = MZS
                        MAX-SUPPLY-T = 120.0  MIN-SUPPLY-T = 55.0
                        HEATING-SCHEDULE = S_HT_SCHED
                        COOLING-SCHEDULE = S_CL_SCHED  OA-CONTROL = FIXED
                        SUPPLY-CFM = 33976.  RATED-CFM = 33976.
                        MAX-OA-FRACTION = 0.0  SUPPLY-DELTA-T = 2.7
                        SUPPLY-KW = 0.00088
                        MOTOR-PLACEMENT = OUTSIDE-AIRFLOW
                        MAX-FAN-RATIO = 1.0  MIN-FAN-RATIO = 0.2
                        NIGHT-CYCLE-CTRL = STAY-OFF  NIGHT-VENT-DT = 0.0
                        MIN-CFM-RATIO = 1.0  COOLING-CAPACITY = 1052000.
                        COOL-SH-CAP = 865200.  HEATING-CAPACITY = -1014400.
                        RETURN-AIR-PATH = DUCT
                        ZONE-NAMES = (inter-zone, EXTER-N, EXTER-S,
                                      EXTER-E, EXTER-W) ..

```

## \$ HOURLY REPORT DESCRIPTION

```

RPT_#1  =REPORT-BLOCK VARIABLE-TYPE = inter-zone
          VARIABLE-LIST = (17,18,7,6) ..
rpt_#2  =REPORT-BLOCK VARIABLE-TYPE = EXTER-N
          VARIABLE-LIST = (17,18,7,6) ..
AHU-RPT =REPORT-BLOCK VARIABLE-TYPE = MULTIZONE
          VARIABLE-LIST = (3,S,6,18,19) ..
INTERZN = HOURLY-REPORT REPORT-SCHEDULE = S_HRLY-RPT
          REPORT-BLOCK = (RPT_#1)
..
EXT_N_ZN = HOURLY-REPORT REPORT-SCHEDULE = S_HRLY-RPT
          REPORT-BLOCK = (rpt_#2)
..
AHU_REPORT = HOURLY-REPORT REPORT-SCHEDULE = S_HRLY-RPT
          REPORT-BLOCK = (AHU-RPT)
..
END ..
COMPUTE SYSTEMS ..

INPUT PLANT ..

```

```

$-----$
$ E Z - D O E   P L A N T S   I N P U T $
$-----$

```

## \$ GENERAL PROJECT DATA

```

TITLE  LINE-1 *      EMC      ENGINEERS      INC.      *
        LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
        LINE-3 *      DENVER,      CO      80227      *

        LINE-4 *BASELINE SIMULATION OF BLDG. 7618      *
        LINE-5 *ENL MEN BARRACKS W/O DIN      * ..

ABORT      ERRORS ..
DIAGNOSTIC  WARNINGS ..

```

PLANT-REPORT VERIFICATION=(PV-A)  
SUMMARY=(PS-B,BEPS)  
HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

PD\_ON =DAY-SCHEDULE (1,24) (1.) ..

PD\_OFF =DAY-SCHEDULE (1,24) (0.) ..

PW\_OFF =WEEK-SCHEDULE (ALL) PD\_OFF ..

PW\_ON =WEEK-SCHEDULE (ALL) PD\_ON ..

\$ HEATING SEASON

P\_HEAT =SCHEDULE THRU MAY 15 PW\_ON  
THRU OCT 1 PW\_OFF  
THRU DEC 31 PW\_ON ..

\$ COOLING SEASON

P\_COOL =SCHEDULE THRU MAY 15 PW\_OFF  
THRU OCT 1 PW\_ON  
THRU DEC 31 PW\_OFF ..

\$ EQUIPMENT DESCRIPTION

BOILER-HW =PLANT-EQUIPMENT TYPE = HW-BOILER  
SIZE = -999. ..

CHILLER-RC =PLANT-EQUIPMENT TYPE = HERM-REC-CHLR  
SIZE = -999. INSTALLED-NUMBER = 2  
MAX-NUMBER-AVAIL = 2 ..

PLANT-PARAMETERS BOILER-FUEL = NATURAL-GAS HERM-REC-COND-TYPE = AIR ..

ENERGY-RESOURCE RESOURCE = ELECTRICITY ..  
ENERGY-RESOURCE RESOURCE = NATURAL-GAS ..

HEAT-SESN =LOAD-ASSIGNMENT TYPE = HEATING  
OPERATION-MODE = RUN-NEEDED  
  
LOAD-RANGE = 0.000  
PLANT-EQUIPMENT = BOILER-HW  
NUMBER = 1 ..

COOL-SEASO =LOAD-ASSIGNMENT TYPE = COOLING  
OPERATION-MODE = RUN-NEEDED  
  
LOAD-RANGE = 0.000  
PLANT-EQUIPMENT = CHILLER-RC  
NUMBER = 2 ..

END ..  
COMPUTE PLANT ..  
STOP ..

EMC ENGINEERS INC. DOE-2.1D 5/11/1995 13:43:41 LDL RUN 1  
 DENVER, CO 80227 ENL MEN BARRACKS W/O DIN  
 REPORT- LV-D DETAILS OF EXTERIOR SURFACES IN THE PROJECT TOPEKA, KS

NUMBER OF EXTERIOR SURFACES 9 RECTANGULAR 9 OTHER 0  
 (U-VALUE INCLUDES INSIDE AIR FILM PLUS OUTSIDE AIR FILM AT 7.5 MPH WINDSPEED )

SURFACE	SPACE	U-VALUE (BTU/HR-SQFT-F)	AREA (SQFT)	U-VALUE (BTU/HR-SQFT-F)	W A L L + G L A S S - AREA (SQFT)	U-VALUE (BTU/HR-SQFT-F)	AREA (SQFT)	AZIMUTH
EXTER-N		0.487	2205.00	0.258	6315.00	0.317	8520.00	NORTH
EXTER-E		0.487	35.10	0.258	1665.90	0.263	1701.00	EAST
EXTER-S		0.487	2205.00	0.258	6315.00	0.317	8520.00	SOUTH
EXTER-W		0.487	35.10	0.258	1665.90	0.263	1701.00	WEST
EXTER-S		0.000	0.00	0.064	4985.00	0.064	4985.00	ROOF
EXTER-N		0.000	0.00	0.064	4560.00	0.064	4560.00	ROOF
EXTER-E		0.000	0.00	0.064	805.00	0.064	805.00	ROOF
inter-zone		0.000	0.00	0.064	2803.00	0.064	2803.00	ROOF
EXTER-W		0.000	0.00	0.064	805.00	0.064	805.00	ROOF
inter-zone		0.000	0.00	0.020	2803.00	0.020	2803.00	UNDERGRND
EXTER-N		0.000	0.00	0.020	4560.00	0.020	4560.00	UNDERGRND
EXTER-S		0.000	0.00	0.020	4985.00	0.020	4985.00	UNDERGRND
EXTER-E		0.000	0.00	0.020	805.00	0.020	805.00	UNDERGRND
EXTER-W		0.000	0.00	0.020	805.00	0.020	805.00	UNDERGRND

EMC ENGINEERS INC. DOE-2.1D 5/11/1995 13:43:41 LDL RUN 1  
 DENVER, CO 80227 ENL MEN BARRACKS W/O DIN  
 REPORT- LV-D DETAILS OF EXTERIOR SURFACES IN THE PROJECT TOPEKA, KS

NUMBER OF EXTERIOR SURFACES 9 RECTANGULAR 9 OTHER 0  
 (U-VALUE INCLUDES INSIDE AIR FILM PLUS OUTSIDE AIR FILM AT 7.5 MPH WINDSPEED )

SURFACE	SPACE	AVERAGE U-VALUE/GLASS (BTU/HR-SQFT-F)	AVERAGE U-VALUE/WALLS (BTU/HR-SQFT-F)	AVERAGE U-VALUE WALLS+GLASS (BTU/HR-SQFT-F)	GLASS AREA (SQFT)	OPAQUE AREA (SQFT)	GLASS+OPAQUE AREA (SQFT)
NORTH		0.487	0.258	0.317	2205.00	6315.00	8520.00
EAST		0.487	0.258	0.263	35.10	1665.90	1701.00
SOUTH		0.487	0.258	0.317	2205.00	6315.00	8520.00
WEST		0.487	0.258	0.263	35.10	1665.90	1701.00
ROOF		0.000	0.064	0.064	0.00	13958.00	13958.00
ALL WALLS		0.487	0.258	0.308	4480.20	15961.80	20442.00
WALLS+ROOFS		0.487	0.167	0.209	4480.20	29919.80	34400.00
UNDERGRND		0.000	0.020	0.020	0.00	13958.00	13958.00
BUILDING		0.487	0.120	0.154	4480.20	43877.80	48358.00



EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/11/1995 13:43:41 LDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION OF BLDG. 7618 ENL MEN BARRACKS W/O DIN  
 REPORT- LS-C BUILDING PEAK LOAD COMPONENTS TOPEKA, KS

\*\*\* BUILDING \*\*\*

FLOOR AREA 13958 SQFT 1297 SQMT  
 VOLUME 418734 CUFT 11859 CUMT

TIME AUG 24 7PM  
 DRY-BULB TEMP 92F 33C  
 WET-BULB TEMP 76F 24C

HEATING LOAD  
 JAN 4 3AM  
 8F -13C  
 7F -14C

	SENSIBLE (KBTU/H)	( KW )	COOLING LOAD (KBTU/H)	( KW )	LATENT (KBTU/H)	( KW )	SENSIBLE (KBTU/H)	( KW )
WALLS	69.083	20.233	0.000	0.000	0.000	0.000	-230.041	-67.373
ROOFS	19.337	5.663	0.000	0.000	0.000	0.000	-39.155	-11.467
GLASS CONDUCTION	40.916	11.983	0.000	0.000	0.000	0.000	-151.937	-44.499
GLASS SOLAR	99.635	29.181	0.000	0.000	0.000	0.000	6.654	1.949
DOOR	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
INTERNAL SURFACES	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
UNDERGROUND SURFACES	-1.321	-0.387	0.000	0.000	0.000	0.000	-6.405	-1.876
OCCUPANTS TO SPACE	27.009	7.910	46.875	13.729	0.000	0.000	46.820	13.712
LIGHT TO SPACE	104.108	30.491	0.000	0.000	0.000	0.000	24.551	7.190
EQUIPMENT TO SPACE	96.808	28.353	0.000	0.000	0.000	0.000	14.187	4.155
PROCESS TO SPACE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
INFILTRATION	188.739	55.277	318.441	93.264	0.000	0.000	-659.139	-193.045
TOTAL	644.316	188.704	365.316	106.992	0.000	0.000	-994.467	-291.254
TOTAL LOAD	1009.632	KBTU/H	295.696	KW	-994.467	KBTU/H	-291.254	KW
TOTAL LOAD / AREA	72.33	BTU/H.SQFT	228.034	W /SQMT	71.248	BTU/H.SQFT	224.608	W /SQMT

\*\*\*\*\*  
 \* NOTE 1) THE ABOVE LOADS EXCLUDE OUTSIDE VENTILATION AIR \*  
 \* LOADS \*  
 \* 2) TIMES GIVEN IN STANDARD TIME FOR THE LOCATION \*  
 \* IN CONSIDERATION \*  
 \*\*\*\*\*

EMC ENGINEERS INC. EZZOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/11/1995 13:43:41 SDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION OF BLDG. 7618 ENL MEN BARRACKS W/O DIN TOPEKA, KS  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR MULTIZONE

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC LOAD (KW)
JAN	0.00000				-185.666	4	3	8.F	7.F	50190.	98.953
FEB	0.00000				-118.677	1	23	17.F	15.F	45333.	98.953
MAR	0.00000				-81.129	3	4	16.F	13.F	50190.	98.953
APR	0.00000				-16.407	4	10	34.F	31.F	48571.	98.953
MAY	162.08939	16	2	62.F	-3.089	3	22	58.F	56.F	50190.	98.953
JUN	354.96628	19	19	86.F	0.000					48571.	98.953
JUL	416.69571	2	19	84.F	0.000					50190.	98.953
AUG	410.92154	24	19	92.F	0.000					48571.	98.953
SEP	276.45010	5	17	90.F	0.000					50190.	98.953
OCT	6.72422	1	18	83.F	-13.900	31	7	43.F	39.F	50190.	98.953
NOV	0.00000				-43.304	2	4	17.F	15.F	48571.	98.953
DEC	0.00000				-164.413	8	10	24.F	22.F	50190.	98.953
TOTAL	1627.847				-626.590					590934.	
MAX										-883.762	98.953

EMC ENGINEERS INC. EZZOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/11/1995 13:43:41 SDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION OF BLDG. 7618 ENL MEN BARRACKS W/O DIN TOPEKA, KS  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR MULTIZONE

MONTH	N U M B E R O F H O U R S				C O I N C I D E N T L O A D S				C O I N C I D E N T L O A D S	
	HOURS HEATING LOAD	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.	HOURS FAN ON	HOURS HEATING COOLING AVAIL.	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.	HOURS FAN ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)
JAN	744	0	744	0	0	0	0	0	-136.753	33.650
FEB	672	0	672	0	0	0	0	0	-118.913	33.650
MAR	744	0	744	0	0	0	0	0	-193.627	33.650
APR	720	0	720	0	0	0	0	0	-23.532	33.650
MAY	360	0	360	0	384	0	0	0	0.000	33.650
JUN	720	0	720	0	720	0	0	0	0.000	33.650
JUL	744	0	744	0	744	0	0	0	0.000	98.953
AUG	744	0	744	0	744	0	0	0	0.000	98.953
SEP	718	0	720	0	744	0	0	0	0.000	80.199
OCT	24	0	720	0	24	0	0	0	0.000	98.953
NOV	720	0	720	0	744	0	0	0	-226.291	33.650
DEC	744	0	744	0	0	0	0	0	-237.822	33.650
ANNUAL	3334	0	5424	0	3336	8760	0	0		

MO	UTILITY- TOTAL(MBTU) PEAK(KBTU) DY/HR	ELECTRICITY TOTAL(MBTU) PEAK(KBTU) DY/HR	NATURAL-GAS TOTAL(MBTU) PEAK(KBTU) DY/HR
JAN	184.359 360.717 28/ 8	184.359 360.717 28/ 8	277.371 1112.063 4/ 3
FEB	165.654 360.717 27/18	165.654 360.717 27/18	189.359 917.868 1/23
MAR	179.606 360.717 31/ 9	179.606 360.717 31/ 9	130.718 869.264 3/ 4
APR	169.986 360.717 4/ 9	169.986 360.717 4/ 9	33.577 499.429 4/10
MAY	231.126 658.803 30/18	231.126 658.803 30/18	8.511 149.754 3/22
JUN	292.952 658.410 19/19	292.952 658.410 19/19	0.000 0.000 30/ 1
JUL	318.887 680.153 23/18	318.887 680.153 23/18	0.000 0.000 31/ 1
AUG	322.748 689.452 24/18	322.748 689.452 24/18	0.000 0.000 31/ 1
SEP	269.572 678.056 5/18	269.572 678.056 5/18	0.000 0.000 30/ 1
OCT	177.996 577.426 1/18	177.996 577.426 1/18	29.458 448.138 31/ 7
NOV	172.059 360.717 30/ 9	172.059 360.717 30/ 9	76.033 539.579 2/ 4
DEC	183.931 360.717 31/ 9	183.931 360.717 31/ 9	250.832 946.975 8/10
	ONE YEAR USE/PEAK	2668.876 689.452	995.860 1112.063

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/11/1995 13:43:41 PDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION OF BLDG. 7618 ENL MEN BARRACKS W/O DIN  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE	ELECTRICITY	NATURAL-GAS
IN SITE MBTU -		
CATEGORY OF USE		
SPACE HEAT	42.80	995.86
SPACE COOL	547.49	0.00
HVAC AUX	955.23	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	612.35	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	511.10	0.00
TOTAL	2668.96	995.86

TOTAL SITE ENERGY 3664.74 MBTU 87.5 KBTU/SQFT-YR GROSS-AREA 262.6 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 9010.50 MBTU 215.1 KBTU/SQFT-YR GROSS-AREA 645.6 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 0.3  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.



INPUT SYSTEMS ..

```

$-----$
$ E Z - D O E   S Y S T E M S   I N P U T $
$-----$

```

\$ GENERAL PROJECT DATA

```

TITLE  LINE-1 *      EMC      ENGINEERS      INC.      *
LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
LINE-3 *      DENVER,      CO      80227      *

LINE-4 *RUN #1 NIGHT SETBACK FOR BLDG. 7618      *
LINE-5 *ENL MEN BARRACKS W/O DIN      * ..

ABORT      ERRORS      ..
DIAGNOSTIC  WARNINGS  ..
SYSTEMS-REPORT  VERIFICATION=(SV-A)
SUMMARY=(SS-A,SS-C,SS-K,SS-O)
HOURLY-DATA-SAVE = YES  ..

```

\$ SCHEDULES

```

SD_ON      =DAY-SCHEDULE  (1,24) (1.) ..
SD_OFF     =DAY-SCHEDULE  (1,24) (0.) ..
SD_W_HT_F  =DAY-SCHEDULE  (1,4) (65.)
              (5,21) (74.)
              (22,24) (65.) ..
SD_S_CL_F  =DAY-SCHEDULE  (1,24) (72.) ..
SD_W_CL_F  =DAY-SCHEDULE  (1,4) (66.)
              (5,21) (75.)
              (22,24) (66.) ..
SD_S_HT_F  =DAY-SCHEDULE  (1,24) (71.) ..

SW_ON      =WEEK-SCHEDULE (ALL) SD_ON  ..
SW_OFF     =WEEK-SCHEDULE (ALL) SD_OFF ..
SW_W_HT_F  =WEEK-SCHEDULE (ALL) SD_W_HT_F ..
SW_S_CL_F  =WEEK-SCHEDULE (ALL) SD_S_CL_F ..
SW_W_CL_F  =WEEK-SCHEDULE (ALL) SD_W_CL_F ..
SW_S_HT_F  =WEEK-SCHEDULE (ALL) SD_S_HT_F ..

```



\$ FULL ON SYSTEM

S\_ON =SCHEDULE THRU DEC 31 SW\_ON ..

\$ FULL OFF SYSTEM

S\_OFF =SCHEDULE THRU DEC 31 SW\_OFF ..

\$ COOLING SEASON

S\_CL\_SCHD =SCHEDULE THRU MAY 15 SW\_OFF

THRU OCT 1 SW\_ON  
THRU DEC 31 SW\_OFF ..

\$ HEATING SET TEMP

S\_HT\_SET\_F =SCHEDULE THRU MAY 15 SW\_W\_HT\_F  
THRU OCT 1 SW\_S\_HT\_F  
THRU DEC 31 SW\_W\_HT\_F ..

\$ COOLING SET TEMP

S\_CL\_SET\_F =SCHEDULE THRU MAY 15 SW\_W\_CL\_F  
THRU OCT 1 SW\_S\_CL\_F  
THRU DEC 31 SW\_W\_CL\_F ..

\$ HEATING SEASON

S\_HT\_SCHED =SCHEDULE THRU MAY 15 SW\_ON  
THRU OCT 1 SW\_OFF  
THRU DEC 31 SW\_ON ..

S\_HRLY-RPT =SCHEDULE THRU JAN 10 SW\_OFF  
THRU JAN 11 SW\_ON  
THRU JUN 17 SW\_OFF  
THRU JUN 18 SW\_ON  
THRU DEC 31 SW\_OFF ..

\$ ZONE DESCRIPTION

inter-zone =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 1.0  
SIZING-OPTION = FROM-LOADS ..

EXTER-N =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 1.0  
SIZING-OPTION = FROM-LOADS ..

EXTER-S =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 1.0  
SIZING-OPTION = FROM-LOADS ..

EXTER-E =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 1.0  
SIZING-OPTION = FROM-LOADS ..

EXTER-W =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 1.0

SIZING-OPTION = FROM-LOADS ..

\$ SYSTEM DESCRIPTION

MULTIZONE =SYSTEM SYSTEM-TYPE = MZS  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_HT\_SCHED  
 COOLING-SCHEDULE = S\_CL\_SCHED  
 HEAT-CONTROL = COLDEST COOL-CONTROL = WARMEST  
 OA-CONTROL = FIXED SUPPLY-CFM = 33976.  
 RATED-CFM = 33976. MAX-OA-FRACTION = 0.0  
 SUPPLY-DELTA-T = 2.7 SUPPLY-KW = 0.00088  
 MOTOR-PLACEMENT = OUTSIDE-AIRFLOW  
 MAX-FAN-RATIO = 1.0 MIN-FAN-RATIO = 0.2  
 NIGHT-CYCLE-CTRL = STAY-OFF NIGHT-VENT-DT = 0.0  
 MIN-CFM-RATIO = 1.0 COOLING-CAPACITY = 1052000.  
 COOL-SH-CAP = 865200. HEATING-CAPACITY = -1014400.  
 RETURN-AIR-PATH = DUCT  
 ZONE-NAMES = (inter-zone, EXTER-N, EXTER-S,  
 EXTER-E, EXTER-W) ..



\$ HOURLY REPORT DESCRIPTION

RPT\_#1 =REPORT-BLOCK VARIABLE-TYPE = inter-zone  
 VARIABLE-LIST = (17,18,7,6) ..  
 rpt\_#2 =REPORT-BLOCK VARIABLE-TYPE = EXTER-N  
 VARIABLE-LIST = (17,18,7,6) ..  
 AHU-RPT =REPORT-BLOCK VARIABLE-TYPE = MULTIZONE  
 VARIABLE-LIST = (3,5,6,18,19) ..  
 INTERZN = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (RPT\_#1)  
 ..  
 EXT\_N\_ZN = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (rpt\_#2)  
 ..  
 AHU\_REPORT = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (AHU-RPT)  
 ..  
 END ..  
 COMPUTE SYSTEMS ..

INPUT PLANT ..

\$-----\$  
 \$ E Z - D O E P L A N T S I N P U T \$  
 \$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
 LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
 LINE-3 \* DENVER, CO 80227 \*



LINE-4 \*RUN #1 NIGHT SETBACK FOR BLDG. 7618 \*  
LINE-5 \*ENL MEN BARRACKS W/O DIN \* ..

ABORT ERRORS ..  
DIAGNOSTIC WARNINGS ..  
PLANT-REPORT VERIFICATION=(PV-A)  
SUMMARY=(PS-B,BEPS)  
HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

PD\_ON =DAY-SCHEDULE (1,24) (1.) ..

PD\_OFF =DAY-SCHEDULE (1,24) (0.) ..

PW\_OFF =WEEK-SCHEDULE (ALL) PD\_OFF ..

PW\_ON =WEEK-SCHEDULE (ALL) PD\_ON ..

\$ HEATING SEASON

P\_HEAT =SCHEDULE THRU MAY 15 PW\_ON  
THRU OCT 1 PW\_OFF  
THRU DEC 31 PW\_ON ..

\$ COOLING SEASON

P\_COOL =SCHEDULE THRU MAY 15 PW\_OFF  
THRU OCT 1 PW\_ON  
THRU DEC 31 PW\_OFF ..

\$ EQUIPMENT DESCRIPTION

BOILER-HW =PLANT-EQUIPMENT TYPE = HW-BOILER  
SIZE = -999. ..

CHILLER-RC =PLANT-EQUIPMENT TYPE = HERM-REC-CHLR  
SIZE = -999. INSTALLED-NUMBER = 2  
MAX-NUMBER-AVAIL = 2 ..

PLANT-PARAMETERS BOILER-FUEL = NATURAL-GAS HERM-REC-COND-TYPE = AIR ..

ENERGY-RESOURCE RESOURCE = ELECTRICITY ..  
ENERGY-RESOURCE RESOURCE = NATURAL-GAS ..

HEAT-SESN =LOAD-ASSIGNMENT TYPE = HEATING  
OPERATION-MODE = RUN-NEEDED  
  
LOAD-RANGE = 0.000  
PLANT-EQUIPMENT = BOILER-HW  
NUMBER = 1 ..

COOL-SEASO =LOAD-ASSIGNMENT TYPE = COOLING

OPERATION-MODE = RUN-NEEDED

LOAD-RANGE = 0.000

PLANT-EQUIPMENT = CHILLER-RC

NUMBER = 2 ..

END ..

COMPUTE PLANT ..

STOP ..

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/11/1995 13:59:13 SDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SETBACK FOR BLDG. 7618 ENL MEN BARRACKS W/O DIN TOPEKA, KS  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR MULTIZONE

MONTH	COOLING				HEATING				ELECTRIC			
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	MAXIMUM COOLING LOAD (KBTU/HR)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-164.169	4 5	7. F	6. F	50190.	-830.917	0.000	98.953
FEB	0.00000				-101.110	2 6	6. F	5. F	45333.	-602.559	0.000	98.953
MAR	0.00000				-68.509	3 5	15. F	13. F	50190.	-707.752	0.000	98.953
APR	0.00000				-13.942	4 10	34. F	31. F	48571.	-342.604	0.000	98.953
MAY	161.85303	16 2	62. F	59. F	-3.054	3 22	58. F	56. F	50190.	-85.729	0.000	98.953
JUN	354.06180	19 19	86. F	75. F	0.000				48571.	0.000	0.000	98.953
JUL	416.12445	2 19	84. F	77. F	0.000				50190.	0.000	0.000	98.953
AUG	409.96030	24 19	92. F	76. F	0.000				48571.	0.000	0.000	98.953
SEP	275.14450	5 18	90. F	77. F	-12.160	31 5	45. F	40. F	50190.	-365.775	0.000	98.953
OCT	6.63783	1 18	83. F	68. F	-35.900	2 5	16. F	15. F	48571.	-430.584	0.000	98.953
NOV	0.00000				-143.762	8 10	24. F	22. F	50190.	-786.953	0.000	98.953
DEC	0.00000				-542.606							
TOTAL	1623.784									-830.917		
MAX												98.953

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/11/1995 13:59:13 SDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SETBACK FOR BLDG. 7618 ENL MEN BARRACKS W/O DIN TOPEKA, KS  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR MULTIZONE

MONTH	COOLING				HEATING				ELECTRIC			
	HOURS COOLING LOAD	HOURS HEATING LOAD	HOURS COOL-HEAT LOAD	HOURS COINCIDENT LOAD	HOURS COOLING AVAIL.	HOURS HEATING AVAIL.	HOURS FAN CYCLE ON	HOURS NIGHT VENTING	HOURS FLOATING WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)	
JAN	0	725	0	0	0	744	0	0	19	-39.767	33.650	
FEB	0	650	0	0	0	672	0	0	22	-29.649	33.650	
MAR	0	612	0	0	0	744	0	0	132	-29.541	33.650	
APR	0	392	0	0	0	720	0	0	328	-23.509	33.650	
MAY	384	161	0	0	384	744	0	0	199	0.000	33.650	
JUN	720	0	0	0	720	720	0	0	0	0.000	98.953	
JUL	744	0	0	0	744	744	0	0	0	0.000	98.953	
AUG	744	0	0	0	744	744	0	0	0	0.000	98.953	
SEP	720	0	0	0	720	720	0	0	0	0.000	98.953	
OCT	24	386	0	0	24	744	0	0	334	0.000	98.953	
NOV	0	519	0	0	0	720	0	0	201	-12.527	33.650	
DEC	0	714	0	0	0	744	0	0	30	-14.388	33.650	
ANNUAL	3336	4159	0	0	3336	8760	0	0	1265			

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/11/1995 13:59:13 PDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SETBACK FOR BLDG. 7618 ENL MEN BARRACKS W/O DIN TOPEKA, KS  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY 182.626 359.351 31/8	NATURAL-GAS 243.540 1045.567 4/5
JAN	TOTAL (MBTU) PEAK (KBTU) DY/HR	182.626 359.351 31/8	243.540 1045.567 4/5
FEB	TOTAL (MBTU) PEAK (KBTU) DY/HR	163.878 359.351 28/9	160.019 800.165 2/6
MAR	TOTAL (MBTU) PEAK (KBTU) DY/HR	177.887 359.351 31/9	108.572 914.746 3/5
APR	TOTAL (MBTU) PEAK (KBTU) DY/HR	168.399 359.351 5/9	25.983 505.753 4/10
MAY	TOTAL (MBTU) PEAK (KBTU) DY/HR	230.223 655.958 30/18	6.447 149.140 3/22
JUN	TOTAL (MBTU) PEAK (KBTU) DY/HR	292.852 658.505 19/19	0.000 0.000 30/1
JUL	TOTAL (MBTU) PEAK (KBTU) DY/HR	318.677 682.260 23/18	0.000 0.000 31/1
AUG	TOTAL (MBTU) PEAK (KBTU) DY/HR	322.328 689.613 24/18	0.000 0.000 31/1
SEP	TOTAL (MBTU) PEAK (KBTU) DY/HR	269.279 680.666 5/18	0.000 0.000 30/1
OCT	TOTAL (MBTU) PEAK (KBTU) DY/HR	176.360 526.842 1/18	23.133 532.646 31/5
NOV	TOTAL (MBTU) PEAK (KBTU) DY/HR	170.451 359.351 30/9	61.304 607.190 2/5
DEC	TOTAL (MBTU) PEAK (KBTU) DY/HR	182.139 359.351 31/20	217.718 999.283 8/10
	ONE YEAR USE/PEAK	2655.101 689.613	846.715 1045.567

EMC ENGINEERS INC. E2DOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/11/1995 13:59:13 PDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SETBACK FOR BLDG. 7618 ENL MEN BARRACKS W/O DIN TOPEKA, KS  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE

ENERGY TYPE	ELECTRICITY	NATURAL-GAS
IN SITE MBTU -		
CATEGORY OF USE		
SPACE HEAT	35.23	846.71
SPACE COOL	546.22	0.00
HVAC AUX	950.30	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	612.35	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	511.10	0.00
TOTAL	2655.21	846.71

TOTAL SITE ENERGY 3501.82 MBTU 83.6 KBTU/SQFT-YR GROSS-AREA 250.9 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 8819.99 MBTU 210.5 KBTU/SQFT-YR GROSS-AREA 631.9 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 0.4  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

INPUT SYSTEMS ..

```

$-----$
$ E Z - D O E   S Y S T E M S   I N P U T $
$-----$

```

## \$ GENERAL PROJECT DATA

```

TITLE  LINE-1 *      EMC      ENGINEERS      INC.      *
LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
LINE-3 *      DENVER,      CO      80227      *

LINE-4 *RUN #2 DDC CONTROL OF BLDG. 7618      *
LINE-5 *ENL MEN BARRACKS W/O DIN      * ..

ABORT      ERRORS      ..
DIAGNOSTIC      WARNINGS ..
SYSTEMS-REPORT      VERIFICATION=(SV-A)
SUMMARY=(SS-A,SS-C,SS-K,SS-O)
HOURLY-DATA-SAVE = YES ..

```

## \$ SCHEDULES

```

SD_ON      =DAY-SCHEDULE (1,24) (1.) ..
SD_OFF     =DAY-SCHEDULE (1,24) (0.) ..
SD_W_HT_F  =DAY-SCHEDULE (1,24) (70.) ..
SD_S_CL_F  =DAY-SCHEDULE (1,24) (76.) ..
SD_W_CL_F  =DAY-SCHEDULE (1,24) (71.) ..
SD_S_HT_F  =DAY-SCHEDULE (1,24) (75.) ..

SW_ON      =WEEK-SCHEDULE (ALL) SD_ON ..
SW_OFF     =WEEK-SCHEDULE (ALL) SD_OFF ..
SW_W_HT_F  =WEEK-SCHEDULE (ALL) SD_W_HT_F ..
SW_S_CL_F  =WEEK-SCHEDULE (ALL) SD_S_CL_F ..
SW_W_CL_F  =WEEK-SCHEDULE (ALL) SD_W_CL_F ..
SW_S_HT_F  =WEEK-SCHEDULE (ALL) SD_S_HT_F ..

```

## \$ FULL ON SYSTEM

```
S_ON      =SCHEDULE THRU DEC 31 SW_ON ..
```

## \$ FULL OFF SYSTEM

```
S_OFF     =SCHEDULE THRU DEC 31 SW_OFF ..
```

## \$ COOLING SEASON

```
S_CL_SCHED =SCHEDULE THRU MAY 15 SW_OFF
            THRU OCT 1 SW_ON
            THRU DEC 31 SW_OFF ..
```

## \$ HEATING SET TEMP

```
S_HT_SET_F =SCHEDULE THRU MAY 15 SW_W_HT_F
              THRU OCT  1 SW_S_HT_F
              THRU DEC 31 SW_W_HT_F ..
```

## \$ COOLING SET TEMP

```
S_CL_SET_F =SCHEDULE THRU MAY 15 SW_W_CL_F
              THRU OCT  1 SW_S_CL_F
              THRU DEC 31 SW_W_CL_F ..
```

## \$ HEATING SEASON

```
S_HT_SCHED =SCHEDULE THRU MAY 15 SW_ON
              THRU OCT  1 SW_OFF
              THRU DEC 31 SW_ON ..
```

```
S_HRLY-RPT =SCHEDULE THRU JAN 10 SW_OFF
              THRU JAN 11 SW_ON
              THRU JUN 17 SW_OFF
              THRU JUN 18 SW_ON
              THRU DEC 31 SW_OFF ..
```

## \$ ZONE DESCRIPTION

```
inter-zone =ZONE  DESIGN-HEAT-T = 74.0  DESIGN-COOL-T = 72.0
                  HEAT-TEMP-SCH = S_HT_SET_F  COOL-TEMP-SCH = S_CL_SET_F
                  ZONE-TYPE = CONDITIONED
                  THERMOSTAT-TYPE = PROPORTIONAL  THROTTLING-RANGE = 1.0
                  SIZING-OPTION = FROM-LOADS ..
```

```
EXTER-N      =ZONE  DESIGN-HEAT-T = 74.0  DESIGN-COOL-T = 72.0
                  HEAT-TEMP-SCH = S_HT_SET_F  COOL-TEMP-SCH = S_CL_SET_F
                  ZONE-TYPE = CONDITIONED
                  THERMOSTAT-TYPE = PROPORTIONAL  THROTTLING-RANGE = 1.0
                  SIZING-OPTION = FROM-LOADS ..
```

```
EXTER-S      =ZONE  DESIGN-HEAT-T = 74.0  DESIGN-COOL-T = 72.0
                  HEAT-TEMP-SCH = S_HT_SET_F  COOL-TEMP-SCH = S_CL_SET_F
                  ZONE-TYPE = CONDITIONED
                  THERMOSTAT-TYPE = PROPORTIONAL  THROTTLING-RANGE = 1.0
                  SIZING-OPTION = FROM-LOADS ..
```

```
EXTER-E      =ZONE  DESIGN-HEAT-T = 74.0  DESIGN-COOL-T = 72.0
                  HEAT-TEMP-SCH = S_HT_SET_F  COOL-TEMP-SCH = S_CL_SET_F
                  ZONE-TYPE = CONDITIONED
                  THERMOSTAT-TYPE = PROPORTIONAL  THROTTLING-RANGE = 1.0
                  SIZING-OPTION = FROM-LOADS ..
```

```
EXTER-W      =ZONE  DESIGN-HEAT-T = 74.0  DESIGN-COOL-T = 72.0
                  HEAT-TEMP-SCH = S_HT_SET_F  COOL-TEMP-SCH = S_CL_SET_F
                  ZONE-TYPE = CONDITIONED
                  THERMOSTAT-TYPE = PROPORTIONAL  THROTTLING-RANGE = 1.0
                  SIZING-OPTION = FROM-LOADS ..
```

## \$ SYSTEM DESCRIPTION

```

MULTIZONE =SYSTEM      SYSTEM-TYPE = MZS
                        MAX-SUPPLY-T = 120.0  MIN-SUPPLY-T = 55.0
                        HEATING-SCHEDULE = S_HT_SCHED
                        COOLING-SCHEDULE = S_CL_SCHED
                        HEAT-CONTROL = COLDEST  COOL-CONTROL = WARMEST
                        OA-CONTROL = FIXED  SUPPLY-CFM = 33976.
                        RATED-CFM = 33976.  MAX-OA-FRACTION = 0.0
                        SUPPLY-DELTA-T = 2.7  SUPPLY-KW = 0.00088
                        MOTOR-PLACEMENT = OUTSIDE-AIRFLOW
                        MAX-FAN-RATIO = 1.0  MIN-FAN-RATIO = 0.2
                        NIGHT-CYCLE-CTRL = STAY-OFF  NIGHT-VENT-DT = 0.0
                        MIN-CFM-RATIO = 1.0  COOLING-CAPACITY = 1052000.
                        COOL-SH-CAP = 865200.  HEATING-CAPACITY = -1014400.
                        RETURN-AIR-PATH = DUCT
                        ZONE-NAMES = (inter-zone, EXTER-N, EXTER-S,
                                      EXTER-E, EXTER-W) ..

```

\$ HOURLY REPORT DESCRIPTION

```

RPT_#1  =REPORT-BLOCK VARIABLE-TYPE = inter-zone
          VARIABLE-LIST = (17,18,7,6) ..
rpt_#2  =REPORT-BLOCK VARIABLE-TYPE = EXTER-N
          VARIABLE-LIST = (17,18,7,6) ..
AHU-RPT =REPORT-BLOCK VARIABLE-TYPE = MULTIZONE
          VARIABLE-LIST = (3,5,6,18,19) ..
INTERZN = HOURLY-REPORT REPORT-SCHEDULE = S_HRLY-RPT
          REPORT-BLOCK = (RPT_#1)
..
EXT_N_ZN = HOURLY-REPORT REPORT-SCHEDULE = S_HRLY-RPT
          REPORT-BLOCK = (rpt_#2)
..
AHU_REPORT = HOURLY-REPORT REPORT-SCHEDULE = S_HRLY-RPT
          REPORT-BLOCK = (AHU-RPT)
..
END ..
COMPUTE SYSTEMS ..

INPUT PLANT ..

```

```

$-----$
$ E Z - D O E   P L A N T S   I N P U T $
$-----$

```

\$ GENERAL PROJECT DATA

```

TITLE  LINE-1 *   EMC      ENGINEERS      INC.      *
        LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
        LINE-3 *   DENVER,      CO      80227      *

        LINE-4 *RUN #2 DDC CONTROL OF BLDG. 7618      *
        LINE-5 *ENL MEN BARRACKS W/O DIN      * ..

```

ABORT ERRORS ..



DOE-2.1D 5/11/1995 13:46: 9 SDL RUN 1  
 ENL MEN BARRACKS W/O DIN TOPEKA, KS

EZDOE - ELITE SOFTWARE DEVELOPMENT INC  
 RUN #2 DDC CONTROL OF BLDG. 7618 MULTIZONE

EMC ENGINEERS INC. 80227  
 DENVER, CO SYSTEM MONTHLY LOADS SUMMARY FOR

C O O L I N G				H E A T I N G				E L E C			
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-150.091	4	3	8.F	7.F	-820.753	50190.
FEB	0.00000				-86.406	1	23	17.F	15.F	-629.502	45333.
MAR	0.00000				-55.972	3	4	16.F	13.F	-589.142	50190.
APR	0.00000				-9.262	4	10	34.F	31.F	-226.484	48571.
MAY	140.76512	16	2	62.F	-2.987	3	22	58.F	56.F	-85.729	50190.
JUN	317.55890	19	20	84.F	0.000					0.000	48571.
JUL	378.86865	1	18	87.F	0.000					0.000	50190.
AUG	374.46912	24	19	92.F	0.000					0.000	50190.
SEP	234.02747	5	18	90.F	0.000					0.000	48571.
OCT	5.33917	1	18	83.F	-8.489	31	7	43.F	39.F	-185.514	50190.
NOV	0.00000				-27.057	2	4	17.F	15.F	-310.865	48571.
DEC	0.00000				-128.658	8	10	24.F	22.F	-650.391	50190.
TOTAL MAX	1451.029				-468.923					-820.753	590934.

DOE-2.1D 5/11/1995 13:46: 9 SDL RUN 1  
 ENL MEN BARRACKS W/O DIN TOPEKA, KS

EZDOE - ELITE SOFTWARE DEVELOPMENT INC  
 RUN #2 DDC CONTROL OF BLDG. 7618 MULTIZONE

EMC ENGINEERS INC. 80227  
 DENVER, CO SYSTEM MONTHLY LOAD HOURS FOR

N U M B E R O F H O U R S												
MONTH	HOURS COOLING LOAD	HOURS HEATING LOAD	HOURS COOL-HEAT LOAD	HOURS COINCIDENT LOAD	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.	HOURS FANS ON	HOURS FANS ON CYCLE	HOURS NIGHT VENTING	HOURS FLOATING WHEN FANS ON	COINCIDENT HEATING LOAD AT COOLING PEAK (KBTU/HR)	COINCIDENT ELECTRIC LOAD AT COOLING PEAK (KW)
JAN	0	695	0	0	744	0	744	0	0	49	-79.229	33.650
FEB	0	630	0	0	672	0	672	0	0	42	-69.146	33.650
MAR	0	543	0	0	744	0	744	0	0	201	-122.456	33.650
APR	0	363	0	0	720	0	720	0	0	357	-23.510	33.650
MAY	384	158	0	0	360	384	744	0	0	202	0.000	33.650
JUN	720	0	0	0	720	720	720	0	0	0	0.000	98.953
JUL	744	0	0	0	744	744	744	0	0	0	0.000	98.953
AUG	744	0	0	0	744	744	744	0	0	0	0.000	98.953
SEP	720	0	0	0	720	720	720	0	0	0	0.000	98.953
OCT	24	376	0	0	24	0	744	0	0	344	0.000	98.953
NOV	0	470	0	0	720	0	720	0	0	250	-169.767	33.650
DEC	0	684	0	0	744	0	744	0	0	60	-194.766	33.650
ANNUAL	3336	3919	0	0	5424	3336	8760	0	0	1505		

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/11/1995 13:46: 9 PDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL OF BLDG. 7618 ENL MEN BARRACKS W/O DIN  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY TOTAL (MBTU) PEAK (KBTU) DY/HR	NATURAL-GAS TOTAL (MBTU) PEAK (KBTU) DY/HR
JAN	182.084 359.088 28/ 8	182.084 359.088 28/ 8	224.874 1032.776 4/ 3
FEB	163.367 359.088 27/18	163.367 359.088 27/18	140.373 828.039 1/23
MAR	177.160 359.088 31/ 9	177.160 359.088 31/ 9	90.855 783.711 3/ 4
APR	167.934 353.851 5/ 9	167.934 353.851 5/ 9	18.367 367.847 4/10
MAY	225.990 643.814 30/18	225.990 643.814 30/18	6.293 149.029 3/22
JUN	284.679 653.619 19/19	284.679 653.619 19/19	0.000 0.000 30/ 1
JUL	309.142 679.873 23/19	309.142 679.873 23/19	0.000 0.000 31/ 1
AUG	312.468 693.323 24/18	312.468 693.323 24/18	0.000 0.000 31/ 1
SEP	260.260 670.206 5/18	260.260 670.206 5/18	0.000 0.000 30/ 1
OCT	175.771 519.934 1/18	175.771 519.934 1/18	17.232 312.092 31/ 7
NOV	169.783 359.088 3/ 9	169.783 359.088 3/ 9	47.927 467.427 2/ 4
DEC	181.531 359.088 31/ 9	181.531 359.088 31/ 9	197.532 850.828 8/10
	ONE YEAR USE/PEAK	2610.166 693.323	743.454 1032.776

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/11/1995 13:46: 9 PDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL OF BLDG. 7618 ENL MEN BARRACKS W/O DIN  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

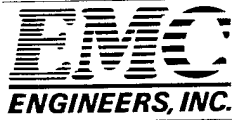
ENERGY TYPE	ELECTRICITY	NATURAL-GAS
IN SITE MBTU -		
CATEGORY OF USE		
SPACE HEAT	32.24	743.46
SPACE COOL	502.80	0.00
HVAC AUX	951.77	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	612.35	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	511.10	0.00
TOTAL	2610.26	743.46

TOTAL SITE ENERGY 3353.62 MBTU 80.1 KBTU/SQFT-YR GROSS-AREA 240.3 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 8581.79 MBTU 204.9 KBTU/SQFT-YR GROSS-AREA 614.8 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 0.7  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

**COMPUTER ENERGY SIMULATIONS**

**BLDG. 409**

**BARRACKS BLOCK-TYPE BUILDINGS**



DENVER - ATLANTA

PROJECT: FEASIBILITY STUDY FOR  
 INSTALLATION OF UMCS  
 LOCATION: FORT RILEY, KANSAS

BUILDING NO.: 409  
 BLDG. TYPE: ENL BARRACKS W/AS

EMC NO: 1406-001  
 CALC. BY: AJN  
 CHECKED BY: CEL  
 DATE: 05-Jul-95

**ENERGY CONSTANT CALCULATIONS**

	BASERUN	RUN1	RUN2	RUN3	RUN4	RUN5
HEATING (MBtu)	332.6	299.0	265.6	291.4	0.0	269.7
COOLING (kWH)	149,754	149,640	144,770	144,122	0	147,615

SUPPLY AIR FAN	6,360 CFM
FLOOR AREA	5,304 FT <sup>2</sup>
CFM1	890 CFM
UA	1779 BTU/HR-°F
BLDG CONSTR.	2 (1 FOR LIGHT ) (2 FOR HEAVY)

EZDOE COMPUTER RUN DEFINITION:	
BASERUN	EXISTING OPERATION
RUN1	NIGHT SETBACK
RUN2	DDC CONTROL
RUN3	ECONOMIZER
RUN4	NIGHTTIME INFILTRATION (OA)
RUN5	DAYTIME INFILTRATION (OA)

HOURS OF OCCUPANCY				ANNUAL HEATING & COOLING HOURS	
M-F	0	2400	120 HR	HR. ON HEATING	5448 HR/YR
SAT.	0	2400	24 HR	HR. ON COOLING	3312 HR/YR
SUN.	0	2400	24 HR	HR. OFF HEATING	0 HR/YR
	TOTAL OCCUPY HR.		168 HR/WK	HR. OFF COOLING	0 HR/YR
	TOTAL UNOCC. HR.		0 HR/WK		
	ANNUAL OCCUPY HR.		8760 HR/YR		
	ANNUAL UNOCC. HR.		0 HR/YR		

PRESENT HR. OF OPERATION FOR SYS. WITH HEATING AND COOLING 8760 HR/YR  
 PRESENT HR. OF OPERATION FOR SYS. WITH HEATING ONLY 5448 HR/YR  
 PRESENT HR. OF OPERATION FOR SYS. WITH COOLING ONLY 3312 HR/YR  
 HRS SAVED (HTG ONLY) 5448 - 5448 = 0 HR/YR  
 HRS SAVED (CLG ONLY) 3312 - 3312 = 0 HR/YR

HOAUHC	332.58 MBtu	-	0 MBtu	=	0.00E+00 Btu/CFM-HR
	890.4 CFM	x	0 HR/YR		
HOAUH	332.58 MBtu	-	0 MBtu	=	0.00E+00 Btu/CFM-HR
	890.4 CFM	x	0 HR/YR		
COAUHC	149,753.9 kWH	-	0.0 kWH	=	0.00E+00 kWH/CFM-HR
	890.4 CFM	x	0 HR/YR		
COAUHC	149,753.9 kWH	-	0.0 kWH	=	0.00E+00 kWH/CFM-HR
	890.4 CFM	x	0 HR/YR		
HOAOHC	332.58 MBtu	-	269.68 MBtu	=	8.06E+00 Btu/CFM-HR
	890.4 CFM	x	8760 HR/YR		
HOAOH	332.58 MBtu	-	269.68 MBtu	=	1.30E+01 Btu/CFM-HR
	890.4 CFM	x	5448 HR/YR		
COAOHC	149,753.9 kWH	-	147,615.0 kWH	=	2.74E-04 kWH/CFM-HR
	890.4 CFM	x	8760 HR/YR		
COAOHC	149,753.9 kWH	-	147,615.0 kWH	=	7.25E-04 kWH/CFM-HR
	890.4 CFM	x	3312 HR/YR		
DC DUTY	1 / 6 (10 MINUTES PER HOUR)			=	0.17
DC DEMAND	1 / 6 (10 MINUTES PER HOUR)			=	0.17
ECC	149,753.9 kWH	-	144,122.5 kWH	=	2.67E-04 kWH/CFM-HR
	6360 CFM	x	3312 HR/YR		
ECHC	149,753.9 kWH	-	144,122.5 kWH	=	1.01E-04 kWH/CFM-HR
	6360 CFM	x	8760 HR/YR		
NSUCHC	149,753.9 kWH	-	149,639.6 kWH	=	0.00E+00 kWH/CFM-HR
	6360 CFM	x	0 HR/YR		
NSUCC	149,753.9 kWH	-	149,639.6 kWH	=	0.00E+00 kWH/CFM-HR
	6360 CFM	x	0 HR/YR		
DDCCHC	149,753.9 kWH	-	144,770.0 kWH	=	8.95E-05 kWH/CFM-HR
	6360 CFM	x	8760 HR/YR		
DDCCC	149,753.9 kWH	-	144,770.0 kWH	=	2.37E-04 kWH/CFM-HR
	6360 CFM	x	3312 HR/YR		
NSC	332.58 MBtu	-	298.99 MBtu	=	1.89E+04 Btu/UA
	1778.644 UA				
DDCH	332.58 MBtu	-	265.64 MBtu	=	3.76E+04 Btu/UA
	1778.644 UA				
OPT	(2 HR/DAY X 240 DAY/YR)		175 HR/YR	=	0 HR/YR
CHWR	(1.10 kW X 0.012 Eff. X 664 HRS X 2 Degrees of Reset)			=	17.5 kWH/TON
OAR	567 HR/YR	x	0.01	=	5.67 HR/YR



INPUT LOADS ..

```

$-----$
$ E Z - D O E   L O A D S   I N P U T $
$-----$

```

\$ GENERAL PROJECT DATA

```

TITLE LINE-1 *      EMC      ENGINEERS      INC.      *
LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
LINE-3 *      DENVER,      CO      80227      *

LINE-4 *BASELINE SIMULATION FOR BLDG #409      *
LINE-5 *ENL BARRACKS W/AS      * ..

```

```

ABORT          ERRORS ..
DIAGNOSTIC     WARNINGS ..
LOADS-REPORT   VERIFICATION=(LV-D)
               SUMMARY=(LS-C,LS-D)
               HOURLY-DATA-SAVE = YES ..
BUILDING-LOCATION LATITUDE = 39.0
                LONGITUDE = 96.5
                ALTITUDE = 1065.
                TIME-ZONE = 6
                GROSS-AREA = 5304
                SHIELDING-COEF = 0.29
                X-REF = 0.0
                Y-REF = 0.0 ..
RUN-PERIOD     JAN 1 1994 THRU DEC 31 1994 ..

```

\$ SCHEDULES

```

LD_ON          =DAY-SCHEDULE (1,24) (1.) ..
LD_OFF         =DAY-SCHEDULE (1,24) (0.) ..

LD_PEOPLEW    =DAY-SCHEDULE (1,5) (1.)
                  (6,7) (0.75)
                  (8,10) (0.25)
                  (11,13) (0.5,0.75,0.5)
                  (14,16) (0.25)
                  (17,19) (0.75)
                  (20,24) (1.) ..

LD_PEEPLEE    =DAY-SCHEDULE (1,8) (1.)
                  (9,23) (0.75)
                  (24) (1.) ..

LD_LIT/EQW    =DAY-SCHEDULE (1,5) (0.1)
                  (6,7) (0.5,0.75)
                  (8,20) (1.)
                  (21,22) (0.75,0.5)
                  (23,24) (0.1) ..

```

LD\_LIT/EQE =DAY-SCHEDULE (1,7) (0.1)  
(8,9) (0.25,0.75)  
(10,22) (1.)  
(23,24) (0.75,0.5) ..

LD\_PE\_ENTW =DAY-SCHEDULE (1,5) (0.)  
(6,7) (0.25)  
(8,17) (0.1)  
(18) (0.75)  
(19,22) (1.)  
(23,24) (0.5,0.1) ..

LD\_PE\_ENTE =DAY-SCHEDULE (1) (0.2)  
(2,6) (0.)  
(7,8) (0.2)  
(9) (0.75)  
(10,24) (1.) ..

LW\_PEOPLE =WEEK-SCHEDULE (WD) LD\_PEOPLEW  
(WEH) LD\_PEOPLEE ..

LW\_LIT/EQP =WEEK-SCHEDULE (WD) LD\_LIT/EQW  
(WEH) LD\_LIT/EQE ..

LW\_PEO\_ENT =WEEK-SCHEDULE (WD) LD\_PE\_ENTW  
(WEH) LD\_PE\_ENTE ..

LW\_ON =WEEK-SCHEDULE (ALL) LD\_ON ..

LW\_OFF =WEEK-SCHEDULE (ALL) LD\_OFF ..

\$ ON 100% LOADS

L\_ON =SCHEDULE THRU DEC 31 LW\_ON ..

\$ OFF 100% LOADS

L\_OFF =SCHEDULE THRU DEC 31 LW\_OFF ..

\$ PEOPLE LOAD

L\_PEOPLE =SCHEDULE THRU DEC 31 LW\_PEOPLE ..

\$ LIGHTS AND EQUIPMENT

L\_EQUI/LIG =SCHEDULE THRU DEC 31 LW\_LIT/EQP ..

\$ POOL/TV\_ROOM ENTERTAINMT

L\_PEO\_ENT =SCHEDULE THRU DEC 31 LW\_PEO\_ENT ..

\$ CONSTRUCTION TYPES



## \$ SAND-BLOCK, AIRSPACE, GYP

EXWALL-1 =LAYERS MATERIAL=(CB17,CB07,AL11,GP02)  
 THICKNESS=(1.000,0.500,0.000,0.052) ..  
 EXWALL =CONSTRUCTION LAYERS = EXWALL-1  
 ABSORPTANCE = 0.820  
 ROUGHNESS = 2 ..

## \$ SLAB FLOOR

FLOOR =CONSTRUCTION U-VALUE = 0.020  
 ABSORPTANCE = 0.610  
 ROUGHNESS = 5 ..

## \$ SHINGLE COVERED ROOF

ROOFSHNG =LAYERS MATERIAL=(AR02,HF-E3,PW05,AL33,IN03,GP03)  
 THICKNESS=(0.000,0.031,0.063,0.000,0.511,0.063) ..  
 SHNGROOF =CONSTRUCTION LAYERS = ROOFSHNG  
 ABSORPTANCE = 0.910 ..

## \$ STANDARD WOOD DOOR

DOOR-STD =LAYERS MATERIAL=(WD01,IN31,WD01) I-F-R= 0.6100  
 THICKNESS=(0.063,0.042,0.063) ..  
 DOOR-WOD =CONSTRUCTION LAYERS = DOOR-STD  
 ABSORPTANCE = 0.860  
 ROUGHNESS = 5 ..

## SP\_W/\_ST =GLASS-TYPE

GLASS-TYPE-CODE = 2  
 PANES = 2 ..

## \$ SPACE DESCRIPTION

SW\_ROOMS =SPACE AREA = 1140.0 VOLUME = 29640.0  
 TEMPERATURE = (73.) ZONE-TYPE = CONDITIONED  
 PEOPLE-SCHEDULE = L\_PEOPLE NUMBER-OF-PEOPLE = 16.0  
 PEOPLE-HG-LAT = 625.0 PEOPLE-HG-SENS = 375.0  
 LIGHTING-TYPE = SUS-FLUOR LIGHTING-W/SQFT = 1.27  
 LIGHT-TO-SPACE = 1.0 LIGHTING-SCHEDULE = L\_EQUI/LIG  
 EQUIP-SCHEDULE = L\_EQUI/LIG EQUIPMENT-KW = 1.46  
 FURN-WEIGHT = 0.8 INF-METHOD = NONE ..

E-W HEIGHT = 26.0 WIDTH = 76.0 CONS = EXWALL  
 AZIMUTH = 225 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 8.0 WIDTH = 3.5 G-T = SP\_W/\_ST  
 MULTIPLIER = 13.0 SETBACK = 1.0  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5  
 OVERHANG-A = 10. OVERHANG-W = 23.5  
 OVERHANG-D = 9. ..

DOOR HEIGHT = 7.5 WIDTH = 3.5 CONS = SHNGROOF  
 MULTIPLIER = 2.0 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 26.0 WIDTH = 15.0 CONS = EXWALL  
 AZIMUTH = 315 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 8.0 WIDTH = 3.5 G-T = SP\_W/\_ST  
 MULTIPLIER = 2.0 SETBACK = 1.0  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5  
 OVERHANG-A = 10. OVERHANG-W = 23.5  
 OVERHANG-D = 9. ..

ROOF HEIGHT = 15.0 WIDTH = 76.0 CONS = SHNGROOF  
 TILT = 0 SKY-FORM-FACTOR = 0.75  
 GND-FORM-FACTOR = 0.25 ..

NE\_ROOMS =SPACE AREA = 1140.0 VOLUME = 29640.0  
 TEMPERATURE = (73.) ZONE-TYPE = CONDITIONED  
 PEOPLE-SCHEDULE = L\_PEOPLE NUMBER-OF-PEOPLE = 16.0  
 PEOPLE-HG-LAT = 625.0 PEOPLE-HG-SENS = 375.0  
 LIGHTING-TYPE = SUS-FLUOR LIGHTING-W/SQFT = 1.27  
 LIGHT-TO-SPACE = 1.0 LIGHTING-SCHEDULE = L\_EQUI/LIG  
 EQUIP-SCHEDULE = L\_EQUI/LIG EQUIPMENT-KW = 1.46  
 FURN-WEIGHT = 0.8 INF-METHOD = NONE ..

E-W HEIGHT = 26.0 WIDTH = 76.0 CONS = EXWALL  
 AZIMUTH = 45 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 8.0 WIDTH = 3.5 G-T = SP\_W/\_ST  
 MULTIPLIER = 13.0 SETBACK = 1.0  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5  
 OVERHANG-A = 10. OVERHANG-W = 23.5  
 OVERHANG-D = 9. ..

DOOR HEIGHT = 7.5 WIDTH = 3.5 CONS = SHNGROOF  
 MULTIPLIER = 2.0 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 26.0 WIDTH = 15.0 CONS = EXWALL  
 AZIMUTH = 315 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 8.0 WIDTH = 3.5 G-T = SP\_W/\_ST  
 MULTIPLIER = 2.0 SETBACK = 1.0  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5  
 OVERHANG-A = 10. OVERHANG-W = 23.5  
 OVERHANG-D = 9. ..

ROOF HEIGHT = 15.0 WIDTH = 76.0 CONS = SHNGROOF  
 TILT = 0 SKY-FORM-FACTOR = 0.75  
 GND-FORM-FACTOR = 0.25 ..

TV/POOL\_RM =SPACE AREA = 2200.0 VOLUME = 28600.0  
 TEMPERATURE = (73.) ZONE-TYPE = CONDITIONED  
 PEOPLE-SCHEDULE = L\_PEO\_ENT NUMBER-OF-PEOPLE = 10.0

PEOPLE-HG-LAT = 625.0 PEOPLE-HG-SENS = 375.0  
 LIGHTING-TYPE = SUS-FLUOR LIGHTING-KW = 2.05  
 LIGHT-TO-SPACE = 1.0 LIGHTING-SCHEDULE = L\_EQUI/LIG  
 EQUIP-SCHEDULE = L\_EQUI/LIG EQUIPMENT-KW = 0.3  
 FURN-WEIGHT = 0.8 INF-METHOD = NONE ..

E-W HEIGHT = 5.0 WIDTH = 40.0 CONS = EXWALL  
 AZIMUTH = 45 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 3.0 WIDTH = 4.0 G-T = SP\_W/\_ST  
 MULTIPLIER = 3.0 SETBACK = 1.0  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5  
 OVERHANG-A = 10. OVERHANG-W = 23.5  
 OVERHANG-D = 9. ..

E-W HEIGHT = 5.0 WIDTH = 55.0 CONS = EXWALL  
 AZIMUTH = 315 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 3.0 WIDTH = 4.0 G-T = SP\_W/\_ST  
 MULTIPLIER = 6.0 SETBACK = 1.0  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5  
 OVERHANG-A = 10. OVERHANG-W = 23.5  
 OVERHANG-D = 9. ..

E-W HEIGHT = 5.0 WIDTH = 55.0 CONS = EXWALL  
 AZIMUTH = 135 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 3.0 WIDTH = 4.0 G-T = SP\_W/\_ST  
 MULTIPLIER = 6.0 SETBACK = 1.0  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5  
 OVERHANG-A = 10. OVERHANG-W = 23.5  
 OVERHANG-D = 9. ..

U-W HEIGHT = 8.0 WIDTH = 170.0 CONS = FLOOR ..

U-W HEIGHT = 40.0 WIDTH = 55.0 CONS = FLOOR ..

BASE\_HALL =SPACE AREA = 824.0 VOLUME = 10712.0  
 TEMPERATURE = (73.) ZONE-TYPE = CONDITIONED  
 PEOPLE-SCHEDULE = L\_PEO\_ENT NUMBER-OF-PEOPLE = 3.0  
 PEOPLE-HG-LAT = 625.0 PEOPLE-HG-SENS = 375.0  
 LIGHTING-TYPE = SUS-FLUOR LIGHTING-KW = 0.6  
 LIGHT-TO-SPACE = 1.0 LIGHTING-SCHEDULE = L\_EQUI/LIG  
 EQUIP-SCHEDULE = L\_EQUI/LIG FURN-WEIGHT = 0.8  
 INF-METHOD = NONE ..

E-W HEIGHT = 4.0 WIDTH = 23.0 CONS = EXWALL  
 AZIMUTH = 225 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 3.0 WIDTH = 3.5 G-T = SP\_W/\_ST  
 MULTIPLIER = 2.0 SETBACK = 1.0

SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5  
OVERHANG-A = 10. OVERHANG-W = 23.5  
OVERHANG-D = 9. ..

E-W HEIGHT = 4.0 WIDTH = 17.0 CONS = EXWALL  
AZIMUTH = 135 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 4.0 WIDTH = 10.0 CONS = EXWALL  
AZIMUTH = 45 INSIDE-VIS-REFL = 0.2 ..

WINDOW HEIGHT = 3.0 WIDTH = 3.5 G-T = SP\_W/\_ST  
SETBACK = 1.0 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 OVERHANG-A = 10.  
OVERHANG-W = 23.5 OVERHANG-D = 9. ..

U-W HEIGHT = 9.0 WIDTH = 23.0 CONS = FLOOR  
AZIMUTH = 225 ..

U-W HEIGHT = 9.0 WIDTH = 17.0 CONS = FLOOR  
AZIMUTH = 135 ..

U-W HEIGHT = 9.0 WIDTH = 10.0 CONS = FLOOR  
AZIMUTH = 45 ..

U-W HEIGHT = 16.0 WIDTH = 51.5 CONS = FLOOR ..

END ..

COMPUTE LOADS ..

INPUT SYSTEMS ..

\$-----\$  
\$ E Z - D O E S Y S T E M S I N P U T \$  
\$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
LINE-3 \* DENVER, CO 80227 \*  
  
LINE-4 \*BASELINE SIMULATION FOR BLDG #409 \*  
LINE-5 \*ENL BARRACKS W/AS \* ..  
ABORT ERRORS ..  
DIAGNOSTIC WARNINGS ..  
SYSTEMS-REPORT VERIFICATION=(SV-A)  
SUMMARY=(SS-A,SS-C,SS-K,SS-O)  
HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

SD\_ON =DAY-SCHEDULE (1,24) (1.) ..  
SD\_OFF =DAY-SCHEDULE (1,24) (0.) ..

```

SD_WT_HT  =DAY-SCHEDULE (1,24) (74.) ..
SD_SM_CL  =DAY-SCHEDULE (1,24) (72.) ..
SD_WT_CL  =DAY-SCHEDULE (1,16) (74.2)
           (17) (74.27)
           (18,24) (74.2) ..
SD_SM_HT  =DAY-SCHEDULE (1,24) (71.8) ..
SD_OA_FRAC =DAY-SCHEDULE (1,24) (0.14) ..

SW_ON     =WEEK-SCHEDULE (ALL) SD_ON  ..
SW_OFF    =WEEK-SCHEDULE (ALL) SD_OFF ..
SW_WT_HT  =WEEK-SCHEDULE (ALL) SD_WT_HT ..
SW_SM_CL  =WEEK-SCHEDULE (ALL) SD_SM_CL ..
SW_WT_CL  =WEEK-SCHEDULE (ALL) SD_WT_CL ..
SW_SM_HT  =WEEK-SCHEDULE (ALL) SD_SM_HT ..
SW_OA_FRAC =WEEK-SCHEDULE (ALL) SD_OA_FRAC ..

```

## \$ FULL ON SYSTEM

```
S_ON      =SCHEDULE THRU DEC 31 SW_ON  ..
```

## \$ FULL OFF SYSTEM

```
S_OFF     =SCHEDULE THRU DEC 31 SW_OFF ..
```

## \$ HEATING SEASON

```
S_HE-SCHED =SCHEDULE THRU MAY 15 SW_ON
            THRU OCT  1 SW_OFF
            THRU DEC 31 SW_ON  ..
```

## \$ COOLING SEASON

```
S_CL_SCHED =SCHEDULE THRU MAY 15 SW_OFF
            THRU OCT  1 SW_ON
            THRU DEC 31 SW_OFF ..
```

## \$ HEATING SET TEMP

```
S_HT_SET_F =SCHEDULE THRU MAY 15 SW_WT_HT
            THRU OCT  1 SW_SM_HT
            THRU DEC 31 SW_WT_HT ..
```

## \$ COOLING SET TEMP

```
S_CL_SET_F =SCHEDULE THRU MAY 15 SW_WT_CL
            THRU OCT  1 SW_SM_CL
            THRU DEC 31 SW_WT_CL ..
```

## \$ HRLY-RPT =SCHEDULE THRU JAN 20 SW\_OFF

```

            THRU JAN 21 SW_ON
            THRU AUG 14 SW_OFF
            THRU AUG 15 SW_ON
            THRU DEC 31 SW_OFF ..
```

```
S_OA_FRACT =SCHEDULE THRU DEC 31 SW_OA_FRAC ..
```

## \$ ZONE DESCRIPTION

SW\_ROOMS =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
 SIZING-OPTION = FROM-LOADS ..

NE\_ROOMS =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
 SIZING-OPTION = FROM-LOADS ..

TV/POOL\_RM =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
 SIZING-OPTION = FROM-LOADS ..

BASE\_HALL =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
 SIZING-OPTION = FROM-LOADS ..

## \$ SYSTEM DESCRIPTION

MZ-ZN\_1&2 =SYSTEM SYSTEM-TYPE = MZS  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_HE-SCHED  
 COOLING-SCHEDULE = S\_CL\_SCHED PREHEAT-T = 0.0  
 OA-CONTROL = FIXED SUPPLY-CFM = 6115.  
 RATED-CFM = 6115. MIN-OUTSIDE-AIR = 0.14  
 MIN-AIR-SCH = S\_OA\_FRACT MAX-OA-FRACTION = 0.14  
 SUPPLY-DELTA-T = 2.7 SUPPLY-KW = 0.00088  
 MOTOR-PLACEMENT = OUTSIDE-AIRFLOW  
 NIGHT-CYCLE-CTRL = STAY-OFF NIGHT-VENT-DT = 0.0  
 MIN-CFM-RATIO = 1.0 COOLING-CAPACITY = 151000.  
 COOL-SH-CAP = 127000. HEATING-CAPACITY = -174600.  
 RETURN-AIR-PATH = DUCT  
 ZONE-NAMES = (SW\_ROOMS, NE\_ROOMS) ..

MZ-ZN\_3&4 =SYSTEM SYSTEM-TYPE = MZS  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_HE-SCHED  
 COOLING-SCHEDULE = S\_CL\_SCHED PREHEAT-T = 0.0  
 OA-CONTROL = FIXED SUPPLY-CFM = 1950.  
 RATED-CFM = 1950. MIN-OUTSIDE-AIR = 0.14  
 MIN-AIR-SCH = S\_OA\_FRACT MAX-OA-FRACTION = 0.14  
 SUPPLY-DELTA-T = 2.7 SUPPLY-KW = 0.00088  
 MOTOR-PLACEMENT = OUTSIDE-AIRFLOW

NIGHT-CYCLE-CTRL = STAY-OFF NIGHT-VENT-DT = 0.0  
 MIN-CFM-RATIO = 1.0 COOLING-CAPACITY = 50400.  
 COOL-SH-CAP = 40700. HEATING-CAPACITY = -42200.  
 RETURN-AIR-PATH = DUCT  
 ZONE-NAMES = (TV/POOL\_RM, BASE\_HALL) ..

\$ HOURLY REPORT DESCRIPTION

ZONE1-BLK =REPORT-BLOCK VARIABLE-TYPE = SW\_ROOMS  
                                   VARIABLE-LIST = (17,18,7,6) ..  
 ZONE3-BLK =REPORT-BLOCK VARIABLE-TYPE = TV/POOL\_RM  
                                   VARIABLE-LIST = (17,18,7,6) ..  
 AHU-1-BLK =REPORT-BLOCK VARIABLE-TYPE = MZ-ZN\_1&2  
                                   VARIABLE-LIST = (3,5,6,18,19,17) ..  
 AHU-2-BLK =REPORT-BLOCK VARIABLE-TYPE = MZ-ZN\_3&4  
                                   VARIABLE-LIST = (3,5,6,18,19,17) ..  
 HRLY-ZN-1 = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
                                   REPORT-BLOCK = (ZONE1-BLK)  
 ..  
 HRLY-ZN-3 = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
                                   REPORT-BLOCK = (ZONE3-BLK)  
 ..  
 HRLY-AHU-1 = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
                                   REPORT-BLOCK = (AHU-1-BLK)  
 ..  
 HRLY-AHU-2 = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
                                   REPORT-BLOCK = (AHU-2-BLK)  
 ..  
 END ..  
 COMPUTE SYSTEMS ..  
 INPUT PLANT ..

\$-----\$  
 \$ E Z - D O E P L A N T S I N P U T \$  
 \$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
 LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
 LINE-3 \* DENVER, CO 80227 \*  
 LINE-4 \*BASELINE SIMULATION FOR BLDG #409 \*  
 LINE-5 \*ENL BARRACKS W/AS \* ..

ABORT ERRORS ..  
 DIAGNOSTIC WARNINGS ..  
 PLANT-REPORT VERIFICATION=(PV-A)  
 SUMMARY=(PS-B,BEPS)  
 HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

PD\_ON =DAY-SCHEDULE (1,24) (1.) ..

PD\_OFF =DAY-SCHEDULE (1,24) (0.) ..

PW\_OFF =WEEK-SCHEDULE (ALL) PD\_OFF ..

PW\_ON =WEEK-SCHEDULE (ALL) PD\_ON ..

\$ HEATING SEASON

P\_HEAT =SCHEDULE THRU MAY 15 PW\_ON  
THRU OCT 1 PW\_OFF  
THRU DEC 31 PW\_ON ..

\$ COOLING SEASON

P\_COOL =SCHEDULE THRU MAY 15 PW\_OFF  
THRU OCT 1 PW\_ON  
THRU DEC 31 PW\_OFF ..

\$ EQUIPMENT DESCRIPTION

BOILSTM =PLANT-EQUIPMENT TYPE = STM-BOILER  
SIZE = -999. ..

REC-CHILLR =PLANT-EQUIPMENT TYPE = HERM-REC-CHLR  
SIZE = -999. INSTALLED-NUMBER = 2  
MAX-NUMBER-AVAIL = 2 ..

PLANT-PARAMETERS BOILER-FUEL = NATURAL-GAS HERM-REC-COND-TYPE = AIR  
CCIRC-HEAD = 0.0 HCIRC-HEAD = 0.0 ..

ENERGY-RESOURCE RESOURCE = ELECTRICITY ..

ENERGY-RESOURCE RESOURCE = NATURAL-GAS ..

HEAT-SEASO =LOAD-ASSIGNMENT TYPE = HEATING  
OPERATION-MODE = RUN-NEEDED

LOAD-RANGE = 0.000  
PLANT-EQUIPMENT = BOILSTM  
NUMBER = 1 ..

COOL-SEASO =LOAD-ASSIGNMENT TYPE = COOLING  
OPERATION-MODE = RUN-NEEDED

LOAD-RANGE = 0.000  
PLANT-EQUIPMENT = REC-CHILLR  
NUMBER = 2 ..

END ..

COMPUTE PLANT ..



Path: C:\ELITE\EZDOE

File: MOD409 .INP 21,492 .a.. 6-12-95 12:33:08

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STOP ..

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 6/12/1995 12:33:17 LDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG #409 ENL BARRACKS W/AS  
 REPORT- LV-D DETAILS OF EXTERIOR SURFACES IN THE PROJECT TOPEKA, KS

NUMBER OF EXTERIOR SURFACES 12 RECTANGULAR 12 OTHER 0  
 (U-VALUE INCLUDES INSIDE AIR FILM PLUS OUTSIDE AIR FILM AT 7.5 MPH WINDSPEED )

SURFACE	SPACE	U-VALUE (BTU/HR-SQFT-F)	AREA (SQFT)	U-VALUE (BTU/HR-SQFT-F)	AREA (SQFT)	W A L L + G L A S S - U-VALUE (BTU/HR-SQFT-F)	AREA (SQFT)	AZIMUTH
NE ROOMS		0.490	364.00	0.231	1612.00	0.278	1976.00	NORTH-EAST
TV/POOL_RM		0.490	36.00	0.231	164.00	0.277	200.00	NORTH-EAST
BASE_HALL		0.490	10.50	0.231	29.50	0.299	40.00	NORTH-EAST
BASE_HALL		0.000	0.00	0.231	68.00	0.231	68.00	SOUTH-EAST
TV/POOL_RM		0.490	72.00	0.231	203.00	0.299	275.00	SOUTH-EAST
SW ROOMS		0.490	364.00	0.231	1612.00	0.278	1976.00	SOUTH-EAST
BASE_HALL		0.490	21.00	0.231	71.00	0.290	92.00	SOUTH-WEST
SW ROOMS		0.490	56.00	0.231	334.00	0.268	390.00	NORTH-WEST
TV/POOL_RM		0.490	72.00	0.231	203.00	0.299	275.00	NORTH-WEST
NE ROOMS		0.490	56.00	0.231	334.00	0.268	390.00	NORTH-WEST
SW ROOMS		0.000	0.00	0.041	1140.00	0.041	1140.00	ROOF
NE ROOMS		0.000	0.00	0.041	1140.00	0.041	1140.00	ROOF
TV/POOL_RM		0.000	0.00	0.020	1360.00	0.020	1360.00	UNDERGRND
TV/POOL_RM		0.000	0.00	0.020	2200.00	0.020	2200.00	UNDERGRND
BASE_HALL		0.000	0.00	0.020	207.00	0.020	207.00	UNDERGRND
BASE_HALL		0.000	0.00	0.020	153.00	0.020	153.00	UNDERGRND
BASE_HALL		0.000	0.00	0.020	90.00	0.020	90.00	UNDERGRND
BASE_HALL		0.000	0.00	0.020	824.00	0.020	824.00	UNDERGRND

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 6/12/1995 12:33:17 LDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG #409 ENL BARRACKS W/AS  
 REPORT- LV-D DETAILS OF EXTERIOR SURFACES IN THE PROJECT TOPEKA, KS

NORTH-EAST	SOUTH-EAST	SOUTH-WEST	NORTH-WEST	ROOF	ALL WALLS	WALLS+ROOFS	UNDERGRND	BUILDING	AVERAGE U-VALUE/GLASS (BTU/HR-SQFT-F)	AVERAGE U-VALUE WALLS+GLASS (BTU/HR-SQFT-F)	GLASS AREA (SQFT)	OPAQUE AREA (SQFT)	GLASS+OPAQUE AREA (SQFT)
									0.490	0.279	410.50	1805.50	2216.00
									0.490	0.285	72.00	271.00	343.00
									0.490	0.279	385.00	1683.00	2068.00
									0.490	0.276	184.00	871.00	1055.00
									0.000	0.041	0.00	2280.00	2280.00
									0.490	0.279	1051.50	4630.50	5682.00
									0.490	0.210	1051.50	6910.50	7962.00
									0.000	0.020	0.00	4834.00	4834.00
									0.490	0.139	1051.50	11744.50	12796.00

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOB-2.1D 6/12/1995 12:33:17 LDL RUN 1  
 DENVER, CO 80227 ENL BARRACKS W/AS TOPEKA, KS  
 REPORT- LS-C BUILDING PEAK LOAD COMPONENTS

\*\*\* BUILDING \*\*\*

FLOOR AREA 5304 SOFT 493 SOMT  
 VOLUME 98592 CUFT 2792 CUMT

COOLING LOAD  
 JUL 23 5PM  
 DRY-BULB TEMP 97F 36C  
 WET-BULB TEMP 79F 26C

HEATING LOAD  
 JAN 28 5AM  
 -1F -18C  
 -2F -19C

	SENSIBLE (KBTU/H)	( KW )	LATENT (KBTU/H)	( KW )	SENSIBLE (KBTU/H)	( KW )	HEATING LOAD (KBTU/H)	( KW )
WALLS	12.782	3.743	0.000	0.000	-66.921	-19.600		
ROOFS	5.103	1.494	0.000	0.000	-6.980	-2.044		
GLASS CONDUCTION	11.154	3.267	0.000	0.000	-39.924	-11.693		
GLASS SOLAR	26.039	7.626	0.000	0.000	1.066	0.312		
DOOR	0.107	0.031	0.000	0.000	-0.325	-0.095		
INTERNAL SURFACES	0.000	0.000	0.000	0.000	0.000	0.000		
UNDERGROUND SURFACES	-0.868	-0.254	0.000	0.000	-2.776	-0.813		
OCCUPANTS TO SPACE	13.681	4.007	23.125	6.773	11.980	3.509		
LIGHT TO SPACE	16.782	4.915	0.000	0.000	4.737	1.387		
EQUIPMENT TO SPACE	10.145	2.971	0.000	0.000	2.220	0.650		
PROCESS TO SPACE	0.000	0.000	0.000	0.000	0.000	0.000		
INFILTRATION	0.000	0.000	0.000	0.000	0.000	0.000		
TOTAL	94.924	27.801	23.125	6.773	-96.924	-28.387		
TOTAL LOAD	118.049	KBTU/H	34.573	KW	-96.924	KBTU/H		
TOTAL LOAD / AREA	22.26BTU/H.SQFT		70.163	W /SQMT	18.274BTU/H.SQFT	57.608	W /SQMT	

\*\*\*\*\*  
 \* \* NOTE 1) THE ABOVE LOADS EXCLUDE OUTSIDE VENTILATION AIR \* \*  
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EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 6/12/1995 12:33:17 LDL RUN 1  
 DENVER, CO 80227 ENL BARRACKS W/AS TOPEKA, KS  
 REPORT- LS-D BUILDING MONTHLY LOADS SUMMARY

MONTH	C O O L I N G				H E A T I N G				E L E C						
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	TRICAL ENERGY (KWH)
JAN	0.21470	9	16	50.F	38.F	-33.117	28	5	-1.F	-2.F	-96.924	-2.F	-2.F	4378.	8.762
FEB	0.53246	13	17	54.F	46.F	-22.035	3	5	-1.F	-2.F	-80.606	-2.F	-2.F	3955.	8.762
MAR	2.88930	10	17	64.F	50.F	-13.465	4	5	14.F	12.F	-64.779	12.F	12.F	4383.	8.762
APR	14.07210	27	17	74.F	66.F	-2.435	1	3	36.F	32.F	-40.694	32.F	32.F	4239.	8.762
MAY	27.51047	31	17	90.F	76.F	-0.198	5	4	44.F	40.F	-12.358	40.F	40.F	4378.	8.762
JUN	37.07587	27	18	88.F	76.F	0.000	11	5	58.F	56.F	0.000	56.F	56.F	4241.	8.762
JUL	43.51595	23	16	97.F	79.F	0.000					0.000			4376.	8.762
AUG	42.90731	12	18	94.F	73.F	0.000					0.000			4383.	8.762
SEP	26.28091	7	17	91.F	74.F	-0.110	18	6	51.F	50.F	-9.381	50.F	50.F	4239.	8.762
OCT	13.10257	11	17	82.F	66.F	-1.998	20	4	25.F	25.F	-33.271	25.F	25.F	4376.	8.762
NOV	3.55864	23	16	70.F	58.F	-11.306	3	5	13.F	12.F	-58.599	12.F	12.F	4236.	8.762
DEC	0.43201	3	16	55.F	44.F	-28.657	15	5	8.F	7.F	-88.115	7.F	7.F	4378.	8.762
TOTAL	212.092					-113.321					-96.924			51562.	8.762
MAX															

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 6/12/1995 12:33:17 SDL RUN 1  
 DENVER, CO 80227 ENL BARRACKS W/AS TOPEKA, KS  
 REPORT- SV-A SYSTEM DESIGN PARAMETERS MZ-ZN\_1&2

SYSTEM NAME	ALTITUDE	MULTIPLIER	RETURN FAN			OUTSIDE AIR			COOLING CAPACITY			HEATING CAPACITY			EXTRACTION RATE		
			ELEC (KW)	DELTA-T (F)	FLOW (CFM)	DELTA-T (F)	RATIO	FLOW (KBTU/HR)	DELTA-T (F)	RATIO	FLOW (KBTU/HR)	DELTA-T (F)	RATIO	FLOW (KBTU/HR)	DELTA-T (F)	RATIO	FLOW (KBTU/HR)
MZ-ZN_1&2		1.040	5.381	2.6	0.	0.091	151.000	0.0	0.0	151.000	0.091	151.000	0.0	0.0	151.000	0.091	151.000
SW_ROOMS		3180.	0.	0.	0.	1.000	290.	1.000	1.000	290.	1.000	290.	0.00	0.00	42.63	0.00	42.63
NE_ROOMS		3180.	0.	0.	0.	1.000	290.	1.000	1.000	290.	1.000	290.	0.00	0.00	42.63	0.00	42.63

EMC ENGINEERS INC. DOE-2.1D 6/12/1995 12:33:17 SDL RUN 1  
 DENVER, CO 80227 EZDOE - ELITE SOFTWARE DEVELOPMENT INC ENL BARRACKS W/AS  
 REPORT- SV-A SYSTEM DESIGN PARAMETERS MZ-ZN\_3&4 BASELINE SIMULATION FOR BLDG #409 TOPEKA, KS

SYSTEM NAME	ALTITUDE MULTIPLIER	RETURN FAN (CFM)	ELEC (KW)	DELTA-T (F)	OUTSIDE AIR RATIO	COOLING CAPACITY (KBTU/HR)	SENSIBLE (SHR)	HEATING CAPACITY (KBTU/HR)	COOLING EIR (BTU/BTU)	HEATING EIR (BTU/BTU)	HEATING ADDITION RATE (KBTU/HR)	MULTIPLIER
MZ-ZN_3&4	1.040	0.	0.000	0.0	0.088	50.400	0.808	-42.200	0.00	0.00		1.0
TV/POOL_RM		0.	0.000	1.000	143.	0.00	0.00	21.59	0.00	0.00	-25.97	1.0
BASE_HALL		0.	0.000	1.000	35.	0.00	0.00	5.29	0.00	0.00	-6.36	1.0

EMC ENGINEERS INC. DOE-2.1D 6/12/1995 12:33:17 SDL RUN 1  
 DENVER, CO 80227 EZDOE - ELITE SOFTWARE DEVELOPMENT INC ENL BARRACKS W/AS  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR MZ-ZN\_1&2 TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C			
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	MAXIMUM ELEC LOAD (KW)	MULTIPLIER
JAN	0.00000				-49.586	15	-7.F	-8.F	6908.	-139.382	11.194	
FEB	0.00000				-33.954	3	-1.F	-2.F	6240.	-118.579	11.194	
MAR	0.00000				-21.519	4	14.F	12.F	6911.	-91.308	11.194	
APR	0.00000				-3.379	1	32.F	29.F	6687.	-52.056	11.194	
MAY	24.36190	31	90.F	76.F	-0.359	10	60.F	56.F	6908.	-4.717	11.194	
JUN	58.90283	27	89.F	77.F	0.000				6688.	0.000	11.194	
JUL	73.04342	17	88.F	80.F	0.000				6907.	0.000	11.194	
AUG	69.46891	22	95.F	77.F	0.000				6911.	0.000	11.194	
SEP	38.63323	5	90.F	77.F	0.000				6687.	0.000	11.194	
OCT	0.70455	1	83.F	68.F	-2.985	20	23.F	22.F	6907.	-57.293	11.194	
NOV	0.00000				-18.309	3	13.F	12.F	6685.	-87.805	11.194	
DEC	0.00000				-43.211	15	3.F	2.F	6908.	-120.453	11.194	
TOTAL MAX	265.115				-173.299				81351.	-139.382	11.194	

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 6/12/1995 12:33:17 SDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG #409 ENL BARRACKS W/AS TOPEKA, KS  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR MZ-ZN\_1&2

MONTH	HOURS HEATING LOAD		HOURS COOLING LOAD		HOURS COINCIDENT COOL-HEAT LOAD		HOURS HEATING AVAIL.		HOURS COOLING AVAIL.		HOURS FANS ON		HOURS FAN CYCLE ON		HOURS NIGHT VENTING		HOURS FLOATING WHEN FANS ON		--COINCIDENT LOADS--		
	HOURS	LOAD	HOURS	LOAD	HOURS	LOAD	HOURS	AVAIL.	HOURS	AVAIL.	HOURS	ON	HOURS	ON	HOURS	VENTING	HOURS	ON	HOURS	AT PEAK	ELECTRIC LOAD AT COOLING PEAK (KW)
JAN	0	744	0	0	0	0	744	0	0	744	0	0	0	0	0	0	0	0	0	-57.761	5.963
FEB	0	672	0	0	0	0	672	0	0	672	0	0	0	0	0	0	0	0	0	-54.478	5.963
MAR	0	744	0	0	0	0	744	0	0	744	0	0	0	0	0	0	0	0	0	-51.100	5.963
APR	0	720	0	0	0	0	720	0	0	720	0	0	0	0	0	0	0	0	0	-4.653	5.963
MAY	380	360	0	4	0	4	360	384	0	744	0	0	0	0	0	0	4	0	0	0.000	11.194
JUN	714	0	0	6	0	6	0	720	0	720	0	0	0	0	0	0	6	0	0	0.000	11.194
JUL	744	0	0	0	0	0	0	744	0	744	0	0	0	0	0	0	0	0	0	0.000	11.194
AUG	744	0	0	0	0	0	0	744	0	744	0	0	0	0	0	0	0	0	0	0.000	11.194
SEP	611	0	0	0	0	0	0	744	0	744	0	0	0	0	0	0	0	0	0	0.000	11.194
OCT	15	720	0	9	0	9	720	24	0	744	0	0	0	0	0	0	9	0	0	0.000	11.194
NOV	0	720	0	0	0	0	720	0	0	720	0	0	0	0	0	0	0	0	0	-63.991	5.963
DEC	0	744	0	0	0	0	744	0	0	744	0	0	0	0	0	0	0	0	0	-68.513	8.288
ANNUAL	3208	5424	0	128	0	128	5424	3336	0	8760	0	0	0	0	0	0	128	0	0		

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 6/12/1995 12:33:17 SDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG #409 ENL BARRACKS W/AS TOPEKA, KS  
 REPORT- SS-K SPACE TEMPERATURE SUMMARY MZ-ZN\_1&2

MONTH	AVERAGE TEMPERATURE		DIFFERENCE BETWEEN		SUMMED TEMP DIFFERENCE BETWEEN		HUMIDITY RATIO DIFFERENCE	
	COOLING HOURS (F)	HEATING HOURS (F)	OUTDOOR& ROOM AIR ALL HOURS (F)	OUTDOOR& ROOM AIR FAN ON HOURS (F)	OUTDOOR& ROOM AIR FAN OFF HOURS (F)	OUTDOOR& ROOM AIR HEATING HOURS (F)	OUTDOOR& ROOM AIR ALL HOURS (F)	OUTDOOR AND ROOM AIR (FRAC.OR MULT. )
JAN	74.04	74.04	-48.23	-48.23	0.00	1495.16	1495.16	-0.00363
FEB	74.08	74.08	-42.40	-42.40	0.00	1187.14	1187.14	-0.00365
MAR	74.54	74.54	-34.26	-34.26	0.00	1062.15	1062.15	-0.00362
APR	81.12	81.12	-24.35	-24.35	0.00	730.36	730.36	-0.00373
MAY	78.87	78.87	-12.78	-12.78	0.00	354.63	478.73	-0.00244
JUN	71.84	71.84	1.81	1.81	0.00	213.21	213.21	0.00126
JUL	71.86	71.86	5.32	5.32	0.00	215.06	215.06	0.00309
AUG	71.85	71.85	7.27	7.27	0.00	293.05	293.05	0.00178
SEP	71.82	71.75	-4.20	-4.20	0.00	303.31	303.31	-0.00085
OCT	71.79	79.92	-22.03	-22.03	0.00	676.92	689.18	-0.00372
NOV	75.17	75.17	-31.06	-31.06	0.00	931.81	931.81	-0.00368
DEC	74.06	74.06	-44.02	-44.02	0.00	1364.50	1364.50	-0.00362
ANNUAL	74.93	74.93	-20.63	-20.63	0.00	7802.66	8963.67	-0.00189

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 6/12/1995 12:33:17 SDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG #409 ENL BARRACKS W/AS  
 REPORT- SS-O TEMPERATURE SCATTER PLOT MZ-ZN\_1&2 FOR SW\_ROOMS TOPEKA, KS

HOUR	TOTAL HOURS AT TEMPERATURE LEVEL AND TIME OF DAY												TOTAL												
	1AM	2	3	4	5	6	7	8	9	10	11	12													
ABOVE 85	14	13	11	11	11	11	9	11	13	18	22	27	30	30	35	40	43	41	37	34	31	25	21	20	558
81-85	23	19	18	16	13	12	16	16	19	21	23	25	27	32	29	28	24	27	27	25	22	24	24	23	533
76-80	26	28	26	26	24	24	27	28	30	29	32	29	26	36	42	39	32	29	29	30	30	28	24	700	
71-75	301	304	309	311	314	316	315	310	305	296	291	281	279	277	265	255	259	265	272	277	282	286	292	298	6960
66-70	1	1	1	1	1	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	
61-65	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
BELOW 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 6/12/1995 12:33:17 SDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG #409 ENL BARRACKS W/AS  
 REPORT- SS-O TEMPERATURE SCATTER PLOT MZ-ZN\_1&2 FOR NE\_ROOMS TOPEKA, KS

HOUR	TOTAL HOURS AT TEMPERATURE LEVEL AND TIME OF DAY												TOTAL												
	1AM	2	3	4	5	6	7	8	9	10	11	12													
ABOVE 85	13	11	11	11	11	10	9	11	13	16	22	25	29	29	32	36	37	38	36	33	28	24	20	16	521
81-85	20	18	16	15	13	13	16	16	18	19	21	27	24	30	31	29	28	25	22	23	25	20	22	23	514
76-80	27	29	28	23	23	22	23	26	27	31	29	28	33	29	29	30	30	30	32	31	28	32	27	26	673
71-75	304	306	309	315	317	318	316	311	307	299	293	285	279	277	273	270	270	272	275	278	284	289	296	299	7042
66-70	1	1	1	1	1	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	10
61-65	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
BELOW 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 6/12/1995 12:33:17 SDL RUN 1  
 DENVER, CO 80227 ENL BARRACKS W/AS TOPEKA, KS  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR MZ-ZN 3&4

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-11.336	15	-8.F	-9.F	2750.	-37.881	4.665
FEB	0.00000				-7.861	3	-1.F	-2.F	2484.	-33.571	4.665
MAR	0.00000				-4.768	4	14.F	12.F	2752.	-26.332	4.665
APR	0.00000				-0.421	1	32.F	29.F	2662.	-15.251	4.665
MAY	7.46482	16	62.F	59.F	-0.035	8	50.F	48.F	2750.	-0.680	4.665
JUN	16.70531	19	87.F	76.F	0.000				2663.	0.000	4.665
JUL	21.08891	17	88.F	80.F	0.000				2749.	0.000	4.665
AUG	20.23787	21	95.F	77.F	0.000				2752.	0.000	4.665
SEP	12.41614	5	90.F	77.F	0.000				2662.	0.000	4.665
OCT	0.32934	1	83.F	68.F	-0.124	2	64.F	59.F	2749.	-9.923	4.665
NOV	0.00000				-2.816	3	13.F	12.F	2661.	-23.858	4.665
DEC	0.00000				-9.277	15	4.F	3.F	2750.	-31.684	4.665
TOTAL	78.242				-36.636				32384.		
MAX										-37.881	4.665

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 6/12/1995 12:33:17 SDL RUN 1  
 DENVER, CO 80227 ENL BARRACKS W/AS TOPEKA, KS  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR MZ-ZN 3&4

MONTH	HOURS OF				HOURS				COINCIDENT LOADS--				
	COOLING LOAD	HEATING LOAD	COOL-HEAT LOAD	COINCIDENT LOAD	HEATING AVAIL.	COOLING AVAIL.	FANS ON CYCLE	FANS ON VENTING	HEATING AT PEAK (KBTU/HR)	COOLING AT PEAK (KBTU/HR)	HEATING AT PEAK (KBTU/HR)	COOLING AT PEAK (KBTU/HR)	ELECTRIC LOAD (KW)
JAN	0	0	0	0	0	0	744	0	0	0	0	0	2.011
FEB	0	0	0	0	0	0	672	0	0	0	0	0	2.011
MAR	0	0	0	0	0	0	744	0	0	0	0	0	2.011
APR	0	0	0	0	0	0	720	0	0	0	0	0	2.011
MAY	380	360	0	0	384	0	744	0	0	0	4	0	2.011
JUN	714	0	0	0	720	0	720	0	0	0	6	0	4.665
JUL	744	0	0	0	744	0	744	0	0	0	0	0	4.665
AUG	744	0	0	0	744	0	744	0	0	0	0	0	4.665
SEP	612	0	0	0	720	0	744	0	0	0	108	0	4.665
OCT	16	0	0	0	24	0	744	0	0	0	8	0	4.665
NOV	0	0	0	0	0	0	720	0	0	0	0	0	2.011
DEC	0	0	0	0	0	0	744	0	0	0	0	0	3.190
ANNUAL	3210	5424	0	0	3336	5424	8760	0	0	0	126	0	



EMC ENGINEERS INC. DOE-2.1D 6/12/1995 12:33:17 SDL RUN 1  
 DENVER, CO 80227 ENL BARRACKS W/AS  
 REPORT- SS-K SPACE TEMPERATURE SUMMARY MZ-ZN 3&4 TOPEKA, KS

MONTH	AVERAGE SPACE TEMP			AVERAGE TEMPERATURE DIFFERENCE BETWEEN OUTDOOR& ROOM AIR ALL HOURS (F)			SUMMED TEMP DIFFERENCE BETWEEN OUTDOOR& ROOM AIR HEATING HOURS (F)			HUMIDITY RATIO DIFFERENCE BETWEEN OUTDOOR AND ROOM AIR (FRAC.OR MULT. )		
	ALL HOURS (F)	HEATING HOURS (F)	FAN ON HOURS (F)	FAN OFF HOURS (F)	OUTDOOR& ROOM AIR ALL HOURS (F)	OUTDOOR& ROOM AIR FAN ON HOURS (F)	OUTDOOR& ROOM AIR FAN OFF HOURS (F)	OUTDOOR& ROOM AIR HEATING HOURS (F)	OUTDOOR& ROOM AIR ALL HOURS (F)	OUTDOOR& ROOM AIR HEATING HOURS (F)	OUTDOOR& ROOM AIR ALL HOURS (F)	OUTDOOR AND ROOM AIR (FRAC.OR MULT. )
JAN	74.04	74.04	74.04	0.00	-48.22	-48.22	0.00	1494.88	1494.88	1494.88	-0.00255	
FEB	74.08	74.08	74.08	0.00	-42.40	-42.40	0.00	1187.20	1187.20	1187.20	-0.00256	
MAR	74.44	74.44	74.44	0.00	-34.17	-34.17	0.00	1059.12	1059.12	1059.12	-0.00241	
APR	80.02	80.02	80.02	0.00	-23.25	-23.25	0.00	697.60	697.60	697.60	-0.00257	
MAY	78.98	86.19	78.98	0.00	-12.89	-12.89	0.00	352.17	479.32	479.32	-0.00149	
JUN	71.82	71.82	71.82	0.00	1.83	1.83	0.00	213.25	213.25	213.25	0.00173	
JUL	71.83	71.83	71.83	0.00	5.35	5.35	0.00	215.42	215.42	215.42	0.00333	
AUG	71.83	71.83	71.83	0.00	7.30	7.30	0.00	293.30	293.30	293.30	0.00217	
SEP	71.78	71.78	71.78	0.00	-4.24	-4.24	0.00	304.77	304.77	304.77	0.00002	
OCT	82.29	82.66	82.29	0.00	-24.41	-24.41	0.00	749.61	762.70	762.70	-0.00263	
NOV	75.66	75.66	75.66	0.00	-31.55	-31.55	0.00	946.36	946.36	946.36	-0.00260	
DEC	74.07	74.07	74.07	0.00	-44.02	-44.02	0.00	1364.73	1364.73	1364.73	-0.00254	
ANNUAL	75.08	77.06	75.08	0.00	-20.78	-20.78	0.00	7851.67	9018.65	9018.65	-0.00100	

EMC ENGINEERS INC. DOE-2.1D 6/12/1995 12:33:17 SDL RUN 1  
 DENVER, CO 80227 ENL BARRACKS W/AS  
 REPORT- SS-O TEMPERATURE SCATTER PLOT MZ-ZN 3&4 TOPEKA, KS

HOUR	TOTAL HOURS AT TEMPERATURE LEVEL AND TIME OF DAY												TOTAL												
	1AM	2	3	4	5	6	7	8	9	10	11	12													
ABOVE 85	19	19	15	13	15	15	14	16	18	22	23	25	26	28	31	33	33	33	33	32	30	24	23	23	563
81-85	26	25	28	28	26	27	27	27	26	27	28	32	32	31	28	27	28	27	28	28	28	34	32	26	675
76-80	35	34	33	35	33	32	32	32	36	35	39	37	41	46	51	50	49	51	48	47	46	41	33	35	951
71-75	285	287	289	289	291	291	292	290	285	281	275	271	266	260	255	255	254	257	258	261	266	277	281	6571	
66-70	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61-65	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BELOW 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 6/12/1995 12:33:17 SDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG #409 ENL BARRACKS W/AS  
 REPORT- SS-O TEMPERATURE SCATTER PLOT MZ-ZN 3&4 FOR BASE\_HALL TOPEKA, KS

HOUR	TOTAL HOURS AT TEMPERATURE LEVEL AND TIME OF DAY																								TOTAL
	1AM	2	3	4	5	6	7	8	9	10	11	12	1PM	2	3	4	5	6	7	8	9	10	11	12	
ABOVE 85	19	18	15	15	15	15	16	16	16	20	21	21	23	23	23	23	29	29	28	26	25	23	21	21	501
81-85	25	26	28	27	26	26	26	28	29	26	28	29	28	30	32	34	28	28	30	31	32	30	30	26	683
76-80	38	36	35	35	36	36	35	35	38	37	40	41	41	43	40	44	47	44	44	44	41	42	37	37	937
71-75	283	285	287	288	288	288	288	286	285	281	279	275	273	271	267	268	264	261	263	264	267	270	277	281	6639
66-70	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61-65	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BELOW 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

HOURLY DATA FILE 1 FROM PROG 2

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 6/12/1995 12:33:17 PDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG #409 ENL BARRACKS W/AS  
 REPORT- PV-A EQUIPMENT SIZES TOPEKA, KS

EQUIPMENT	SIZE (MBTU/H)		NUMBER INSTD		AVAIL (MBTU/H)		NUMBER INSTD		AVAIL (MBTU/H)	
	1	2	1	2	1	2	1	2	1	2
STM-BOILER	0.179	1	1	1						
HERM-REC-CHLR	0.103	2	2	2						

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY	NATURAL-GAS
JAN	35.771 58.087 31/13	35.771 58.087 31/13	90.629 232.643 15/6
FEB	32.159 58.087 28/11	32.159 58.087 28/11	65.336 205.008 3/5
MAR	34.768 58.087 31/11	34.768 58.087 31/11	43.348 165.728 4/5
APR	32.348 58.087 5/8	32.348 58.087 5/8	8.531 105.989 1/1
MAY	43.246 113.673 31/18	43.246 113.673 31/18	1.753 12.035 10/23
JUN	56.064 113.519 27/19	56.064 113.519 27/19	0.000 0.000 30/1
JUL	62.897 121.901 23/16	62.897 121.901 23/16	0.000 0.000 31/1
AUG	62.670 119.834 21/17	62.670 119.834 21/17	0.000 0.000 31/1
SEP	48.402 113.566 5/18	48.402 113.566 5/18	0.000 0.000 30/1
OCT	33.687 84.867 1/17	33.687 84.867 1/17	7.413 93.794 20/8
NOV	33.427 58.087 30/20	33.427 58.087 30/20	35.607 158.786 3/5
DEC	35.647 58.087 31/22	35.647 58.087 31/22	79.965 204.990 15/2
	ONE YEAR USE/PEAK	511.088 121.901	332.581 232.643

ENERGY TYPE	ELECTRICITY	NATURAL-GAS
IN SITE MBTU -		
CATEGORY OF USE		
SPACE HEAT	12.02	332.58
SPACE COOL	110.74	0.00
HVAC AUX	212.29	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	111.39	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	64.67	0.00
TOTAL	511.11	332.58

TOTAL SITE ENERGY 843.67 MBTU 159.1 KBTU/SQFT-YR GROSS-AREA 159.1 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 1867.38 MBTU 352.1 KBTU/SQFT-YR GROSS-AREA 352.1 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 0.7  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.1  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5  
OVERHANG-A = 10. OVERHANG-W = 23.5  
OVERHANG-D = 9. ..

E-W HEIGHT = 4.0 WIDTH = 17.0 CONS = EXWALL  
AZIMUTH = 135 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 4.0 WIDTH = 10.0 CONS = EXWALL  
AZIMUTH = 45 INSIDE-VIS-REFL = 0.2 ..

WINDOW HEIGHT = 3.0 WIDTH = 3.5 G-T = SP\_W/\_ST  
SETBACK = 1.0 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 OVERHANG-A = 10.  
OVERHANG-W = 23.5 OVERHANG-D = 9. ..

U-W HEIGHT = 9.0 WIDTH = 23.0 CONS = FLOOR  
AZIMUTH = 225 ..

U-W HEIGHT = 9.0 WIDTH = 17.0 CONS = FLOOR  
AZIMUTH = 135 ..

U-W HEIGHT = 9.0 WIDTH = 10.0 CONS = FLOOR  
AZIMUTH = 45 ..

U-W HEIGHT = 16.0 WIDTH = 51.5 CONS = FLOOR ..

END ..  
COMPUTE LOADS ..  
INPUT SYSTEMS ..

\$-----\$  
\$ E Z - D O E S Y S T E M S I N P U T \$  
\$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
LINE-3 \* DENVER, CO 80227 \*  
  
LINE-4 \*RUN #1 NIGHT SETBACK FOR BLDG #409 \*  
LINE-5 \*ENL BARRACKS W/AS \* ..  
  
ABORT ERRORS ..  
DIAGNOSTIC WARNINGS ..  
SYSTEMS-REPORT VERIFICATION=(SV-A)  
SUMMARY=(SS-A,SS-C,SS-K,SS-O)  
HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

SD\_ON =DAY-SCHEDULE (1,24) (1.) ..  
SD\_OFF =DAY-SCHEDULE (1,24) (0.) ..

```

SD_WT_HT =DAY-SCHEDULE (1,4) (65.)
           (5,21) (74.)
           (22,24) (65.) ..
SD_SM_CL =DAY-SCHEDULE (1,24) (72.) ..
SD_WT_CL =DAY-SCHEDULE (1,4) (65.2)
           (5,16) (74.2)
           (17) (74.27)
           (18,21) (74.2)
           (22,24) (65.2) ..
SD_SM_HT =DAY-SCHEDULE (1,24) (71.8) ..
SD_OA_FRAC =DAY-SCHEDULE (1,24) (0.14) ..

```



```

SW_ON =WEEK-SCHEDULE (ALL) SD_ON ..
SW_OFF =WEEK-SCHEDULE (ALL) SD_OFF ..
SW_WT_HT =WEEK-SCHEDULE (ALL) SD_WT_HT ..
SW_SM_CL =WEEK-SCHEDULE (ALL) SD_SM_CL ..
SW_WT_CL =WEEK-SCHEDULE (ALL) SD_WT_CL ..
SW_SM_HT =WEEK-SCHEDULE (ALL) SD_SM_HT ..
SW_OA_FRAC =WEEK-SCHEDULE (ALL) SD_OA_FRAC ..

```

\$ FULL ON SYSTEM

S\_ON =SCHEDULE THRU DEC 31 SW\_ON ..

\$ FULL OFF SYSTEM

S\_OFF =SCHEDULE THRU DEC 31 SW\_OFF ..

\$ HEATING SEASON

```

S_HE-SCHED =SCHEDULE THRU MAY 15 SW_ON
              THRU OCT 1 SW_OFF
              THRU DEC 31 SW_ON ..

```

\$ COOLING SEASON

```

S_CL_SCHED =SCHEDULE THRU MAY 15 SW_OFF
              THRU OCT 1 SW_ON
              THRU DEC 31 SW_OFF ..

```

\$ HEATING SET TEMP

```

S_HT_SET_F =SCHEDULE THRU MAY 15 SW_WT_HT
              THRU OCT 1 SW_SM_HT
              THRU DEC 31 SW_WT_HT ..

```

\$ COOLING SET TEMP

```

S_CL_SET_F =SCHEDULE THRU MAY 15 SW_WT_CL
              THRU OCT 1 SW_SM_CL
              THRU DEC 31 SW_WT_CL ..

```

```

S_HRLY-RPT =SCHEDULE THRU JAN 20 SW_OFF
              THRU JAN 21 SW_ON
              THRU AUG 14 SW_OFF

```

THRU AUG 15 SW\_ON  
THRU DEC 31 SW\_OFF ..

S\_OA\_FRACT =SCHEDULE THRU DEC 31 SW\_OA\_FRAC ..

\$ ZONE DESCRIPTION

SW\_ROOMS =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

NE\_ROOMS =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

TV/POOL\_RM =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

BASE\_HALL =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

\$ SYSTEM DESCRIPTION

MZ-ZN\_1&2 =SYSTEM SYSTEM-TYPE = MZS  
MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
HEATING-SCHEDULE = S\_HE-SCHED  
COOLING-SCHEDULE = S\_CL\_SCHED PREHEAT-T = 0.0  
HEAT-CONTROL = COLDEST COOL-CONTROL = WARMEST  
OA-CONTROL = FIXED SUPPLY-CFM = 6115.  
RATED-CFM = 6115. MIN-OUTSIDE-AIR = 0.14  
MIN-AIR-SCH = S\_OA\_FRACT MAX-OA-FRACTION = 0.14  
SUPPLY-DELTA-T = 2.7 SUPPLY-KW = 0.00088  
MOTOR-PLACEMENT = OUTSIDE-AIRFLOW  
NIGHT-CYCLE-CTRL = STAY-OFF NIGHT-VENT-DT = 0.0  
MIN-CFM-RATIO = 1.0 COOLING-CAPACITY = 151000.  
COOL-SH-CAP = 127000. HEATING-CAPACITY = -174600.  
RETURN-AIR-PATH = DUCT  
ZONE-NAMES = (SW\_ROOMS, NE\_ROOMS) ..

MZ-ZN\_3&4 =SYSTEM SYSTEM-TYPE = MZS  
MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
HEATING-SCHEDULE = S\_HE-SCHED  
COOLING-SCHEDULE = S\_CL\_SCHED PREHEAT-T = 0.0

HEAT-CONTROL = COLDEST COOL-CONTROL = WARMEST  
 OA-CONTROL = FIXED SUPPLY-CFM = 1950.  
 RATED-CFM = 1950. MIN-OUTSIDE-AIR = 0.14  
 MIN-AIR-SCH = S\_OA\_FRACT MAX-OA-FRACTION = 0.14  
 SUPPLY-DELTA-T = 2.7 SUPPLY-KW = 0.00088  
 MOTOR-PLACEMENT = OUTSIDE-AIRFLOW  
NIGHT-CYCLE-CTRL = STAY-OFF NIGHT-VENT-DT = 0.0  
 MIN-CFM-RATIO = 1.0 COOLING-CAPACITY = 50400.  
 COOL-SH-CAP = 40700. HEATING-CAPACITY = -42200.  
 RETURN-AIR-PATH = DUCT  
 ZONE-NAMES = (TV/POOL\_RM, BASE\_HALL) ..



\$ HOURLY REPORT DESCRIPTION

ZONE1-BLK =REPORT-BLOCK VARIABLE-TYPE = SW\_ROOMS  
 VARIABLE-LIST = (17,18,7,6) ..  
 ZONE3-BLK =REPORT-BLOCK VARIABLE-TYPE = TV/POOL\_RM  
 VARIABLE-LIST = (17,18,7,6) ..  
 AHU-1-BLK =REPORT-BLOCK VARIABLE-TYPE = MZ-ZN\_1&2  
 VARIABLE-LIST = (3,5,6,18,19,17) ..  
 AHU-2-BLK =REPORT-BLOCK VARIABLE-TYPE = MZ-ZN\_3&4  
 VARIABLE-LIST = (3,5,6,18,19,17) ..  
 HRLY-ZN-1 = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (ZONE1-BLK)  
 ..  
 HRLY-ZN-3 = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (ZONE3-BLK)  
 ..  
 HRLY-AHU-1 = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (AHU-1-BLK)  
 ..  
 HRLY-AHU-2 = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (AHU-2-BLK)  
 ..  
 END ..  
 COMPUTE SYSTEMS ..  
 INPUT PLANT ..

\$-----\$  
 \$ E Z - D O E P L A N T S I N P U T \$  
 \$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
 LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
 LINE-3 \* DENVER, CO 80227 \*  
 LINE-4 \*RUN #1 NIGHT SETBACK FOR BLDG #409 \*  
 LINE-5 \*ENL BARRACKS W/AS \* ..  
 ABORT ERRORS ..  
 DIAGNOSTIC WARNINGS ..



EMC ENGINEERS INC. DOE-2.1D 6/12/1995 13:18: 7 SDL RUN 1  
 DENVER, CO 80227 ENL BARRACKS W/AS  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR MZ-ZN\_1&2 TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C				
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	MAXIMUM COOLING LOAD (KBTU/HR)	MAXIMUM ELEC ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-44.767	15	-8.F	-9.F	6908.	-158.822	0.000	6908.	11.194
FEB	0.00000				-29.927	3	-1.F	-2.F	6240.	-139.190	0.000	6240.	11.194
MAR	0.00000				-18.265	4	14.F	12.F	6911.	-111.514	0.000	6911.	11.194
APR	0.00000				-2.723	5	31.F	29.F	6687.	-60.163	0.000	6687.	11.194
MAY	24.47659	31	18	90.F	76.F	10	23	60.F	6908.	-4.689	0.000	6688.	11.194
JUN	59.06521	27	17	89.F	77.F				6907.	0.000	0.000	6907.	11.194
JUL	73.11463	23	18	95.F	79.F				6911.	0.000	0.000	6911.	11.194
AUG	69.58331	22	17	95.F	77.F				6687.	0.000	0.000	6687.	11.194
SEP	38.96878	5	18	90.F	77.F	20	5	25.F	6907.	-72.644	0.000	6907.	11.194
OCT	0.70920	1	18	83.F	68.F	3	5	13.F	6685.	-108.116	0.000	6685.	11.194
NOV	0.00000				-38.599	13	6	2.F	6908.	-138.847	0.000	6908.	11.194
DEC	0.00000				-152.655				81351.				
TOTAL	265.917									-158.822			11.194
MAX													

EMC ENGINEERS INC. DOE-2.1D 6/12/1995 13:18: 7 SDL RUN 1  
 DENVER, CO 80227 ENL BARRACKS W/AS  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR MZ-ZN\_1&2 TOPEKA, KS

MONTH	N U M B E R O F H O U R S				C O I N C I D E N T C O O L - H E A T L O A D				H E A T I N G C O O L I N G A V A I L .				H O U R S F L O A T I N G W H E N F A N S O N				C O I N C I D E N T L O A D S - - E L E C T R I C L O A D A T C O O L I N G P E A K			
	HOURS COOLING LOAD	HOURS HEATING LOAD	HOURS COOL-HEAT LOAD	HOURS FLOATING	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.	HOURS FANS ON CYCLE	HOURS NIGHT VENTING	HOURS FANS ON	HOURS FLOATING	HOURS HEATING	HOURS COOLING	HOURS FANS ON	HOURS NIGHT VENTING	HOURS FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)			
JAN	0	0	0	0	744	0	0	0	0	0	0	0	0	0	-9.147	5.963				
FEB	0	0	0	2	672	0	0	0	0	0	0	0	0	0	-7.102	5.963				
MAR	0	0	0	72	744	0	0	0	0	0	0	0	0	0	-3.390	5.963				
APR	0	0	0	299	720	0	0	0	0	0	0	0	0	0	-4.626	5.963				
MAY	384	177	0	183	360	384	0	0	0	0	0	0	0	0	0.000	11.194				
JUN	720	0	0	0	720	720	0	0	0	0	0	0	0	0	0.000	11.194				
JUL	744	0	0	0	744	744	0	0	0	0	0	0	0	0	0.000	11.194				
AUG	744	0	0	0	744	744	0	0	0	0	0	0	0	0	0.000	11.194				
SEP	671	0	0	0	720	744	0	0	0	0	0	0	0	0	0.000	11.194				
OCT	16	471	0	257	720	24	0	0	0	0	0	0	0	0	0.000	11.194				
NOV	0	627	0	93	720	0	0	0	0	0	0	0	0	0	-17.212	5.963				
DEC	0	744	0	0	744	0	0	0	0	0	0	0	0	0	-22.691	8.288				
ANNUAL	3279	4526	0	955	5424	3336	0	0	0	8760	0	0	0	0						

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 6/12/1995 13:18: 7 PDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SETBACK FOR BLDG #409 ENL BARRACKS W/AS  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY TOTAL (MBTU) PEAK (KBTU) DY/HR	NATURAL-GAS TOTAL (MBTU) PEAK (KBTU) DY/HR
JAN	35.750 58.590 31/14	83.978 262.395 15/ 6	
FEB	32.024 58.590 28/12	59.166 237.250 3/ 6	
MAR	34.573 58.590 31/12	37.875 205.279 4/ 6	
APR	32.247 58.590 5/ 8	6.593 127.532 1/ 5	
MAY	43.247 113.543 31/18	1.242 12.338 10/23	
JUN	56.153 113.435 27/19	0.000 0.000 30/ 1	
JUL	62.926 121.764 23/16	0.000 0.000 31/ 1	
AUG	62.701 119.602 21/17	0.000 0.000 31/ 1	
SEP	48.643 113.460 5/18	0.000 0.000 30/ 1	
OCT	33.622 93.240 1/18	5.977 115.904 20/ 5	
NOV	33.249 58.590 30/20	30.802 200.546 3/ 5	
DEC	35.568 58.590 31/21	73.358 239.898 13/ 6	
	ONE YEAR USE/PEAK	510.701 121.764	298.992 262.395

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 6/12/1995 13:18: 7 PDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SETBACK FOR BLDG #409 ENL BARRACKS W/AS TOPEKA, KS  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
SPACE HEAT	11.21	298.99
SPACE COOL	111.16	0.00
HVAC AUX	212.29	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	111.39	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	64.67	0.00
TOTAL	510.72	298.99

TOTAL SITE ENERGY 809.69 MBTU 152.7 KBTU/SQFT-YR GROSS-AREA 152.7 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 1832.63 MBTU 345.5 KBTU/SQFT-YR GROSS-AREA 345.5 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 2.1  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.1  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.



SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5  
OVERHANG-A = 10. OVERHANG-W = 23.5  
OVERHANG-D = 9. ..

E-W HEIGHT = 4.0 WIDTH = 17.0 CONS = EXWALL  
AZIMUTH = 135 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 4.0 WIDTH = 10.0 CONS = EXWALL  
AZIMUTH = 45 INSIDE-VIS-REFL = 0.2 ..

WINDOW HEIGHT = 3.0 WIDTH = 3.5 G-T = SP\_W/\_ST  
SETBACK = 1.0 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 OVERHANG-A = 10.  
OVERHANG-W = 23.5 OVERHANG-D = 9. ..

U-W HEIGHT = 9.0 WIDTH = 23.0 CONS = FLOOR  
AZIMUTH = 225 ..

U-W HEIGHT = 9.0 WIDTH = 17.0 CONS = FLOOR  
AZIMUTH = 135 ..

U-W HEIGHT = 9.0 WIDTH = 10.0 CONS = FLOOR  
AZIMUTH = 45 ..

U-W HEIGHT = 16.0 WIDTH = 51.5 CONS = FLOOR ..

END ..  
COMPUTE LOADS ..  
  
INPUT SYSTEMS ..

\$-----\$  
\$ E Z - D O E S Y S T E M S I N P U T \$  
\$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
LINE-3 \* DENVER, CO 80227 \*  
  
LINE-4 \*RUN #2 DDC CONTROL FOR BLDG #409 \*  
LINE-5 \*ENL BARRACKS W/AS \* ..  
  
ABORT ERRORS ..  
DIAGNOSTIC WARNINGS ..  
SYSTEMS-REPORT VERIFICATION=(SV-A)  
SUMMARY=(SS-A,SS-C,SS-K,SS-O)  
HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

SD\_ON =DAY-SCHEDULE (1,24) (1.) ..  
SD\_OFF =DAY-SCHEDULE (1,24) (0.) ..

```
SD_WT_HT =DAY-SCHEDULE (1,24) (70.) ..  
SD_SM_CL =DAY-SCHEDULE (1,24) (76.) ..  
SD_WT_CL =DAY-SCHEDULE (1,24) (70.2) ..  
SD_SM_HT =DAY-SCHEDULE (1,24) (75.8) ..  
SD_OA_FRAC =DAY-SCHEDULE (1,24) (0.14) ..
```



```
SW_ON =WEEK-SCHEDULE (ALL) SD_ON ..  
SW_OFF =WEEK-SCHEDULE (ALL) SD_OFF ..  
SW_WT_HT =WEEK-SCHEDULE (ALL) SD_WT_HT ..  
SW_SM_CL =WEEK-SCHEDULE (ALL) SD_SM_CL ..  
SW_WT_CL =WEEK-SCHEDULE (ALL) SD_WT_CL ..  
SW_SM_HT =WEEK-SCHEDULE (ALL) SD_SM_HT ..  
SW_OA_FRAC =WEEK-SCHEDULE (ALL) SD_OA_FRAC ..
```

\$ FULL ON SYSTEM

```
S_ON =SCHEDULE THRU DEC 31 SW_ON ..
```

\$ FULL OFF SYSTEM

```
S_OFF =SCHEDULE THRU DEC 31 SW_OFF ..
```

\$ HEATING SEASON

```
S_HE-SCHED =SCHEDULE THRU MAY 15 SW_ON  
THRU OCT 1 SW_OFF  
THRU DEC 31 SW_ON ..
```

\$ COOLING SEASON

```
S_CL_SCHED =SCHEDULE THRU MAY 15 SW_OFF  
THRU OCT 1 SW_ON  
THRU DEC 31 SW_OFF ..
```

\$ HEATING SET TEMP

```
S_HT_SET_F =SCHEDULE THRU MAY 15 SW_WT_HT  
THRU OCT 1 SW_SM_HT  
THRU DEC 31 SW_WT_HT ..
```

\$ COOLING SET TEMP

```
S_CL_SET_F =SCHEDULE THRU MAY 15 SW_WT_CL  
THRU OCT 1 SW_SM_CL  
THRU DEC 31 SW_WT_CL ..
```

```
S_HRLY-RPT =SCHEDULE THRU JAN 20 SW_OFF  
THRU JAN 21 SW_ON  
THRU AUG 14 SW_OFF  
THRU AUG 15 SW_ON  
THRU DEC 31 SW_OFF ..
```

```
S_OA_FRAC =SCHEDULE THRU DEC 31 SW_OA_FRAC ..
```

## \$ ZONE DESCRIPTION

```

SW_ROOMS =ZONE  DESIGN-HEAT-T = 74.0  DESIGN-COOL-T = 72.0
                HEAT-TEMP-SCH = S_HT_SET_F  COOL-TEMP-SCH = S_CL_SET_F
                ZONE-TYPE = CONDITIONED
                THERMOSTAT-TYPE = PROPORTIONAL  THROTTLING-RANGE = 0.2
                SIZING-OPTION = FROM-LOADS  ..

NE_ROOMS =ZONE  DESIGN-HEAT-T = 74.0  DESIGN-COOL-T = 72.0
                HEAT-TEMP-SCH = S_HT_SET_F  COOL-TEMP-SCH = S_CL_SET_F
                ZONE-TYPE = CONDITIONED
                THERMOSTAT-TYPE = PROPORTIONAL  THROTTLING-RANGE = 0.2
                SIZING-OPTION = FROM-LOADS  ..

TV/POOL_RM =ZONE  DESIGN-HEAT-T = 74.0  DESIGN-COOL-T = 72.0
                HEAT-TEMP-SCH = S_HT_SET_F  COOL-TEMP-SCH = S_CL_SET_F
                ZONE-TYPE = CONDITIONED
                THERMOSTAT-TYPE = PROPORTIONAL  THROTTLING-RANGE = 0.2
                SIZING-OPTION = FROM-LOADS  ..

BASE_HALL =ZONE  DESIGN-HEAT-T = 74.0  DESIGN-COOL-T = 72.0
                HEAT-TEMP-SCH = S_HT_SET_F  COOL-TEMP-SCH = S_CL_SET_F
                ZONE-TYPE = CONDITIONED
                THERMOSTAT-TYPE = PROPORTIONAL  THROTTLING-RANGE = 0.2
                SIZING-OPTION = FROM-LOADS  ..

```

## \$ SYSTEM DESCRIPTION

```

MZ-ZN_1&2 =SYSTEM  SYSTEM-TYPE = MZS
                  MAX-SUPPLY-T = 120.0  MIN-SUPPLY-T = 55.0
                  HEATING-SCHEDULE = S_HE-SCHED
                  COOLING-SCHEDULE = S_CL_SCHED  PREHEAT-T = 0.0
                  HEAT-CONTROL = COLDEST  COOL-CONTROL = WARMEST
                  OA-CONTROL = FIXED  SUPPLY-CFM = 6115.
                  RATED-CFM = 6115.  MIN-OUTSIDE-AIR = 0.14
                  MIN-AIR-SCH = S_OA_FRACT  MAX-OA-FRACTION = 0.14
                  SUPPLY-DELTA-T = 2.7  SUPPLY-KW = 0.00088
                  MOTOR-PLACEMENT = OUTSIDE-AIRFLOW
                  NIGHT-CYCLE-CTRL = STAY-OFF  NIGHT-VENT-DT = 0.0
                  MIN-CFM-RATIO = 1.0  COOLING-CAPACITY = 151000.
                  COOL-SH-CAP = 127000.  HEATING-CAPACITY = -174600.
                  RETURN-AIR-PATH = DUCT
                  ZONE-NAMES = (SW_ROOMS, NE_ROOMS)  ..

MZ-ZN_3&4 =SYSTEM  SYSTEM-TYPE = MZS
                  MAX-SUPPLY-T = 120.0  MIN-SUPPLY-T = 55.0
                  HEATING-SCHEDULE = S_HE-SCHED
                  COOLING-SCHEDULE = S_CL_SCHED  PREHEAT-T = 0.0
                  HEAT-CONTROL = COLDEST  COOL-CONTROL = WARMEST
                  OA-CONTROL = FIXED  SUPPLY-CFM = 1950.
                  RATED-CFM = 1950.  MIN-OUTSIDE-AIR = 0.14
                  MIN-AIR-SCH = S_OA_FRACT  MAX-OA-FRACTION = 0.14
                  SUPPLY-DELTA-T = 2.7  SUPPLY-KW = 0.00088
                  MOTOR-PLACEMENT = OUTSIDE-AIRFLOW

```

NIGHT-CYCLE-CTRL = STAY-OFF NIGHT-VENT-DT = 0.0  
 MIN-CFM-RATIO = 1.0 COOLING-CAPACITY = 50400.  
 COOL-SH-CAP = 40700. HEATING-CAPACITY = -42200.  
 RETURN-AIR-PATH = DUCT  
 ZONE-NAMES = (TV/POOL\_RM, BASE\_HALL) ..

\$ HOURLY REPORT DESCRIPTION

ZONE1-BLK =REPORT-BLOCK VARIABLE-TYPE = SW\_ROOMS  
 VARIABLE-LIST = (17,18,7,6) ..  
 ZONE3-BLK =REPORT-BLOCK VARIABLE-TYPE = TV/POOL\_RM  
 VARIABLE-LIST = (17,18,7,6) ..  
 AHU-1-BLK =REPORT-BLOCK VARIABLE-TYPE = MZ-ZN\_1&2  
 VARIABLE-LIST = (3,5,6,18,19,17) ..  
 AHU-2-BLK =REPORT-BLOCK VARIABLE-TYPE = MZ-ZN\_3&4  
 VARIABLE-LIST = (3,5,6,18,19,17) ..  
 HRLY-ZN-1 = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (ZONE1-BLK)  
 ..  
 HRLY-ZN-3 = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (ZONE3-BLK)  
 ..  
 HRLY-AHU-1 = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (AHU-1-BLK)  
 ..  
 HRLY-AHU-2 = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (AHU-2-BLK)  
 ..  
 END ..  
 COMPUTE SYSTEMS ..  
 INPUT PLANT ..

\$-----\$  
 \$ E Z - D O E P L A N T S I N P U T \$  
 \$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
 LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
 LINE-3 \* DENVER, CO 80227 \*  
 LINE-4 \*RUN #2 DDC CONTROL FOR BLDG #409 \*  
 LINE-5 \*ENL BARRACKS W/AS \* ..

ABORT ERRORS ..  
 DIAGNOSTIC WARNINGS ..  
 PLANT-REPORT VERIFICATION=(PV-A)  
 SUMMARY=(PS-B,BEPS)  
 HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES



EMC ENGINEERS INC. EZZOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 6/12/1995 13:24:29 SDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG #409 ENL BARRACKS W/AS  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR MZ-ZN 1&2 TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC LOAD (KW)
JAN	0.00000				-42.631	15	6	-8.F	-9.F	-130.790	6908.
FEB	0.00000				-27.723	3	5	-1.F	-2.F	-109.663	6240.
MAR	0.00000				-15.679	4	5	14.F	12.F	-82.232	6911.
APR	0.00000				-1.909	1	1	32.F	29.F	-42.452	6687.
MAY	19.97078	31	18	90.F	76.F	10	23	60.F	56.F	-4.689	6908.
JUN	50.25921	27	17	89.F	77.F					0.000	6688.
JUL	63.75431	23	17	97.F	79.F					0.000	6907.
AUG	60.45490	22	17	95.F	77.F					0.000	6911.
SEP	31.18378	5	18	90.F	77.F					0.000	6687.
OCT	0.44644	1	18	83.F	68.F					-47.019	6907.
NOV	0.00000				-13.381	3	5	13.F	12.F	-78.936	6685.
DEC	0.00000				-36.234	15	2	3.F	2.F	-111.339	6908.
TOTAL	226.069				-139.467					-130.790	81351.
MAX											11.194

EMC ENGINEERS INC. EZZOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 6/12/1995 13:24:29 SDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG #409 ENL BARRACKS W/AS  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR MZ-ZN 1&2 TOPEKA, KS

MONTH	HOURS				HOURS				HOURS				COINCIDENT LOADS	
	COOLING LOAD	HEATING LOAD	COOL-HEAT LOAD	COINCIDENT	HEATING AVAIL.	HEATING AVAIL.	COOLING AVAIL.	COOLING AVAIL.	FANS ON	FANS ON	FANS ON	FANS ON	HEATING LOAD AT PEAK (KBTU/HR)	ELECTRIC LOAD AT PEAK (KW)
JAN	0	744	0	0	744	0	0	0	744	0	0	-48.207	5.963	
FEB	0	659	0	0	672	0	0	0	672	0	0	-44.574	5.963	
MAR	0	613	0	0	744	0	0	0	744	0	0	-41.418	5.963	
APR	0	394	0	0	720	0	0	0	720	0	0	-4.626	5.963	
MAY	384	176	0	0	360	384	0	0	744	184	0	0.000	11.194	
JUN	719	0	0	0	720	720	0	0	720	1	0	0.000	11.194	
JUL	744	0	0	0	744	744	0	0	744	0	0	0.000	11.194	
AUG	744	0	0	0	744	744	0	0	744	0	0	0.000	11.194	
SEP	615	0	0	0	720	24	0	0	744	105	0	0.000	11.194	
OCT	14	440	0	0	720	0	0	0	744	290	0	0.000	11.194	
NOV	0	579	0	0	744	0	0	0	720	141	0	-54.599	5.963	
DEC	0	739	0	0	744	0	0	0	744	5	0	-59.243	8.288	
ANNUAL	3220	4344	0	0	5424	3336	0	0	8760	0	0			

EMC ENGINEERS INC. EZZOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 6/12/1995 13:24:29 SDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG #409 ENL BARRACKS W/AS  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR MZ-ZN\_3&4 TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-9.376	15	-8.F	-9.F	2750.	-35.569	4.665
FEB	0.00000				-6.149	3	-1.F	-2.F	2484.	-31.171	4.665
MAR	0.00000				-3.091	4	14.F	12.F	2752.	-23.809	4.665
APR	0.00000				-0.129	1	32.F	29.F	2662.	-12.350	4.665
MAY	6.18017	16	2	62.F	-0.027	8	50.F	48.F	2750.	-0.659	4.665
JUN	14.29015	27	19	88.F	0.000				2663.	0.000	4.665
JUL	18.43104	17	18	88.F	0.000				2749.	0.000	4.665
AUG	17.69712	21	17	95.F	0.000				2752.	0.000	4.665
SEP	10.25095	5	18	90.F	0.000				2662.	0.000	4.665
OCT	0.24603	1	18	83.F	-0.049	19	32.F	29.F	2749.	-0.734	4.665
NOV	0.00000				-1.494	3	13.F	12.F	2661.	-20.882	4.665
DEC	0.00000				-7.323	15	4.F	3.F	2750.	-29.202	4.665
TOTAL	67.095				-27.638				32384.	-35.569	4.665
MAX											

EMC ENGINEERS INC. EZZOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 6/12/1995 13:24:29 SDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG #409 ENL BARRACKS W/AS  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR MZ-ZN\_3&4 TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C				
	HOURS COOLING LOAD	HOURS HEATING LOAD	HOURS COINCIDENT COOL-HEAT LOAD	HOURS FLOATING	HOURS COOLING AVAIL.	HOURS HEATING AVAIL.	HOURS FANS ON CYCLE ON	HOURS NIGHT VENTING	HOURS FLOATING WHEN FANS ON	HEATING COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)	MAXIMUM HEATING LOAD (KBTU/HR)	MAXIMUM ELEC LOAD (KW)
JAN	0	717	0	27	0	744	0	0	27	-12.939	2.011	-35.569	4.665
FEB	0	623	0	49	0	672	0	0	49	-11.647	2.011	-31.171	4.665
MAR	0	491	0	253	0	744	0	0	253	-11.641	2.011	-23.809	4.665
APR	0	261	0	459	0	720	0	0	459	-0.802	2.011	-12.350	4.665
MAY	370	131	0	243	384	744	0	0	243	0.000	2.011	-0.659	4.665
JUN	711	0	0	9	720	720	0	0	9	0.000	2.011	0.000	4.665
JUL	744	0	0	0	744	744	0	0	0	0.000	2.011	0.000	4.665
AUG	744	0	0	0	744	744	0	0	0	0.000	2.011	0.000	4.665
SEP	626	0	0	94	720	720	0	0	94	0.000	2.011	0.000	4.665
OCT	16	259	0	469	24	744	0	0	469	0.000	2.011	-20.882	4.665
NOV	0	362	0	358	0	720	0	0	358	-13.393	2.011	-29.202	4.665
DEC	0	656	0	88	0	744	0	0	88	-9.299	2.011	-29.202	4.665
ANNUAL	3211	3500	0	2049	3336	8760	0	0	2049				

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 6/12/1995 13:24:29 PDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG #409 ENL BARRACKS W/AS  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY TOTAL (MBTU) PEAK (KBTU) DY/HR	NATURAL-GAS TOTAL (MBTU) PEAK (KBTU) DY/HR
JAN	78.122 218.429 15/6	35.472 57.846 31/12	78.122 218.429 15/6
FEB	53.859 190.221 3/5	31.847 57.846 28/10	53.859 190.221 3/5
MAR	31.295 150.481 4/5	34.305 57.846 31/10	31.295 150.481 4/5
APR	4.557 89.251 1/1	32.153 56.732 5/8	4.557 89.251 1/1
MAY	1.136 11.769 10/23	41.578 108.678 31/18	1.136 11.769 10/23
JUN	0.000 0.000 30/1	52.754 108.625 27/19	0.000 0.000 30/1
JUL	0.000 0.000 31/1	59.349 116.817 23/16	0.000 0.000 31/1
AUG	0.000 0.000 31/1	59.180 114.465 21/17	0.000 0.000 31/1
SEP	0.000 0.000 30/1	45.666 108.444 5/18	0.000 0.000 30/1
OCT	3.965 79.697 20/8	33.424 79.978 1/18	3.965 79.697 20/8
NOV	25.538 143.217 3/5	33.050 57.846 30/20	25.538 143.217 3/5
DEC	67.172 189.885 15/2	35.307 57.846 31/22	67.172 189.885 15/2
	ONE YEAR USE/PEAK	494.085 116.817	265.643 218.429

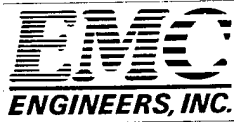
EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 6/12/1995 13:24:29 PDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG #409 ENL BARRACKS W/AS TOPEKA, KS  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE

ENERGY TYPE	ELECTRICITY	NATURAL-GAS
IN SITE MBTU -		
CATEGORY OF USE		
SPACE HEAT	9.82	265.64
SPACE COOL	95.93	0.00
HVAC AUX	212.29	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	111.39	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	64.67	0.00
TOTAL	494.10	265.64

TOTAL SITE ENERGY 759.73 MBTU 143.2 KBTU/SQFT-YR GROSS-AREA 143.2 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 1749.38 MBTU 329.8 KBTU/SQFT-YR GROSS-AREA 329.8 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 1.4  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.1  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

**COMPUTER ENERGY SIMULATIONS**

**BLDG. 7108  
BATTALION BUILDINGS**



DENVER - ATLANTA

PROJECT: FEASIBILITY STUDY FOR  
INSTALLATION OF UMCS  
LOCATION: FORT RILEY, KANSAS

BUILDING NO.: 7108  
BLDG. TYPE: BN ADMIN & CLRM

EMC NO: 1406-001  
CALC. BY: AJN  
CHECKED BY: CEL  
DATE: 05-Jul-95

**ENERGY CONSTANT CALCULATIONS**

	BASERUN	RUN1	RUN2	RUN3	RUN4	RUN5
HEATING (MBtu)	545.6	427.9	448.9	424.7	471.2	460.9
COOLING (kWH)	176,387	133,302	170,457	131,280	175,209	173,454

SUPPLY AIR FAN	8,133 CFM
FLOOR AREA	12,179 FT <sup>2</sup>
CFMI	813 CFM
UA	3215 BTU/HR-°F
BLDG CONSTR.	2 (1 FOR LIGHT ) (2 FOR HEAVY)

EZDOE COMPUTER RUN DEFINITION:	
BASERUN	EXISTING OPERATION
RUN1	NIGHT SETBACK
RUN2	DDC CONTROL
RUN3	ECONOMIZER
RUN4	NIGHTTIME INFILTRATION (OA)
RUN5	DAYTIME INFILTRATION (OA)

HOURS OF OCCUPANCY			ANNUAL HEATING & COOLING HOURS	
M-F	700	1800	55 HR	HR. ON HEATING 1946 HR/YR
SAT.	700	1200	5 HR	HR. ON COOLING 1183 HR/YR
SUN.	0	0	0 HR	HR. OFF HEATING 3502 HR/YR
	TOTAL OCCUPY HR.		60 HR/WK	HR. OFF COOLING 2129 HR/YR
	TOTAL UNOCC. HR.		108 HR/WK	
	ANNUAL OCCUPY HR.		3129 HR/YR	
	ANNUAL UNOCC. HR.		5631 HR/YR	

PRESENT HR. OF OPERATION FOR SYS. WITH HEATING AND COOLING 8760 HR/YR  
 PRESENT HR. OF OPERATION FOR SYS. WITH HEATING ONLY 5448 HR/YR  
 PRESENT HR. OF OPERATION FOR SYS. WITH COOLING ONLY 3312 HR/YR  
 HRS SAVED (HTG ONLY) 5448 - 1946 = 3502 HR/YR  
 HRS SAVED (CLG ONLY) 3312 - 1183 = 2129 HR/YR

HOAUHC	545.61 MBtu	-	471.24 MBtu	=	1.62E+01 Btu/CFM-HR
	813.3 CFM	x	5631 HR/YR		
HOAUH	545.61 MBtu	-	471.24 MBtu	=	2.61E+01 Btu/CFM-HR
	813.3 CFM	x	3502 HR/YR		
COAUHC	176,387.3 kWH	-	175,209.5 kWH	=	2.57E-04 kWH/CFM-HR
	813.3 CFM	x	5631 HR/YR		
COAUC	176,387.3 kWH	-	175,209.5 kWH	=	6.80E-04 kWH/CFM-HR
	813.3 CFM	x	2129 HR/YR		
HOAOHC	545.61 MBtu	-	460.9 MBtu	=	3.33E+01 Btu/CFM-HR
	813.3 CFM	x	3129 HR/YR		
HOAOH	545.61 MBtu	-	460.9 MBtu	=	5.35E+01 Btu/CFM-HR
	813.3 CFM	x	1946 HR/YR		
COAOHC	176,387.3 kWH	-	173,454.4 kWH	=	1.15E-03 kWH/CFM-HR
	813.3 CFM	x	3129 HR/YR		
COAOC	176,387.3 kWH	-	173,454.4 kWH	=	3.05E-03 kWH/CFM-HR
	813.3 CFM	x	1183 HR/YR		
DC DUTY	1 / 6 (10 MINUTES PER HOUR)			=	0.17
DC DEMAND	1 / 6 (10 MINUTES PER HOUR)			=	0.17
ECC	133,302.1 kWH	-	131,280.4 kWH	=	2.10E-04 kWH/CFM-HR
	8133 CFM	x	1183 HR/YR		
ECHC	133,302.1 kWH	-	131,280.4 kWH	=	7.95E-05 kWH/CFM-HR
	8133 CFM	x	3129 HR/YR		
NSUCHC	176,387.3 kWH	-	133,302.1 kWH	=	9.41E-04 kWH/CFM-HR
	8133 CFM	x	5631 HR/YR		
NSUCC	176,387.3 kWH	-	133,302.1 kWH	=	2.49E-03 kWH/CFM-HR
	8133 CFM	x	2129 HR/YR		
DDCCHC	176,387.3 kWH	-	170,457.1 kWH	=	2.33E-04 kWH/CFM-HR
	8133 CFM	x	3129 HR/YR		
DDCCC	176,387.3 kWH	-	170,457.1 kWH	=	6.16E-04 kWH/CFM-HR
	8133 CFM	x	1183 HR/YR		
NSC	545.61 MBtu	-	427.92 MBtu	=	3.66E+04 Btu/UA
	3215.433 UA				
DDCH	545.61 MBtu	-	448.88 MBtu	=	3.01E+04 Btu/UA
	3215.433 UA				
OPT	( 2 HR/DAY X 240 DAY/YR )		175 HR/YR	=	305 HR/YR
CHWR	(1.10 kW X 0.012 Eff. X 664 HRS X 2 Degrees of Reset)			=	17.5 kWH/TON
OAR	567 HR/YR	x	0.01	=	5.67 HR/YR



INPUT LOADS ..

\$-----\$  
\$ E Z - D O E L O A D S I N P U T \$  
\$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
LINE-3 \* DENVER, CO 80227 \*  
  
LINE-4 \*BASELINE SIMULATION FOR BLDG. #7108 \*  
LINE-5 \*BN ADMIN & CLRM \* ..

ABORT ERRORS ..  
DIAGNOSTIC WARNINGS ..  
LOADS-REPORT VERIFICATION=(LV-D)  
SUMMARY=(LS-C,LS-D)  
HOURLY-DATA-SAVE = YES ..  
  
BUILDING-LOCATION LATITUDE = 39.0  
LONGITUDE = 96.5  
ALTITUDE = 1065.  
TIME-ZONE = 6  
GROSS-AREA = 12273  
SHIELDING-COEF = 0.29  
X-REF = 0.0  
Y-REF = 0.0 ..  
  
RUN-PERIOD JAN 1 1994 THRU DEC 31 1994 ..

\$ SCHEDULES

LD\_PEOPLE =DAY-SCHEDULE (1,5) (0.)  
(6) (0.5)  
(7,11) (1.)  
(12) (0.5)  
(13,18) (1.)  
(19,24) (0.) ..

LD\_LIT/EQU =DAY-SCHEDULE (1,5) (0.)  
(6) (0.5)  
(7,18) (1.)  
(19,24) (0.) ..

LD\_ON =DAY-SCHEDULE (1,24) (1.) ..

LD\_OFF =DAY-SCHEDULE (1,24) (0.) ..

LW\_ON =WEEK-SCHEDULE (ALL) LD\_ON ..

LW\_OFF =WEEK-SCHEDULE (ALL) LD\_OFF ..



LW\_PEOPLE =WEEK-SCHEDULE (WD) LD\_PEOPLE  
(WEH) LD\_OFF ..

LW\_LIT/EQU =WEEK-SCHEDULE (WD) LD\_LIT/EQU  
(WEH) LD\_OFF ..

## \$ ON 100% LOADS

L\_ON =SCHEDULE THRU DEC 31 LW\_ON ..

## \$ OFF 100% LOADS

L\_OFF =SCHEDULE THRU DEC 31 LW\_OFF ..

## \$ PEOPLE LOAD

L\_PEOPLE =SCHEDULE THRU DEC 31 LW\_PEOPLE ..

## \$ LIGHTS AND EQUIPMENT

L\_EQUI/LIG =SCHEDULE THRU DEC 31 LW\_LIT/EQU ..

## \$ CONSTRUCTION TYPES

## \$ BRICK, AIR, BRICK

WALL-1 =LAYERS MATERIAL=(BK01,IN45,CB11) I-F-R= 0.6100  
THICKNESS=(0.333,0.167,0.667) ..

END-WALL =CONSTRUCTION LAYERS = WALL-1  
ABSORPTANCE = 0.880  
ROUGHNESS = 2 ..

## \$ SLAB FLOOR

FLOOR =CONSTRUCTION U-VALUE = 0.020  
ABSORPTANCE = 0.610  
ROUGHNESS = 5 ..

## \$ BRICK, FELT, INSL, CMU

WALL-2 =LAYERS MATERIAL=(BK01,HF-E3,HF-B6,CB11) I-F-R= 0.6100  
THICKNESS=(0.333,0.031,0.167,0.667) ..

SIDWALL1 =CONSTRUCTION LAYERS = WALL-2  
ABSORPTANCE = 0.880  
ROUGHNESS = 2 ..

## \$ STANDARD METAL DOOR

DOOR-MET =CONSTRUCTION U-VALUE = 0.480  
ABSORPTANCE = 0.860  
ROUGHNESS = 5 ..

## \$ FACIA, BRICK, FELT, INSL, CMU

WALL-2A =LAYERS MATERIAL=(HF-A3,AL11,BK01,HF-E3,HF-B6,CB11) I-F-R= 0.6100  
THICKNESS=(0.005,0.000,0.333,0.031,0.167,0.667) ..

SIDW/FAC =CONSTRUCTION LAYERS = WALL-2A  
ABSORPTANCE = 0.750  
ROUGHNESS = 5 ..

## \$ 1/2" DROP CEILING ACU TILE

DROP-CEL =CONSTRUCTION U-VALUE = 0.550  
 ABSORPTANCE = 0.750  
 ROUGHNESS = 2 ..

## \$ METAL ROOF, 3IN INSL

THINROOF =LAYERS MATERIAL=(HF-A3,IN75,HF-A3)  
 THICKNESS=(0.005,0.208,0.005) ..  
 ROOF-1 =CONSTRUCTION LAYERS = THINROOF  
 ABSORPTANCE = 0.800 ..

2PAN\_STD =GLASS-TYPE GLASS-TYPE-CODE = 1  
 PANES = 2 ..

## \$ SPACE DESCRIPTION

SPACE\_1 =SPACE AREA = 4445.0 VOLUME = 44450.0  
 TEMPERATURE = (73.) ZONE-TYPE = CONDITIONED  
 PEOPLE-SCHEDULE = L\_PEOPLE AREA/PERSON = 300.0  
 PEOPLE-HG-LAT = 625.0 PEOPLE-HG-SENS = 375.0  
 LIGHTING-TYPE = SUS-FLUOR LIGHTING-W/SQFT = 1.39  
 LIGHT-TO-SPACE = 1.0 LIGHTING-SCHEDULE = L\_EQUI/LIG  
 EQUIP-SCHEDULE = L\_EQUI/LIG EQUIPMENT-W/SQFT = 0.23  
 FURN-WEIGHT = 0.8 INF-METHOD = AIR-CHANGE  
 AIR-CHANGES/HR = 0.09 ..

E-W HEIGHT = 10.0 WIDTH = 127.0 CONS = SIDWALL1  
 AZIMUTH = 130 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 4.5 WIDTH = 3.3 G-T = 2PAN\_STD  
 MULTIPLIER = 9.0 SETBACK = 0.5  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5  
 OVERHANG-A = 10. OVERHANG-W = 30.  
 OVERHANG-D = 2.5 ..

E-W HEIGHT = 10.0 WIDTH = 36.0 CONS = END-WALL  
 AZIMUTH = 220 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

DOOR HEIGHT = 7.5 WIDTH = 3.5 CONS = DOOR-MET  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5  
 OVERHANG-A = 5. OVERHANG-W = 20. OVERHANG-D = 1.5  
 LEFT-FIN-H = 10. LEFT-FIN-D = 1.  
 RIGHT-FIN-H = 10. RIGHT-FIN-D = 1. ..

E-W HEIGHT = 10.0 WIDTH = 19.0 CONS = END-WALL  
 AZIMUTH = 40 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

U-W HEIGHT = 35.0 WIDTH = 127.0 CONS = FLOOR ..

I-W HEIGHT = 35.0 WIDTH = 127.0 CONS = DROP-CEL  
NEXT-TO = PLENUM\_1 ..

SPACE\_2 =SPACE AREA = 3234.0 VOLUME = 32340.0  
TEMPERATURE = (73.) ZONE-TYPE = CONDITIONED  
PEOPLE-SCHEDULE = L\_PEOPLE AREA/PERSON = 300.0  
PEOPLE-HG-LAT = 625.0 PEOPLE-HG-SENS = 375.0  
LIGHTING-TYPE = SUS-FLUOR LIGHTING-W/SQFT = 1.39  
LIGHT-TO-SPACE = 1.0 LIGHTING-SCHEDULE = L\_EQUI/LIG  
EQUIP-SCHEDULE = L\_EQUI/LIG EQUIPMENT-W/SQFT = 0.23  
FURN-WEIGHT = 0.8 INF-METHOD = AIR-CHANGE  
AIR-CHANGES/HR = 0.09 ..

E-W HEIGHT = 10.0 WIDTH = 42.0 CONS = END-WALL  
AZIMUTH = 220 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

DOOR HEIGHT = 7.5 WIDTH = 3.5 CONS = DOOR-MET  
SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5  
OVERHANG-A = 5. OVERHANG-W = 20. OVERHANG-D = 1.5  
LEFT-FIN-H = 10. LEFT-FIN-D = 1.  
RIGHT-FIN-H = 10. RIGHT-FIN-D = 1. ..

E-W HEIGHT = 10.0 WIDTH = 77.0 CONS = SIDWALL1  
AZIMUTH = 310 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 4.5 WIDTH = 3.3 G-T = 2PAN\_STD  
MULTIPLIER = 5.0 SETBACK = 0.5  
SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5  
OVERHANG-A = 10. OVERHANG-W = 30.  
OVERHANG-D = 2.5 ..

U-W HEIGHT = 42.0 WIDTH = 77.0 CONS = FLOOR ..

I-W HEIGHT = 42.0 WIDTH = 77.0 CONS = DROP-CEL  
NEXT-TO = PLENUM\_1 ..

SPACE\_3 =SPACE AREA = 3576.0 VOLUME = 35760.0  
TEMPERATURE = (73.) ZONE-TYPE = CONDITIONED  
PEOPLE-SCHEDULE = L\_PEOPLE AREA/PERSON = 300.0  
PEOPLE-HG-LAT = 625.0 PEOPLE-HG-SENS = 375.0  
LIGHTING-TYPE = SUS-FLUOR LIGHTING-W/SQFT = 1.39  
LIGHT-TO-SPACE = 1.0 LIGHTING-SCHEDULE = L\_EQUI/LIG  
EQUIP-SCHEDULE = L\_EQUI/LIG EQUIPMENT-W/SQFT = 0.23  
FURN-WEIGHT = 0.8 INF-METHOD = AIR-CHANGE  
AIR-CHANGES/HR = 0.09 ..

E-W HEIGHT = 10.0 WIDTH = 91.0 CONS = SIDWALL1  
AZIMUTH = 310 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

DOOR HEIGHT = 7.5 WIDTH = 3.5 CONS = DOOR-MET  
MULTIPLIER = 4.0 SKY-FORM-FACTOR = 0.5

GND-FORM-FACTOR = 0.5 OVERHANG-A = 5.  
 OVERHANG-W = 20. OVERHANG-D = 1.5  
 LEFT-FIN-H = 10. LEFT-FIN-D = 1.  
 RIGHT-FIN-H = 10. RIGHT-FIN-D = 1. . .

WINDOW HEIGHT = 4.5 WIDTH = 3.3 G-T = 2PAN\_STD  
 MULTIPLIER = 2.0 SETBACK = 0.5  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5  
 OVERHANG-A = 10. OVERHANG-W = 30.  
 OVERHANG-D = 2.5 ..

E-W HEIGHT = 10.0 WIDTH = 36.0 CONS = END-WALL  
 AZIMUTH = 40 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

U-W HEIGHT = 59.5 WIDTH = 60.0 CONS = FLOOR ..

I-W HEIGHT = 59.5 WIDTH = 60.0 CONS = DROP-CEL  
 NEXT-TO = PLENUM\_1 ..

SPACE\_4 =SPACE AREA = 924.0 VOLUME = 9240.0  
 TEMPERATURE = (73.) ZONE-TYPE = CONDITIONED  
 PEOPLE-SCHEDULE = L\_PEOPLE AREA/PERSON = 300.0  
 PEOPLE-HG-LAT = 625.0 PEOPLE-HG-SENS = 375.0  
 LIGHTING-TYPE = SUS-FLUOR LIGHTING-W/SQFT = 1.39  
 LIGHT-TO-SPACE = 1.0 LIGHTING-SCHEDULE = L\_EQUI/LIG  
 EQUIP-SCHEDULE = L\_EQUI/LIG EQUIPMENT-W/SQFT = 0.23  
 FURN-WEIGHT = 0.8 INF-METHOD = AIR-CHANGE  
 AIR-CHANGES/HR = 0.09 ..

E-W HEIGHT = 10.0 WIDTH = 22.0 CONS = END-WALL  
 AZIMUTH = 40 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 10.0 WIDTH = 42.0 CONS = SIDWALL1  
 AZIMUTH = 130 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

DOOR HEIGHT = 7.5 WIDTH = 3.5 CONS = DOOR-MET  
 MULTIPLIER = 2.0 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 OVERHANG-A = 5.  
 OVERHANG-W = 20. OVERHANG-D = 1.5  
 LEFT-FIN-H = 10. LEFT-FIN-D = 1.  
 RIGHT-FIN-H = 10. RIGHT-FIN-D = 1. . .

U-W HEIGHT = 22.0 WIDTH = 42.0 CONS = FLOOR ..

I-W HEIGHT = 22.0 WIDTH = 42.0 CONS = DROP-CEL  
 NEXT-TO = PLENUM\_1 ..

PLENUM\_1 =SPACE AREA = 12179.0 VOLUME = 66984.5  
 TEMPERATURE = (73.) ZONE-TYPE = PLENUM  
 EQUIP-SENSIBLE = 0.0 SOURCE-SENSIBLE = 0.0  
 FLOOR-WEIGHT = 1. ..

```

E-W      HEIGHT = 5.5  WIDTH = 168.0  CONS = SIDW/FAC
        AZIMUTH = 130  SKY-FORM-FACTOR = 0.5
        GND-FORM-FACTOR = 0.5  ..

E-W      HEIGHT = 5.5  WIDTH = 168.0  CONS = SIDW/FAC
        AZIMUTH = 310  SKY-FORM-FACTOR = 0.5
        GND-FORM-FACTOR = 0.5  ..

E-W      HEIGHT = 5.5  WIDTH = 78.0   CONS = SIDW/FAC
        AZIMUTH = 220  SKY-FORM-FACTOR = 0.5
        GND-FORM-FACTOR = 0.5  ..

E-W      HEIGHT = 5.5  WIDTH = 78.0   CONS = SIDW/FAC
        AZIMUTH = 40   SKY-FORM-FACTOR = 0.5
        GND-FORM-FACTOR = 0.5  ..

ROOF     HEIGHT = 78.0  WIDTH = 220.0  CONS = ROOF-1
        TILT = 0   SKY-FORM-FACTOR = 1.0  ..

```

\$ HOURLY REPORT DESCRIPTION

```

OUTDOOR-BK =REPORT-BLOCK VARIABLE-TYPE = GLOBAL
            VARIABLE-LIST = (3,4) ..

END ..

COMPUTE LOADS ..

INPUT SYSTEMS ..

```

```

$-----$
$ E Z - D O E   S Y S T E M S   I N P U T $
$-----$

```

\$ GENERAL PROJECT DATA

```

TITLE  LINE-1 *   EMC      ENGINEERS      INC.      *
        LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
        LINE-3 *   DENVER,      CO      80227      *

        LINE-4 *BASELINE SIMULATION FOR BLDG. #7108      *
        LINE-5 *BN ADMIN & CLRM      * ..

ABORT      ERRORS ..

DIAGNOSTIC  WARNINGS ..

SYSTEMS-REPORT  VERIFICATION=(SV-A)
                SUMMARY=(SS-A,SS-C,SS-K,SS-O)
                HOURLY-DATA-SAVE = YES ..

```

\$ SCHEDULES

```

SD_ON      =DAY-SCHEDULE (1,24) (1.) ..
SD_OFF     =DAY-SCHEDULE (1,24) (0.) ..
SD_WT_HT   =DAY-SCHEDULE (1,24) (74.) ..
SD_SM_CL   =DAY-SCHEDULE (1,24) (72.) ..

```

```

SD_10%_OA =DAY-SCHEDULE (1,24) (0.1) ..
SD_WT_CL =DAY-SCHEDULE (1,24) (74.2) ..
SD_SM_HT =DAY-SCHEDULE (1,24) (71.8) ..

SW_ON =WEEK-SCHEDULE (ALL) SD_ON ..

SW_OFF =WEEK-SCHEDULE (ALL) SD_OFF ..

SW_WT_HT =WEEK-SCHEDULE (ALL) SD_WT_HT ..

SW_SM_CL =WEEK-SCHEDULE (ALL) SD_SM_CL ..

SW_10%_OA =WEEK-SCHEDULE (ALL) SD_10%_OA ..

SW_WT_CL =WEEK-SCHEDULE (ALL) SD_WT_CL ..

SW_SM_HT =WEEK-SCHEDULE (ALL) SD_SM_HT ..

$ FULL ON SYSTEM
S_ON =SCHEDULE THRU DEC 31 SW_ON ..

$ FULL OFF SYSTEM
S_OFF =SCHEDULE THRU DEC 31 SW_OFF ..

$ HEATING SEASON
S_HE-SCHED =SCHEDULE THRU MAY 15 SW_ON
                THRU OCT 1 SW_OFF
                THRU DEC 31 SW_ON ..

$ COOLING SEASON
S_CL_SCHED =SCHEDULE THRU MAY 15 SW_OFF
                THRU OCT 1 SW_ON
                THRU DEC 31 SW_OFF ..

$ HEATING TEMP
S_HT_SET_F =SCHEDULE THRU MAY 15 SW_WT_HT
                THRU OCT 1 SW_SM_HT
                THRU DEC 31 SW_WT_HT ..

$ COOLING TEMP
S_CL_SET_F =SCHEDULE THRU MAY 15 SW_WT_CL
                THRU OCT 1 SW_SM_CL
                THRU DEC 31 SW_WT_CL ..

$ 10% OA 100% OF THE TIME
S_OA@10% =SCHEDULE THRU DEC 31 SW_10%_OA ..

HRLY-SCHED =SCHEDULE THRU JAN 12 SW_OFF
                THRU JAN 13 SW_ON
                THRU AUG 15 SW_OFF
                THRU AUG 16 SW_ON
                THRU DEC 31 SW_OFF ..

```

## \$ ZONE DESCRIPTION

```

SPACE_1  =ZONE  DESIGN-HEAT-T = 74.0  DESIGN-COOL-T = 72.0
           HEAT-TEMP-SCH = S_HT_SET_F  COOL-TEMP-SCH = S_CL_SET_F
           ZONE-TYPE = CONDITIONED
           THERMOSTAT-TYPE = PROPORTIONAL  THROTTLING-RANGE = 0.2
           SIZING-OPTION = FROM-LOADS  ..

SPACE_2  =ZONE  DESIGN-HEAT-T = 74.0  DESIGN-COOL-T = 72.0
           HEAT-TEMP-SCH = S_HT_SET_F  COOL-TEMP-SCH = S_CL_SET_F
           ZONE-TYPE = CONDITIONED
           THERMOSTAT-TYPE = PROPORTIONAL  THROTTLING-RANGE = 0.2
           SIZING-OPTION = FROM-LOADS  ...

SPACE_3  =ZONE  DESIGN-HEAT-T = 74.0  DESIGN-COOL-T = 72.0
           HEAT-TEMP-SCH = S_HT_SET_F  COOL-TEMP-SCH = S_CL_SET_F
           ZONE-TYPE = CONDITIONED
           THERMOSTAT-TYPE = PROPORTIONAL  THROTTLING-RANGE = 0.2
           SIZING-OPTION = FROM-LOADS  ..

SPACE_4  =ZONE  DESIGN-HEAT-T = 74.0  DESIGN-COOL-T = 72.0
           HEAT-TEMP-SCH = S_HT_SET_F  COOL-TEMP-SCH = S_CL_SET_F
           ZONE-TYPE = CONDITIONED
           THERMOSTAT-TYPE = PROPORTIONAL  THROTTLING-RANGE = 0.2
           SIZING-OPTION = FROM-LOADS  ..

PLENUM_1 =ZONE  DESIGN-HEAT-T = 72.0  DESIGN-COOL-T = 74.0
           ZONE-TYPE = PLENUM  THROTTLING-RANGE = 0.2
           SIZING-OPTION = FROM-LOADS  ..

```

## \$ SYSTEM DESCRIPTION

```

MZ-FAN-SYS =SYSTEM  SYSTEM-TYPE = MZS
                MAX-SUPPLY-T = 120.0  MIN-SUPPLY-T = 55.0
                HEATING-SCHEDULE = S_HE-SCHED
                COOLING-SCHEDULE = S_CL_SCHED  PREHEAT-T = 0.0
                OA-CONTROL = FIXED  SUPPLY-CFM = 7820.
                RATED-CFM = 7820.  MIN-OUTSIDE-AIR = 0.1
                MIN-AIR-SCH = S_OA@10%  SUPPLY-DELTA-T = 2.7
                SUPPLY-KW = 0.00088
                MOTOR-PLACEMENT = OUTSIDE-AIRFLOW
                NIGHT-CYCLE-CTRL = STAY-OFF  RETURN-STATIC = 0.7
                RETURN-EFF = 0.77  NIGHT-VENT-DT = 0.0
                MIN-CFM-RATIO = 1.0  COOLING-CAPACITY = 248100.
                COOL-SH-CAP = 198484.  HEATING-CAPACITY = -299800.
                RETURN-AIR-PATH = PLENUM-ZONES
                ZONE-NAMES = (SPACE_1, SPACE_2, SPACE_3, SPACE_4,
                               PLENUM_1)
                PLENUM-NAMES = (PLENUM_1)  ..

```

## \$ HOURLY REPORT DESCRIPTION

```

AHU-BLOCK =REPORT-BLOCK VARIABLE-TYPE = MZ-FAN-SYS
                VARIABLE-LIST = (3,5,6,17,18,19) ..

```

```

ZONE-BLOCK =REPORT-BLOCK VARIABLE-TYPE = .SPACE_3
                VARIABLE-LIST = (17,18,7,6) ..
HRLY-AHU     = HOURLY-REPORT  REPORT-SCHEDULE = HRLY-SCHED
                REPORT-BLOCK = (AHU-BLOCK)
..
HRLY-ZONE   = HOURLY-REPORT  REPORT-SCHEDULE = HRLY-SCHED
                REPORT-BLOCK = (ZONE-BLOCK)
..
END ..
COMPUTE SYSTEMS ..

INPUT PLANT ..

```

```

$-----$
$ E Z - D O E   P L A N T S   I N P U T $
$-----$

```

\$ GENERAL PROJECT DATA

```

TITLE  LINE-1 *      EMC      ENGINEERS      INC.      *
        LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
        LINE-3 *      DENVER,      CO      80227      *

        LINE-4 *BASELINE SIMULATION FOR BLDG. #7108      *
        LINE-5 *BN ADMIN & CLRM      * ..

```

```

ABORT          ERRORS ..
DIAGNOSTIC     WARNINGS ..
PLANT-REPORT   VERIFICATION=(PV-A)
                SUMMARY=(PS-B,BEPS)
                HOURLY-DATA-SAVE = YES ..

```

\$ SCHEDULES

```

PD_ON          =DAY-SCHEDULE (1,24) (1.) ..
PD_OFF         =DAY-SCHEDULE (1,24) (0.) ..

PW_OFF         =WEEK-SCHEDULE (ALL) PD_OFF ..
PW_ON          =WEEK-SCHEDULE (ALL) PD_ON ..

```

\$ HEATING SEASON

```

P_HEAT        =SCHEDULE THRU MAY 15 PW_ON
                THRU OCT 1 PW_OFF
                THRU DEC 31 PW_ON ..

```

\$ COOLING SEASON

```

P_COOL        =SCHEDULE THRU MAY 15 PW_OFF
                THRU OCT 1 PW_ON
                THRU DEC 31 PW_OFF ..

```



## \$ EQUIPMENT DESCRIPTION

HW-PLANT =PLANT-EQUIPMENT TYPE = HW-BOILER  
SIZE = -999. ..

COOL-PLANT =PLANT-EQUIPMENT TYPE = HERM-REC-CHLR  
SIZE = -999. INSTALLED-NUMBER = 2  
MAX-NUMBER-AVAIL = 2 ..

PLANT-PARAMETERS BOILER-FUEL = NATURAL-GAS HERM-REC-COND-TYPE = AIR  
CCIRC-HEAD = 70.0 HCIRC-HEAD = 70.0 ..

ENERGY-RESOURCE RESOURCE = ELECTRICITY ..

ENERGY-RESOURCE RESOURCE = NATURAL-GAS ..

HEAT =LOAD-ASSIGNMENT TYPE = HEATING  
OPERATION-MODE = RUN-NEEDED

LOAD-RANGE = 0.000  
PLANT-EQUIPMENT = HW-PLANT  
NUMBER = 1 ..

COOL =LOAD-ASSIGNMENT TYPE = COOLING  
OPERATION-MODE = RUN-NEEDED

LOAD-RANGE = 0.000  
PLANT-EQUIPMENT = COOL-PLANT  
NUMBER = 2 ..

END ..  
COMPUTE PLANT ..  
STOP ..

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 8/1995 14:32:41 LDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #7108 BN ADMIN & CLRM TOPEKA, KS  
 REPORT- LV-D DETAILS OF EXTERIOR SURFACES IN THE PROJECT

NUMBER OF EXTERIOR SURFACES 14 RECTANGULAR 14 OTHER 0  
 (U-VALUE INCLUDES INSIDE AIR FILM PLUS OUTSIDE AIR FILM AT 7.5 MPH WINDSPEED )

SURFACE	SPACE	G L A S S		W A L L		U - V A L U E		A R E A		W A L L + G L A S S		A Z I M U T H
		U-VALUE (BTU/HR-SQFT-F)	AREA (SQFT)	U-VALUE (BTU/HR-SQFT-F)	AREA (SQFT)	U-VALUE (BTU/HR-SQFT-F)	AREA (SQFT)	U-VALUE (BTU/HR-SQFT-F)	AREA (SQFT)	U-VALUE (BTU/HR-SQFT-F)	AREA (SQFT)	
SPACE 1		0.000	0.00	0.065	190.00	0.065	190.00	190.00	0.065	190.00	NORTH	
SPACE 3		0.000	0.00	0.065	360.00	0.065	360.00	360.00	0.065	360.00	NORTH	
SPACE 4		0.000	0.00	0.065	220.00	0.065	220.00	220.00	0.065	220.00	NORTH	
PLENUM 1		0.000	0.00	0.094	429.00	0.094	429.00	429.00	0.103	429.00	NORTH	
SPACE 4		0.000	0.00	0.103	420.00	0.103	420.00	420.00	0.094	420.00	EAST	
PLENUM 1		0.000	0.00	0.094	924.00	0.094	924.00	924.00	0.144	1270.00	EAST	
SPACE 1		0.490	133.65	0.103	1136.35	0.065	420.00	420.00	0.065	420.00	SOUTH	
SPACE 2		0.000	0.00	0.065	429.00	0.094	429.00	429.00	0.094	429.00	SOUTH	
PLENUM 1		0.000	0.00	0.065	360.00	0.065	360.00	360.00	0.094	360.00	SOUTH	
SPACE 1		0.000	0.00	0.094	924.00	0.094	924.00	924.00	0.094	924.00	WEST	
SPACE 2		0.490	74.25	0.103	695.75	0.141	880.30	880.30	0.116	770.00	WEST	
SPACE 3		0.490	29.70	0.103	880.30	0.128	17160.00	17160.00	0.128	17160.00	ROOF	
PLENUM 1		0.000	0.00	0.020	4445.00	0.020	4445.00	4445.00	0.020	4445.00	UNDERGRND	
SPACE 1		0.000	0.00	0.020	3234.00	0.020	3234.00	3234.00	0.020	3234.00	UNDERGRND	
SPACE 2		0.000	0.00	0.020	3570.00	0.020	3570.00	3570.00	0.020	3570.00	UNDERGRND	
SPACE 3		0.000	0.00	0.020	924.00	0.020	924.00	924.00	0.020	924.00	UNDERGRND	
SPACE 4		0.000	0.00	0.020	0.00	0.020	0.00	0.00	0.020	0.00	UNDERGRND	

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 8/1995 14:32:41 LDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #7108 BN ADMIN & CLRM TOPEKA, KS  
 REPORT- LV-D DETAILS OF EXTERIOR SURFACES IN THE PROJECT

NORTH	EAST	SOUTH	WEST	ROOF	ALL WALLS	WALLS+ROOFS	UNDERGRND	BUILDING	AVERAGE U-VALUE		GLASS		OPAQUE		GLASS+OPAQUE	
									U-VALUE/GLASS (BTU/HR-SQFT-F)	U-VALUE/WALLS (BTU/HR-SQFT-F)	U-VALUE/WALLS+GLASS (BTU/HR-SQFT-F)	U-VALUE/WALLS+GLASS (BTU/HR-SQFT-F)	U-VALUE/WALLS+GLASS (BTU/HR-SQFT-F)	U-VALUE/WALLS+GLASS (BTU/HR-SQFT-F)	U-VALUE/WALLS+GLASS (BTU/HR-SQFT-F)	U-VALUE/WALLS+GLASS (BTU/HR-SQFT-F)
0.000	0.076	0.100	0.076	0.076	0.076	0.076	0.076	0.076	0.076	0.076	0.00	0.00	1199.00	1199.00	1199.00	1199.00
0.490	0.100	0.076	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	133.65	133.65	2480.35	2480.35	2480.35	2480.35
0.000	0.076	0.100	0.076	0.076	0.076	0.076	0.076	0.076	0.076	0.076	0.00	0.00	1209.00	1209.00	1209.00	1209.00
0.490	0.100	0.076	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	103.95	103.95	2500.05	2500.05	2500.05	2500.05
0.000	0.076	0.100	0.076	0.076	0.076	0.076	0.076	0.076	0.076	0.076	0.00	0.00	17160.00	17160.00	17160.00	17160.00
0.490	0.092	0.117	0.092	0.092	0.092	0.092	0.092	0.092	0.092	0.092	237.60	237.60	7388.40	7388.40	7388.40	7388.40
0.000	0.076	0.100	0.076	0.076	0.076	0.076	0.076	0.076	0.076	0.076	237.60	237.60	24548.40	24548.40	24548.40	24548.40
0.490	0.117	0.092	0.117	0.117	0.117	0.117	0.117	0.117	0.117	0.117	0.00	0.00	12173.00	12173.00	12173.00	12173.00
0.000	0.076	0.100	0.076	0.076	0.076	0.076	0.076	0.076	0.076	0.076	237.60	237.60	36721.40	36721.40	36721.40	36721.40
0.490	0.085	0.100	0.085	0.085	0.085	0.085	0.085	0.085	0.085	0.085	0.00	0.00	1199.00	1199.00	1199.00	1199.00

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 8/1995 14:32:41 LDD RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #7108 BN ADMIN & CLRM TOPEKA, KS  
 REPORT- LS-C BUILDING PEAK LOAD COMPONENTS

\*\*\* BUILDING \*\*\*

FLOOR AREA 12179 SQFT 1131 SQMT  
 VOLUME 188775 CUFT 5346 CUMT

COOLING LOAD HEATING LOAD  
 AUG 24 6PM JAN 16 6AM  
 93F 34C 10F -12C  
 76F 24C 8F -13C

	SENSIBLE (KBTU/H)	( KW )	LATENT (KBTU/H)	( KW )	SENSIBLE (KBTU/H)	( KW )
WALLS	5.905	1.729	0.000	0.000	-28.955	-8.480
ROOFS	0.000	0.000	0.000	0.000	0.000	0.000
GLASS CONDUCTION	2.382	0.698	0.000	0.000	-8.267	-2.421
GLASS SOLAR	6.870	2.012	0.000	0.000	0.609	0.178
DOOR	2.310	0.677	0.000	0.000	-6.229	-1.824
INTERNAL SURFACES	0.000	0.000	0.000	0.000	0.000	0.000
UNDERGROUND SURFACES	-1.152	-0.337	0.000	0.000	-6.990	-2.047
OCCUPANTS TO SPACE	14.248	4.173	25.373	7.431	0.031	0.009
LIGHT TO SPACE	53.232	15.590	0.000	0.000	0.177	0.052
EQUIPMENT TO SPACE	9.050	2.650	0.000	0.000	0.020	0.006
PROCESS TO SPACE	0.000	0.000	0.000	0.000	0.000	0.000
INFILTRATION	7.706	2.257	11.955	3.501	-19.339	-5.664
TOTAL	100.551	29.449	37.328	10.933	-68.942	-20.191
TOTAL LOAD	137.880	KBTU/H	40.382	KW	-68.942	KBTU/H
TOTAL LOAD / AREA	11.32	BTU/H.SQFT	35.690	W /SQMT	5.66	BTU/H.SQFT

\*\*\*\*\*  
 \* NOTE 1) THE ABOVE LOADS EXCLUDE OUTSIDE VENTILATION AIR \*  
 \* LOADS \*  
 \* 2) TIMES GIVEN IN STANDARD TIME FOR THE LOCATION \*  
 \* IN CONSIDERATION \*  
 \*\*\*\*\*

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOB-2.1D 5/ 8/1995 14:32:41 SDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #7108 BN ADMIN & CLRM  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR MZ-FAN-SYS TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C			
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC-TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				0.000	-95.137	15	8	-7.F	-273.478	10918.	27.438
FEB	0.00000				0.000	-69.797	3	5	-2.F	-240.197	9869.	27.438
MAR	0.00000				0.000	-50.681	3	5	13.F	-193.289	11411.	27.438
APR	0.00000				0.000	-13.714	5	5	29.F	-129.702	10732.	27.438
MAY	30.68973	31	18	90.F	278.564	-2.152	9	5	44.F	-79.934	10918.	27.438
JUN	76.41174	29	15	88.F	274.997	0.000				0.000	10979.	27.438
JUL	94.50362	7	18	83.F	300.327	0.000				0.000	10671.	27.438
AUG	96.42191	4	17	92.F	290.192	0.000				0.000	11411.	27.438
SEP	48.79247	7	15	92.F	264.794	0.000				0.000	10732.	27.438
OCT	0.17299	1	18	83.F	43.344	-11.298	20	5	25.F	-140.569	10671.	27.438
NOV	0.00000				0.000	-42.580	3	5	12.F	-186.719	10486.	27.438
DEC	0.00000				0.000	-84.120	15	5	7.F	-233.355	10918.	27.438
TOTAL	346.993				300.327	-369.476				-273.478	129722.	27.438

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 8/1995 14:32:41 SDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #7108 BN ADMIN & CLRM  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR MZ-FAN-SYS TOPEKA, KS

MONTH	HOURS OF				HOURS				COINCIDENT LOADS				
	COOLING LOAD	HEATING LOAD	COOL-HEAT LOAD	FLOATING	HEATING AVAIL.	COOLING AVAIL.	FANS ON	VENTING	FLOATING WHEN	HEATING PEAK	ELECTRIC LOAD AT PEAK	COOLING PEAK	ELECTRIC LOAD AT PEAK
JAN	0	744	0	0	744	0	744	0	0	-117.027	7.716	0	7.716
FEB	0	672	0	0	672	0	672	0	0	-119.979	7.716	0	7.716
MAR	0	744	0	0	744	0	744	0	0	-116.748	7.716	0	7.716
APR	0	720	0	0	720	0	720	0	0	-0.036	7.716	0	7.716
MAY	311	360	0	73	384	0	744	0	73	0.000	27.438	0	27.438
JUN	664	0	0	56	720	0	744	0	56	0.000	27.438	0	27.438
JUL	736	0	0	8	744	0	744	0	8	0.000	27.438	0	27.438
AUG	727	0	0	17	744	0	744	0	17	0.000	27.438	0	27.438
SEP	491	0	0	229	720	0	744	0	229	0.000	27.438	0	27.438
OCT	6	720	0	18	24	0	744	0	18	0.000	27.438	0	27.438
NOV	0	720	0	0	720	0	744	0	0	-140.023	7.716	0	7.716
DEC	0	744	0	0	744	0	744	0	0	-156.261	7.716	0	7.716
ANNUAL	2935	5424	0	401	5424	3336	8760	0	401				

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY TOTAL (MBTU) PEAK (KBTU) DY/HR	NATURAL-GAS TOTAL (MBTU) PEAK (KBTU) DY/HR
JAN	42.281 100.921 31/10	42.281 100.921 31/10	133.874 343.935 15/ 8
FEB	38.039 100.921 28/10	38.039 100.921 28/10	101.619 308.672 3/ 5
MAR	76.464 100.921 31/ 9	42.820 100.921 31/ 9	76.464 257.615 3/ 5
APR	23.349 100.921 15/ 8	38.610 100.921 15/ 8	23.349 185.869 5/ 5
MAY	4.490 189.118 31/18	49.771 189.118 31/18	4.490 127.682 9/ 5
JUN	0.000 188.307 28/16	66.518 188.307 28/16	0.000 0.000 30/ 1
JUL	0.000 193.603 22/16	72.114 193.603 22/16	0.000 0.000 31/ 1
AUG	0.000 199.465 11/16	76.150 199.465 11/16	0.000 0.000 31/ 1
SEP	0.000 55.884 7/16	55.884 189.212 7/16	0.000 0.000 30/ 1
OCT	19.871 100.921 20/10	38.403 100.921 20/10	19.871 198.337 20/ 5
NOV	64.890 100.921 30/11	39.237 100.921 30/11	64.890 250.336 3/ 5
DEC	121.051 100.921 30/18	42.209 100.921 30/18	121.051 301.323 15/ 5
ONE YEAR USE/PEAK	602.036 199.465	602.036 199.465	545.608 343.935

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 8/1995 14:32:41 PDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #7108 BN ADMIN & CLRM TOPEKA, KS  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE

ENERGY TYPE	ELECTRICITY	NATURAL-GAS
IN SITE MBTU -		
CATEGORY OF USE		
SPACE HEAT	19.62	545.61
SPACE COOL	121.65	0.00
HVAC AUX	248.63	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	182.00	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	30.11	0.00
TOTAL	602.01	545.61

TOTAL SITE ENERGY 1147.64 MBTU 93.5 KBTU/SQFT-YR GROSS-AREA 94.2 KBTU/SOFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 2353.52 MBTU 191.8 KBTU/SQFT-YR GROSS-AREA 193.2 KBTU/SOFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 4.3  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.



```

E-W    HEIGHT = 5.5  WIDTH = 168.0  CONS = SIDW/FAC
        AZIMUTH = 130  SKY-FORM-FACTOR = 0.5
        GND-FORM-FACTOR = 0.5  ..

E-W    HEIGHT = 5.5  WIDTH = 168.0  CONS = SIDW/FAC
        AZIMUTH = 310  SKY-FORM-FACTOR = 0.5
        GND-FORM-FACTOR = 0.5  ..

E-W    HEIGHT = 5.5  WIDTH = 78.0  CONS = SIDW/FAC
        AZIMUTH = 220  SKY-FORM-FACTOR = 0.5
        GND-FORM-FACTOR = 0.5  ..

E-W    HEIGHT = 5.5  WIDTH = 78.0  CONS = SIDW/FAC
        AZIMUTH = 40  SKY-FORM-FACTOR = 0.5
        GND-FORM-FACTOR = 0.5  ..

ROOF   HEIGHT = 78.0  WIDTH = 220.0  CONS = ROOF-1
        TILT = 0  SKY-FORM-FACTOR = 1.0  ..

```

\$ HOURLY REPORT DESCRIPTION

```

OUTDOOR-BK =REPORT-BLOCK VARIABLE-TYPE = GLOBAL
            VARIABLE-LIST = (3,4) ..

```

```

END ..
COMPUTE LOADS ..

```

INPUT SYSTEMS ..

```

$-----$
$ E Z - D O E   S Y S T E M S   I N P U T $
$-----$

```

\$ GENERAL PROJECT DATA

```

TITLE  LINE-1 *   EMC      ENGINEERS      INC.      *
        LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
        LINE-3 *   DENVER,      CO      80227      *

        LINE-4 *RUN #1 NIGHT SET BACK FOR BLDG. #7108 *
        LINE-5 *BN ADMIN & CLRM      * ..

```

```

ABORT      ERRORS ..
DIAGNOSTIC WARNINGS ..
SYSTEMS-REPORT  VERIFICATION=(SV-A)
                SUMMARY=(SS-A,SS-C,SS-K,SS-O)
                HOURLY-DATA-SAVE = YES ..

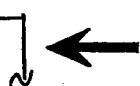
```

\$ SCHEDULES

```

SD_ON      =DAY-SCHEDULE (1,24) (1.) ..
SD_OFF     =DAY-SCHEDULE (1,24) (0.) ..
SD_WT_HT   =DAY-SCHEDULE (1,5) (55.)
                (6,18) (74.)

```





```

(19,24) (55.) ..
SD_SM_CL =DAY-SCHEDULE (1,5) (85.)
(6,18) (72.)
(19,24) (85.) ..
SD_10%_OA =DAY-SCHEDULE (1,24) (0.1) ..
SD_WT_CL =DAY-SCHEDULE (1,5) (55.2)
(6,18) (74.2)
(19,24) (55.2) ..
SD_SM_HT =DAY-SCHEDULE (1,5) (84.8)
(6,18) (71.8)
(19,24) (84.8) ..
SD_FAN_CYC =DAY-SCHEDULE (1,5) (-1.)
(6,18) (1.)
(19,24) (-1.) ..

```



```

SW_ON =WEEK-SCHEDULE (ALL) SD_ON ..
SW_OFF =WEEK-SCHEDULE (ALL) SD_OFF ..
SW_WT_HT =WEEK-SCHEDULE (ALL) SD_WT_HT ..
SW_SM_CL =WEEK-SCHEDULE (ALL) SD_SM_CL ..
SW_10%_OA =WEEK-SCHEDULE (ALL) SD_10%_OA ..
SW_WT_CL =WEEK-SCHEDULE (ALL) SD_WT_CL ..
SW_SM_HT =WEEK-SCHEDULE (ALL) SD_SM_HT ..
SW_FAN_CYC =WEEK-SCHEDULE (ALL) SD_FAN_CYC ..

```

```

$ FULL ON SYSTEM
S_ON =SCHEDULE THRU DEC 31 SW_ON ..

```

```

$ FULL OFF SYSTEM
S_OFF =SCHEDULE THRU DEC 31 SW_OFF ..

```

```

$ HEATING SEASON
S_HE-SCHED =SCHEDULE THRU MAY 15 SW_ON
THRU OCT 1 SW_OFF
THRU DEC 31 SW_ON ..

```

```

$ COOLING SEASON
S_CL_SCHED =SCHEDULE THRU MAY 15 SW_OFF
THRU OCT 1 SW_ON
THRU DEC 31 SW_OFF ..

```

```

$ HEATING TEMP
S_HT_SET_F =SCHEDULE THRU MAY 15 SW_WT_HT
THRU OCT 1 SW_SM_HT
THRU DEC 31 SW_WT_HT ..

```

```

$ COOLING TEMP
S_CL_SET_F =SCHEDULE THRU MAY 15 SW_WT_CL
THRU OCT 1 SW_SM_CL

```

THRU DEC 31 SW\_WT\_CL ..

\$ 10% OA 100% OF THE TIME

S\_OA@10% =SCHEDULE THRU DEC 31 SW\_10%\_OA ..

HRLY-SCHED =SCHEDULE THRU JAN 30 SW\_OFF

THRU JAN 31 SW\_ON

THRU AUG 10 SW\_OFF

THRU AUG 11 SW\_ON

THRU DEC 31 SW\_OFF ..

S\_FAN\_CYC =SCHEDULE THRU DEC 31 SW\_FAN\_CYC ..

\$ ZONE DESCRIPTION

SPACE\_1 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

SPACE\_2 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

SPACE\_3 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

SPACE\_4 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

PLENUM\_1 =ZONE DESIGN-HEAT-T = 72.0 DESIGN-COOL-T = 74.0  
ZONE-TYPE = PLENUM THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

\$ SYSTEM DESCRIPTION

MZ-FAN-SYS =SYSTEM SYSTEM-TYPE = MZS  
MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
HEATING-SCHEDULE = S\_HE-SCHED  
COOLING-SCHEDULE = S\_CL\_SCHED PREHEAT-T = 0.0  
HEAT-CONTROL = COLDEST COOL-CONTROL = WARMEST  
OA-CONTROL = FIXED SUPPLY-CFM = 7820.  
RATED-CFM = 7820. MIN-OUTSIDE-AIR = 0.1  
MIN-AIR-SCH = S\_OA@10% MAX-OA-FRACTION = 0.1

```

FAN-SCHEDULE = S_FAN_CYC  SUPPLY-DELTA-T = 2.7
SUPPLY-KW = 0.00088
MOTOR-PLACEMENT = OUTSIDE-AIRFLOW
NIGHT-CYCLE-CTRL = CYCLE-ON-ANY  RETURN-STATIC = 0.7
RETURN-EFF = 0.77  NIGHT-VENT-DT = 0.0
MIN-CFM-RATIO = 1.0  COOLING-CAPACITY = 248100.
COOL-SH-CAP = 198484.  HEATING-CAPACITY = -299800.
RETURN-AIR-PATH = PLENUM-ZONES
ZONE-NAMES = (SPACE_1, SPACE_2, SPACE_3, SPACE_4,
              PLENUM_1)
PLENUM-NAMES = (PLENUM_1) ..

```

\$ HOURLY REPORT DESCRIPTION

```

AHU-BLOCK =REPORT-BLOCK VARIABLE-TYPE = MZ-FAN-SYS
              VARIABLE-LIST = (3,5,6,17,18,19,23,39) ..
ZONE-BLOCK =REPORT-BLOCK VARIABLE-TYPE = SPACE_3
              VARIABLE-LIST = (17,18,7,6) ..
HRLY-AHU = HOURLY-REPORT  REPORT-SCHEDULE = HRLY-SCHED
              REPORT-BLOCK = (AHU-BLOCK)
..
HRLY-ZONE = HOURLY-REPORT  REPORT-SCHEDULE = HRLY-SCHED
              REPORT-BLOCK = (ZONE-BLOCK)
..
END ..
COMPUTE SYSTEMS ..

INPUT PLANT ..

```

```

$-----$
$ E Z - D O E  P L A N T S  I N P U T $
$-----$

```

\$ GENERAL PROJECT DATA

```

TITLE  LINE-1 *   EMC      ENGINEERS      INC.      *
        LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
        LINE-3 *   DENVER,      CO      80227      *

        LINE-4 *RUN #1 NIGHT SET BACK FOR BLDG. #7108  *
        LINE-5 *BN ADMIN & CLRM                          * ..

```

```

ABORT          ERRORS ..
DIAGNOSTIC     WARNINGS ..
PLANT-REPORT   VERIFICATION=(PV-A)
               SUMMARY=(PS-B,BEPS)
               HOURLY-DATA-SAVE = YES ..

```

\$ SCHEDULES

```

PD_ON   =DAY-SCHEDULE (1,24) (1.) ..
PD_OFF  =DAY-SCHEDULE (1,24) (0.) ..

```

EMC ENGINEERS INC. EZZOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1.D 5/ 5/1995 8: 7:52 SDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SET BACK FOR BLDG. #7108 BN ADMIN & CLRM  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR MZ-FAN-SYS TOPEKA, KS

MONTH	COOLING				HEATING				H E A T I N G				E L E C	
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	MAXIMUM COOLING LOAD (KBTU/HR)	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC- ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-76.286	15	7	-7. F	-8. F	0.000	0.000	-357.783	8286.	27.438
FEB	0.00000				-56.537	3	7	-5. F	-6. F	0.000	0.000	-349.900	7493.	27.438
MAR	0.00000				-40.338	4	7	14. F	12. F	0.000	0.000	-337.881	8780.	27.438
APR	0.00000				-12.067	5	6	31. F	28. F	0.000	0.000	-313.756	8186.	27.438
MAY	24.82872	31	18	90. F	-2.234	9	6	44. F	44. F	279.010	279.010	-177.382	8288.	28.486
JUN	61.75295	29	15	88. F	0.000					281.268	281.268	0.000	8433.	27.438
JUL	75.18604	7	18	83. F	0.000					304.253	304.253	0.000	8040.	27.438
AUG	77.02224	4	17	92. F	0.000					294.195	294.195	0.000	8780.	27.438
SEP	39.93212	7	16	93. F	-9.572	20	6	24. F	23. F	0.000	0.000	-316.584	8188.	27.438
OCT	0.11945	1	18	83. F	-34.039	3	7	19. F	17. F	0.000	0.000	-337.925	7940.	27.438
NOV	0.00000				-68.145	15	7	11. F	9. F	0.000	0.000	-344.684	8286.	27.438
DEC	0.00000									0.000	0.000			
TOTAL	278.841				-299.217					304.253	304.253	-357.783	98739.	28.486
MAX														

EMC ENGINEERS INC. EZZOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1.D 5/ 5/1995 8: 7:52 SDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SET BACK FOR BLDG. #7108 BN ADMIN & CLRM  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR MZ-FAN-SYS TOPEKA, KS

MONTH	HOURS				HOURS				HOURS				HOURS			
	COOLING LOAD	HEATING LOAD	COINCIDENT COOL-HEAT LOAD	FLOATING	HEATING AVAIL.	COOLING AVAIL.	FANS ON	FANS ON CYCLE	FANS ON	NIGHT VENTING	FLOATING WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC COOLING PEAK (KW)	COINCIDENT HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC COOLING PEAK (KW)	
JAN	0	403	0	341	744	0	403	0	0	0	0	0.000	0.000	0.000	0.000	
FEB	0	363	0	309	672	0	364	0	0	0	1	0.000	0.000	0.000	0.000	
MAR	0	390	0	354	744	0	403	0	0	0	13	0.000	0.000	0.000	0.000	
APR	0	322	0	398	720	0	390	0	0	0	68	0.000	0.000	0.000	0.000	
MAY	187	138	0	419	360	384	403	0	0	0	78	0.000	0.000	0.000	27.438	
JUN	375	0	0	345	0	720	390	0	0	0	15	0.000	0.000	0.000	27.438	
JUL	403	0	0	341	0	744	403	0	0	0	0	0.000	0.000	0.000	27.438	
AUG	403	0	0	341	0	744	403	0	0	0	0	0.000	0.000	0.000	27.438	
SEP	293	0	0	427	0	720	390	0	0	0	97	0.000	0.000	0.000	27.438	
OCT	4	314	0	426	720	24	403	0	0	0	34	0.000	0.000	0.000	7.716	
NOV	0	356	0	364	720	0	390	0	0	0	85	0.000	0.000	0.000	0.000	
DEC	0	403	0	341	744	0	403	0	0	0	0	0.000	0.000	0.000	0.000	
ANNUAL	1665	2689	0	4406	5424	3336	4745	0	0	0	391					

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY	NATURAL-GAS
JAN	31.871 104.869 449.959	31.871 103.151 31/12	104.869 449.959 15/ 7
FEB	28.671 103.151 28/12	28.671 103.151 28/12	79.861 441.685 3/ 7
MAR	32.618 103.151 31/11	32.618 103.151 31/11	58.621 429.002 4/ 7
APR	29.279 103.151 15/ 9	29.279 103.151 15/ 9	19.292 403.304 5/ 6
MAY	37.682 189.750 31/18	37.682 189.750 31/18	4.096 252.012 9/ 6
JUN	50.509 189.762 28/16	50.509 189.762 28/16	0.000 0.000 30/ 1
JUL	53.984 195.191 22/16	53.984 195.191 22/16	0.000 0.000 31/ 1
AUG	57.683 201.143 11/16	57.683 201.143 11/16	0.000 0.000 31/ 1
SEP	42.634 190.640 7/16	42.634 190.640 7/16	0.000 0.000 30/ 1
OCT	28.771 103.151 31/ 9	28.771 103.151 31/ 9	15.942 406.334 20/ 6
NOV	29.479 103.151 30/13	29.479 103.151 30/13	50.081 429.048 3/ 7
DEC	31.778 103.151 30/18	31.778 103.151 30/18	95.154 436.190 15/ 7
	ONE YEAR USE/PEAK	454.958 201.143	427.917 449.959

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 5/1995 8: 7:52 PDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SET BACK FOR BLDG. #7108 BN ADMIN & CLRM TOPEKA, KS  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
SPACE HEAT	13.99	427.92
SPACE COOL	93.10	0.00
HVAC AUX	135.76	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	182.00	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	30.11	0.00
TOTAL	454.96	427.92

TOTAL SITE ENERGY 882.87 MBTU 71.9 KBTU/SOFT-YR GROSS-AREA 72.5 KBTU/SOFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 1794.16 MBTU 146.2 KBTU/SOFT-YR GROSS-AREA 147.3 KBTU/SOFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 9.3  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.



```

E-W    HEIGHT = 5.5  WIDTH = 168.0  CONS = SIDW/FAC
        AZIMUTH = 130  SKY-FORM-FACTOR = 0.5
        GND-FORM-FACTOR = 0.5  ..

E-W    HEIGHT = 5.5  WIDTH = 168.0  CONS = SIDW/FAC
        AZIMUTH = 310  SKY-FORM-FACTOR = 0.5
        GND-FORM-FACTOR = 0.5  ..

E-W    HEIGHT = 5.5  WIDTH = 78.0   CONS = SIDW/FAC
        AZIMUTH = 220  SKY-FORM-FACTOR = 0.5
        GND-FORM-FACTOR = 0.5  ..

E-W    HEIGHT = 5.5  WIDTH = 78.0   CONS = SIDW/FAC
        AZIMUTH = 40   SKY-FORM-FACTOR = 0.5
        GND-FORM-FACTOR = 0.5  ..

ROOF   HEIGHT = 78.0  WIDTH = 220.0  CONS = ROOF-1
        TILT = 0     SKY-FORM-FACTOR = 1.0  ..

```

\$ HOURLY REPORT DESCRIPTION

```

OUTDOOR-BK =REPORT-BLOCK VARIABLE-TYPE = GLOBAL
            VARIABLE-LIST = (3,4) ..

```

```

END ..
COMPUTE LOADS ..

```

INPUT SYSTEMS ..

```

$-----$
$ E Z - D O E   S Y S T E M S   I N P U T $
$-----$

```

\$ GENERAL PROJECT DATA

```

TITLE  LINE-1 *    EMC      ENGINEERS      INC.      *
        LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
        LINE-3 *    DENVER,      CO      80227      *

        LINE-4 *RUN #2 DDC CONTROL FOR BLDG. #7108      *
        LINE-5 *BN ADMIN & CLRM      * ..

ABORT      ERRORS ..
DIAGNOSTIC WARNINGS ..
SYSTEMS-REPORT  VERIFICATION=(SV-A)
                SUMMARY=(SS-A,SS-C,SS-K,SS-O)
                HOURLY-DATA-SAVE = YES ..

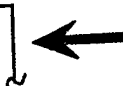
```

\$ SCHEDULES

```

SD_ON      =DAY-SCHEDULE (1,24) (1.) ..
SD_OFF     =DAY-SCHEDULE (1,24) (0.) ..
SD_WT_HT   =DAY-SCHEDULE (1,24) (70.) ..
SD_SM_CL   =DAY-SCHEDULE (1,24) (76.) ..

```





```
SD_10%_OA =DAY-SCHEDULE (1,24) (0.1) ..
SD_WT_CL  =DAY-SCHEDULE (1,24) (70.2) ..
SD_SM_HT  =DAY-SCHEDULE (1,24) (75.8) ..
```

```
SW_ON     =WEEK-SCHEDULE (ALL) SD_ON  ..
SW_OFF    =WEEK-SCHEDULE (ALL) SD_OFF ..
SW_WT_HT  =WEEK-SCHEDULE (ALL) SD_WT_HT ..
SW_SM_CL  =WEEK-SCHEDULE (ALL) SD_SM_CL ..
SW_10%_OA =WEEK-SCHEDULE (ALL) SD_10%_OA ..
SW_WT_CL  =WEEK-SCHEDULE (ALL) SD_WT_CL ..
SW_SM_HT  =WEEK-SCHEDULE (ALL) SD_SM_HT ..
```

\$ FULL ON SYSTEM

S\_ON =SCHEDULE THRU DEC 31 SW\_ON ..

\$ FULL OFF SYSTEM

S\_OFF =SCHEDULE THRU DEC 31 SW\_OFF ..

\$ HEATING SEASON

```
S_HE-SCHED =SCHEDULE THRU MAY 15 SW_ON
              THRU OCT 1 SW_OFF
              THRU DEC 31 SW_ON ..
```

\$ COOLING SEASON

```
S_CL_SCHED =SCHEDULE THRU MAY 15 SW_OFF
              THRU OCT 1 SW_ON
              THRU DEC 31 SW_OFF ..
```

\$ HEATING TEMP

```
S_HT_SET_F =SCHEDULE THRU MAY 15 SW_WT_HT
              THRU OCT 1 SW_SM_HT
              THRU DEC 31 SW_WT_HT ..
```

\$ COOLING TEMP

```
S_CL_SET_F =SCHEDULE THRU MAY 15 SW_WT_CL
              THRU OCT 1 SW_SM_CL
              THRU DEC 31 SW_WT_CL ..
```

\$ 10% OA 100% OF THE TIME

S\_OA@10% =SCHEDULE THRU DEC 31 SW\_10%\_OA ..

HRLY-SCHED =SCHEDULE THRU JAN 12 SW\_OFF

```
THRU JAN 13 SW_ON
THRU AUG 15 SW_OFF
THRU AUG 16 SW_ON
THRU DEC 31 SW_OFF ..
```

## \$ ZONE DESCRIPTION

```

SPACE_1  =ZONE  DESIGN-HEAT-T = 74.0  DESIGN-COOL-T = 72.0
           HEAT-TEMP-SCH = S_HT_SET_F  COOL-TEMP-SCH = S_CL_SET_F
           ZONE-TYPE = CONDITIONED
           THERMOSTAT-TYPE = PROPORTIONAL  THROTTLING-RANGE = 0.2
           SIZING-OPTION = FROM-LOADS  ..

SPACE_2  =ZONE  DESIGN-HEAT-T = 74.0  DESIGN-COOL-T = 72.0
           HEAT-TEMP-SCH = S_HT_SET_F  COOL-TEMP-SCH = S_CL_SET_F
           ZONE-TYPE = CONDITIONED
           THERMOSTAT-TYPE = PROPORTIONAL  THROTTLING-RANGE = 0.2
           SIZING-OPTION = FROM-LOADS  ..

SPACE_3  =ZONE  DESIGN-HEAT-T = 74.0  DESIGN-COOL-T = 72.0
           HEAT-TEMP-SCH = S_HT_SET_F  COOL-TEMP-SCH = S_CL_SET_F
           ZONE-TYPE = CONDITIONED
           THERMOSTAT-TYPE = PROPORTIONAL  THROTTLING-RANGE = 0.2
           SIZING-OPTION = FROM-LOADS  ..

SPACE_4  =ZONE  DESIGN-HEAT-T = 74.0  DESIGN-COOL-T = 72.0
           HEAT-TEMP-SCH = S_HT_SET_F  COOL-TEMP-SCH = S_CL_SET_F
           ZONE-TYPE = CONDITIONED
           THERMOSTAT-TYPE = PROPORTIONAL  THROTTLING-RANGE = 0.2
           SIZING-OPTION = FROM-LOADS  ..

PLENUM_1  =ZONE  DESIGN-HEAT-T = 72.0  DESIGN-COOL-T = 74.0
           ZONE-TYPE = PLENUM  THROTTLING-RANGE = 0.2
           SIZING-OPTION = FROM-LOADS  ..

```

## \$ SYSTEM DESCRIPTION

```

MZ-FAN-SYS =SYSTEM  SYSTEM-TYPE = MZS
                MAX-SUPPLY-T = 120.0  MIN-SUPPLY-T = 55.0
                HEATING-SCHEDULE = S_HE-SCHED
                COOLING-SCHEDULE = S_CL_SCHED  PREHEAT-T = 0.0
                HEAT-CONTROL = COLDEST  COOL-CONTROL = WARMEST
                OA-CONTROL = FIXED  SUPPLY-CFM = 7820.
                RATED-CFM = 7820.  MIN-OUTSIDE-AIR = 0.1
                MIN-AIR-SCH = S_OA@10%  SUPPLY-DELTA-T = 2.7
                SUPPLY-KW = 0.00088
                MOTOR-PLACEMENT = OUTSIDE-AIRFLOW
                NIGHT-CYCLE-CTRL = STAY-OFF  RETURN-STATIC = 0.7
                RETURN-EFF = 0.77  NIGHT-VENT-DT = 0.0
                MIN-CFM-RATIO = 1.0  COOLING-CAPACITY = 248100.
                COOL-SH-CAP = 198484.  HEATING-CAPACITY = -299800.
                RETURN-AIR-PATH = PLENUM-ZONES
                ZONE-NAMES = (SPACE_1, SPACE_2, SPACE_3, SPACE_4,
                             PLENUM_1)
                PLENUM-NAMES = (PLENUM_1)  ..

```

## \$ HOURLY REPORT DESCRIPTION

```

AHU-BLOCK  =REPORT-BLOCK VARIABLE-TYPE = MZ-FAN-SYS

```

```

                VARIABLE-LIST = (3,5,6,17,18,19) ..
ZONE-BLOCK =REPORT-BLOCK VARIABLE-TYPE = SPACE_3
                VARIABLE-LIST = (17,18,7,6) ..
HRLY-AHU      = HOURLY-REPORT REPORT-SCHEDULE = HRLY-SCHED
                REPORT-BLOCK = (AHU-BLOCK)
..
HRLY-ZONE     = HOURLY-REPORT REPORT-SCHEDULE = HRLY-SCHED
                REPORT-BLOCK = (ZONE-BLOCK)
..
END ..
COMPUTE SYSTEMS ..

INPUT PLANT ..

```

```

$-----$
$ E Z - D O E   P L A N T S   I N P U T $
$-----$

```

\$ GENERAL PROJECT DATA

```

TITLE LINE-1 *   EMC      ENGINEERS      INC.      *
      LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
      LINE-3 *   DENVER,      CO      80227      *
      LINE-4 *RUN #2 DDC CONTROL FOR BLDG. #7108      *
      LINE-5 *BN ADMIN & CLRM                        * ..

```

```

ABORT      ERRORS ..
DIAGNOSTIC WARNINGS ..
PLANT-REPORT VERIFICATION=(PV-A)
            SUMMARY=(PS-B,BEPS)
            HOURLY-DATA-SAVE = YES ..

```

\$ SCHEDULES

```

PD_ON      =DAY-SCHEDULE (1,24) (1.) ..
PD_OFF     =DAY-SCHEDULE (1,24) (0.) ..

PW_OFF     =WEEK-SCHEDULE (ALL) PD_OFF ..
PW_ON      =WEEK-SCHEDULE (ALL) PD_ON ..

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\$ HEATING SEASON

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P_HEAT     =SCHEDULE THRU MAY 15 PW_ON
            THRU OCT 1 PW_OFF
            THRU DEC 31 PW_ON ..

```

\$ COOLING SEASON

```

P_COOL     =SCHEDULE THRU MAY 15 PW_OFF
            THRU OCT 1 PW_ON
            THRU DEC 31 PW_OFF ..

```

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 5/1995 8:13: 0 SDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. #7108 BN ADMIN & CLRM  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR MZ-FAN-SYS TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C			
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	ELEC-TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC-TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-83.388	15	-6.F	-7.F	10918.	-259.654	10918.	27.438
FEB	0.00000				-59.224	3	-1.F	-2.F	9869.	-225.835	9869.	27.438
MAR	0.00000				-39.818	3	15.F	13.F	11411.	-177.086	11411.	27.438
APR	0.00000				-8.014	5	31.F	29.F	10732.	-112.071	10732.	27.438
MAY	23.60585	31	90.F	76.F	-1.108	9	45.F	44.F	10918.	-36.997	10918.	27.438
JUN	63.63251	29	88.F	75.F	0.000				10979.	0.000	10979.	27.438
JUL	80.88409	7	83.F	74.F	0.000				10671.	0.000	10671.	27.438
AUG	83.24850	4	92.F	70.F	0.000				11411.	0.000	11411.	27.438
SEP	37.76545	7	93.F	76.F	0.000				10732.	0.000	10732.	27.438
OCT	0.00000	1	70.F	64.F	-5.579	20	25.F	25.F	10671.	-111.177	10671.	27.438
NOV	0.00000				-33.100	3	13.F	12.F	10486.	-172.275	10486.	27.438
DEC	0.00000				-72.337	15	3.F	2.F	10918.	-218.468	10918.	27.438
TOTAL	289.137				-302.568				129722.	-259.654	129722.	27.438
MAX												

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 5/1995 8:13: 0 SDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. #7108 BN ADMIN & CLRM  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR MZ-FAN-SYS TOPEKA, KS

MONTH	H O U R S				H O U R S				C O I N C I D E N T				C O I N C I D E N T			
	HOURS COOLING LOAD	HOURS HEATING LOAD	HOURS COOL-HEAT LOAD	HOURS COINCIDENT	HOURS COOLING AVAIL.	HOURS HEATING AVAIL.	HOURS FANS ON	HOURS FANS ON	HOURS COOLING AVAIL.	HOURS HEATING AVAIL.	HOURS FANS ON	HOURS FANS ON	HEATING LOAD AT PEAK (KBTU/HR)	ELECTRIC LOAD AT PEAK (KW)	HEATING LOAD AT PEAK (KBTU/HR)	ELECTRIC LOAD AT PEAK (KW)
JAN	0	734	0	0	0	744	744	0	0	0	0	0	-96.903	7.716	-96.903	7.716
FEB	0	660	0	0	0	672	672	0	0	0	0	0	-98.216	7.716	-98.216	7.716
MAR	0	676	0	0	0	744	744	0	0	0	0	0	-95.868	7.716	-95.868	7.716
APR	0	473	0	0	0	720	720	0	0	0	0	0	0.000	27.438	0.000	27.438
MAY	256	168	0	0	384	744	744	0	0	0	0	0	0.000	27.438	0.000	27.438
JUN	620	0	0	0	720	744	744	0	0	0	0	0	0.000	27.438	0.000	27.438
JUL	710	0	0	0	744	744	744	0	0	0	0	0	0.000	27.438	0.000	27.438
AUG	710	0	0	0	744	744	744	0	0	0	0	0	0.000	27.438	0.000	27.438
SEP	424	0	0	0	720	744	744	0	0	0	0	0	0.000	27.438	0.000	27.438
OCT	1	393	0	0	24	744	744	0	0	0	0	0	0.000	27.438	0.000	27.438
NOV	0	597	0	0	0	744	744	0	0	0	0	0	0.000	27.438	0.000	27.438
DEC	0	731	0	0	0	744	744	0	0	0	0	0	-124.366	7.716	-124.366	7.716
ANNUAL	2721	4432	0	0	3336	5424	8760	0	0	0	0	0	-140.990	7.716	-140.990	7.716

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 5/1995 8:13: 0 PDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. #7108 BN ADMIN & CLRM TOPEKA, KS  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY TOTAL (KWH) PEAK (KW) DY/HR	NATURAL-GAS TOTAL (MBTU) PEAK (KBTU) DY/HR
JAN	41.885 100.555 31/10	118.361 326.549 15/ 8	
FEB	37.630 100.555 28/10	87.334 290.688 3/ 5	
MAR	42.160 100.555 31/ 9	60.718 237.466 3/ 5	
APR	37.865 100.555 5/ 8	13.900 163.678 5/ 5	
MAY	47.231 190.643 31/18	2.246 63.050 9/ 5	
JUN	63.191 189.581 28/16	0.000 0.000 30/ 1	
JUL	68.657 196.192 22/16	0.000 0.000 31/ 1	
AUG	72.938 206.254 11/16	0.000 0.000 31/ 1	
SEP	52.454 189.902 7/16	0.000 0.000 30/ 1	
OCT	37.410 100.555 20/ 9	10.030 162.641 20/ 5	
NOV	38.565 100.555 30/ 9	50.911 232.116 3/ 5	
DEC	41.798 100.555 30/18	105.386 282.760 15/ 2	
	ONE YEAR USE/PEAK	581.783 206.254	448.885 326.549

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 5/1995 8:13: 0 PDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. #7108 BN ADMIN & CLRM TOPEKA, KS  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
SPACE HEAT	16.54	448.88
SPACE COOL	106.08	0.00
HVAC AUX	247.04	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	182.00	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	30.11	0.00
TOTAL	581.77	448.88

TOTAL SITE ENERGY 1030.67 MBTU 84.0 KBTU/SQFT-YR GROSS-AREA 84.6 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 2195.98 MBTU 178.9 KBTU/SQFT-YR GROSS-AREA 180.3 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 6.8  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.



```

E-W    HEIGHT = 5.5  WIDTH = 168.0  CONS = SIDW/FAC
      AZIMUTH = 130  SKY-FORM-FACTOR = 0.5
      GND-FORM-FACTOR = 0.5  ..

E-W    HEIGHT = 5.5  WIDTH = 168.0  CONS = SIDW/FAC
      AZIMUTH = 310  SKY-FORM-FACTOR = 0.5
      GND-FORM-FACTOR = 0.5  ..

E-W    HEIGHT = 5.5  WIDTH = 78.0   CONS = SIDW/FAC
      AZIMUTH = 220  SKY-FORM-FACTOR = 0.5
      GND-FORM-FACTOR = 0.5  ..

E-W    HEIGHT = 5.5  WIDTH = 78.0   CONS = SIDW/FAC
      AZIMUTH = 40   SKY-FORM-FACTOR = 0.5
      GND-FORM-FACTOR = 0.5  ..

ROOF   HEIGHT = 78.0  WIDTH = 220.0  CONS = ROOF-1
      TILT = 0   SKY-FORM-FACTOR = 1.0  ..

```

\$ HOURLY REPORT DESCRIPTION

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OUTDOOR-BK =REPORT-BLOCK VARIABLE-TYPE = GLOBAL
            VARIABLE-LIST = (3,4) ..

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END ..
COMPUTE LOADS ..

```

INPUT SYSTEMS ..

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$-----$
$ E Z - D O E   S Y S T E M S   I N P U T $
$-----$

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\$ GENERAL PROJECT DATA

```

TITLE  LINE-1 *    EMC      ENGINEERS      INC.      *
      LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
      LINE-3 *    DENVER,      CO      80227      *

      LINE-4 *RUN #3 ECONOMIZER FOR BLDG. #7108      *
      LINE-5 *BN ADMIN & CLRM      * ..

ABORT      ERRORS ..
DIAGNOSTIC  WARNINGS ..
SYSTEMS-REPORT  VERIFICATION=(SV-A)
                SUMMARY=(SS-A,SS-C,SS-K,SS-O)
                HOURLY-DATA-SAVE = YES ..

```

\$ SCHEDULES

```

SD_ON      =DAY-SCHEDULE (1,24) (1.) ..
SD_OFF     =DAY-SCHEDULE (1,24) (0.) ..
SD_WT_HT   =DAY-SCHEDULE (1,5) (55.)
                (6,18) (74.)

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(19,24) (55.) ..
SD_SM_CL =DAY-SCHEDULE (1,5) (65.)
(6,18) (72.)
(19,24) (85.) ..
SD_10%_OA =DAY-SCHEDULE (1,24) (0.1) ..
SD_WT_CL =DAY-SCHEDULE (1,5) (55.2)
(6,18) (74.2)
(19,24) (55.2) ..
SD_SM_HT =DAY-SCHEDULE (1,5) (84.8)
(6,18) (71.8)
(19,24) (84.8) ..
SD_FAN_CYC =DAY-SCHEDULE (1,5) (-1.)
(6,18) (1.)
(19,24) (-1.) ..

SW_ON =WEEK-SCHEDULE (ALL) SD_ON ..
SW_OFF =WEEK-SCHEDULE (ALL) SD_OFF ..
SW_WT_HT =WEEK-SCHEDULE (ALL) SD_WT_HT ..
SW_SM_CL =WEEK-SCHEDULE (ALL) SD_SM_CL ..
SW_10%_OA =WEEK-SCHEDULE (ALL) SD_10%_OA ..
SW_WT_CL =WEEK-SCHEDULE (ALL) SD_WT_CL ..
SW_SM_HT =WEEK-SCHEDULE (ALL) SD_SM_HT ..
SW_FAN_CYC =WEEK-SCHEDULE (ALL) SD_FAN_CYC ..

$ FULL ON SYSTEM
S_ON =SCHEDULE THRU DEC 31 SW_ON ..

$ FULL OFF SYSTEM
S_OFF =SCHEDULE THRU DEC 31 SW_OFF ..

$ HEATING SEASON
S_HE-SCHED =SCHEDULE THRU MAY 15 SW_ON
THRU OCT 1 SW_OFF
THRU DEC 31 SW_ON ..

$ COOLING SEASON
S_CL_SCHED =SCHEDULE THRU MAY 15 SW_OFF
THRU OCT 1 SW_ON
THRU DEC 31 SW_OFF ..

$ HEATING TEMP
S_HT_SET_F =SCHEDULE THRU MAY 15 SW_WT_HT
THRU OCT 1 SW_SM_HT
THRU DEC 31 SW_WT_HT ..

$ COOLING TEMP
S_CL_SET_F =SCHEDULE THRU MAY 15 SW_WT_CL
THRU OCT 1 SW_SM_CL

```

THRU DEC 31 SW\_WT\_CL ..

\$ 10% OA 100% OF THE TIME

S\_OA@10% =SCHEDULE THRU DEC 31 SW\_10%\_OA ..

HRLY-SCHED =SCHEDULE THRU JAN 30 SW\_OFF  
 THRU JAN 31 SW\_ON  
 THRU AUG 10 SW\_OFF  
 THRU AUG 11 SW\_ON  
 THRU DEC 31 SW\_OFF ..

S\_FAN\_CYC =SCHEDULE THRU DEC 31 SW\_FAN\_CYC ..

\$ ZONE DESCRIPTION

SPACE\_1 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
 SIZING-OPTION = FROM-LOADS ..

SPACE\_2 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
 SIZING-OPTION = FROM-LOADS ..

SPACE\_3 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
 SIZING-OPTION = FROM-LOADS ..

SPACE\_4 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
 SIZING-OPTION = FROM-LOADS ..

PLENUM\_1 =ZONE DESIGN-HEAT-T = 72.0 DESIGN-COOL-T = 74.0  
 ZONE-TYPE = PLENUM THROTTLING-RANGE = 0.2  
 SIZING-OPTION = FROM-LOADS ..

\$ SYSTEM DESCRIPTION

MZ-FAN-SYS =SYSTEM SYSTEM-TYPE = MZS  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_HE\_SCHED  
 COOLING-SCHEDULE = S\_CL\_SCHED PREHEAT-T = 0.0  
ECONO-LIMIT-T = 70.0 HEAT-CONTROL = COLDEST ←  
 COOL-CONTROL = WARMEST SUPPLY-CFM = 7820.  
 RATED-CFM = 7820. MIN-OUTSIDE-AIR = 0.1  
 FAN-SCHEDULE = S\_FAN\_CYC SUPPLY-DELTA-T = 2.7

SUPPLY-KW = 0.00088  
MOTOR-PLACEMENT = OUTSIDE-AIRFLOW  
NIGHT-CYCLE-CTRL = CYCLE-ON-ANY RETURN-STATIC = 0.7  
RETURN-EFF = 0.77 NIGHT-VENT-DT = 0.0  
MIN-CFM-RATIO = 1.0 COOLING-CAPACITY = 248100.  
COOL-SH-CAP = 198484. HEATING-CAPACITY = -299800.  
RETURN-AIR-PATH = PLENUM-ZONES  
ZONE-NAMES = (SPACE\_1, SPACE\_2, SPACE\_3, SPACE\_4,  
PLENUM\_1)  
PLENUM-NAMES = (PLENUM\_1) ..

\$ HOURLY REPORT DESCRIPTION

AHU-BLOCK =REPORT-BLOCK VARIABLE-TYPE = MZ-FAN-SYS  
VARIABLE-LIST = (3,5,6,17,18,19,23,39) ..  
ZONE-BLOCK =REPORT-BLOCK VARIABLE-TYPE = SPACE\_3  
VARIABLE-LIST = (17,18,7,6) ..  
HRLY-AHU = HOURLY-REPORT REPORT-SCHEDULE = HRLY-SCHED  
REPORT-BLOCK = (AHU-BLOCK)  
..  
HRLY-ZONE = HOURLY-REPORT REPORT-SCHEDULE = HRLY-SCHED  
REPORT-BLOCK = (ZONE-BLOCK)  
..  
END ..  
COMPUTE SYSTEMS ..  
INPUT PLANT ..

\$-----\$  
\$ E Z - D O E P L A N T S I N P U T \$  
\$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
LINE-3 \* DENVER, CO 80227 \*  
  
LINE-4 \*RUN #3 ECONOMIZER FOR BLDG. #7108 \*  
LINE-5 \*BN ADMIN & CLRM \* ..

ABORT ERRORS ..  
DIAGNOSTIC WARNINGS ..  
PLANT-REPORT VERIFICATION=(PV-A)  
SUMMARY=(PS-B,BEPS)  
HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

PD\_ON =DAY-SCHEDULE (1,24) (1.) ..  
PD\_OFF =DAY-SCHEDULE (1,24) (0.) ..

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 5/1995 8:16:34 SDL RUN 1  
 DENVER, CO 80227 RUN #3 ECONOMIZER FOR BLDG. #7108 BN ADMIN & CLRM TOPEKA, KS  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR MZ-FAN-SYS

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-72.294	15	-8.F	-9.F	8286.	-343.803	27.438
FEB	0.00000				-53.879	3	-1.F	-2.F	7493.	-338.988	27.438
MAR	0.00000				-40.477	4	14.F	12.F	8780.	-327.051	27.438
APR	0.00000				-14.530	5	31.F	28.F	8186.	-257.431	27.438
MAY	20.61729	31	18	90.F	-3.682	1	37.F	37.F	8289.	-205.377	29.589
JUN	55.40369	29	15	88.F	0.000				8434.	0.000	28.983
JUL	71.55746	7	18	83.F	0.000				8040.	0.000	27.438
AUG	73.18030	4	17	92.F	0.000				8780.	0.000	27.438
SEP	36.54521	7	16	93.F	0.000				8188.	0.000	29.325
OCT	0.12637	1	18	83.F	-11.874	20	24.F	23.F	8040.	-275.227	27.438
NOV	0.00000				-34.186	3	13.F	12.F	7940.	-328.386	27.438
DEC	0.00000				-64.897	12	3.F	2.F	8286.	-334.846	27.438
TOTAL MAX	257.431				-295.819				98742.	-343.803	29.589

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 5/1995 8:16:34 SDL RUN 1  
 DENVER, CO 80227 RUN #3 ECONOMIZER FOR BLDG. #7108 BN ADMIN & CLRM TOPEKA, KS  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR MZ-FAN-SYS

MONTH	H O U R S										
	HOURS COOLING LOAD	HOURS HEATING LOAD	HOURS COINCIDENT COOL-HEAT LOAD	HOURS FLOATING	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.	HOURS FANS ON CYCLE ON	HOURS NIGHT VENTING	HOURS FLOATING WHEN FANS ON	COINCIDENT HEATING LOAD AT COOLING PEAK (KBTU/HR)	COINCIDENT ELECTRIC LOAD AT COOLING PEAK (KW)
JAN	0	403	0	341	744	0	403	0	0	0.000	0.000
FEB	0	364	0	308	672	0	364	0	0	0.000	0.000
MAR	0	403	0	341	744	0	403	0	0	0.000	0.000
APR	0	324	0	396	720	0	390	0	0	0.000	0.000
MAY	160	134	0	450	360	384	403	0	66	0.000	0.000
JUN	352	0	0	368	0	720	390	0	109	0.000	27.438
JUL	396	0	0	348	0	744	403	0	38	0.000	27.438
AUG	396	0	0	348	0	744	403	0	7	0.000	27.438
SEP	262	0	0	458	0	720	390	0	7	0.000	27.438
OCT	4	318	0	422	720	24	403	0	128	0.000	27.438
NOV	0	370	0	350	720	0	390	0	81	0.000	7.716
DEC	0	403	0	341	744	0	403	0	20	0.000	0.000
ANNUAL	1570	2719	0	4471	5424	3336	4745	0	456	0.000	0.000

REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY TOTAL (MBTU) PEAK (KBTU) DY/HR	NATURAL-GAS TOTAL (MBTU) PEAK (KBTU) DY/HR
JAN	31.742 102.781 31/12	31.742 102.781 31/12	99.860 432.378 15/ 6
FEB	28.552 102.781 28/12	28.552 102.781 28/12	76.340 427.327 3/ 6
MAR	32.625 102.781 31/11	32.625 102.781 31/11	58.921 414.748 4/ 6
APR	29.372 102.781 25/ 7	29.372 102.781 25/ 7	22.730 339.759 5/ 6
MAY	36.349 187.202 31/18	36.349 187.202 31/18	6.167 281.874 1/ 6
JUN	48.645 187.171 28/16	48.645 187.171 28/16	0.000 0.000 30/ 1
JUL	52.849 192.329 22/16	52.849 192.329 22/16	0.000 0.000 31/ 1
AUG	56.476 198.964 11/16	56.476 198.964 11/16	0.000 0.000 31/ 1
SEP	41.412 187.908 7/16	41.412 187.908 7/16	0.000 0.000 30/ 1
OCT	28.895 102.781 31/ 9	28.895 102.781 31/ 9	19.329 359.193 20/ 6
NOV	29.504 102.781 30/12	29.504 102.781 30/12	50.464 416.159 3/ 6
DEC	31.641 102.781 30/18	31.641 102.781 30/18	90.888 422.972 12/ 6
	ONE YEAR USE/PEAK	448.061 198.964	424.700 432.378

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 5/1995 8:16:34 PDL RUN 1  
 DENVER, CO 80227 RUN #3 ECONOMIZER FOR BLDG. #7108 BN ADMIN & CLRM TOPEKA, KS  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE

ENERGY TYPE IN SITE MBTU -	ELECTRICITY	NATURAL-GAS
SPACE HEAT	14.03	424.70
SPACE COOL	86.77	0.00
HVAC AUX	135.15	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	182.00	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	30.11	0.00
TOTAL	448.06	424.70

TOTAL SITE ENERGY 872.76 MBTU 71.1 KBTU/SQFT-YR GROSS-AREA 71.7 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 1770.23 MBTU 144.2 KBTU/SQFT-YR GROSS-AREA 145.4 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 13.5  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.



```

E-W      HEIGHT = 5.5  WIDTH = 168.0  CONS = SIDW/FAC
        AZIMUTH = 130  SKY-FORM-FACTOR = 0.5
        GND-FORM-FACTOR = 0.5  ..

E-W      HEIGHT = 5.5  WIDTH = 168.0  CONS = SIDW/FAC
        AZIMUTH = 310  SKY-FORM-FACTOR = 0.5
        GND-FORM-FACTOR = 0.5  ..

E-W      HEIGHT = 5.5  WIDTH = 78.0   CONS = SIDW/FAC
        AZIMUTH = 220  SKY-FORM-FACTOR = 0.5
        GND-FORM-FACTOR = 0.5  ..

E-W      HEIGHT = 5.5  WIDTH = 78.0   CONS = SIDW/FAC
        AZIMUTH = 40   SKY-FORM-FACTOR = 0.5
        GND-FORM-FACTOR = 0.5  ..

ROOF     HEIGHT = 78.0  WIDTH = 220.0  CONS = ROOF-1
        TILT = 0   SKY-FORM-FACTOR = 1.0  ..

```

\$ HOURLY REPORT DESCRIPTION

```

OUTDOOR-BK =REPORT-BLOCK VARIABLE-TYPE = GLOBAL
            VARIABLE-LIST = (3,4) ..

```

```

END ..
COMPUTE LOADS ..
INPUT SYSTEMS ..

```

```

$-----$
$ E Z - D O E   S Y S T E M S   I N P U T $
$-----$

```

\$ GENERAL PROJECT DATA

```

TITLE  LINE-1 *   EMC      ENGINEERS      INC.      *
        LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
        LINE-3 *   DENVER,      CO      80227      *

        LINE-4 *RUN #4 NIGHTIME INFILT. FOR BLDG. #7108 *
        LINE-5 *BN ADMIN & CLRM      * ..

ABORT      ERRORS ..
DIAGNOSTIC  WARNINGS ..
SYSTEMS-REPORT  VERIFICATION=(SV-A)
                SUMMARY=(SS-A,SS-C,SS-K,SS-O)
                HOURLY-DATA-SAVE = YES ..

```

\$ SCHEDULES


```

SD_ON      =DAY-SCHEDULE (1,24) (1.) ..
SD_OFF     =DAY-SCHEDULE (1,24) (0.) ..
SD_WT_HT   =DAY-SCHEDULE (1,24) (74.) ..
SD_SM_CL   =DAY-SCHEDULE (1,24) (72.) ..

```



SD_10%_OA	=DAY-SCHEDULE	(1,5) (0.)
		(6,18) (0.1)
		(19,24) (0.) ..



SD\_WT\_CL =DAY-SCHEDULE (1,24) (74.2) ..  
SD\_SM\_HT =DAY-SCHEDULE (1,24) (71.8) ..

SW\_ON =WEEK-SCHEDULE (ALL) SD\_ON ..

SW\_OFF =WEEK-SCHEDULE (ALL) SD\_OFF ..

SW\_WT\_HT =WEEK-SCHEDULE (ALL) SD\_WT\_HT ..

SW\_SM\_CL =WEEK-SCHEDULE (ALL) SD\_SM\_CL ..

SW\_10%\_OA =WEEK-SCHEDULE (ALL) SD\_10%\_OA ..

SW\_WT\_CL =WEEK-SCHEDULE (ALL) SD\_WT\_CL ..

SW\_SM\_HT =WEEK-SCHEDULE (ALL) SD\_SM\_HT ..

\$ FULL ON SYSTEM

S\_ON =SCHEDULE THRU DEC 31 SW\_ON ..

\$ FULL OFF SYSTEM

S\_OFF =SCHEDULE THRU DEC 31 SW\_OFF ..

\$ HEATING SEASON

S\_HE-SCHED =SCHEDULE THRU MAY 15 SW\_ON  
THRU OCT 1 SW\_OFF  
THRU DEC 31 SW\_ON ..

\$ COOLING SEASON

S\_CL\_SCHED =SCHEDULE THRU MAY 15 SW\_OFF  
THRU OCT 1 SW\_ON  
THRU DEC 31 SW\_OFF ..

\$ HEATING TEMP

S\_HT\_SET\_F =SCHEDULE THRU MAY 15 SW\_WT\_HT  
THRU OCT 1 SW\_SM\_HT  
THRU DEC 31 SW\_WT\_HT ..

\$ COOLING TEMP

S\_CL\_SET\_F =SCHEDULE THRU MAY 15 SW\_WT\_CL  
THRU OCT 1 SW\_SM\_CL  
THRU DEC 31 SW\_WT\_CL ..

\$ 10% OA 100% OF THE TIME

S\_OA@10% =SCHEDULE THRU DEC 31 SW\_10%\_OA ..

HRLY-SCHED =SCHEDULE THRU JAN 12 SW\_OFF

THRU JAN 13 SW\_ON  
THRU AUG 15 SW\_OFF  
THRU AUG 16 SW\_ON  
THRU DEC 31 SW\_OFF ..

## \$ ZONE DESCRIPTION

SPACE\_1 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
 SIZING-OPTION = FROM-LOADS ..


SPACE\_2 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
 SIZING-OPTION = FROM-LOADS ..

SPACE\_3 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
 SIZING-OPTION = FROM-LOADS ..

SPACE\_4 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
 SIZING-OPTION = FROM-LOADS ..

PLENUM\_1 =ZONE DESIGN-HEAT-T = 72.0 DESIGN-COOL-T = 74.0  
 ZONE-TYPE = PLENUM THROTTLING-RANGE = 0.2  
 SIZING-OPTION = FROM-LOADS ..

## \$ SYSTEM DESCRIPTION

MZ-FAN-SYS =SYSTEM SYSTEM-TYPE = MZS  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_HE-SCHED  
 COOLING-SCHEDULE = S\_CL\_SCHED PREHEAT-T = 0.0  
 OA-CONTROL = FIXED SUPPLY-CFM = 7820.  
 RATED-CFM = 7820. MIN-OUTSIDE-AIR = 0.1  
 MIN-AIR-SCH = S\_OA@10% SUPPLY-DELTA-T = 2.7   
 SUPPLY-KW = 0.00088  
 MOTOR-PLACEMENT = OUTSIDE-AIRFLOW  
 NIGHT-CYCLE-CTRL = STAY-OFF RETURN-STATIC = 0.7  
 RETURN-EFF = 0.77 NIGHT-VENT-DT = 0.0  
 MIN-CFM-RATIO = 1.0 COOLING-CAPACITY = 248100.  
 COOL-SH-CAP = 198484. HEATING-CAPACITY = -299800.  
 RETURN-AIR-PATH = PLENUM-ZONES  
 ZONE-NAMES = (SPACE\_1, SPACE\_2, SPACE\_3, SPACE\_4,  
 PLENUM\_1)  
 PLENUM-NAMES = (PLENUM\_1) ..

## \$ HOURLY REPORT DESCRIPTION

```

AHU-BLOCK =REPORT-BLOCK VARIABLE-TYPE = MZ-FAN-SYS
          VARIABLE-LIST = (3,5,6,17,18,19) ..
ZONE-BLOCK =REPORT-BLOCK VARIABLE-TYPE = SPACE_3
          VARIABLE-LIST = (17,18,7,6) ..
HRLY-AHU   = HOURLY-REPORT REPORT-SCHEDULE = HRLY-SCHED
          REPORT-BLOCK = (AHU-BLOCK)
..
HRLY-ZONE  = HOURLY-REPORT REPORT-SCHEDULE = HRLY-SCHED
          REPORT-BLOCK = (ZONE-BLOCK)
..
END ..
COMPUTE SYSTEMS ..

INPUT PLANT ..

```

```

$-----$
$ E Z - D O E   P L A N T S   I N P U T $
$-----$

```

\$ GENERAL PROJECT DATA

```

TITLE  LINE-1 *      EMC      ENGINEERS      INC.      *
        LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
        LINE-3 *      DENVER,      CO      80227      *

        LINE-4 *RUN #4 NIGHTIME INFILT. FOR BLDG. #7108 *
        LINE-5 *BN ADMIN & CLRM      * ..

```

```

ABORT      ERRORS ..
DIAGNOSTIC WARNINGS ..
PLANT-REPORT VERIFICATION=(PV-A)
            SUMMARY=(PS-B,BEPS)
            HOURLY-DATA-SAVE = YES ..

```

\$ SCHEDULES

```

PD_ON      =DAY-SCHEDULE (1,24) (1.) ..
PD_OFF     =DAY-SCHEDULE (1,24) (0.) ..

PW_OFF     =WEEK-SCHEDULE (ALL) PD_OFF ..
PW_ON      =WEEK-SCHEDULE (ALL) PD_ON ..

```

\$ HEATING SEASON

```

P_HEAT     =SCHEDULE THRU MAY 15 PW_ON
            THRU OCT 1 PW_OFF
            THRU DEC 31 PW_ON ..

```

\$ COOLING SEASON

```

P_COOL     =SCHEDULE THRU MAY 15 PW_OFF
            THRU OCT 1 PW_ON
            THRU DEC 31 PW_OFF ..

```

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 5/1995 8:18:57 SDL RUN 1  
 DENVER, CO 80227 RUN #4 NIGHTTIME INFILT. FOR BLDG. #7108 BN ADMIN & CLRM  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR MZ-FAN-SYS TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	ELEC- TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-82.443	15	8	-6.F	-7.F	10918.	27.438
FEB	0.00000				-59.633	3	6	-1.F	-2.F	9869.	27.438
MAR	0.00000				-41.478	6	8	26.F	25.F	11411.	27.438
APR	0.00000				-9.962	5	6	31.F	28.F	10732.	27.438
MAY	31.06560	31	18	90.F	76.F	9	6	44.F	44.F	10918.	27.438
JUN	73.35986	29	15	88.F	75.F					10979.	27.438
JUL	88.47661	7	18	83.F	74.F					10671.	27.438
AUG	91.48322	4	17	92.F	70.F					11411.	27.438
SEP	48.36908	7	15	92.F	76.F					10732.	27.438
OCT	0.27038	1	18	83.F	68.F					10671.	27.438
NOV	0.00000				-34.798	20	6	24.F	23.F	10486.	27.438
DEC	0.00000				-72.499	12	6	3.F	2.F	10918.	27.438
TOTAL	333.025				-309.939					129722.	
MAX										-272.958	27.438

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 5/1995 8:18:57 SDL RUN 1  
 DENVER, CO 80227 RUN #4 NIGHTTIME INFILT. FOR BLDG. #7108 BN ADMIN & CLRM  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR MZ-FAN-SYS TOPEKA, KS

MONTH	HOURS OF HOURS				HOURS OF HOURS				COINCIDENT LOADS--				
	HOURS COOLING LOAD	HOURS HEATING LOAD	HOURS COOL-HEAT LOAD	HOURS FLOATING	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.	HOURS FANS ON CYCLE	HOURS NIGHT VENTING	HOURS FLOATING WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)
JAN	0	744	0	0	744	0	0	0	0	-86.034	7.716	-88.026	7.716
FEB	0	672	0	0	672	0	0	0	0	-85.579	7.716	-85.579	7.716
MAR	0	744	0	0	744	0	0	0	0	-0.037	7.716	-0.037	7.716
APR	0	720	0	0	720	0	0	0	0	0.000	27.438	0.000	27.438
MAY	327	360	0	57	360	384	0	0	57	0.000	27.438	0.000	27.438
JUN	680	0	0	40	0	720	0	0	40	0.000	27.438	0.000	27.438
JUL	739	0	0	5	0	744	0	0	5	0.000	27.438	0.000	27.438
AUG	733	0	0	11	0	744	0	0	11	0.000	27.438	0.000	27.438
SEP	527	0	0	193	0	744	0	0	193	0.000	27.438	0.000	27.438
OCT	8	0	0	16	0	24	0	0	16	0.000	7.716	0.000	7.716
NOV	0	720	0	0	720	0	0	0	0	-104.373	7.716	-104.373	7.716
DEC	0	744	0	0	744	0	0	0	0	-122.944	7.716	-122.944	7.716
ANNUAL	3014	5424	0	322	5424	3336	0	0	322				

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 5/1995 8:18:57 PDL RUN 1  
 DENVER, CO 80227 RUN #4 NIGHTTIME INFILT. FOR BLDG. #7108 BN ADMIN & CLRM  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY TOTAL (MBTU) PEAK (KBTU) DY/HR	NATURAL-GAS TOTAL (MBTU) PEAK (KBTU) DY/HR
JAN	42.253 100.907 31/10	42.253 100.907 31/10	119.297 343.282 15/ 8
FEB	37.992 100.907 28/10	37.992 100.907 28/10	89.637 290.591 3/ 6
MAR	42.586 100.907 31/ 9	42.586 100.907 31/ 9	64.529 245.135 6/ 8
APR	38.387 100.907 15/ 8	38.387 100.907 15/ 8	17.780 164.035 5/ 6
MAY	49.986 189.118 31/18	49.986 189.118 31/18	3.161 95.412 9/ 6
JUN	65.837 188.305 28/16	65.837 188.305 28/16	0.000 0.000 30/ 1
JUL	70.553 193.600 22/16	70.553 193.600 22/16	0.000 0.000 31/ 1
AUG	74.859 199.463 11/16	74.859 199.463 11/16	0.000 0.000 31/ 1
SEP	56.135 189.209 7/16	56.135 189.209 7/16	0.000 0.000 30/ 1
OCT	38.206 100.907 20/10	38.206 100.907 20/10	14.469 177.291 20/ 6
NOV	39.061 100.907 30/11	39.061 100.907 30/11	54.885 232.439 12/ 7
DEC	42.166 100.907 30/18	42.166 100.907 30/18	107.475 278.254 12/ 6
	ONE YEAR USE/PEAK	598.021 199.463	471.234 343.282

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 5/1995 8:18:57 PDL RUN 1  
 DENVER, CO 80227 RUN #4 NIGHTTIME INFILT. FOR BLDG. #7108 BN ADMIN & CLRM TOPEKA, KS  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE

ENERGY TYPE	ELECTRICITY	NATURAL-GAS
IN SITE MBTU -		
CATEGORY OF USE		
SPACE HEAT	18.57	471.24
SPACE COOL	118.39	0.00
HVAC AUX	248.93	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	181.99	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	30.11	0.00
TOTAL	597.99	471.24

TOTAL SITE ENERGY 1069.26 MBTU 87.1 KBTU/SQFT-YR GROSS-AREA 87.8 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 2267.09 MBTU 184.7 KBTU/SQFT-YR GROSS-AREA 186.1 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 3.4  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.



```

E-W      HEIGHT = 5.5  WIDTH = 168.0  CONS = SIDW/FAC
        AZIMUTH = 130  SKY-FORM-FACTOR = 0.5
        GND-FORM-FACTOR = 0.5  ..

E-W      HEIGHT = 5.5  WIDTH = 168.0  CONS = SIDW/FAC
        AZIMUTH = 310  SKY-FORM-FACTOR = 0.5
        GND-FORM-FACTOR = 0.5  ..

E-W      HEIGHT = 5.5  WIDTH = 78.0   CONS = SIDW/FAC
        AZIMUTH = 220  SKY-FORM-FACTOR = 0.5
        GND-FORM-FACTOR = 0.5  ..

E-W      HEIGHT = 5.5  WIDTH = 78.0   CONS = SIDW/FAC
        AZIMUTH = 40   SKY-FORM-FACTOR = 0.5
        GND-FORM-FACTOR = 0.5  ..

ROOF     HEIGHT = 78.0  WIDTH = 220.0  CONS = ROOF-1
        TILT = 0      SKY-FORM-FACTOR = 1.0  ..

```

\$ HOURLY REPORT DESCRIPTION

```

OUTDOOR-BK =REPORT-BLOCK VARIABLE-TYPE = GLOBAL
            VARIABLE-LIST = (3,4) ..

```

```

END ..
COMPUTE LOADS ..

```

INPUT SYSTEMS ..

```

$-----$
$ E Z - D O E   S Y S T E M S   I N P U T $
$-----$

```

\$ GENERAL PROJECT DATA

```

TITLE  LINE-1 *   EMC      ENGINEERS      INC.      *
        LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
        LINE-3 *   DENVER,      CO      80227      *

        LINE-4 *RUN #5 DAYTIME INFILT. FOR BLDG. #7108 *
        LINE-5 *BN ADMIN & CLRM                          * ..

ABORT      ERRORS ..
DIAGNOSTIC WARNINGS ..
SYSTEMS-REPORT  VERIFICATION=(SV-A)
                SUMMARY=(SS-A,SS-C,SS-K,SS-O)
                HOURLY-DATA-SAVE = YES ..

```

\$ SCHEDULES

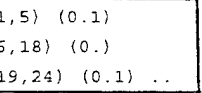
```

SD_ON      =DAY-SCHEDULE (1,24) (1.) ..
SD_OFF     =DAY-SCHEDULE (1,24) (0.) ..
SD_WT_HT   =DAY-SCHEDULE (1,24) (74.) ..
SD_SM_CL   =DAY-SCHEDULE (1,24) (72.) ..

```



```
SD_10%_OA =DAY-SCHEDULE (1,5) (0.1)
              (6,18) (0.)
              (19,24) (0.1) ..
```



```
SD_WT_CL =DAY-SCHEDULE (1,24) (74.2) ..
SD_SM_HT =DAY-SCHEDULE (1,24) (71.8) ..
```

SW\_ON =WEEK-SCHEDULE (ALL) SD\_ON ..

SW\_OFF =WEEK-SCHEDULE (ALL) SD\_OFF ..

SW\_WT\_HT =WEEK-SCHEDULE (ALL) SD\_WT\_HT ..

SW\_SM\_CL =WEEK-SCHEDULE (ALL) SD\_SM\_CL ..

SW\_10%\_OA =WEEK-SCHEDULE (ALL) SD\_10%\_OA ..

SW\_WT\_CL =WEEK-SCHEDULE (ALL) SD\_WT\_CL ..

SW\_SM\_HT =WEEK-SCHEDULE (ALL) SD\_SM\_HT ..

\$ FULL ON SYSTEM

S\_ON =SCHEDULE THRU DEC 31 SW\_ON ..

\$ FULL OFF SYSTEM

S\_OFF =SCHEDULE THRU DEC 31 SW\_OFF ..

\$ HEATING SEASON

```
S_HE-SCHED =SCHEDULE THRU MAY 15 SW_ON
              THRU OCT 1 SW_OFF
              THRU DEC 31 SW_ON ..
```

\$ COOLING SEASON

```
S_CL_SCHED =SCHEDULE THRU MAY 15 SW_OFF
              THRU OCT 1 SW_ON
              THRU DEC 31 SW_OFF ..
```

\$ HEATING TEMP

```
S_HT_SET_F =SCHEDULE THRU MAY 15 SW_WT_HT
              THRU OCT 1 SW_SM_HT
              THRU DEC 31 SW_WT_HT ..
```

\$ COOLING TEMP

```
S_CL_SET_F =SCHEDULE THRU MAY 15 SW_WT_CL
              THRU OCT 1 SW_SM_CL
              THRU DEC 31 SW_WT_CL ..
```

\$ 10% OA 100% OF THE TIME

S\_OA@10% =SCHEDULE THRU DEC 31 SW\_10%\_OA ..

HRLY-SCHED =SCHEDULE THRU JAN 12 SW\_OFF

```
THRU JAN 13 SW_ON
THRU AUG 15 SW_OFF
THRU AUG 16 SW_ON
THRU DEC 31 SW_OFF ..
```

## \$ ZONE DESCRIPTION

SPACE\_1 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
 SIZING-OPTION = FROM-LOADS ..


SPACE\_2 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
 SIZING-OPTION = FROM-LOADS ..

SPACE\_3 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
 SIZING-OPTION = FROM-LOADS ..

SPACE\_4 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
 SIZING-OPTION = FROM-LOADS ..

PLENUM\_1 =ZONE DESIGN-HEAT-T = 72.0 DESIGN-COOL-T = 74.0  
 ZONE-TYPE = PLENUM THROTTLING-RANGE = 0.2  
 SIZING-OPTION = FROM-LOADS ..

## \$ SYSTEM DESCRIPTION

MZ-FAN-SYS =SYSTEM SYSTEM-TYPE = MZS  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_HE-SCHED  
 COOLING-SCHEDULE = S\_CL\_SCHED PREHEAT-T = 0.0  
 OA-CONTROL = FIXED SUPPLY-CFM = 7820.  
 RATED-CFM = 7820. MIN-OUTSIDE-AIR = 0.1  
 MIN-AIR-SCH = S\_OA@10% SUPPLY-DELTA-T = 2.7   
 SUPPLY-KW = 0.00088  
 MOTOR-PLACEMENT = OUTSIDE-AIRFLOW  
 NIGHT-CYCLE-CTRL = STAY-OFF RETURN-STATIC = 0.7  
 RETURN-EFF = 0.77 NIGHT-VENT-DT = 0.0  
 MIN-CFM-RATIO = 1.0 COOLING-CAPACITY = 248100.  
 COOL-SH-CAP = 198484. HEATING-CAPACITY = -299800.  
 RETURN-AIR-PATH = PLENUM-ZONES  
 ZONE-NAMES = (SPACE\_1, SPACE\_2, SPACE\_3, SPACE\_4,  
 PLENUM\_1)  
 PLENUM-NAMES = (PLENUM\_1) ..

## \$ HOURLY REPORT DESCRIPTION

```

AHU-BLOCK =REPORT-BLOCK VARIABLE-TYPE = MZ-FAN-SYS
          VARIABLE-LIST = (3,5,6,17,18,19) ..
ZONE-BLOCK =REPORT-BLOCK VARIABLE-TYPE = SPACE_3
          VARIABLE-LIST = (17,18,7,6) ..
HRLY-AHU  = HOURLY-REPORT REPORT-SCHEDULE = HRLY-SCHED
          REPORT-BLOCK = (AHU-BLOCK)
..
HRLY-ZONE = HOURLY-REPORT REPORT-SCHEDULE = HRLY-SCHED
          REPORT-BLOCK = (ZONE-BLOCK)
..
END ..
COMPUTE SYSTEMS ..

INPUT PLANT ..

```

```

$-----$
$ E Z - D O E   P L A N T S   I N P U T $
$-----$

```

## \$ GENERAL PROJECT DATA

```

TITLE LINE-1 *   EMC      ENGINEERS      INC.      *
      LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
      LINE-3 *   DENVER,      CO      80227      *

      LINE-4 *RUN #5 DAYTIME INFILT. FOR BLDG. #7108 *
      LINE-5 *BN ADMIN & CLRM                                * ..

```

```

ABORT          ERRORS ..
DIAGNOSTIC     WARNINGS ..
PLANT-REPORT   VERIFICATION=(PV-A)
               SUMMARY=(PS-B,BEPS)
               HOURLY-DATA-SAVE = YES ..

```

## \$ SCHEDULES

```

PD_ON          =DAY-SCHEDULE (1,24) (1.) ..
PD_OFF         =DAY-SCHEDULE (1,24) (0.) ..

PW_OFF        =WEEK-SCHEDULE (ALL) PD_OFF ..
PW_ON         =WEEK-SCHEDULE (ALL) PD_ON ..

```

## \$ HEATING SEASON

```

P_HEAT        =SCHEDULE THRU MAY 15 PW_ON
               THRU OCT  1 PW_OFF
               THRU DEC 31 PW_ON ..

```

## \$ COOLING SEASON

```

P_COOL        =SCHEDULE THRU MAY 15 PW_OFF
               THRU OCT  1 PW_ON
               THRU DEC 31 PW_OFF ..

```

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 5/1995 8:21:33 SDL RUN 1  
 DENVER, CO 80227 RUN #5 DAYTIME INFILT. FOR BLDG. #7108 BN ADMIN & CLRM TOPEKA, KS  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR MZ-FAN-SYS

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC LOAD (KW)
JAN	0.00000				-81.103	15	5	-9.F	10918.	-267.516	27.438
FEB	0.00000				-58.558	3	5	-2.F	9869.	-240.070	27.438
MAR	0.00000				-41.729	3	5	13.F	11411.	-193.076	27.438
APR	0.00000				-10.499	5	5	29.F	10732.	-127.463	27.438
MAY	31.41247	31	19	84.F	-1.598	9	5	44.F	10918.	-74.389	27.438
JUN	72.31274	29	15	88.F	0.000				10979.	0.000	27.438
JUL	86.62682	7	18	83.F	0.000				10671.	0.000	27.438
AUG	89.39081	4	17	92.F	0.000				11411.	0.000	27.438
SEP	48.50097	14	15	83.F	0.000				10732.	0.000	27.438
OCT	0.17676	1	19	81.F	-8.395	20	5	25.F	10671.	-131.912	27.438
NOV	0.00000				-35.211	3	5	12.F	10486.	-186.055	27.438
DEC	0.00000				-71.406	15	5	8.F	10918.	-233.218	27.438
TOTAL	328.421				-308.495				129722.	-267.516	27.438
MAX											

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 5/1995 8:21:33 SDL RUN 1  
 DENVER, CO 80227 RUN #5 DAYTIME INFILT. FOR BLDG. #7108 BN ADMIN & CLRM TOPEKA, KS  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR MZ-FAN-SYS

MONTH	C O O L I N G				H E A T I N G				E L E C	
	HOURS COOLING LOAD	HOURS HEATING LOAD	HOURS COINCIDENT COOL-HEAT LOAD	HOURS FLOATING	HOURS COOLING AVAIL.	HOURS HEATING AVAIL.	HOURS FANS ON CYCLE	HOURS NIGHT VENTING	HOURS HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELEC LOAD AT COOLING PEAK (KW)
JAN	0	744	0	0	0	744	0	0	-109.258	7.716
FEB	0	672	0	0	0	672	0	0	-113.546	7.716
MAR	0	744	0	0	0	744	0	0	-108.494	7.716
APR	0	720	0	0	0	720	0	0	-0.036	7.716
MAY	325	360	0	59	384	744	0	59	0.000	7.716
JUN	676	0	0	44	720	720	0	44	0.000	27.438
JUL	741	0	0	3	744	744	0	3	0.000	27.438
AUG	732	0	0	12	744	744	0	12	0.000	27.438
SEP	510	0	0	210	720	720	0	210	0.000	27.438
OCT	8	720	0	16	24	744	0	16	0.000	7.716
NOV	0	720	0	0	0	720	0	0	0.000	7.716
DEC	0	744	0	0	0	744	0	0	-139.501	7.716
ANNUAL	2992	5424	0	344	3336	8760	0	344	-156.051	7.716

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY TOTAL (MBTU) PEAK (KBTU) DY/HR	NATURAL-GAS TOTAL (MBTU) PEAK (KBTU) DY/HR
JAN	41.890 100.763 31/ 9	115.601 336.437 15/ 5	
FEB	37.571 100.763 28/10	86.077 307.408 3/ 5	
MAR	42.350 100.763 31/ 7	63.574 256.415 3/ 5	
APR	38.374 99.840 5/ 7	18.402 182.494 5/ 5	
MAY	49.772 180.603 31/18	3.568 120.380 9/ 5	
JUN	64.899 179.581 28/16	0.000 0.000 30/ 1	
JUL	69.315 183.961 22/16	0.000 0.000 31/ 1	
AUG	73.438 192.869 11/16	0.000 0.000 31/ 1	
SEP	55.566 180.022 7/16	0.000 0.000 30/ 1	
OCT	38.183 100.130 20/ 8	15.313 187.607 20/ 5	
NOV	38.823 100.763 29/ 8	54.142 248.656 3/ 5	
DEC	41.821 100.763 30/13	104.228 300.075 15/ 5	
	ONE YEAR USE/PEAK	592.002 192.869	460.906 336.437

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 5/1995 8:21:33 PDL RUN 1  
 DENVER, CO 80227 RUN #5 DAYTIME INFILT. FOR BLDG. #7108 BN ADMIN & CLRM TOPEKA, KS  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE

ENERGY TYPE	ELECTRICITY	NATURAL-GAS
IN SITE MBTU -		
CATEGORY OF USE		
SPACE HEAT	17.11	460.90
SPACE COOL	114.81	0.00
HVAC AUX	247.97	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	182.00	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	30.11	0.00
TOTAL	592.00	460.90

TOTAL SITE ENERGY 1052.91 MBTU 85.8 KBTU/SQFT-YR GROSS-AREA 86.5 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 2238.69 MBTU 182.4 KBTU/SQFT-YR GROSS-AREA 183.8 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 3.9  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.



**COMPUTER ENERGY SIMULATIONS**

**BLDG. 7086  
CHURCH BUILDINGS**





DENVER - ATLANTA

PROJECT: FEASIBILITY STUDY FOR  
 INSTALLATION OF UMCS  
 LOCATION: FORT RILEY, KANSAS

EMC NO: 1406-001  
 CALC. BY: AJN  
 CHECKED BY: CEL  
 DATE: 05-Jul-95

BUILDING NO.: 7086  
 BLDG. TYPE: UNIT CHAPEL (Sanctuary)

**ENERGY CONSTANT CALCULATIONS**

	BASERUN	RUN1	RUN2	RUN3	RUN4	RUN5
HEATING (MBtu)	833.9	617.5	715.4	622.5	616.3	608.6
COOLING (KWH)	121,928	110,560	113,856	108,892	117,442	114,114

SUPPLY AIR FAN	8,008 CFM
FLOOR AREA	4,590 FT <sup>2</sup>
CFM/F	1842 CFM
UA	2125 BTU/HR-°F
BLDG CONSTR.	2 (1 FOR LIGHT ) (2 FOR HEAVY)

EZDOE COMPUTER RUN DEFINITION:	
BASERUN	EXISTING OPERATION
RUN1	NIGHT SETBACK
RUN2	DDC CONTROL
RUN3	ECONOMIZER
RUN4	NIGHTTIME INFILTRATION (OA)
RUN5	DAYTIME INFILTRATION (OA)

HOURS OF OCCUPANCY			ANNUAL HEATING & COOLING HOURS	
M-F	1800	2000	10 HR	HR. ON HEATING 1070 HR/YR
SAT.	700	1800	11 HR	HR. ON COOLING 651 HR/YR
SUN.	600	1800	12 HR	HR. OFF HEATING 4378 HR/YR
	TOTAL OCCUPY HR.		33 HR/WK	HR. OFF COOLING 2661 HR/YR
	TOTAL UNOCC. HR.		135 HR/WK	
	ANNUAL OCCUPY HR.		1721 HR/YR	
	ANNUAL UNOCC. HR.		7039 HR/YR	

PRESENT HR. OF OPERATION FOR SYS. WITH HEATING AND COOLING 8760 HR/YR  
 PRESENT HR. OF OPERATION FOR SYS. WITH HEATING ONLY 5448 HR/YR  
 PRESENT HR. OF OPERATION FOR SYS. WITH COOLING ONLY 3312 HR/YR  
 HRS SAVED (HTG ONLY) 5448 - 1070 = 4378 HR/YR  
 HRS SAVED (CLG ONLY) 3312 - 651 = 2661 HR/YR

HOAUHC	833.85 MBtu	-	616.27 MBtu	=	1.68E+01 Btu/CFM-HR
	1841.84 CFM	x	7039 HR/YR		
HOAUH	833.85 MBtu	-	616.27 MBtu	=	2.70E+01 Btu/CFM-HR
	1841.84 CFM	x	4378 HR/YR		
COAUHC	121,927.9 kWH	-	117,442.1 kWH	=	3.46E-04 kWH/CFM-HR
	1841.84 CFM	x	7039 HR/YR		
COAUC	121,927.9 kWH	-	117,442.1 kWH	=	9.15E-04 kWH/CFM-HR
	1841.84 CFM	x	2661 HR/YR		
HOAOHC	833.85 MBtu	-	608.63 MBtu	=	7.11E+01 Btu/CFM-HR
	1841.84 CFM	x	1721 HR/YR		
HOAOH	833.85 MBtu	-	608.63 MBtu	=	1.14E+02 Btu/CFM-HR
	1841.84 CFM	x	1070 HR/YR		
COAOHC	121,927.9 kWH	-	114,113.7 kWH	=	2.47E-03 kWH/CFM-HR
	1841.84 CFM	x	1721 HR/YR		
COAOC	121,927.9 kWH	-	114,113.7 kWH	=	6.52E-03 kWH/CFM-HR
	1841.84 CFM	x	651 HR/YR		
DC DUTY	1 / 6 (10 MINUTES PER HOUR)			=	0.17
DC DEMAND	1 / 6 (10 MINUTES PER HOUR)			=	0.17
ECC	110,559.6 kWH	-	108,892.5 kWH	=	3.20E-04 kWH/CFM-HR
	8008 CFM	x	651 HR/YR		
ECHC	110,559.6 kWH	-	108,892.5 kWH	=	1.21E-04 kWH/CFM-HR
	8008 CFM	x	1721 HR/YR		
NSUCHC	121,927.9 kWH	-	110,559.6 kWH	=	2.02E-04 kWH/CFM-HR
	8008 CFM	x	7039 HR/YR		
NSUCC	121,927.9 kWH	-	110,559.6 kWH	=	5.33E-04 kWH/CFM-HR
	8008 CFM	x	2661 HR/YR		
DDCCHC	121,927.9 kWH	-	113,855.8 kWH	=	5.86E-04 kWH/CFM-HR
	8008 CFM	x	1721 HR/YR		
DDCCC	121,927.9 kWH	-	113,855.8 kWH	=	1.55E-03 kWH/CFM-HR
	8008 CFM	x	651 HR/YR		
NSC	833.85 MBtu	-	617.52 MBtu	=	1.02E+05 Btu/UA
	2125.305 UA				
DDCH	833.85 MBtu	-	715.4 MBtu	=	5.57E+04 Btu/UA
	2125.305 UA				
OPT	(2 HR/DAY X 240 DAY/YR)			=	175 HR/YR
CHWR	(1.10 kW X 0.012 Eff. X 664 HRS X 2 Degrees of Reset)			=	305 HR/YR
OWR	567 HR/YR	x	0.01	=	17.5 kWH/TON
				=	5.67 HR/YR



INPUT LOADS ..

```

$-----$
$ E Z - D O E   L O A D S   I N P U T $
$-----$

```

## \$ GENERAL PROJECT DATA

```

TITLE LINE-1 *      EMC      ENGINEERS      INC.      *
LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
LINE-3 *      DENVER,      CO      80227      *

LINE-4 *BASELINE SIMULATION FOR BLDG. 7086      *
LINE-5 *UNIT CHAPEL W/ SINGLE ZONE      * ..

```

```

ABORT          ERRORS ..
DIAGNOSTIC     WARNINGS ..
LOADS-REPORT   VERIFICATION=(LV-D)
                SUMMARY=(LS-C,LS-D)
                HOURLY-DATA-SAVE = YES ..
BUILDING-LOCATION LATITUDE = 39.0
                LONGITUDE = 96.5
                ALTITUDE = 1065.
                TIME-ZONE = 6
                GROSS-AREA = 4590
                SHIELDING-COEF = 0.29
                X-REF = 0.0
                Y-REF = 0.0 ..
RUN-PERIOD     JAN 1 1994 THRU DEC 31 1994 ..

```

## \$ SCHEDULES

```

LD_ON          =DAY-SCHEDULE (1,24) (1.) ..
LD_OFF         =DAY-SCHEDULE (1,24) (0.) ..
LD_SATURDY    =DAY-SCHEDULE (1,6) (0.)
                (7,8) (0.1)
                (9,11) (0.5)
                (12,16) (0.1)
                (17) (0.02)
                (18,24) (0.) ..
LD_SUNDAY     =DAY-SCHEDULE (1,5) (0.)
                (6) (0.01)
                (7,8) (0.5)
                (9,10) (1.)
                (11,14) (0.33,0.25,0.2,0.05)
                (15,17) (0.02)
                (18,24) (0.) ..
LD_WEEKDAY    =DAY-SCHEDULE (1,7) (0.)
                (8) (0.02)

```

(9,16) (0.05)  
 (17,24) (0.) ..

LD\_LITES =DAY-SCHEDULE (1,5) (0.)  
 (6) (0.2)  
 (7,17) (1.)  
 (18) (0.5)  
 (19,24) (0.) ..

LW\_ON =WEEK-SCHEDULE (ALL) LD\_ON ..

LW\_OFF =WEEK-SCHEDULE (ALL) LD\_OFF ..

LW\_CHAPEL =WEEK-SCHEDULE (WD) LD\_WEEKDAY  
 (SAT) LD\_SATURDY  
 (SUN) LD\_SUNDAY  
 (HOL) LD\_SUNDAY ..

LW\_LITES =WEEK-SCHEDULE (ALL) LD\_LITES ..

\$ ON 100% OF THE TIME

L\_ON =SCHEDULE THRU DEC 31 LW\_ON ..

\$ OFF 100% OF THE TIME

L\_OFF =SCHEDULE THRU DEC 31 LW\_OFF ..

\$ CHAPEL SCHEDULE

L\_CHAPEL =SCHEDULE THRU DEC 31 LW\_CHAPEL ..

\$ LIGHTING SCHEDULE

L\_LIGHTS =SCHEDULE THRU DEC 31 LW\_LITES ..

#### \$ CONSTRUCTION TYPES

\$ BRICK-CMU WALL W/ INSL

WALL-1 =LAYERS MATERIAL=(BK01,IN22,CB36,AL21,GP04) I-F-R= 0.6100  
 THICKNESS=(0.333,0.083,1.000,0.000,0.063) ..

EXWALL-1 =CONSTRUCTION LAYERS = WALL-1  
 ABSORPTANCE = 0.880  
 ROUGHNESS = 2 ..

FLOOR =CONSTRUCTION U-VALUE = 0.020  
 ABSORPTANCE = 0.610  
 ROUGHNESS = 5 ..

\$ SHINGLED ROOF

SHIN-ROF =LAYERS MATERIAL=(AB03,HF-E3,HF-B10,IN73,AL12,AC03)  
 THICKNESS=(0.000,0.031,0.167,0.125,0.000,0.063) ..

ROOF-1 =CONSTRUCTION LAYERS = SHIN-ROF  
 ABSORPTANCE = 0.800

ROUGHNESS = 1 ..

\$ STANDARD WOOD DOOR

DOOR-STD =LAYERS MATERIAL=(WD12,WD12) I-F-R= 0.6100  
 THICKNESS=(0.083,0.083) ..  
 DOOR-WOD =CONSTRUCTION LAYERS = DOOR-STD  
 ABSORPTANCE = 0.860  
 ROUGHNESS = 5 ..

1\_PN\_STD =GLASS-TYPE GLASS-TYPE-CODE = 8  
 PANES = 1 ..

## \$ SPACE DESCRIPTION

SPACE\_1 =SPACE AREA = 4590.0 VOLUME = 123930.0  
 TEMPERATURE = (73.) ZONE-TYPE = CONDITIONED  
 PEOPLE-SCHEDULE = L\_CHAPEL NUMBER-OF-PEOPLE = 150.0  
 PEOPLE-HG-LAT = 625.0 PEOPLE-HG-SENS = 375.0  
 LIGHTING-TYPE = INCAND LIGHTING-W/SQFT = 2.2  
 LIGHT-TO-SPACE = 1.0 LIGHTING-SCHEDULE = L\_LIGHTS  
 SOURCE-SENSIBLE = 0.0 FURN-WEIGHT = 2.  
 INF-METHOD = AIR-CHANGE AIR-CHANGES/HR = 0.18  
 INF-SCHEDULE = L\_ON ..

WEST-WALL =E-W HEIGHT = 27.0 WIDTH = 54.0 CONS = EXWALL-1  
 AZIMUTH = 256 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 2.0 WIDTH = 5.0 G-T = 1\_PN\_STD  
 MULTIPLIER = 4.0 SETBACK = 0.5  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 15.0 WIDTH = 1.0 G-T = 1\_PN\_STD  
 MULTIPLIER = 3.0 SETBACK = 0.5  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 4.0 WIDTH = 1.0 G-T = 1\_PN\_STD  
 MULTIPLIER = 3.0 SETBACK = 0.5  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

DOOR HEIGHT = 2.5 WIDTH = 3.0 CONS = DOOR-WOD  
 MULTIPLIER = 4.0 SETBACK = 0.2  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

NORTH-WALL =E-W HEIGHT = 22.5 WIDTH = 97.0 CONS = EXWALL-1  
 AZIMUTH = 346 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 2.0 WIDTH = 5.0 G-T = 1\_PN\_STD  
 MULTIPLIER = 2.0 SETBACK = 0.5  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 14.0 WIDTH = 4.0 G-T = 1\_PN\_STD

MULTIPLIER = 8.0 SETBACK = 0.5  
SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

DOOR HEIGHT = 2.5 WIDTH = 3.0 CONS = DOOR-WOD  
MULTIPLIER = 2.0 SETBACK = 0.2  
SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

EAST-WALL =E-W HEIGHT = 27.0 WIDTH = 46.0 CONS = EXWALL-1  
AZIMUTH = 76 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

SOUTH-WALL =E-W HEIGHT = 22.5 WIDTH = 70.0 CONS = EXWALL-1  
AZIMUTH = 166 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 2.0 WIDTH = 5.0 G-T = 1\_PN\_STD  
MULTIPLIER = 2.0 SETBACK = 0.5  
SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 14.0 WIDTH = 4.0 G-T = 1\_PN\_STD  
MULTIPLIER = 4.0 SETBACK = 0.5  
SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

DOOR HEIGHT = 2.5 WIDTH = 3.0 CONS = DOOR-WOD  
MULTIPLIER = 2.0 SETBACK = 0.2  
SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

U-W HEIGHT = 10.0 WIDTH = 459.0 CONS = FLOOR ..

ROOF HEIGHT = 25.0 WIDTH = 97.0 CONS = ROOF-1  
AZIMUTH = 346 TILT = 21 SKY-FORM-FACTOR = 1.0 ..

ROOF HEIGHT = 35.0 WIDTH = 97.0 CONS = ROOF-1  
AZIMUTH = 166 TILT = 21 SKY-FORM-FACTOR = 1.0 ..

END ..

COMPUTE LOADS ..

INPUT SYSTEMS ..

\$-----\$  
\$ E Z - D O E S Y S T E M S I N P U T \$  
\$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
LINE-3 \* DENVER, CO 80227 \*  
  
LINE-4 \*BASELINE SIMULATION FOR BLDG. 7086 \*  
LINE-5 \*UNIT CHAPEL W/ SINGLE ZONE \* ..  
ABORT ERRORS ..  
DIAGNOSTIC WARNINGS ..

SYSTEMS-REPORT VERIFICATION=(SV-A)  
 SUMMARY=(SS-A,SS-C,SS-K,SS-O)  
 HOURLY-DATA-SAVE = YES ..

## \$ SCHEDULES

SD\_ON =DAY-SCHEDULE (1,24) (1.) ..  
 SD\_OFF =DAY-SCHEDULE (1,24) (0.) ..  
 SD\_W\_HT\_F =DAY-SCHEDULE (1,24) (74.) ..  
 SD\_S\_CL\_F =DAY-SCHEDULE (1,24) (72.) ..  
 SD\_W\_CL\_F =DAY-SCHEDULE (1,24) (75.) ..  
 SD\_S\_HT\_F =DAY-SCHEDULE (1,24) (71.) ..

SW\_ON =WEEK-SCHEDULE (ALL) SD\_ON ..  
 SW\_OFF =WEEK-SCHEDULE (ALL) SD\_OFF ..  
 SW\_W\_HT\_F =WEEK-SCHEDULE (ALL) SD\_W\_HT\_F ..  
 SW\_S\_CL\_F =WEEK-SCHEDULE (ALL) SD\_S\_CL\_F ..  
 SW\_W\_CL\_F =WEEK-SCHEDULE (ALL) SD\_W\_CL\_F ..  
 SW\_S\_HT\_F =WEEK-SCHEDULE (ALL) SD\_S\_HT\_F ..

## \$ FULL ON SYSTEM

S\_ON =SCHEDULE THRU DEC 31 SW\_ON ..

## \$ FULL OFF SYSTEM

S\_OFF =SCHEDULE THRU DEC 31 SW\_OFF ..

## \$ HEATING SEASON

S\_HE-SCHED =SCHEDULE THRU MAY 15 SW\_ON  
 THRU OCT 1 SW\_OFF  
 THRU DEC 31 SW\_ON ..

## \$ COOLING SEASON

S\_CL\_SCHED =SCHEDULE THRU MAY 15 SW\_OFF  
 THRU OCT 1 SW\_ON  
 THRU DEC 31 SW\_OFF ..

## \$ HEATING SET TEMP

S\_HT\_SET\_F =SCHEDULE THRU MAY 15 SW\_W\_HT\_F  
 THRU OCT 1 SW\_S\_HT\_F  
 THRU DEC 31 SW\_W\_HT\_F ..

## \$ COOLING SET TEMP

S\_CL\_SET\_F =SCHEDULE THRU MAY 15 SW\_W\_CL\_F  
 THRU OCT 1 SW\_S\_CL\_F  
 THRU DEC 31 SW\_W\_CL\_F ..

S\_HRLY-RPT =SCHEDULE THRU JAN 14 SW\_OFF  
 THRU JAN 15 SW\_ON  
 THRU AUG 20 SW\_OFF  
 THRU AUG 21 SW\_ON

THRU DEC 31 SW\_OFF ..

\$ ZONE DESCRIPTION

SPACE\_1 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 1.0  
 ASSIGNED-CFM = 7700. SIZING-OPTION = FROM-LOADS ..

\$ SYSTEM DESCRIPTION

AC-1 =SYSTEM SYSTEM-TYPE = PSZ  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_HE-SCHED  
 COOLING-SCHEDULE = S\_CL\_SCHED OA-CONTROL = FIXED  
 SUPPLY-CFM = 7700. RATED-CFM = 7700.  
 MIN-OUTSIDE-AIR = 0.23 MAX-OA-FRACTION = 0.23  
 SUPPLY-DELTA-T = 1.8 SUPPLY-KW = 0.00059  
 NIGHT-CYCLE-CTRL = STAY-OFF NIGHT-VENT-DT = 0.0  
 COOLING-CAPACITY = 250250. COOL-SH-CAP = 200200.  
 COOL-FT-MIN = 0. HEATING-CAPACITY = -423500.  
 CRANKCASE-MAX-T = 0. OUTSIDE-FAN-T = 45.  
 HEAT-SOURCE = HOT-WATER SIZING-OPTION = COINCIDENT  
 ZONE-NAMES = (SPACE\_1) ..

\$ HOURLY REPORT DESCRIPTION

ZONE-BLOCK =REPORT-BLOCK VARIABLE-TYPE = SPACE\_1  
 VARIABLE-LIST = (17,18,7,31) ..  
 AHU-BLOCK =REPORT-BLOCK VARIABLE-TYPE = AC-1  
 VARIABLE-LIST = (3,5,6,17,39) ..  
 ZONE-RPT = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (ZONE-BLOCK)  
 ..  
 AHU-RPT = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (AHU-BLOCK)  
 ..  
 END ..  
 COMPUTE SYSTEMS ..

INPUT PLANT ..

-----\$  
 \$EZ - DOE PLANTS INPUT\$  
 -----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
 LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*



LINE-3 \* DENVER, CO 80227 \*

LINE-4 \*BASELINE SIMULATION FOR BLDG. 7086 \*

LINE-5 \*UNIT CHAPEL W/ SINGLE ZONE \* ..

ABORT ERRORS ..  
DIAGNOSTIC WARNINGS ..  
PLANT-REPORT VERIFICATION=(PV-A)  
SUMMARY=(PS-B,BEPS)  
HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

PD\_ON =DAY-SCHEDULE (1,24) (1.) ..

PD\_OFF =DAY-SCHEDULE (1,24) (0.) ..

PW\_OFF =WEEK-SCHEDULE (ALL) PD\_OFF ..

PW\_ON =WEEK-SCHEDULE (ALL) PD\_ON ..

\$ HEATING SEASON

P\_HEAT =SCHEDULE THRU MAY 15 PW\_ON  
THRU OCT 1 PW\_OFF  
THRU DEC 31 PW\_ON ..

\$ COOLING SEASON

P\_COOL =SCHEDULE THRU MAY 15 PW\_OFF  
THRU OCT 1 PW\_ON  
THRU DEC 31 PW\_OFF ..

\$ EQUIPMENT DESCRIPTION

BOIL-HW =PLANT-EQUIPMENT TYPE = HW-BOILER  
SIZE = -999. ..

REC-ACCU =PLANT-EQUIPMENT TYPE = HERM-REC-CHLR  
SIZE = -999. INSTALLED-NUMBER = 2  
MAX-NUMBER-AVAIL = 2 ..

PLANT-PARAMETERS BOILER-FUEL = NATURAL-GAS TWR-PUMP-HEAD = 35.  
HERM-REC-COND-TYPE = AIR CCIRC-HEAD = 15.0  
HCIRC-HEAD = 15.0 ..

ENERGY-RESOURCE RESOURCE = ELECTRICITY ..  
ENERGY-RESOURCE RESOURCE = NATURAL-GAS ..

HEAT-SEASO =LOAD-ASSIGNMENT TYPE = HEATING  
OPERATION-MODE = RUN-NEEDED  
LOAD-RANGE = 0.000

PLANT-EQUIPMENT = BOIL-HW

NUMBER = 1 ..

COOL-SEASO =LOAD-ASSIGNMENT TYPE = COOLING

OPERATION-MODE = RUN-NEEDED

LOAD-RANGE = 0.000

PLANT-EQUIPMENT = REC-ACCU

NUMBER = 2 ..

END ..

COMPUTE PLANT ..

STOP ..

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/12/1995 10:16:38 LDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. 7086 UNIT CHAPEL W/ SINGLE ZONE  
 REPORT- LV-D DETAILS OF EXTERIOR SURFACES IN THE PROJECT TOPEKA, KS

NUMBER OF EXTERIOR SURFACES 6 RECTANGULAR 6 OTHER 0  
 (U-VALUE INCLUDES INSIDE AIR FILM PLUS OUTSIDE AIR FILM AT 7.5 MPH WINDSPEED )

SURFACE	SPACE	G L A S S		W A L L		W A L L + G L A S S		AZIMUTH
		U-VALUE (BTU/HR-SQFT-F)	AREA (SQFT)	U-VALUE (BTU/HR-SQFT-F)	AREA (SQFT)	U-VALUE (BTU/HR-SQFT-F)	AREA (SQFT)	
NORTH-WALL	SPACE_1	1.021	468.00	0.118	1714.50	0.312	2182.50	NORTH
EAST-WALL	SPACE_1	0.000	0.00	0.118	1242.00	0.118	1242.00	NORTH-EAST
SOUTH-WALL	SPACE_1	1.021	244.00	0.118	1331.00	0.258	1575.00	SOUTH-EAST
WEST-WALL	SPACE_1	1.021	97.00	0.118	1361.00	0.178	1458.00	SOUTH-WEST
	SPACE_1	0.000	0.00	0.094	2425.00	0.094	2425.00	ROOF
	SPACE_1	0.000	0.00	0.094	3395.00	0.094	3395.00	ROOF
	SPACE_1	0.000	0.00	0.020	4590.00	0.020	4590.00	UNDERGRND

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/12/1995 10:16:38 LDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. 7086 UNIT CHAPEL W/ SINGLE ZONE  
 REPORT- LV-D DETAILS OF EXTERIOR SURFACES IN THE PROJECT TOPEKA, KS

SURFACE	SPACE	AVERAGE U-VALUE		GLASS AREA (SQFT)	OPAQUE AREA (SQFT)	GLASS+OPAQUE AREA (SQFT)
		U-VALUE/GLASS (BTU/HR-SQFT-F)	WALLS+GLASS (BTU/HR-SQFT-F)			
NORTH	1.021	0.118	0.312	468.00	1714.50	2182.50
NORTH-EAST	0.000	0.118	0.118	0.00	1242.00	1242.00
SOUTH-EAST	1.021	0.118	0.258	244.00	1331.00	1575.00
SOUTH-WEST	1.021	0.118	0.178	97.00	1361.00	1458.00
ROOF	0.000	0.094	0.094	0.00	5820.00	5820.00
ALL WALLS	1.021	0.118	0.231	809.00	5648.50	6457.50
WALLS+ROOFS	1.021	0.106	0.166	809.00	11468.50	12277.50
UNDERGRND	0.000	0.020	0.020	0.00	4590.00	4590.00
BUILDING	1.021	0.081	0.126	809.00	16058.50	16867.50

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/12/1995 10:16:38 LDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. 7086 UNIT CHAPEL W/ SINGLE ZONE  
 REPORT- LS-C BUILDING PEAK LOAD COMPONENTS TOPEKA, KS

\*\*\* BUILDING \*\*\*

FLOOR AREA 4590 SOFT 426 SOMT  
 VOLUME 123930 CUFT 3510 CUMT

COOLING LOAD HEATING LOAD  
 =====  
 TIME JUL 23 4PM  
 DRY-BULB TEMP 98F 37C  
 WET-BULB TEMP 79F 26C

	SENSIBLE (KBTU/H)	( KW )	LATENT (KBTU/H)	( KW )	SENSIBLE (KBTU/H)	( KW )
WALLS	8.170	2.393	0.000	0.000	-31.018	-9.084
ROOFS	12.808	3.751	0.000	0.000	-32.144	-9.414
GLASS CONDUCTION	22.230	6.511	0.000	0.000	-62.587	-18.330
GLASS SOLAR	9.508	2.785	0.000	0.000	0.436	0.128
DOOR	0.776	0.227	0.000	0.000	-1.512	-0.443
INTERNAL SURFACES	0.000	0.000	0.000	0.000	0.000	0.000
UNDERGROUND SURFACES	-0.824	-0.241	0.000	0.000	-2.636	-0.772
OCCUPANTS TO SPACE	6.543	1.916	9.375	2.746	0.188	0.055
LIGHT TO SPACE	30.393	8.901	0.000	0.000	4.408	1.291
EQUIPMENT TO SPACE	0.000	0.000	0.000	0.000	0.000	0.000
PROCESS TO SPACE	0.000	0.000	0.000	0.000	0.000	0.000
INFILTRATION	12.063	3.533	17.769	5.204	-57.812	-16.932
TOTAL	101.666	29.775	27.144	7.950	-182.676	-53.501
TOTAL LOAD	128.810	KBTU/H	37.725	KW	-182.676	KBTU/H
TOTAL LOAD / AREA	28.06	BTU/H.SQFT	88.469	W /SQMT	39.799	BTU/H.SQFT
						125.464
						W /SQMT

\*\*\*\*\*  
 \* NOTE 1) THE ABOVE LOADS EXCLUDE OUTSIDE VENTILATION AIR \*  
 \* ---- LOADS GIVEN IN STANDARD TIME FOR THE LOCATION \*  
 \* 2) TIMES GIVEN IN STANDARD TIME FOR THE LOCATION \*  
 \* IN CONSIDERATION \*  
 \*\*\*\*\*

EMC ENGINEERS INC. DOE-2.1D 5/12/1995 10:16:38 SDL RUN 1  
 DENVER, CO 80227 EZDOE - ELITE SOFTWARE DEVELOPMENT INC UNIT CHAPEL W/ SINGLE ZONE  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR AC-1 TOPEKA, KS

MONTH	C O O L I N G			H E A T I N G			E L E C			
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP WET- BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP WET- BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC- TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000			-132.870	15	3	-8.F	-9.F	7046.	14.737
FEB	0.00000			-101.107	3	6	-1.F	-2.F	6360.	14.737
MAR	0.00000			-84.020	3	4	16.F	13.F	7041.	14.637
APR	0.00000			-30.302	5	6	31.F	28.F	6814.	14.637
MAY	20.62210	31	16	-6.965	5	5	44.F	40.F	9025.	34.720
JUN	64.83260	19	10	0.000					13111.	38.743
JUL	92.03951	24	10	0.000					15954.	42.044
AUG	89.48664	21	10	0.000					16048.	40.818
SEP	38.51265	6	16	0.000					10579.	39.252
OCT	0.16323	1	17	-26.102	20	6	24.F	23.F	7059.	20.972
NOV	0.00000			-66.373	2	6	15.F	14.F	6814.	14.637
DEC	0.00000			-120.204	15	5	8.F	7.F	7041.	14.737
TOTAL	305.657			-567.944					112900.	
MAX							284.550	-321.525		42.044

EMC ENGINEERS INC. DOE-2.1D 5/12/1995 10:16:38 SDL RUN 1  
 DENVER, CO 80227 EZDOE - ELITE SOFTWARE DEVELOPMENT INC UNIT CHAPEL W/ SINGLE ZONE  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR AC-1 TOPEKA, KS

MONTH	N U M B E R O F H O U R S				C O I N C I D E N T L O A D S				C O I N C I D E N T L O A D S				
	HOURS COOLING LOAD	HOURS HEATING LOAD	HOURS COOL-HEAT LOAD	HOURS FLOATING LOAD	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.	HOURS FANS ON CYCLE	HOURS FANS ON VENTING	HOURS FLOATING WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)
JAN	0	744	0	0	744	0	0	0	0	-159.635	4.543	-157.478	4.543
FEB	0	672	0	0	672	0	0	0	0	-158.809	4.543	-158.809	4.543
MAR	0	736	0	8	744	0	0	0	8	-56.766	4.543	-56.766	4.543
APR	0	602	0	118	720	0	0	0	118	0.000	34.720	0.000	34.720
MAY	291	257	0	69	360	293	0	0	196	0.000	38.743	0.000	38.743
JUN	651	0	0	11	720	651	0	0	69	0.000	39.366	0.000	39.366
JUL	740	0	0	4	740	740	0	0	4	0.000	40.818	0.000	40.818
AUG	733	0	0	11	733	744	0	0	11	0.000	39.252	0.000	39.252
SEP	452	0	0	268	455	4	0	0	268	0.000	20.972	0.000	20.972
OCT	4	569	0	171	720	4	0	0	171	-180.423	4.543	-180.423	4.543
NOV	0	687	0	33	720	0	0	0	33	-178.018	4.543	-178.018	4.543
DEC	0	744	0	0	744	0	0	0	0				
ANNUAL	2871	5011	0	878	5424	2876	8760	0	878				

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY TOTAL (MBTU) PEAK (KBTU) DY/HR	NATURAL-GAS TOTAL (MBTU) PEAK (KBTU) DY/HR
JAN	29.557 57.754 28/ 9	184.608 405.590 15/ 3	
FEB	26.637 57.754 3/ 8	145.332 369.390 3/ 6	
MAR	29.002 57.413 31/17	125.834 331.368 3/ 4	
APR	25.781 57.413 17/ 8	49.913 229.553 5/ 6	
MAY	31.553 118.549 31/16	12.528 166.524 5/ 5	
JUN	44.766 132.286 19/10	0.000 0.000 30/ 1	
JUL	54.473 143.556 23/16	0.000 0.000 31/ 1	
AUG	54.794 139.370 21/10	0.000 0.000 31/ 1	
SEP	36.121 134.024 6/16	0.000 0.000 30/ 1	
OCT	26.460 71.608 1/17	44.078 236.742 20/ 6	
NOV	27.506 57.413 30/17	101.395 293.859 2/ 6	
DEC	29.494 57.754 13/ 8	170.162 372.805 15/ 5	
	ONE YEAR USE/PEAK	416.143 143.556	833.850 405.590

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/12/1995 10:16:38 PDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. 7086 UNIT CHAPEL W/ SINGLE ZONE  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
SPACE HEAT	29.19	833.85
SPACE COOL	102.39	0.00
HVAC AUX	137.38	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	147.18	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	0.00	0.00
TOTAL	416.14	833.85

TOTAL SITE ENERGY 1249.99 MBTU 272.3 KBTU/SQFT-YR GROSS-AREA 272.3 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 2083.53 MBTU 453.9 KBTU/SQFT-YR GROSS-AREA 453.9 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 0.0  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.





MULTIPLIER = 8.0 SETBACK = 0.5  
SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

DOOR HEIGHT = 2.5 WIDTH = 3.0 CONS = DOOR-WOD  
MULTIPLIER = 2.0 SETBACK = 0.2  
SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

EAST-WALL =E-W HEIGHT = 27.0 WIDTH = 46.0 CONS = EXWALL-1  
AZIMUTH = 76 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

SOUTH-WALL =E-W HEIGHT = 22.5 WIDTH = 70.0 CONS = EXWALL-1  
AZIMUTH = 166 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 2.0 WIDTH = 5.0 G-T = 1\_PN\_STD  
MULTIPLIER = 2.0 SETBACK = 0.5  
SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 14.0 WIDTH = 4.0 G-T = 1\_PN\_STD  
MULTIPLIER = 4.0 SETBACK = 0.5  
SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

DOOR HEIGHT = 2.5 WIDTH = 3.0 CONS = DOOR-WOD  
MULTIPLIER = 2.0 SETBACK = 0.2  
SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

U-W HEIGHT = 10.0 WIDTH = 459.0 CONS = FLOOR ..

ROOF HEIGHT = 25.0 WIDTH = 97.0 CONS = ROOF-1  
AZIMUTH = 346 TILT = 21 SKY-FORM-FACTOR = 1.0 ..

ROOF HEIGHT = 35.0 WIDTH = 97.0 CONS = ROOF-1  
AZIMUTH = 166 TILT = 21 SKY-FORM-FACTOR = 1.0 ..

END ..

COMPUTE LOADS ..

INPUT SYSTEMS ..

\$-----\$  
\$ E Z - D O E S Y S T E M S I N P U T \$  
\$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
LINE-3 \* DENVER, CO 80227 \*

LINE-4 \*RUN #1 NIGHT SETBACK FOR BLDG. 7086 \*  
LINE-5 \*UNIT CHAPEL W/ SINGLE ZONE \* ..

ABORT ERRORS ..  
DIAGNOSTIC WARNINGS ..

SYSTEMS-REPORT VERIFICATION=(SV-A)  
SUMMARY=(SS-A,SS-C,SS-K,SS-O)  
HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

SD_ON	=DAY-SCHEDULE	(1,24)	(1.)	..
SD_OFF	=DAY-SCHEDULE	(1,24)	(0.)	..
SD_W_HT_F	=DAY-SCHEDULE	(1,5)	(55.)	..
		(6,18)	(74.)	..
		(19,24)	(55.)	..
SD_S_CL_F	=DAY-SCHEDULE	(1,5)	(85.)	..
		(6,18)	(72.)	..
		(19,24)	(85.)	..
SD_W_CL_F	=DAY-SCHEDULE	(1,5)	(56.)	..
		(6,18)	(75.)	..
		(19,24)	(56.)	..
SD_S_HT_F	=DAY-SCHEDULE	(1,5)	(84.)	..
		(6,18)	(71.)	..
		(19,24)	(84.)	..
SD_FAN_CYC	=DAY-SCHEDULE	(1,5)	(0.)	..
		(6,18)	(1.)	..
		(19,24)	(0.)	..



SW\_ON =WEEK-SCHEDULE (ALL) SD\_ON ..

SW\_OFF =WEEK-SCHEDULE (ALL) SD\_OFF ..

SW\_W\_HT\_F =WEEK-SCHEDULE (ALL) SD\_W\_HT\_F ..

SW\_S\_CL\_F =WEEK-SCHEDULE (ALL) SD\_S\_CL\_F ..

SW\_W\_CL\_F =WEEK-SCHEDULE (ALL) SD\_W\_CL\_F ..

SW\_S\_HT\_F =WEEK-SCHEDULE (ALL) SD\_S\_HT\_F ..

SW\_FAN\_CYC =WEEK-SCHEDULE (ALL) SD\_FAN\_CYC ..

\$ FULL ON SYSTEM  
S\_ON =SCHEDULE THRU DEC 31 SW\_ON ..

\$ FULL OFF SYSTEM  
S\_OFF =SCHEDULE THRU DEC 31 SW\_OFF ..

\$ HEATING SEASON  
S\_HE-SCHED =SCHEDULE THRU MAY 15 SW\_ON  
THRU OCT 1 SW\_OFF  
THRU DEC 31 SW\_ON ..

\$ COOLING SEASON  
S\_CL\_SCHED =SCHEDULE THRU MAY 15 SW\_OFF  
THRU OCT 1 SW\_ON  
THRU DEC 31 SW\_OFF ..

\$ HEATING SET TEMP

```
S_HT_SET_F =SCHEDULE THRU MAY 15 SW_W_HT_F
              THRU OCT  1 SW_S_HT_F
              THRU DEC 31 SW_W_HT_F ..
```

\$ COOLING SET TEMP

```
S_CL_SET_F =SCHEDULE THRU MAY 15 SW_W_CL_F
              THRU OCT  1 SW_S_CL_F
              THRU DEC 31 SW_W_CL_F ..
```

```
S_HRLY-RPT =SCHEDULE THRU JAN 14 SW_OFF
              THRU JAN 15 SW_ON
              THRU AUG 20 SW_OFF
              THRU AUG 21 SW_ON
              THRU DEC 31 SW_OFF ..
```

```
S_FAN_CYCL =SCHEDULE THRU DEC 31 SW_FAN_CYC ..
```

\$ ZONE DESCRIPTION

```
SPACE_1  =ZONE  DESIGN-HEAT-T = 74.0  DESIGN-COOL-T = 72.0
             HEAT-TEMP-SCH = S_HT_SET_F  COOL-TEMP-SCH = S_CL_SET_F
             ZONE-TYPE = CONDITIONED
             THERMOSTAT-TYPE = PROPORTIONAL  THROTTLING-RANGE = 1.0
             ASSIGNED-CFM = 7700.  SIZING-OPTION = FROM-LOADS ..
```

\$ SYSTEM DESCRIPTION

```
AC-1      =SYSTEM  SYSTEM-TYPE = PSZ
             MAX-SUPPLY-T = 120.0  MIN-SUPPLY-T = 55.0
             HEATING-SCHEDULE = S_HE-SCHED
             COOLING-SCHEDULE = S_CL_SCHED  OA-CONTROL = FIXED
             SUPPLY-CFM = 7700.  RATED-CFM = 7700.
             MIN-OUTSIDE-AIR = 0.23  MAX-OA-FRACTION = 0.23
             FAN-SCHEDULE = S_FAN_CYCL  SUPPLY-DELTA-T = 1.8
             SUPPLY-KW = 0.00059  NIGHT-CYCLE-CTRL = CYCLE-ON-ANY
             NIGHT-VENT-DT = 0.0  COOLING-CAPACITY = 250250.
             COOL-SH-CAP = 200200.  COOL-FT-MIN = 0.
             HEATING-CAPACITY = -423500.  CRANKCASE-MAX-T = 0.
             OUTSIDE-FAN-T = 45.  HEAT-SOURCE = HOT-WATER
             SIZING-OPTION = COINCIDENT
             ZONE-NAMES = (SPACE_1) ..
```



\$ HOURLY REPORT DESCRIPTION

```
ZONE-BLOCK =REPORT-BLOCK VARIABLE-TYPE = SPACE_1
              VARIABLE-LIST = (17,18,7,31) ..
AHU-BLOCK  =REPORT-BLOCK VARIABLE-TYPE = AC-1
              VARIABLE-LIST = (3,5,6,17,39) ..
ZONE-RPT   = HOURLY-REPORT  REPORT-SCHEDULE = S_HRLY-RPT
              REPORT-BLOCK = (ZONE-BLOCK)
..
AHU-RPT    = HOURLY-REPORT  REPORT-SCHEDULE = S_HRLY-RPT
```

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/12/1995 10:56:33 SDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SETBACK FOR BLDG. 7086 UNIT CHAPEL W/ SINGLE ZONE  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR AC-1 TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	ELC-LOAD (KW)
JAN	0.00000				-98.405	14	7	-1.1.F	-2.F	-403.083	6469.
FEB	0.00000				-73.456	3	8	-2.F	-3.F	-368.960	5906.
MAR	0.00000				-60.361	3	6	15.F	12.F	-349.182	6805.
APR	0.00000				-21.263	5	6	31.F	28.F	-246.954	6796.
MAY	16.25379	31	16	88.F	-4.643	5	6	44.F	40.F	-158.567	8594.
JUN	49.50651	19	10	82.F	0.000					0.000	11591.
JUL	68.60999	24	10	80.F	0.000					0.000	13609.
AUG	67.31927	21	9	83.F	0.000					0.000	13698.
SEP	30.50548	5	10	75.F	0.000					0.000	9765.
OCT	0.14094	1	17	85.F	-17.611	20	6	24.F	23.F	-252.533	7048.
NOV	0.00000				-46.661	2	6	15.F	14.F	-316.165	6605.
DEC	0.00000				-88.245	14	7	10.F	8.F	-386.114	6541.
TOTAL	232.336				-410.645					-403.083	103437.
MAX											42.437

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/12/1995 10:56:33 SDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SETBACK FOR BLDG. 7086 UNIT CHAPEL W/ SINGLE ZONE  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR AC-1 TOPEKA, KS

MONTH	HOURS COINCIDENT COOL-HEAT LOAD				HOURS HEATING AVAIL.				HOURS COOLING AVAIL.				HOURS FANS ON				HOURS NIGHT VENTING				HOURS FLOATING WHEN FANS ON				COINCIDENT HEATING COOLING PEAK (KBTU/HR)				COINCIDENT ELECTRIC LOAD AT COOLING PEAK (KW)			
	COOLING LOAD	HEATING LOAD	HEATING LOAD	COOL-HEAT LOAD	HEATING AVAIL.	HEATING AVAIL.	HEATING AVAIL.	HEATING AVAIL.	COOLING AVAIL.	COOLING AVAIL.	COOLING AVAIL.	COOLING AVAIL.	FANS ON	FANS ON	FANS ON	FANS ON	NIGHT VENTING	NIGHT VENTING	NIGHT VENTING	NIGHT VENTING	FLOATING WHEN FANS ON	FLOATING WHEN FANS ON	FLOATING WHEN FANS ON	FLOATING WHEN FANS ON	HEATING COOLING PEAK	HEATING COOLING PEAK	HEATING COOLING PEAK	HEATING COOLING PEAK	ELECTRIC LOAD	ELECTRIC LOAD	ELECTRIC LOAD	ELECTRIC LOAD
JAN	0	0	0	0	744	0	0	0	0	617	0	214	0	0	0	0	0	0	0	0	0	0	0	-5.670	-4.005	-4.335	-4.040	35.873	40.192	40.182	40.337	36.788
FEB	0	0	0	0	672	0	0	0	0	572	0	208	0	1	0	0	0	0	0	0	0	0	0	-4.005	-4.335	-4.040	35.873	40.192	40.182	40.337	36.788	
MAR	0	0	0	0	744	0	0	0	0	692	0	289	0	0	0	0	0	0	0	0	0	0	0	-4.335	-4.040	0.000	0.000	0.000	0.000	0.000	0.000	20.983
APR	0	0	0	0	720	0	0	0	0	716	0	326	0	94	0	0	0	0	0	0	0	0	0	-4.040	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
MAY	183	270	0	0	360	0	0	0	183	744	0	341	0	291	0	0	0	0	0	0	0	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
JUN	371	0	0	0	0	0	0	0	371	720	0	330	0	349	0	0	0	0	0	0	0	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
JUL	403	0	0	0	0	0	0	0	409	743	0	340	0	340	0	0	0	0	0	0	0	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AUG	403	0	0	0	0	0	0	0	409	738	0	335	0	335	0	0	0	0	0	0	0	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SEP	272	0	0	0	0	0	0	0	272	720	0	330	0	448	0	0	0	0	0	0	0	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
OCT	3	589	0	0	720	0	0	0	3	674	0	284	0	150	0	0	0	0	0	0	0	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NOV	0	657	0	0	720	0	0	0	0	674	0	284	0	17	0	0	0	0	0	0	0	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DEC	0	634	0	0	744	0	0	0	0	634	0	231	0	0	0	0	0	0	0	0	0	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ANNUAL	1635	4652	0	0	5424	0	0	0	1642	8312	0	3567	0	2025	0	0	0	0	0	0	0	0	0									

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY 26.645 59.640 28/ 9	NATURAL-GAS 139.846 508.472 14/ 7
JAN	TOTAL (MBTU) PEAK (KBTU) DY/HR	26.645 59.640 28/ 9	139.846 508.472 14/ 7
FEB	TOTAL (MBTU) PEAK (KBTU) DY/HR	24.048 59.640 3/ 8	107.565 472.442 3/ 8
MAR	TOTAL (MBTU) PEAK (KBTU) DY/HR	27.094 59.299 31/17	92.532 451.300 3/ 6
APR	TOTAL (MBTU) PEAK (KBTU) DY/HR	25.129 59.299 24/ 8	36.523 338.973 5/ 6
MAY	TOTAL (MBTU) PEAK (KBTU) DY/HR	29.919 122.485 31/16	9.099 237.748 5/ 6
JUN	TOTAL (MBTU) PEAK (KBTU) DY/HR	39.577 137.234 19/10	0.000 0.000 30/ 1
JUL	TOTAL (MBTU) PEAK (KBTU) DY/HR	46.467 144.899 23/16	0.000 0.000 31/ 1
AUG	TOTAL (MBTU) PEAK (KBTU) DY/HR	46.773 142.103 24/16	0.000 0.000 31/ 1
SEP	TOTAL (MBTU) PEAK (KBTU) DY/HR	33.342 137.223 6/16	0.000 0.000 30/ 1
OCT	TOTAL (MBTU) PEAK (KBTU) DY/HR	25.800 71.644 1/17	31.171 345.235 20/ 6
NOV	TOTAL (MBTU) PEAK (KBTU) DY/HR	25.774 59.299 30/17	73.136 415.578 2/ 6
DEC	TOTAL (MBTU) PEAK (KBTU) DY/HR	26.768 59.640 13/ 8	127.647 490.626 14/ 7
	ONE YEAR USE/PEAK	377.336 144.899	617.519 508.472

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/12/1995 10:56:33 PDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SETBACK FOR BLDG. 7086 UNIT CHAPEL W/ SINGLE ZONE  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE	ELECTRICITY	NATURAL-GAS
IN SITE MBTU -		
CATEGORY OF USE		
SPACE HEAT	22.45	617.52
SPACE COOL	77.03	0.00
HVAC AUX	130.67	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	147.18	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	0.00	0.00
TOTAL	377.34	617.52

TOTAL SITE ENERGY 994.86 MBTU 216.7 KBTU/SOFT-YR GROSS-AREA 216.7 KBTU/SOFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 1750.66 MBTU 381.4 KBTU/SOFT-YR GROSS-AREA 381.4 KBTU/SOFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 0.7  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

MULTIPLIER = 8.0 SETBACK = 0.5  
SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

DOOR HEIGHT = 2.5 WIDTH = 3.0 CONS = DOOR-WOD  
MULTIPLIER = 2.0 SETBACK = 0.2  
SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

EAST-WALL =E-W HEIGHT = 27.0 WIDTH = 46.0 CONS = EXWALL-1  
AZIMUTH = 76 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

SOUTH-WALL =E-W HEIGHT = 22.5 WIDTH = 70.0 CONS = EXWALL-1  
AZIMUTH = 166 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 2.0 WIDTH = 5.0 G-T = 1\_PN\_STD  
MULTIPLIER = 2.0 SETBACK = 0.5  
SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 14.0 WIDTH = 4.0 G-T = 1\_PN\_STD  
MULTIPLIER = 4.0 SETBACK = 0.5  
SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

DOOR HEIGHT = 2.5 WIDTH = 3.0 CONS = DOOR-WOD  
MULTIPLIER = 2.0 SETBACK = 0.2  
SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

U-W HEIGHT = 10.0 WIDTH = 459.0 CONS = FLOOR ..

ROOF HEIGHT = 25.0 WIDTH = 97.0 CONS = ROOF-1  
AZIMUTH = 346 TILT = 21 SKY-FORM-FACTOR = 1.0 ..

ROOF HEIGHT = 35.0 WIDTH = 97.0 CONS = ROOF-1  
AZIMUTH = 166 TILT = 21 SKY-FORM-FACTOR = 1.0 ..

END ..  
COMPUTE LOADS ..  
INPUT SYSTEMS ..

\$-----\$  
\$ E Z - D O E S Y S T E M S I N P U T \$  
\$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
LINE-3 \* DENVER, CO 80227 \*  
  
LINE-4 \*RUN #2 DDC CONTROL FOR BLDG. 7086 \*  
LINE-5 \*UNIT CHAPEL W/ SINGLE ZONE \* ..  
  
ABORT ERRORS ..  
DIAGNOSTIC WARNINGS ..

SYSTEMS-REPORT VERIFICATION=(SV-A)  
 SUMMARY=(SS-A,SS-C,SS-K,SS-O)  
 HOURLY-DATA-SAVE = YES ..

## \$ SCHEDULES

SD_ON	=DAY-SCHEDULE	(1,24)	(1.)	..
SD_OFF	=DAY-SCHEDULE	(1,24)	(0.)	..
SD_W_HT_F	=DAY-SCHEDULE	(1,24)	(70.)	..
SD_S_CL_F	=DAY-SCHEDULE	(1,24)	(76.)	..
SD_W_CL_F	=DAY-SCHEDULE	(1,24)	(71.)	..
SD_S_HT_F	=DAY-SCHEDULE	(1,24)	(75.)	..
SD_FAN_CYC	=DAY-SCHEDULE	(1,24)	(1.)	..



SW\_ON =WEEK-SCHEDULE (ALL) SD\_ON ..  
 SW\_OFF =WEEK-SCHEDULE (ALL) SD\_OFF ..  
 SW\_W\_HT\_F =WEEK-SCHEDULE (ALL) SD\_W\_HT\_F ..  
 SW\_S\_CL\_F =WEEK-SCHEDULE (ALL) SD\_S\_CL\_F ..  
 SW\_W\_CL\_F =WEEK-SCHEDULE (ALL) SD\_W\_CL\_F ..  
 SW\_S\_HT\_F =WEEK-SCHEDULE (ALL) SD\_S\_HT\_F ..  
 SW\_FAN\_CYC =WEEK-SCHEDULE (ALL) SD\_FAN\_CYC ..

## \$ FULL ON SYSTEM

S\_ON =SCHEDULE THRU DEC 31 SW\_ON ..

## \$ FULL OFF SYSTEM

S\_OFF =SCHEDULE THRU DEC 31 SW\_OFF ..

## \$ HEATING SEASON

S\_HE-SCHED =SCHEDULE THRU MAY 15 SW\_ON  
 THRU OCT 1 SW\_OFF  
 THRU DEC 31 SW\_ON ..

## \$ COOLING SEASON

S\_CL\_SCHED =SCHEDULE THRU MAY 15 SW\_OFF  
 THRU OCT 1 SW\_ON  
 THRU DEC 31 SW\_OFF ..

## \$ HEATING SET TEMP

S\_HT\_SET\_F =SCHEDULE THRU MAY 15 SW\_W\_HT\_F  
 THRU OCT 1 SW\_S\_HT\_F  
 THRU DEC 31 SW\_W\_HT\_F ..

## \$ COOLING SET TEMP

S\_CL\_SET\_F =SCHEDULE THRU MAY 15 SW\_W\_CL\_F  
 THRU OCT 1 SW\_S\_CL\_F  
 THRU DEC 31 SW\_W\_CL\_F ..

S\_HRLY-RPT =SCHEDULE THRU JAN 14 SW\_OFF



THRU JAN 15 SW\_ON  
 THRU AUG 20 SW\_OFF  
 THRU AUG 21 SW\_ON  
 THRU DEC 31 SW\_OFF ..

S\_FAN\_CYCL =SCHEDULE THRU DEC 31 SW\_FAN\_CYC ..

\$ ZONE DESCRIPTION

SPACE\_1 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 1.0  
 ASSIGNED-CFM = 7700. SIZING-OPTION = FROM-LOADS ..

\$ SYSTEM DESCRIPTION

AC-1 =SYSTEM SYSTEM-TYPE = PSZ  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_HE-SCHED  
 COOLING-SCHEDULE = S\_CL\_SCHED OA-CONTROL = FIXED  
 SUPPLY-CFM = 7700. RATED-CFM = 7700.  
 MIN-OUTSIDE-AIR = 0.23 MAX-OA-FRACTION = 0.23  
 FAN-SCHEDULE = S\_FAN\_CYCL SUPPLY-DELTA-T = 1.8  
 SUPPLY-KW = 0.00059 NIGHT-CYCLE-CTRL = CYCLE-ON-ANY  
 NIGHT-VENT-DT = 0.0 COOLING-CAPACITY = 250250.  
 COOL-SH-CAP = 200200. COOL-FT-MIN = 0.  
 HEATING-CAPACITY = -423500. CRANKCASE-MAX-T = 0.  
 OUTSIDE-FAN-T = 45. HEAT-SOURCE = HOT-WATER  
 SIZING-OPTION = COINCIDENT  
 ZONE-NAMES = (SPACE\_1) ..

\$ HOURLY REPORT DESCRIPTION

ZONE-BLOCK =REPORT-BLOCK VARIABLE-TYPE = SPACE\_1  
 VARIABLE-LIST = (17,18,7,31) ..  
 AHU-BLOCK =REPORT-BLOCK VARIABLE-TYPE = AC-1  
 VARIABLE-LIST = (3,5,6,17,39) ..  
 ZONE-RPT = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (ZONE-BLOCK)  
 ..  
 AHU-RPT = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (AHU-BLOCK)  
 ..  
 END ..  
 COMPUTE SYSTEMS ..  
 INPUT PLANT ..

\$-----\$  
 \$ E Z - D O E P L A N T S I N P U T \$

EMC ENGINEERS INC. EZZOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/12/1995 11:3:20 SDL RUN 1  
DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. 7086 UNIT CHAPEL W/ SINGLE ZONE  
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR AC-1 TOPEKA, KS

MONTH	COOLING				HEATING				WET-BULB				ELECTRIC			
	ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)	
JAN	0.00000				-119.890	15	-8.F	-9.F	7046.	-305.106	0.000	-119.890	15	3	7046.	
FEB	0.00000				-89.335	3	-1.F	-2.F	6360.	0.000	0.000	-89.335	3	6	6360.	
MAR	0.00000				-70.990	3	15.F	13.F	7041.	0.000	0.000	-70.990	3	5	7041.	
APR	0.00000				-21.139	5	31.F	28.F	6814.	0.000	0.000	-21.139	5	6	6814.	
MAY	12.98170	31	16	88.F	-3.949	5	44.F	40.F	8330.	166.104	0.000	-3.949	5	5	8330.	
JUN	47.83162	19	10	82.F	0.000				11539.	222.754	0.000	0.000			11539.	
JUL	72.38590	24	10	80.F	0.000				14144.	243.422	0.000	0.000			14144.	
AUG	71.82764	21	10	86.F	0.000				14371.	253.064	0.000	0.000			14371.	
SEP	25.89304	6	16	93.F	-17.225	20	24.F	23.F	9405.	200.558	0.000	-17.225	20	6	9405.	
OCT	0.00000				-54.678	2	15.F	14.F	7041.	0.000	0.000	-54.678	2	6	7041.	
NOV	0.00000				-107.118	15	8.F	7.F	6814.	0.000	0.000	-107.118	15	5	6814.	
DEC	0.00000				-484.324				7041.	0.000	0.000	-484.324			7041.	
TOTAL	230.920									253.064						
MAX															40.290	

EMC ENGINEERS INC. EZZOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/12/1995 11:3:20 SDL RUN 1  
DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. 7086 UNIT CHAPEL W/ SINGLE ZONE  
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR AC-1 TOPEKA, KS

MONTH	COOLING				HEATING				WET-BULB				ELECTRIC			
	LOAD	HOURS	HEATING LOAD	COOL-HEAT LOAD	AVAIL.	HOURS	COOLING AVAIL.	HOURS	FANS ON	HEATING ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	MAXIMUM COOLING LOAD (KBTU/HR)	TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)		
JAN	0	744	0	0	744	0	744	0	0	7046.	-305.106	0.000	7046.	14.737		
FEB	0	672	0	0	672	0	672	0	0	6360.	-270.659	0.000	6360.	14.737		
MAR	0	722	0	0	744	0	744	0	0	7041.	-232.920	0.000	7041.	14.637		
APR	0	541	0	0	720	0	720	0	0	6814.	-143.281	0.000	6814.	14.637		
MAY	209	232	0	0	212	0	744	0	0	8330.	-88.411	0.000	8330.	31.996		
JUN	563	0	0	0	565	0	720	0	0	11539.	0.000	0.000	11539.	35.921		
JUL	723	0	0	0	724	0	744	0	0	14144.	0.000	0.000	14144.	40.290		
AUG	699	0	0	0	699	0	744	0	0	14371.	0.000	0.000	14371.	39.195		
SEP	363	0	0	0	364	0	720	0	0	9405.	0.000	0.000	9405.	36.601		
OCT	0	525	0	0	0	0	744	0	0	7041.	-151.041	0.000	7041.	14.637		
NOV	0	668	0	0	0	0	720	0	0	6814.	-200.964	0.000	6814.	14.637		
DEC	0	744	0	0	744	0	744	0	0	7041.	-272.302	0.000	7041.	14.737		
ANNUAL	2557	4848	0	0	2564	0	8760	0	0	105956.	-305.106	0.000	105956.	40.290		

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/12/1995 11:3:20 PDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. 7086 UNIT CHAPEL W/ SINGLE ZONE  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY	NATURAL-GAS
JAN	29.223 57.374 28/ 9	167.779 384.878 15/ 3	
FEB	26.320 57.374 3/ 8	129.912 348.410 3/ 6	
MAR	28.431 57.033 31/13	107.509 307.580 3/ 5	
APR	25.108 57.033 17/ 7	35.460 206.921 5/ 6	
MAY	28.909 109.249 31/16	7.495 142.750 5/ 5	
JUN	39.400 122.649 19/10	0.000 0.000 30/ 1	
JUL	48.295 137.568 23/16	0.000 0.000 31/ 1	
AUG	49.068 133.827 21/10	0.000 0.000 31/ 1	
SEP	32.114 124.972 6/16	0.000 0.000 30/ 1	
OCT	25.694 57.033 31/10	29.830 215.840 20/ 6	
NOV	26.903 57.033 30/17	84.435 272.289 2/ 6	
DEC	29.125 57.374 13/ 8	152.984 350.167 15/ 5	
	ONE YEAR USE/PEAK	388.590 137.568	715.404 384.878

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/12/1995 11: 3:20 PDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. 7086 UNIT CHAPEL W/ SINGLE ZONE  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
SPACE HEAT	25.47	715.40
SPACE COOL	78.68	0.00
HVAC AUX	137.25	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	147.18	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	0.00	0.00
TOTAL	388.59	715.40

TOTAL SITE ENERGY 1103.99 MBTU 240.5 KBTU/SQFT-YR GROSS-AREA 240.5 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 1882.34 MBTU 410.1 KBTU/SQFT-YR GROSS-AREA 410.1 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 0.0  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

MULTIPLIER = 8.0 SETBACK = 0.5  
SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

DOOR HEIGHT = 2.5 WIDTH = 3.0 CONS = DOOR-WOD  
MULTIPLIER = 2.0 SETBACK = 0.2  
SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

EAST-WALL =E-W HEIGHT = 27.0 WIDTH = 46.0 CONS = EXWALL-1  
AZIMUTH = 76 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

SOUTH-WALL =E-W HEIGHT = 22.5 WIDTH = 70.0 CONS = EXWALL-1  
AZIMUTH = 166 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 2.0 WIDTH = 5.0 G-T = 1\_PN\_STD  
MULTIPLIER = 2.0 SETBACK = 0.5  
SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 14.0 WIDTH = 4.0 G-T = 1\_PN\_STD  
MULTIPLIER = 4.0 SETBACK = 0.5  
SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

DOOR HEIGHT = 2.5 WIDTH = 3.0 CONS = DOOR-WOD  
MULTIPLIER = 2.0 SETBACK = 0.2  
SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

U-W HEIGHT = 10.0 WIDTH = 459.0 CONS = FLOOR ..

ROOF HEIGHT = 25.0 WIDTH = 97.0 CONS = ROOF-1  
AZIMUTH = 346 TILT = 21 SKY-FORM-FACTOR = 1.0 ..

ROOF HEIGHT = 35.0 WIDTH = 97.0 CONS = ROOF-1  
AZIMUTH = 166 TILT = 21 SKY-FORM-FACTOR = 1.0 ..

END ..  
COMPUTE LOADS ..

INPUT SYSTEMS ..

\$-----\$  
\$ E Z - D O E S Y S T E M S I N P U T \$  
\$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
LINE-3 \* DENVER, CO 80227 \*  
  
LINE-4 \*RUN #3 ECONOMIZER FOR BLDG. 7086 \*  
LINE-5 \*UNIT CHAPEL W/ SINGLE ZONE \* ..  
  
ABORT ERRORS ..  
DIAGNOSTIC WARNINGS ..

SYSTEMS-REPORT VERIFICATION=(SV-A)  
 SUMMARY=(SS-A,SS-C,SS-K,SS-O)  
 HOURLY-DATA-SAVE = YES ..

## \$ SCHEDULES

SD\_ON =DAY-SCHEDULE (1,24) (1.) ..  
 SD\_OFF =DAY-SCHEDULE (1,24) (0.) ..  
 SD\_W\_HT\_F =DAY-SCHEDULE (1,5) (55.)  
 (6,18) (74.)  
 (19,24) (55.) ..  
 SD\_S\_CL\_F =DAY-SCHEDULE (1,5) (85.)  
 (6,18) (72.)  
 (19,24) (85.) ..  
 SD\_W\_CL\_F =DAY-SCHEDULE (1,5) (56.)  
 (6,18) (75.)  
 (19,24) (56.) ..  
 SD\_S\_HT\_F =DAY-SCHEDULE (1,5) (84.)  
 (6,18) (71.)  
 (19,24) (84.) ..  
 SD\_FAN\_CYC =DAY-SCHEDULE (1,5) (0.)  
 (6,18) (1.)  
 (19,24) (0.) ..

SW\_ON =WEEK-SCHEDULE (ALL) SD\_ON ..  
 SW\_OFF =WEEK-SCHEDULE (ALL) SD\_OFF ..  
 SW\_W\_HT\_F =WEEK-SCHEDULE (ALL) SD\_W\_HT\_F ..  
 SW\_S\_CL\_F =WEEK-SCHEDULE (ALL) SD\_S\_CL\_F ..  
 SW\_W\_CL\_F =WEEK-SCHEDULE (ALL) SD\_W\_CL\_F ..  
 SW\_S\_HT\_F =WEEK-SCHEDULE (ALL) SD\_S\_HT\_F ..  
 SW\_FAN\_CYC =WEEK-SCHEDULE (ALL) SD\_FAN\_CYC ..

\$ FULL ON SYSTEM  
 S\_ON =SCHEDULE THRU DEC 31 SW\_ON ..

\$ FULL OFF SYSTEM  
 S\_OFF =SCHEDULE THRU DEC 31 SW\_OFF ..

\$ HEATING SEASON  
 S\_HE-SCHED =SCHEDULE THRU MAY 15 SW\_ON  
 THRU OCT 1 SW\_OFF  
 THRU DEC 31 SW\_ON ..

\$ COOLING SEASON  
 S\_CL\_SCHED =SCHEDULE THRU MAY 15 SW\_OFF  
 THRU OCT 1 SW\_ON  
 THRU DEC 31 SW\_OFF ..

\$ HEATING SET TEMP

```
S_HT_SET_F =SCHEDULE THRU MAY 15 SW_W_HT_F
              THRU OCT  1 SW_S_HT_F
              THRU DEC 31 SW_W_HT_F ..
```

## \$ COOLING SET TEMP

```
S_CL_SET_F =SCHEDULE THRU MAY 15 SW_W_CL_F
              THRU OCT  1 SW_S_CL_F
              THRU DEC 31 SW_W_CL_F ..
```

```
S_HRLY-RPT =SCHEDULE THRU JAN 14 SW_OFF
              THRU JAN 15 SW_ON
              THRU AUG 20 SW_OFF
              THRU AUG 21 SW_ON
              THRU DEC 31 SW_OFF ..
```

```
S_FAN_CYCL =SCHEDULE THRU DEC 31 SW_FAN_CYC ..
```

## \$ ZONE DESCRIPTION

```
SPACE_1  =ZONE  DESIGN-HEAT-T = 74.0  DESIGN-COOL-T = 72.0
            HEAT-TEMP-SCH = S_HT_SET_F  COOL-TEMP-SCH = S_CL_SET_F
            ZONE-TYPE = CONDITIONED
            THERMOSTAT-TYPE = PROPORTIONAL  THROTTLING-RANGE = 1.0
            ASSIGNED-CFM = 7700.  SIZING-OPTION = FROM-LOADS ..
```

## \$ SYSTEM DESCRIPTION

```
AC-1      =SYSTEM  SYSTEM-TYPE = PSZ
            MAX-SUPPLY-T = 120.0  MIN-SUPPLY-T = 55.0
            HEATING-SCHEDULE = S_HE-SCHED
            COOLING-SCHEDULE = S_CL_SCHED  ECONO-LIMIT-T = 70.0
            SUPPLY-CFM = 7700.  RATED-CFM = 7700.
            MIN-OUTSIDE-AIR = 0.23  FAN-SCHEDULE = S_FAN_CYCL
            SUPPLY-DELTA-T = 1.8  SUPPLY-KW = 0.00059
            NIGHT-CYCLE-CTRL = CYCLE-ON-ANY  NIGHT-VENT-DT = 0.0
            COOLING-CAPACITY = 250250.  COOL-SH-CAP = 200200.
            COOL-FT-MIN = 0.  HEATING-CAPACITY = -423500.
            CRANKCASE-MAX-T = 0.  OUTSIDE-FAN-T = 45.
            HEAT-SOURCE = HOT-WATER  SIZING-OPTION = COINCIDENT
            ZONE-NAMES = (SPACE_1) ..
```

## \$ HOURLY REPORT DESCRIPTION

```
ZONE-BLOCK =REPORT-BLOCK VARIABLE-TYPE = SPACE_1
              VARIABLE-LIST = (17,18,7,31) ..
AHU-BLOCK  =REPORT-BLOCK VARIABLE-TYPE = AC-1
              VARIABLE-LIST = (3,5,6,17,39) ..
ZONE-RPT   = HOURLY-REPORT  REPORT-SCHEDULE = S_HRLY-RPT
              REPORT-BLOCK = (ZONE-BLOCK)
..
AHU-RPT    = HOURLY-REPORT  REPORT-SCHEDULE = S_HRLY-RPT
              REPORT-BLOCK = (AHU-BLOCK)
```

EMC ENGINEERS INC. 80227 RUN #3 ECONOMIZER FOR BLDG. 7086 AC-1										DOE-2.1D 5/12/1995									
DENVER, CO 80227 RUN #3 ECONOMIZER FOR BLDG. 7086 AC-1										UNIT CHAPEL W/ SINGLE ZONE TOPEKA, KS									
REPORT-SS-A SYSTEM MONTHLY LOADS SUMMARY FOR										REPORT-SS-C SYSTEM MONTHLY LOADS SUMMARY FOR									
C O O L I N G										H E A T I N G									
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	TRICAL ENERGY (KWH)	ELEC-TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)						
JAN	0.00000				0.000	-97.675	14	8	-2. F	-3. F	6373.	6373.	14.737						
FEB	0.00000				0.000	-72.940	3	8	-2. F	-3. F	5792.	5792.	14.737						
MAR	0.00000				0.000	-61.474	3	6	15. F	12. F	6709.	6709.	14.637						
APR	0.00000				0.000	-24.809	5	6	31. F	28. F	6768.	6768.	14.637						
MAY	14.15590	31	16	88. F	75. F	-6.659	5	6	44. F	40. F	8412.	8412.	35.873						
JUN	46.32540	19	10	82. F	74. F	0.000					11314.	11314.	40.192						
JUL	67.40615	24	10	80. F	75. F	0.000					13508.	13508.	42.437						
AUG	65.74354	21	9	83. F	75. F	0.000					13568.	13568.	41.618						
SEP	28.14796	5	10	75. F	72. F	0.000					9562.	9562.	40.189						
OCT	0.15025	1	17	85. F	68. F	-22.059	20	6	24. F	23. F	7044.	7044.	21.317						
NOV	0.00000				0.000	-48.462	2	6	15. F	14. F	6537.	6537.	14.637						
DEC	0.00000				0.000	-87.574	14	8	9. F	7. F	6423.	6423.	14.737						
TOTAL	221.929				322.721	-421.651					102022.	102022.	42.437						
MAX																			

EMC ENGINEERS INC. 80227 RUN #3 ECONOMIZER FOR BLDG. 7086 AC-1										DOE-2.1D 5/12/1995									
DENVER, CO 80227 RUN #3 ECONOMIZER FOR BLDG. 7086 AC-1										UNIT CHAPEL W/ SINGLE ZONE TOPEKA, KS									
REPORT-SS-C SYSTEM MONTHLY LOAD HOURS FOR										REPORT-SS-C SYSTEM MONTHLY LOAD HOURS FOR									
C O O L I N G										H E A T I N G									
MONTH	HOURS COOLING LOAD	HOURS HEATING LOAD	HOURS COINCIDENT COOL-HEAT LOAD	HOURS FLOATING LOAD	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.	HOURS FANS ON	HOURS FANS ON CYCLE	HOURS NIGHT VENTING	HOURS FLOATING WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)							
JAN	0	525	0	219	744	0	596	193	0	71	-4.940	4.543							
FEB	0	465	0	207	672	0	547	183	0	82	0.000	0.000							
MAR	0	474	0	270	744	0	671	268	0	197	0.000	0.000							
APR	0	352	0	368	720	0	710	320	0	358	0.000	4.543							
MAY	141	142	0	461	360	183	744	341	0	461	0.000	35.873							
JUN	332	0	0	388	0	371	720	330	0	388	0.000	40.192							
JUL	395	0	0	349	0	404	743	340	0	348	0.000	40.182							
AUG	387	0	0	357	0	409	738	335	0	351	0.000	40.337							
SEP	249	0	0	471	0	272	720	330	0	471	0.000	36.783							
OCT	3	302	0	439	720	3	741	338	0	436	0.000	21.317							
NOV	0	437	0	283	720	0	659	269	0	222	0.000	4.543							
DEC	0	512	0	232	744	0	608	205	0	96	-28.505	0.000							
ANNUAL	1507	3209	0	4044	5424	1642	8197	3452	0	3481									



EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/12/1995 11:35: 2 PDL RUN 1  
 DENVER, CO 80227 RUN #3 ECONOMIZER FOR BLDG. 7086 UNIT CHAPEL W/ SINGLE ZONE  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY 26.160 59.637 28/9	NATURAL-GAS 137.949 508.293 14/8
JAN	TOTAL (MBTU) PEAK (KBTU) DY/HR	23.484 59.637 3/8	105.767 473.062 3/8
FEB	TOTAL (MBTU) PEAK (KBTU) DY/HR	26.546 59.296 31/17	92.137 441.515 3/6
MAR	TOTAL (MBTU) PEAK (KBTU) DY/HR	25.026 59.296 30/8	39.989 348.480 5/6
APR	TOTAL (MBTU) PEAK (KBTU) DY/HR	29.343 122.485 31/16	11.398 272.136 5/6
MAY	TOTAL (MBTU) PEAK (KBTU) DY/HR	38.630 137.234 19/10	0.000 0.000 30/1
JUN	TOTAL (MBTU) PEAK (KBTU) DY/HR	46.124 144.899 23/16	0.000 0.000 31/1
JUL	TOTAL (MBTU) PEAK (KBTU) DY/HR	46.327 142.103 24/16	0.000 0.000 31/1
AUG	TOTAL (MBTU) PEAK (KBTU) DY/HR	32.648 137.223 6/16	0.000 0.000 30/1
SEP	TOTAL (MBTU) PEAK (KBTU) DY/HR	25.816 72.785 1/17	35.860 353.371 20/6
OCT	TOTAL (MBTU) PEAK (KBTU) DY/HR	25.401 59.296 30/17	73.977 418.321 2/6
NOV	TOTAL (MBTU) PEAK (KBTU) DY/HR	26.148 59.637 13/8	125.424 487.989 14/8
DEC	TOTAL (MBTU) PEAK (KBTU) DY/HR	371.652 144.899	622.502 508.293

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/12/1995 11:35: 2 PDL RUN 1  
 DENVER, CO 80227 RUN #3 ECONOMIZER FOR BLDG. 7086 UNIT CHAPEL W/ SINGLE ZONE  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE	ELECTRICITY	NATURAL-GAS
IN SITE MBTU -		
CATEGORY OF USE		
SPACE HEAT	22.14	622.50
SPACE COOL	73.98	0.00
HVAC AUX	128.35	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	147.18	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	0.00	0.00
TOTAL	371.65	622.50

TOTAL SITE ENERGY 994.15 MBTU 216.6 KBTU/SQFT-YR GROSS-AREA 216.6 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 1738.57 MBTU 378.8 KBTU/SQFT-YR GROSS-AREA 378.8 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 17.0  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

MULTIPLIER = 8.0 SETBACK = 0.5  
SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

DOOR HEIGHT = 2.5 WIDTH = 3.0 CONS = DOOR-WOD  
MULTIPLIER = 2.0 SETBACK = 0.2  
SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

EAST-WALL =E-W HEIGHT = 27.0 WIDTH = 46.0 'CONS = EXWALL-1  
AZIMUTH = 76 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

SOUTH-WALL =E-W HEIGHT = 22.5 WIDTH = 70.0 CONS = EXWALL-1  
AZIMUTH = 166 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 2.0 WIDTH = 5.0 G-T = 1\_PN\_STD  
MULTIPLIER = 2.0 SETBACK = 0.5  
SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 14.0 WIDTH = 4.0 G-T = 1\_PN\_STD  
MULTIPLIER = 4.0 SETBACK = 0.5  
SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

DOOR HEIGHT = 2.5 WIDTH = 3.0 CONS = DOOR-WOD  
MULTIPLIER = 2.0 SETBACK = 0.2  
SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

U-W HEIGHT = 10.0 WIDTH = 459.0 CONS = FLOOR ..

ROOF HEIGHT = 25.0 WIDTH = 97.0 CONS = ROOF-1  
AZIMUTH = 346 TILT = 21 SKY-FORM-FACTOR = 1.0 ..

ROOF HEIGHT = 35.0 WIDTH = 97.0 CONS = ROOF-1  
AZIMUTH = 166 TILT = 21 SKY-FORM-FACTOR = 1.0 ..

END ..  
COMPUTE LOADS ..  
INPUT SYSTEMS ..

\$-----\$  
\$ E Z - D O E S Y S T E M S I N P U T \$  
\$-----\$

\$ GENERAL PROJECT DATA


TITLE LINE-1 \* EMC ENGINEERS INC. \*  
LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
LINE-3 \* DENVER, CO 80227 \*  
LINE-4 \*RUN #4 NIGHT INFILTRATION FOR BLDG. 7086\*  
LINE-5 \*UNIT CHAPEL W/ SINGLE ZONE \* ..

ABORT ERRORS ..  
DIAGNOSTIC WARNINGS ..

SYSTEMS-REPORT VERIFICATION=(SV-A)  
SUMMARY=(SS-A,SS-C,SS-K,SS-O)  
HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

SD_ON	=DAY-SCHEDULE	(1,24)	(1.)	..
SD_OFF	=DAY-SCHEDULE	(1,24)	(0.)	..
SD_W_HT_F	=DAY-SCHEDULE	(1,24)	(74.)	..
SD_S_CL_F	=DAY-SCHEDULE	(1,24)	(72.)	..
SD_W_CL_F	=DAY-SCHEDULE	(1,24)	(75.)	..
SD_S_HT_F	=DAY-SCHEDULE	(1,24)	(71.)	..
SD_OA%	=DAY-SCHEDULE	(1,5)	(0.)	..
		(6,18)	(0.23)	..
		(19,24)	(0.)	..



SW_ON	=WEEK-SCHEDULE	(ALL)	SD_ON	..
SW_OFF	=WEEK-SCHEDULE	(ALL)	SD_OFF	..
SW_W_HT_F	=WEEK-SCHEDULE	(ALL)	SD_W_HT_F	..
SW_S_CL_F	=WEEK-SCHEDULE	(ALL)	SD_S_CL_F	..
SW_W_CL_F	=WEEK-SCHEDULE	(ALL)	SD_W_CL_F	..
SW_S_HT_F	=WEEK-SCHEDULE	(ALL)	SD_S_HT_F	..
SW_OA%	=WEEK-SCHEDULE	(ALL)	SD_OA%	..

\$ FULL ON SYSTEM

S\_ON =SCHEDULE THRU DEC 31 SW\_ON ..

\$ FULL OFF SYSTEM

S\_OFF =SCHEDULE THRU DEC 31 SW\_OFF ..

\$ HEATING SEASON

S\_HE-SCHED =SCHEDULE THRU MAY 15 SW\_ON  
THRU OCT 1 SW\_OFF  
THRU DEC 31 SW\_ON ..

\$ COOLING SEASON

S\_CL\_SCHED =SCHEDULE THRU MAY 15 SW\_OFF  
THRU OCT 1 SW\_ON  
THRU DEC 31 SW\_OFF ..

\$ HEATING SET TEMP

S\_HT\_SET\_F =SCHEDULE THRU MAY 15 SW\_W\_HT\_F  
THRU OCT 1 SW\_S\_HT\_F  
THRU DEC 31 SW\_W\_HT\_F ..

\$ COOLING SET TEMP

S\_CL\_SET\_F =SCHEDULE THRU MAY 15 SW\_W\_CL\_F  
THRU OCT 1 SW\_S\_CL\_F  
THRU DEC 31 SW\_W\_CL\_F ..

S\_HRLY-RPT =SCHEDULE THRU JAN 14 SW\_OFF  
 THRU JAN 15 SW\_ON  
 THRU AUG 20 SW\_OFF  
 THRU AUG 21 SW\_ON  
 THRU DEC 31 SW\_OFF ..

S\_OA% =SCHEDULE THRU DEC 31 SW\_OA% ..

\$ ZONE DESCRIPTION

SPACE\_1 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 1.0  
 ASSIGNED-CFM = 7700. SIZING-OPTION = FROM-LOADS ..

\$ SYSTEM DESCRIPTION

AC-1 =SYSTEM SYSTEM-TYPE = PSZ  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_HE-SCHED  
 COOLING-SCHEDULE = S\_CL\_SCHED OA-CONTROL = FIXED  
 SUPPLY-CFM = 7700. RATED-CFM = 7700.  
 MIN-AIR-SCH = S\_OA% MAX-OA-FRACTION = 0.23 ←  
 SUPPLY-DELTA-T = 1.8 SUPPLY-KW = 0.00059  
 NIGHT-CYCLE-CTRL = STAY-OFF NIGHT-VENT-DT = 0.0  
 COOLING-CAPACITY = 250250. COOL-SH-CAP = 200200.  
 COOL-FT-MIN = 0. HEATING-CAPACITY = -423500.  
 CRANKCASE-MAX-T = 0. OUTSIDE-FAN-T = 45.  
 HEAT-SOURCE = HOT-WATER SIZING-OPTION = COINCIDENT  
 ZONE-NAMES = (SPACE\_1) ..

\$ HOURLY REPORT DESCRIPTION

ZONE-BLOCK =REPORT-BLOCK VARIABLE-TYPE = SPACE\_1  
 VARIABLE-LIST = (17,18,7,31) ..  
 AHU-BLOCK =REPORT-BLOCK VARIABLE-TYPE = AC-1  
 VARIABLE-LIST = (3,5,6,17,39) ..  
 ZONE-RPT = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (ZONE-BLOCK)  
 ..  
 AHU-RPT = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (AHU-BLOCK)  
 ..  
 END ..  
 COMPUTE SYSTEMS ..  
 INPUT PLANT ..

\$-----\$

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/12/1995 11:42: 8 SDL RUN 1											
DENVER, CO 80227 RUN #4 NIGHT INFILTRATION FOR BLDG. 7086UNIT CHAPEL W/ SINGLE ZONE											
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR AC-1 TOPEKA, KS											
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC-TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-99.116	14	9	-3.F	-4.F	7046.	14.737
FEB	0.00000				-74.045	3	6	-1.F	-2.F	6360.	14.737
MAR	0.00000				-59.125	3	6	15.F	12.F	7041.	14.637
APR	0.00000				-18.280	5	6	31.F	28.F	6814.	14.637
MAY	21.13025	31	16	88.F	-3.358	5	6	44.F	40.F	9063.	34.710
JUN	57.72066	19	10	82.F	0.000				0.000	12484.	38.728
JUL	77.85484	24	10	80.F	0.000				0.000	14700.	42.040
AUG	77.04541	21	10	86.F	0.000				0.000	14899.	40.807
SEP	36.90620	6	16	93.F	0.000				0.000	10437.	39.244
OCT	0.26216	1	17	85.F	-14.655	20	6	24.F	23.F	7070.	22.587
NOV	0.00000				-44.617	2	6	15.F	14.F	6814.	14.637
DEC	0.00000				-89.226	12	6	3.F	2.F	7041.	14.737
TOTAL	270.920				-402.422					109778.	42.040
MAX									284.204		

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/12/1995 11:42: 8 SDL RUN 1											
DENVER, CO 80227 RUN #4 NIGHT INFILTRATION FOR BLDG. 7086UNIT CHAPEL W/ SINGLE ZONE											
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR AC-1 TOPEKA, KS											
MONTH	HOURS COOLING LOAD	HOURS HEATING LOAD	HOURS COINCIDENT COOL-HEAT LOAD	HOURS FLOATING	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.	HOURS FANS ON CYCLE	HOURS NIGHT VENTING	HOURS FLOATING WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)
JAN	0	744	0	0	0	0	0	0	0	-77.699	4.543
FEB	0	672	0	0	0	0	0	0	0	-73.898	4.543
MAR	0	735	0	9	0	0	0	0	0	-77.167	4.543
APR	0	578	0	142	0	0	0	0	142	-2.556	4.543
MAY	343	228	0	173	343	0	0	0	173	0.000	34.710
JUN	691	0	0	29	692	0	0	0	29	0.000	38.728
JUL	742	0	0	2	742	0	0	0	2	0.000	39.349
AUG	738	0	0	6	738	0	0	0	6	0.000	40.807
SEP	537	0	0	183	537	0	0	0	183	0.000	39.244
OCT	7	546	0	191	7	0	0	0	191	0.000	22.587
NOV	0	682	0	38	0	0	0	0	38	-86.117	4.543
DEC	0	744	0	0	0	0	0	0	0	-88.817	4.543
ANNUAL	3058	4929	0	773	3059	0	0	0	773		

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/12/1995 11:42: 8 PDL RUN 1  
 DENVER, CO 80227 RUN #4 NIGHT INFILTRATION FOR BLDG. 7086UNIT CHAPEL W/ SINGLE ZONE  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY TOTAL (MBTU) PEAK (KBTU) DY/HR	NATURAL-GAS TOTAL (MBTU) PEAK (KBTU) DY/HR
JAN	29.200 57.410 28/ 9	29.200 57.410 28/ 9	143.880 386.836 14/ 9
FEB	26.286 57.410 3/ 8	26.286 57.410 3/ 8	111.939 369.708 3/ 6
MAR	28.261 57.069 31/17	28.261 57.069 31/17	92.772 323.095 3/ 6
APR	24.989 57.069 17/ 8	24.989 57.069 17/ 8	31.537 228.242 5/ 6
MAY	31.356 118.514 31/16	31.356 118.514 31/16	6.497 164.372 5/ 6
JUN	42.625 132.234 19/10	42.625 132.234 19/10	0.000 0.000 30/ 1
JUL	50.190 143.543 23/16	50.190 143.543 23/16	0.000 0.000 31/ 1
AUG	50.873 139.334 21/10	50.873 139.334 21/10	0.000 0.000 31/ 1
SEP	35.638 133.995 6/16	35.638 133.995 6/16	0.000 0.000 30/ 1
OCT	25.606 77.123 1/17	25.606 77.123 1/17	25.877 235.311 20/ 6
NOV	26.719 57.069 30/17	26.719 57.069 30/17	71.684 293.160 2/ 6
DEC	29.082 57.410 13/ 8	29.082 57.410 13/ 8	132.082 359.049 12/ 6
	ONE YEAR USE/PEAK	400.826 143.543	616.267 386.836

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/12/1995 11:42: 8 PDL RUN 1  
 DENVER, CO 80227 RUN #4 NIGHT INFILTRATION FOR BLDG. 7086UNIT CHAPEL W/ SINGLE ZONE  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE	ELECTRICITY	NATURAL-GAS
IN SITE MBTU -		
CATEGORY OF USE		
SPACE HEAT	24.63	616.27
SPACE COOL	91.74	0.00
HVAC AUX	137.29	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	147.18	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	0.00	0.00
TOTAL	400.83	616.27

TOTAL SITE ENERGY 1017.09 MBTU 221.6 KBTU/SQFT-YR GROSS-AREA 221.6 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 1819.95 MBTU 396.5 KBTU/SQFT-YR GROSS-AREA 396.5 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 0.0  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.



MULTIPLIER = 8.0 SETBACK = 0.5  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

DOOR HEIGHT = 2.5 WIDTH = 3.0 CONS = DOOR-WOD  
 MULTIPLIER = 2.0 SETBACK = 0.2  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

EAST-WALL =E-W HEIGHT = 27.0 WIDTH = 46.0 CONS = EXWALL-1  
 AZIMUTH = 76 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

SOUTH-WALL =E-W HEIGHT = 22.5 WIDTH = 70.0 CONS = EXWALL-1  
 AZIMUTH = 166 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 2.0 WIDTH = 5.0 G-T = 1\_PN\_STD  
 MULTIPLIER = 2.0 SETBACK = 0.5  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 14.0 WIDTH = 4.0 G-T = 1\_PN\_STD  
 MULTIPLIER = 4.0 SETBACK = 0.5  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

DOOR HEIGHT = 2.5 WIDTH = 3.0 CONS = DOOR-WOD  
 MULTIPLIER = 2.0 SETBACK = 0.2  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

U-W HEIGHT = 10.0 WIDTH = 459.0 CONS = FLOOR ..

ROOF HEIGHT = 25.0 WIDTH = 97.0 CONS = ROOF-1  
 AZIMUTH = 346 TILT = 21 SKY-FORM-FACTOR = 1.0 ..

ROOF HEIGHT = 35.0 WIDTH = 97.0 CONS = ROOF-1  
 AZIMUTH = 166 TILT = 21 SKY-FORM-FACTOR = 1.0 ..

END ..

COMPUTE LOADS ..

INPUT SYSTEMS ..

-----\$  
 \$ E Z - D O E S Y S T E M S I N P U T \$  
 -----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
 LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
 LINE-3 \* DENVER, CO 80227 \*

LINE-4 \*RUN #5 DAY INFILTRATION FOR BLDG. 7086 \*  
 LINE-5 \*UNIT CHAPEL W/ SINGLE ZONE \* ..

ABORT ERRORS ..  
 DIAGNOSTIC WARNINGS ..

SYSTEMS-REPORT VERIFICATION=(SV-A)
SUMMARY=(SS-A,SS-C,SS-K,SS-O)
HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

SD\_ON =DAY-SCHEDULE (1,24) (1.) ..
SD\_OFF =DAY-SCHEDULE (1,24) (0.) ..
SD\_W\_HT\_F =DAY-SCHEDULE (1,24) (74.) ..
SD\_S\_CL\_F =DAY-SCHEDULE (1,24) (72.) ..
SD\_W\_CL\_F =DAY-SCHEDULE (1,24) (75.) ..
SD\_S\_HT\_F =DAY-SCHEDULE (1,24) (71.) ..
SD\_OA% =DAY-SCHEDULE (1,5) (0.23)
(6,18) (0.)
(19,24) (0.23) ..

SW\_ON =WEEK-SCHEDULE (ALL) SD\_ON ..
SW\_OFF =WEEK-SCHEDULE (ALL) SD\_OFF ..
SW\_W\_HT\_F =WEEK-SCHEDULE (ALL) SD\_W\_HT\_F ..
SW\_S\_CL\_F =WEEK-SCHEDULE (ALL) SD\_S\_CL\_F ..
SW\_W\_CL\_F =WEEK-SCHEDULE (ALL) SD\_W\_CL\_F ..
SW\_S\_HT\_F =WEEK-SCHEDULE (ALL) SD\_S\_HT\_F ..
SW\_OA% =WEEK-SCHEDULE (ALL) SD\_OA% ..

\$ FULL ON SYSTEM

S\_ON =SCHEDULE THRU DEC 31 SW\_ON ..

\$ FULL OFF SYSTEM

S\_OFF =SCHEDULE THRU DEC 31 SW\_OFF ..

\$ HEATING SEASON

S\_HE-SCHED =SCHEDULE THRU MAY 15 SW\_ON
THRU OCT 1 SW\_OFF
THRU DEC 31 SW\_ON ..

\$ COOLING SEASON

S\_CL\_SCHED =SCHEDULE THRU MAY 15 SW\_OFF
THRU OCT 1 SW\_ON
THRU DEC 31 SW\_OFF ..

\$ HEATING SET TEMP

S\_HT\_SET\_F =SCHEDULE THRU MAY 15 SW\_W\_HT\_F
THRU OCT 1 SW\_S\_HT\_F
THRU DEC 31 SW\_W\_HT\_F ..

\$ COOLING SET TEMP

S\_CL\_SET\_F =SCHEDULE THRU MAY 15 SW\_W\_CL\_F
THRU OCT 1 SW\_S\_CL\_F
THRU DEC 31 SW\_W\_CL\_F ..

S\_HRLY-RPT =SCHEDULE THRU JAN 14 SW\_OFF  
 THRU JAN 15 SW\_ON  
 THRU AUG 20 SW\_OFF  
 THRU AUG 21 SW\_ON  
 THRU DEC 31 SW\_OFF ..

S\_OA% =SCHEDULE THRU DEC 31 SW\_OA% ..

\$ ZONE DESCRIPTION

SPACE\_1 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 1.0  
 ASSIGNED-CFM = 7700. SIZING-OPTION = FROM-LOADS ..

\$ SYSTEM DESCRIPTION

AC-1 =SYSTEM SYSTEM-TYPE = PSZ  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_HE-SCHED  
 COOLING-SCHEDULE = S\_CL-SCHED OA-CONTROL = FIXED  
 SUPPLY-CFM = 7700. RATED-CFM = 7700.  
 MIN-AIR-SCH = S\_OA% MAX-OA-FRACTION = 0.23 ←  
 SUPPLY-DELTA-T = 1.8 SUPPLY-KW = 0.00059  
 NIGHT-CYCLE-CTRL = STAY-OFF NIGHT-VENT-DT = 0.0  
 COOLING-CAPACITY = 250250. COOL-SH-CAP = 200200.  
 COOL-FT-MIN = 0. HEATING-CAPACITY = -423500.  
 CRANKCASE-MAX-T = 0. OUTSIDE-FAN-T = 45.  
 HEAT-SOURCE = HOT-WATER SIZING-OPTION = COINCIDENT  
 ZONE-NAMES = (SPACE\_1) ..

\$ HOURLY REPORT DESCRIPTION

ZONE-BLOCK =REPORT-BLOCK VARIABLE-TYPE = SPACE\_1  
 VARIABLE-LIST = (17,18,7,31) ..  
 AHU-BLOCK =REPORT-BLOCK VARIABLE-TYPE = AC-1  
 VARIABLE-LIST = (3,5,6,17,39) ..  
 ZONE-RPT = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (ZONE-BLOCK)  
 ..  
 AHU-RPT = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (AHU-BLOCK)  
 ..  
 END ..  
 COMPUTE SYSTEMS ..  
 INPUT PLANT ..

\$-----\$

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/12/1995 11:48:32 SDL RUN 1 DENVER, CO 80227 RUN #5 DAY INFILTRATION FOR BLDG. 7086 UNIT CHAPEL W/ SINGLE ZONE REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR AC-1 TOPEKA, KS														
COOLING					HEATING					ELECTRIC				
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELECTRIC ENERGY (KWH)	MAXIMUM ELECTRIC LOAD (KW)		
JAN	0.00000				0.000	-96.077	15	3	-8.F	-9.F	7046.	14.737		
FEB	0.00000				0.000	-72.493	3	4	0.F	-1.F	6360.	14.737		
MAR	0.00000				0.000	-59.877	3	4	16.F	13.F	7041.	14.637		
APR	0.00000				0.000	-20.235	5	5	31.F	29.F	6814.	14.637		
MAY	18.61114	22	10	75.F	63.F	-4.182	5	5	44.F	40.F	8832.	30.983		
JUN	51.07773	19	10	82.F	74.F	0.000				0.000	11811.	35.460		
JUL	70.71615	24	10	80.F	75.F	0.000				0.000	13956.	35.938		
AUG	68.61514	21	10	86.F	76.F	0.000				0.000	14010.	36.968		
SEP	32.96278	5	10	75.F	72.F	0.000				0.000	10053.	32.629		
OCT	0.13247	1	19	81.F	66.F	-16.526	20	5	25.F	25.F	7056.	18.804		
NOV	0.00000				0.000	-46.232	2	5	16.F	15.F	6814.	14.637		
DEC	0.00000				0.000	-86.653	15	5	8.F	7.F	7041.	14.737		
TOTAL	242.115				224.986	-402.276				-320.839	106843.	36.968		
MAX														

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/12/1995 11:48:32 SDL RUN 1 DENVER, CO 80227 RUN #5 DAY INFILTRATION FOR BLDG. 7086 UNIT CHAPEL W/ SINGLE ZONE REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR AC-1 TOPEKA, KS														
COOLING					HEATING					ELECTRIC				
MONTH	HOURS COOLING LOAD	HOURS HEATING LOAD	HOURS COINCIDENT COOL-HEAT LOAD	NUMBER OF HOURS	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.	HOURS FANS ON CYCLE	HOURS NIGHT VENTING	HOURS FLOATING WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)			
JAN	0	743	0	1	744	0	0	0	1	-159.229	4.543			
FEB	0	671	0	1	672	0	0	0	1	-157.144	4.543			
MAR	0	705	0	39	744	0	0	0	39	-158.433	4.543			
APR	0	498	0	222	720	0	0	0	222	-43.554	4.543			
MAY	306	208	0	230	744	312	0	0	230	0.000	30.983			
JUN	658	0	0	62	720	664	0	0	62	0.000	35.460			
JUL	741	0	0	7	744	741	0	0	7	0.000	35.938			
AUG	737	0	0	7	744	737	0	0	7	0.000	36.968			
SEP	491	0	0	229	720	494	0	0	229	0.000	32.629			
OCT	4	472	0	268	744	5	0	0	268	0.000	8.503			
NOV	0	624	0	96	720	0	0	0	96	-179.903	4.543			
DEC	0	742	0	2	744	0	0	0	2	-177.453	4.543			
ANNUAL	2937	4663	0	1160	5424	2953	0	0	1160					

EMC ENGINEERS INC. EZZOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/12/1995 11:48:32 PDL RUN 1  
 DENVER, CO 80227 RUN #5 DAY INFILTRATION FOR BLDG. 7086 UNIT CHAPEL W/ SINGLE ZONE  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY TOTAL (MBTU) PEAK (KBTU) DY/HR	NATURAL-GAS TOTAL (MBTU) PEAK (KBTU) DY/HR
JAN	57.738 28/9	28.932 57.738	138.833 404.724
FEB	57.738 3/4	25.927 57.738	108.134 364.498
MAR	57.397 31/9	27.950 57.397	91.976 330.934
APR	56.332 5/7	25.029 56.332	33.950 228.255
MAY	105.788 22/10	30.630 105.788	7.783 165.894
JUN	40.329 121.074	40.329 121.074	0.000 0.000
JUL	47.652 19/10	47.652 122.707	30/1 0.000
AUG	47.837 24/10	47.837 126.223	0.000 0.000
SEP	34.326 111.410	34.326 111.410	31/1 0.000
OCT	25.659 64.204	25.659 64.204	30/1 28.508
NOV	26.436 57.397	26.436 57.397	20/5 231.000
DEC	28.782 57.738	26.436 57.397	72.019 291.704
	13/8	13/8	2/5 127.431
			372.242 15/5
	ONE YEAR USE/PEAK	389.490 126.223	608.634 404.724

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/12/1995 11:48:32 PDL RUN 1  
 DENVER, CO 80227 RUN #5 DAY INFILTRATION FOR BLDG. 7086 UNIT CHAPEL W/ SINGLE ZONE  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE	ELECTRICITY	NATURAL-GAS
IN SITE MBTU -		
CATEGORY OF USE		
SPACE HEAT	23.32	608.63
SPACE COOL	81.71	0.00
HVAC AUX	137.26	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	147.17	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	0.00	0.00
TOTAL	389.47	608.63

TOTAL SITE ENERGY 998.12 MBTU 217.5 KBTU/SQFT-YR GROSS-AREA 217.5 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 1778.27 MBTU 387.4 KBTU/SQFT-YR GROSS-AREA 387.4 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 0.1  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

**COMPUTER ENERGY SIMULATIONS**

**BLDG. 6**

**CHURCH BLOCK-TYPE BUILDINGS**



DENVER - ATLANTA

PROJECT: FEASIBILITY STUDY FOR  
 INSTALLATION OF UMCS  
 LOCATION: FORT RILEY, KANSAS

EMC NO: 1406-001  
 CALC. BY: AJN  
 CHECKED BY: CEL  
 DATE: 05-Jul-95

BUILDING NO.: 6  
 BLDG. TYPE: POST CHAPEL

**ENERGY CONSTANT CALCULATIONS**

	BASERUN	RUN1	RUN2	RUN3	RUN4	RUN5
HEATING (MBtu)	688.3	573.7	588.7	573.4	570.0	492.5
COOLING (kWH)	103,844	97,556	97,477	94,281	101,717	97,401

SUPPLY AIR FAN	8,320 CFM
FLOOR AREA	5,780 FT <sup>2</sup>
CFMI	1331 CFM
UA	2151 BTU/HR-°F
BLDG CONSTR.	2 (1 FOR LIGHT ) (2 FOR HEAVY)

EZDOE COMPUTER RUN DEFINITION:	
BASERUN	EXISTING OPERATION
RUN1	NIGHT SETBACK
RUN2	DDC CONTROL
RUN3	ECONOMIZER
RUN4	NIGHTTIME INFILTRATION (OA)
RUN5	DAYTIME INFILTRATION (OA)

HOURS OF OCCUPANCY			ANNUAL HEATING & COOLING HOURS	
M-F	800	1700	45 HR	HR. ON HEATING 2075 HR/YR
SAT.	1000	1700	7 HR	HR. ON COOLING 1262 HR/YR
SUN.	600	1800	12 HR	HR. OFF HEATING 3373 HR/YR
	TOTAL OCCUPY HR.		64 HR/WK	HR. OFF COOLING 2050 HR/YR
	TOTAL UNOCC. HR.		104 HR/WK	
	ANNUAL OCCUPY HR.		3337 HR/YR	
	ANNUAL UNOCC. HR.		5423 HR/YR	

PRESENT HR. OF OPERATION FOR SYS. WITH HEATING AND COOLING 8760 HR/YR  
 PRESENT HR. OF OPERATION FOR SYS. WITH HEATING ONLY 5448 HR/YR  
 PRESENT HR. OF OPERATION FOR SYS. WITH COOLING ONLY 3312 HR/YR  
 HRS SAVED (HTG ONLY) 5448 - 2075 = 3373 HR/YR  
 HRS SAVED (CLG ONLY) 3312 - 1262 = 2050 HR/YR

HOAUHC	688.27 MBtu	-	569.95 MBtu	=	1.64E+01 Btu/CFM-HR	
	1331 CFM	x	5423 HR/YR			
HOAUH	688.27 MBtu	-	569.95 MBtu	=	2.64E+01 Btu/CFM-HR	
	1331 CFM	x	3373 HR/YR			
COAUHC	103,844.1 kWH	-	101,717.0 kWH	=	2.95E-04 kWH/CFM-HR	
	1331 CFM	x	5423 HR/YR			
COAUC	103,844.1 kWH	-	101,717.0 kWH	=	7.79E-04 kWH/CFM-HR	
	1331 CFM	x	2050 HR/YR			
HOAOHC	688.27 MBtu	-	492.49 MBtu	=	4.41E+01 Btu/CFM-HR	
	1331 CFM	x	3337 HR/YR			
HOAOH	688.27 MBtu	-	492.49 MBtu	=	7.09E+01 Btu/CFM-HR	
	1331 CFM	x	2075 HR/YR			
COAOHC	103,844.1 kWH	-	97,401.1 kWH	=	1.45E-03 kWH/CFM-HR	
	1331 CFM	x	3337 HR/YR			
COAOC	103,844.1 kWH	-	97,401.1 kWH	=	3.84E-03 kWH/CFM-HR	
	1331 CFM	x	1262 HR/YR			
DC DUTY	1 / 6 (10 MINUTES PER HOUR)			=	0.17	
DC DEMAND	1 / 6 (10 MINUTES PER HOUR)			=	0.17	
ECC	97,556.4 kWH	-	94,280.7 kWH	=	3.12E-04 kWH/CFM-HR	
	8320 CFM	x	1262 HR/YR			
ECHC	97,556.4 kWH	-	94,280.7 kWH	=	1.18E-04 kWH/CFM-HR	
	8320 CFM	x	3337 HR/YR			
NSUCHC	103,844.1 kWH	-	97,556.4 kWH	=	1.39E-04 kWH/CFM-HR	
	8320 CFM	x	5423 HR/YR			
NSUCC	103,844.1 kWH	-	97,556.4 kWH	=	3.69E-04 kWH/CFM-HR	
	8320 CFM	x	2050 HR/YR			
DDCCHC	103,844.1 kWH	-	97,477.3 kWH	=	2.29E-04 kWH/CFM-HR	
	8320 CFM	x	3337 HR/YR			
DDCCC	103,844.1 kWH	-	97,477.3 kWH	=	6.07E-04 kWH/CFM-HR	
	8320 CFM	x	1262 HR/YR			
NSC	688.27 MBtu	-	573.72 MBtu	=	5.32E+04 Btu/UA	
	2151.24 UA					
DDCH	688.27 MBtu	-	588.71 MBtu	=	4.63E+04 Btu/UA	
	2151.24 UA					
OPT	(2 HR/DAY X 240 DAY/YR)		-	175 HR/YR	=	305 HR/YR
CHWR	(1.10 kW X 0.012 Eff. X 664 HRS X 2 Degrees of Reset)			=	17.5 kWH/TON	
OAR	567 HR/YR	x	0.01	=	5.67 HR/YR	





INPUT LOADS ..

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$-----$
$ E Z - D O E   L O A D S   I N P U T $
$-----$

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## \$ GENERAL PROJECT DATA

```

TITLE  LINE-1 *      EMC      ENGINEERS      INC.      *
      LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
      LINE-3 *      DENVER,      CO      80227      *

      LINE-4 *BASELINE SIMULATION FOR BLDG. #6      *
      LINE-5 *POST CHAPEL      * ..

```

```

ABORT          ERRORS ..
DIAGNOSTIC     WARNINGS ..
LOADS-REPORT   VERIFICATION=(LV-D)
                SUMMARY=(LS-C,LS-D)
                HOURLY-DATA-SAVE = YES ..
BUILDING-LOCATION  LATITUDE = 39.0
                LONGITUDE = 96.5
                ALTITUDE = 1065.
                TIME-ZONE = 6
                GROSS-AREA = 5780
                SHIELDING-COEF = 0.29
                X-REF = 0.0
                Y-REF = 0.0 ..
RUN-PERIOD     JAN 1 1994 THRU DEC 31 1994 ..

```

## \$ SCHEDULES

```

LD_ON          =DAY-SCHEDULE (1,24) (1.) ..
LD_OFF         =DAY-SCHEDULE (1,24) (0.) ..
LD_SATWEDD    =DAY-SCHEDULE (1,9) (0.)
                (10,12) (0.01)
                (13,17) (0.02,0.18,0.09,0.02,0.01)
                (18,24) (0.) ..
LD_WENS       =DAY-SCHEDULE (1,6) (0.)
                (7,17) (0.01)
                (18) (0.05)
                (19,20) (0.1)
                (21) (0.05)
                (22,24) (0.) ..
LD_SUNDAY     =DAY-SCHEDULE (1,5) (0.)
                (6) (0.01)
                (7,8) (0.2)
                (9,13) (0.3,0.5,1.,0.1,0.01)
                (14) (0.1)

```

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!
      (15,17) (0.)
      (18) (0.12)
      (19,20) (0.24)
      (21) (0.12)
      (22,24) (0.) ..

LD_WEEKDAY =DAY-SCHEDULE (1,6) (0.)
      (7,16) (0.01)
      (17,24) (0.) ..

LD_S-SCHOL =DAY-SCHEDULE (1,24) (0.) ..

LD_BASEMNT =DAY-SCHEDULE (1,7) (0.)
      (8,16) (0.1)
      (17,24) (0.) ..

LD_LITES =DAY-SCHEDULE (1,5) (0.)
      (6) (0.2)
      (7,20) (1.)
      (21) (0.5)
      (22,24) (0.) ..

LW_CHAPEL =WEEK-SCHEDULE (MON) LD_WEEKDAY
      (TUE) LD_WEEKDAY
      (WED) LD_WENS
      (THU) LD_WEEKDAY
      (FRI) LD_WEEKDAY
      (SAT) LD_SATWEDD
      (SUN) LD_SUNDAY
      (HOL) LD_SUNDAY ..

LW_BASEMNT =WEEK-SCHEDULE (WD) LD_BASEMNT
      (SAT) LD_SATWEDD
      (SUN) LD_S-SCHOL
      (HOL) LD_S-SCHOL ..

LW_LITES =WEEK-SCHEDULE (ALL) LD_LITES ..

LW_ON =WEEK-SCHEDULE (ALL) LD_ON ..

LW_OFF =WEEK-SCHEDULE (ALL) LD_OFF ..

$ ON 100% OF THE TIME
L_ON =SCHEDULE THRU DEC 31 LW_ON ..

$ OFF 100% OF THE TIME
L_OFF =SCHEDULE THRU DEC 31 LW_OFF ..

$ CHAPEL SCHEDULE
L_CHAPEL =SCHEDULE THRU DEC 31 LW_CHAPEL ..

$ BASEMENT SCHEDULE
L_S-SCHOOL =SCHEDULE THRU DEC 31 LW_BASEMNT ..

```

## \$ LIGHTS SCHED

L\_LITES =SCHEDULE THRU DEC 31 LW\_LITES ..

## \$ CONSTRUCTION TYPES

## \$ 2'THICK STONE WALL

WALL-1 =LAYERS MATERIAL=(CC07,CC07,AL11,WD11) I-F-R= 0.6100  
THICKNESS=(1.000,1.000,0.000,0.063) ..EXWALL-1 =CONSTRUCTION LAYERS = WALL-1  
ABSORPTANCE = 0.880  
ROUGHNESS = 2 ..FLOOR =CONSTRUCTION U-VALUE = 0.020  
ABSORPTANCE = 0.610  
ROUGHNESS = 5 ..

## \$ SHINGLED ROOF

SHIN-ROF =LAYERS MATERIAL=(AR02,BP01,HF-B10,IN73,AL12,WD01)  
THICKNESS=(0.000,0.000,0.167,0.125,0.000,0.063) ..ROOF-1 =CONSTRUCTION LAYERS = SHIN-ROF  
ABSORPTANCE = 0.800  
ROUGHNESS = 1 ..

## \$ STANDARD WOOD DOOR

DOOR-STD =LAYERS MATERIAL=(WD12,WD12) I-F-R= 0.6100  
THICKNESS=(0.083,0.083) ..DOOR-WOD =CONSTRUCTION LAYERS = DOOR-STD  
ABSORPTANCE = 0.860  
ROUGHNESS = 5 ..1\_PN\_STD =GLASS-TYPE GLASS-TYPE-CODE = 2  
PANES = 1 ..

## \$ SPACE DESCRIPTION

UP-STAIRS =SPACE AREA = 2890.0 VOLUME = 83810.0  
TEMPERATURE = (73.) ZONE-TYPE = CONDITIONED  
PEOPLE-SCHEDULE = L\_CHAPEL NUMBER-OF-PEOPLE = 250.0  
PEOPLE-HG-LAT = 625.0 PEOPLE-HG-SENS = 375.0  
LIGHTING-TYPE = INCAND LIGHTING-W/SQFT = 1.0  
LIGHT-TO-SPACE = 1.0 LIGHTING-SCHEDULE = L\_LITES  
SOURCE-SENSIBLE = 0.0 FURN-WEIGHT = 1.8  
INF-METHOD = AIR-CHANGE AIR-CHANGES/HR = 0.12  
INF-SCHEDULE = L\_ON ..E-W HEIGHT = 29.0 WIDTH = 37.0 CONS = EXWALL-1  
AZIMUTH = 45 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 4.0 WIDTH = 2.5 G-T = 1\_PN\_STD  
 MULTIPLIER = 5.0 SETBACK = 0.5  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

DOOR HEIGHT = 7.5 WIDTH = 3.0 CONS = DOOR-WOD  
 MULTIPLIER = 2.0 SETBACK = 0.2  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

DOOR HEIGHT = 7.5 WIDTH = 3.0 CONS = DOOR-WOD  
 MULTIPLIER = 2.0 SETBACK = 0.2  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 18.0 WIDTH = 95.0 CONS = EXWALL-1  
 AZIMUTH = 135 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 4.0 WIDTH = 2.5 G-T = 1\_PN\_STD  
 MULTIPLIER = 7.0 SETBACK = 0.5  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

DOOR HEIGHT = 7.5 WIDTH = 3.0 CONS = DOOR-WOD  
 MULTIPLIER = 2.0 SETBACK = 0.2  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

DOOR HEIGHT = 7.5 WIDTH = 3.0 CONS = DOOR-WOD  
 MULTIPLIER = 2.0 SETBACK = 0.2  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 29.0 WIDTH = 47.0 CONS = EXWALL-1  
 AZIMUTH = 225 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 4.0 WIDTH = 2.5 G-T = 1\_PN\_STD  
 MULTIPLIER = 4.0 SETBACK = 0.5  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 18.0 WIDTH = 30.0 CONS = EXWALL-1  
 AZIMUTH = 315 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 4.0 WIDTH = 2.5 G-T = 1\_PN\_STD  
 MULTIPLIER = 5.0 SETBACK = 0.5  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 4.0 WIDTH = 2.5 G-T = 1\_PN\_STD  
 MULTIPLIER = 5.0 SETBACK = 0.5  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

ROOF HEIGHT = 30.0 WIDTH = 95.0 CONS = ROOF-1  
 AZIMUTH = 135 TILT = 45 SKY-FORM-FACTOR = 1.0 ..

ROOF HEIGHT = 30.0 WIDTH = 95.0 CONS = ROOF-1  
 AZIMUTH = 315 TILT = 45 SKY-FORM-FACTOR = 1.0 ..

BASEMENT =SPACE AREA = 2890.0 VOLUME = 28900.0

TEMPERATURE = (73.) ZONE-TYPE = CONDITIONED  
PEOPLE-SCHEDULE = L\_S-SCHOOL NUMBER-OF-PEOPLE = 55.0  
PEOPLE-HG-LAT = 625.0 PEOPLE-HG-SENS = 375.0  
LIGHTING-TYPE = INCAND LIGHTING-W/SQFT = 1.0  
LIGHT-TO-SPACE = 1.0 LIGHTING-SCHEDULE = L\_LITES  
SOURCE-SENSIBLE = 0.0 FLOOR-WEIGHT = 130.  
FURN-WEIGHT = 0.5 INF-METHOD = AIR-CHANGE  
AIR-CHANGES/HR = 0.22 INF-SCHEDULE = L\_ON ..

E-W HEIGHT = 4.0 WIDTH = 37.0 CONS = EXWALL-1  
AZIMUTH = 45 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 3.0 WIDTH = 3.0 G-T = 1\_PN\_STD  
MULTIPLIER = 3.0 SETBACK = 0.5  
SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 4.0 WIDTH = 95.0 CONS = EXWALL-1  
AZIMUTH = 135 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 3.0 WIDTH = 3.0 G-T = 1\_PN\_STD  
MULTIPLIER = 7.0 SETBACK = 0.5  
SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 4.0 WIDTH = 47.0 CONS = EXWALL-1  
AZIMUTH = 225 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 3.0 WIDTH = 3.0 G-T = 1\_PN\_STD  
SETBACK = 0.5 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 3.0 WIDTH = 3.0 G-T = 1\_PN\_STD  
SETBACK = 0.5 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 4.0 WIDTH = 30.0 CONS = EXWALL-1  
AZIMUTH = 315 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 3.0 WIDTH = 3.0 G-T = 1\_PN\_STD  
MULTIPLIER = 6.0 SETBACK = 0.5  
SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 3.0 WIDTH = 3.0 G-T = 1\_PN\_STD  
MULTIPLIER = 6.0 SETBACK = 0.5  
SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

U-W HEIGHT = 10.0 WIDTH = 289.0 CONS = FLOOR ..

U-W HEIGHT = 6.0 WIDTH = 209.0 CONS = FLOOR ..

END ..  
COMPUTE LOADS ..

INPUT SYSTEMS ..

```

$-----$
$ E Z - D O E   S Y S T E M S   I N P U T $
$-----$

```

## \$ GENERAL PROJECT DATA

```

TITLE  LINE-1 *      EMC      ENGINEERS      INC.      *
        LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
        LINE-3 *      DENVER,      CO      80227      *

```

```

        LINE-4 *BASELINE SIMULATION FOR BLDG. #6      *

```

```

        LINE-5 *POST CHAPEL      * ..

```

```

ABORT      ERRORS ..
DIAGNOSTIC WARNINGS ..
SYSTEMS-REPORT VERIFICATION=(SV-A)
              SUMMARY=(SS-A,SS-C,SS-K,SS-O)
              HOURLY-DATA-SAVE = YES ..

```

## \$ SCHEDULES

```

SD_ON      =DAY-SCHEDULE (1,24) (1.) ..
SD_OFF     =DAY-SCHEDULE (1,24) (0.) ..
SD_WT_HT   =DAY-SCHEDULE (1,24) (74.) ..
SD_SM_CL   =DAY-SCHEDULE (1,24) (72.) ..
SD_WT_CL   =DAY-SCHEDULE (1,24) (76.) ..
SD_SM_HT   =DAY-SCHEDULE (1,24) (70.) ..
SD_OA%     =DAY-SCHEDULE (1,24) (0.16) ..

```

```

SW_ON      =WEEK-SCHEDULE (ALL) SD_ON ..

```

```

SW_OFF     =WEEK-SCHEDULE (ALL) SD_OFF ..

```

```

SW_WT_HT   =WEEK-SCHEDULE (ALL) SD_WT_HT ..

```

```

SW_SM_CL   =WEEK-SCHEDULE (ALL) SD_SM_CL ..

```

```

SW_WT_CL   =WEEK-SCHEDULE (ALL) SD_WT_CL ..

```

```

SW_SM_HT   =WEEK-SCHEDULE (ALL) SD_SM_HT ..

```

```

SW_OA%     =WEEK-SCHEDULE (ALL) SD_OA% ..

```

## \$ FULL ON SYSTEM

```

S_ON      =SCHEDULE THRU DEC 31 SW_ON ..

```

## \$ FULL OFF SYSTEM

```

S_OFF     =SCHEDULE THRU DEC 31 SW_OFF ..

```

## \$ HEATING SEASON

```

S_HE-SCHED =SCHEDULE THRU MAY 15 SW_ON
            THRU OCT 1 SW_OFF

```

THRU DEC 31 SW\_ON ..

\$ COOLING SEASON

S\_CL\_SCH = SCHEDULE THRU MAY 15 SW\_OFF  
 THRU OCT 1 SW\_ON  
 THRU DEC 31 SW\_OFF ..

\$ HEATING SET TEMP

S\_HT\_SET\_F = SCHEDULE THRU MAY 15 SW\_WT\_HT  
 THRU OCT 1 SW\_SM\_HT  
 THRU DEC 31 SW\_WT\_HT ..

\$ COOLING SET TEMP

S\_CL\_SET\_F = SCHEDULE THRU MAY 15 SW\_WT\_CL  
 THRU OCT 1 SW\_SM\_CL  
 THRU DEC 31 SW\_WT\_CL ..

S\_OA% = SCHEDULE THRU DEC 31 SW\_OA% ..

S\_HRLY-RPT = SCHEDULE THRU JAN 14 SW\_OFF  
 THRU JAN 15 SW\_ON  
 THRU AUG 20 SW\_OFF  
 THRU AUG 21 SW\_ON  
 THRU DEC 31 SW\_OFF ..

\$ ZONE DESCRIPTION

UP-STAIRS =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL ASSIGNED-CFM = 8000.  
 SIZING-OPTION = FROM-LOADS ..

BASEMENT =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL  
 BASEBOARD-CTRL = THERMOSTATIC  
 SIZING-OPTION = FROM-LOADS ..

\$ SYSTEM DESCRIPTION

PACK-COOLU =SYSTEM SYSTEM-TYPE = PSZ  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_HE\_SCH  
 COOLING-SCHEDULE = S\_CL\_SCH OA-CONTROL = FIXED  
 SUPPLY-CFM = 8000. RATED-CFM = 8000.  
 MIN-AIR-SCH = S\_OA% SUPPLY-DELTA-T = 1.8  
 SUPPLY-KW = 0.00059 NIGHT-CYCLE-CTRL = STAY-OFF  
 NIGHT-VENT-DT = 0.0 COOLING-CAPACITY = 240000.  
 COOL-SH-CAP = 180000. COOL-FT-MIN = 0.  
 HEATING-CAPACITY = -800000. CRANKCASE-MAX-T = 0.  
 OUTSIDE-FAN-T = 45. HEAT-SOURCE = HOT-WATER



BASEBOARD-SOURCE = HOT-WATER  
SIZING-OPTION = COINCIDENT  
ZONE-NAMES = (UP-STAIRS) ..

BB-RADIATN =SYSTEM SYSTEM-TYPE = FPH  
HEATING-SCHEDULE = S\_HE-SCHED  
ZONE-NAMES = (BASEMENT) ..

\$ HOURLY REPORT DESCRIPTION

ZONE-UP-BK =REPORT-BLOCK VARIABLE-TYPE = UP-STAIRS  
VARIABLE-LIST = (17,18,7,6) ..  
ZONE-BS-BK =REPORT-BLOCK VARIABLE-TYPE = BASEMENT  
VARIABLE-LIST = (17,18,7,6) ..  
AHU-BLK =REPORT-BLOCK VARIABLE-TYPE = PACK-COOLU  
VARIABLE-LIST = (3,5,6,17) ..  
BB-BASE-BK =REPORT-BLOCK VARIABLE-TYPE = BB-RADIATN  
VARIABLE-LIST = (7) ..  
ZONES-HRLY = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
REPORT-BLOCK = (ZONE-UP-BK,ZONE-BS-BK)  
..  
SYS-HRLY = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
REPORT-BLOCK = (AHU-BLK,BB-BASE-BK)  
..  
END ..  
COMPUTE SYSTEMS ..

INPUT PLANT ..

\$-----\$  
\$ E Z - D O E P L A N T S I N P U T \$  
\$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
LINE-3 \* DENVER, CO 80227 \*  
  
LINE-4 \*BASELINE SIMULATION FOR BLDG. #6 \*  
LINE-5 \*POST CHAPEL \* ..

ABORT ERRORS ..  
DIAGNOSTIC WARNINGS ..  
PLANT-REPORT VERIFICATION=(PV-A)  
SUMMARY=(PS-B,BEPS)  
HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

PD\_ON =DAY-SCHEDULE (1,24) (1.) ..  
PD\_OFF =DAY-SCHEDULE (1,24) (0.) ..

PW\_OFF =WEEK-SCHEDULE (ALL) PD\_OFF ..

PW\_ON =WEEK-SCHEDULE (ALL) PD\_ON ..

\$ HEATING SEASON

P\_HEAT =SCHEDULE THRU MAY 15 PW\_ON  
THRU OCT 1 PW\_OFF  
THRU DEC 31 PW\_ON ..

\$ COOLING SEASON

P\_COOL =SCHEDULE THRU MAY 15 PW\_OFF  
THRU OCT 1 PW\_ON  
THRU DEC 31 PW\_OFF ..

\$ EQUIPMENT DESCRIPTION

PRIM-BOILR =PLANT-EQUIPMENT TYPE = HW-BOILER  
SIZE = -999. ..

DX-COOLING =PLANT-EQUIPMENT TYPE = HERM-REC-CHLR  
SIZE = -999. INSTALLED-NUMBER = 2  
MAX-NUMBER-AVAIL = 2 ..

PLANT-PARAMETERS BOILER-FUEL = NATURAL-GAS TWR-PUMP-HEAD = 35.  
HERM-REC-COND-TYPE = AIR CCIRC-HEAD = 0.0 ..

ENERGY-RESOURCE RESOURCE = ELECTRICITY ..  
ENERGY-RESOURCE RESOURCE = NATURAL-GAS ..

HEAT-ASSIN =LOAD-ASSIGNMENT TYPE = HEATING  
OPERATION-MODE = RUN-NEEDED  
  
LOAD-RANGE = 0.000  
PLANT-EQUIPMENT = PRIM-BOILR  
NUMBER = 1 ..

COOL-ASSIN =LOAD-ASSIGNMENT TYPE = COOLING  
OPERATION-MODE = RUN-NEEDED  
  
LOAD-RANGE = 0.000  
PLANT-EQUIPMENT = DX-COOLING  
NUMBER = 2 ..

END ..  
COMPUTE PLANT ..  
STOP ..

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/11/1995 16:10:18 LDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #6 POST CHAPEL  
 REPORT- LV-D DETAILS OF EXTERIOR SURFACES IN THE PROJECT TOPEKA, KS

NUMBER OF EXTERIOR SURFACES 10 RECTANGULAR 10 OTHER 0  
 (U-VALUE INCLUDES INSIDE AIR FILM PLUS OUTSIDE AIR FILM AT 7.5 MPH WINDSPEED)

SURFACE	SPACE	U-VALUE (BTU/HR-SQFT-F)	GLASS AREA (SQFT)	U-VALUE (BTU/HR-SQFT-F)	WALLS AREA (SQFT)	U-VALUE (BTU/HR-SQFT-F)	GLASS+OPAQUE AREA (SQFT)	U-VALUE (BTU/HR-SQFT-F)	WALLS+GLASS AREA (SQFT)	U-VALUE (BTU/HR-SQFT-F)	GLASS+OPAQUE AREA (SQFT)	AZIMUTH
UP-STAIRS		1.021	50.00	0.198	1023.00	0.236	1073.00	0.236	1073.00	0.236	1073.00	NORTH-EAST
BASEMENT		1.021	27.00	0.198	121.00	0.348	148.00	0.348	148.00	0.348	148.00	NORTH-EAST
UP-STAIRS		1.021	70.00	0.198	1640.00	0.232	1710.00	0.232	1710.00	0.232	1710.00	SOUTH-EAST
BASEMENT		1.021	63.00	0.198	317.00	0.334	380.00	0.334	380.00	0.334	380.00	SOUTH-EAST
UP-STAIRS		1.021	40.00	0.198	1323.00	0.222	1363.00	0.222	1363.00	0.222	1363.00	SOUTH-EAST
BASEMENT		1.021	18.00	0.198	170.00	0.277	188.00	0.277	188.00	0.277	188.00	SOUTH-WEST
UP-STAIRS		1.021	100.00	0.198	440.00	0.350	540.00	0.350	540.00	0.350	540.00	NORTH-WEST
BASEMENT		1.021	108.00	0.198	12.00	0.939	120.00	0.939	120.00	0.939	120.00	NORTH-WEST
UP-STAIRS		0.000	0.00	0.103	2850.00	0.103	2850.00	0.103	2850.00	0.103	2850.00	ROOF
UP-STAIRS		0.000	0.00	0.103	2850.00	0.103	2850.00	0.103	2850.00	0.103	2850.00	ROOF
BASEMENT		0.000	0.00	0.020	2890.00	0.020	2890.00	0.020	2890.00	0.020	2890.00	UNDERGRND
BASEMENT		0.000	0.00	0.020	1254.00	0.020	1254.00	0.020	1254.00	0.020	1254.00	UNDERGRND

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/11/1995 16:10:18 LDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #6 POST CHAPEL  
 REPORT- LV-D DETAILS OF EXTERIOR SURFACES IN THE PROJECT TOPEKA, KS

NUMBER OF EXTERIOR SURFACES 10 RECTANGULAR 10 OTHER 0  
 (U-VALUE INCLUDES INSIDE AIR FILM PLUS OUTSIDE AIR FILM AT 7.5 MPH WINDSPEED)

SURFACE	SPACE	AVERAGE U-VALUE/WALLS (BTU/HR-SQFT-F)	AVERAGE U-VALUE WALLS+GLASS (BTU/HR-SQFT-F)	GLASS AREA (SQFT)	OPAQUE AREA (SQFT)	GLASS+OPAQUE AREA (SQFT)
NORTH-EAST		0.198	0.250	77.00	1144.00	1221.00
SOUTH-EAST		0.198	0.250	133.00	1957.00	2090.00
SOUTH-WEST		0.198	0.229	1493.00	1493.00	1551.00
NORTH-WEST		0.198	0.457	208.00	452.00	660.00
ROOF		0.000	0.103	0.00	5700.00	5700.00
ALL WALLS		0.198	0.269	476.00	5046.00	5522.00
WALLS+ROOFS		0.198	0.185	476.00	10746.00	11222.00
UNDERGRND		0.000	0.020	0.00	4144.00	4144.00
BUILDING		0.112	0.140	476.00	14890.00	15366.00

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/11/1995 16:10:18 LDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #6 POST CHAPEL  
 REPORT- LS-C BUILDING PEAK LOAD COMPONENTS TOPEKA, KS

\*\*\* BUILDING \*\*\*

FLOOR AREA 5780 SOFT 537 SQMT  
 VOLUME 112710 CUFT 3192 CUMT

HEATING LOAD  
 JAN 16 6AM  
 10F -12C  
 8F -13C

COOLING LOAD  
 AUG 21 11AM  
 88F 31C  
 76F 24C

	SENSIBLE (KBTU/H)	( KW )	LATENT (KBTU/H)	( KW )	SENSIBLE (KBTU/H)	( KW )
WALLS	16.972	4.971	0.000	0.000	-101.307	-29.670
ROOFS	0.000	0.000	0.000	0.000	0.000	0.000
GLASS CONDUCTION	5.259	1.540	0.000	0.000	-36.212	-10.606
GLASS SOLAR	14.045	4.114	0.000	0.000	1.997	0.585
DOOR	2.209	0.647	0.000	0.000	-4.649	-1.362
INTERNAL SURFACES	0.000	0.000	0.000	0.000	0.000	0.000
UNDERGROUND SURFACES	-0.392	-0.115	0.000	0.000	-2.380	-0.697
OCCUPANTS TO SPACE	68.054	19.931	156.250	45.762	0.879	0.258
LIGHT TO SPACE	15.492	4.537	0.000	0.000	5.193	1.521
EQUIPMENT TO SPACE	0.000	0.000	0.000	0.000	0.000	0.000
PROCESS TO SPACE	0.000	0.000	0.000	0.000	0.000	0.000
INFILTRATION	4.875	1.428	11.614	3.401	-28.961	-8.482
TOTAL	126.515	37.053	167.864	49.163	-165.439	-48.453
TOTAL LOAD	294.378 KBTU/H	86.216 KW			-165.439 KBTU/H	-48.453 KW
TOTAL LOAD / AREA	50.93BTU/H.SQFT	160.557 W /SQMT			28.623BTU/H.SQFT	90.232 W /SQMT

\*\*\*\*\*  
 \* \* NOTE 1) THE ABOVE LOADS EXCLUDE OUTSIDE VENTILATION AIR \* \*  
 \* \* \* \* \* LOADS \* \*  
 \* \* \* \* \* 2) TIMES GIVEN IN STANDARD TIME FOR THE LOCATION \* \*  
 \* \* \* \* \* IN CONSIDERATION \* \*  
 \*\*\*\*\*

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/11/1995 16:10:18 SDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #6 POST CHAPEL  
 REPORT-SS-A SYSTEM MONTHLY LOADS SUMMARY FOR PACK-COOLU TOPEKA, KS

MONTH	COOLING			HEATING			H E A T I N G			E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC- TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000			-101.250	15	-8.F	-9.F	-226.381	4833.	0.000	4833.	7.709
FEB	0.00000			-77.103	3	-1.F	-2.F	-206.208	4361.	0.000	4361.	7.709
MAR	0.00000			-63.287	3	15.F	13.F	-168.434	4828.	0.000	4828.	7.609
APR	0.00000			-22.690	1	32.F	29.F	-114.722	4672.	0.000	4672.	7.609
MAY	17.28819	30	11	-5.072	5	44.F	40.F	-67.391	6501.	0.000	6501.	28.622
JUN	50.19612	26	11	0.000				0.000	9575.	0.000	9575.	32.869
JUL	70.73447	24	11	0.000				0.000	11714.	0.000	11714.	33.058
AUG	67.62566	21	11	0.000				0.000	11666.	0.000	11666.	34.029
SEP	29.33169	5	11	0.000				0.000	7566.	0.000	7566.	31.256
OCT	0.06924	1	18	-20.052	20	23.F	22.F	-115.936	4836.	0.000	4836.	10.437
NOV	0.00000			-51.497	3	13.F	12.F	-152.258	4672.	0.000	4672.	7.609
DEC	0.00000			-91.736	15	3.F	2.F	-209.624	4828.	0.000	4828.	7.709
TOTAL	235.245			-432.686				-226.381	80053.		80053.	34.029
MAX												

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/11/1995 16:10:18 SDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #6 POST CHAPEL  
 REPORT-SS-C SYSTEM MONTHLY LOAD HOURS FOR PACK-COOLU TOPEKA, KS

MONTH	COOLING			HEATING			HOURS			COINCIDENT			ELECTRIC		
	COOLING LOAD	HOURS HEATING LOAD	HOURS COOL-HEAT LOAD	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.	HOURS FANS ON CYCLE	HOURS FANS ON VENTING	HOURS NIGHT WHEN FANS ON	FLOATING WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	HEATING LOAD AT COOLING PEAK (KBTU/HR)	LOAD AT COOLING PEAK (KW)	LOAD AT COOLING PEAK (KW)		
JAN	0	744	0	744	0	0	744	0	0	-122.937	-122.937	4.720	4.720		
FEB	0	672	0	672	0	0	672	0	0	-113.051	-113.051	4.720	4.720		
MAR	0	743	0	744	0	0	744	0	1	-113.902	-113.902	4.720	4.720		
APR	0	620	0	720	0	0	720	0	100	-33.413	-33.413	4.720	4.720		
MAY	339	254	0	360	342	0	744	0	151	0.000	0.000	28.514	28.514		
JUN	683	0	0	0	685	0	720	0	37	0.000	0.000	32.762	32.762		
JUL	744	0	0	0	744	0	744	0	0	0.000	0.000	33.058	33.058		
AUG	744	0	0	0	744	0	744	0	0	0.000	0.000	34.029	34.029		
SEP	489	0	0	0	493	0	720	0	231	0.000	0.000	31.256	31.256		
OCT	4	595	0	720	4	0	744	0	145	0.000	0.000	10.437	10.437		
NOV	0	710	0	720	0	0	720	0	10	-127.817	-127.817	4.720	4.720		
DEC	0	744	0	744	0	0	744	0	0	-134.786	-134.786	4.720	4.720		
ANNUAL	3003	5082	0	5424	3012	0	8760	0	675						

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/11/1995 16:10:18 SDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #6 POST CHAPEL  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR BB-RADIATN TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC-TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-11.865	4	3	8.F	7.F	1316.	2.889
FEB	0.00000				-8.782	2	3	13.F	11.F	1189.	2.889
MAR	0.00000				-6.536	3	4	16.F	13.F	1316.	2.889
APR	0.00000				-1.436	1	3	36.F	32.F	1274.	2.889
MAY	0.00000				0.000				0.000	1316.	2.889
JUN	0.00000				0.000				0.000	1274.	2.889
JUL	0.00000				0.000				0.000	1316.	2.889
AUG	0.00000				0.000				0.000	1316.	2.889
SEP	0.00000				0.000				0.000	1274.	2.889
OCT	0.00000				-0.269	31	5	45.F	40.F	1316.	2.889
NOV	0.00000				-3.923	30	5	29.F	26.F	1274.	2.889
DEC	0.00000				-10.505	15	5	8.F	7.F	1316.	2.889
TOTAL	0.000				-43.315					15499.	
MAX									-34.457		2.889

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/11/1995 16:10:18 SDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #6 POST CHAPEL  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR BB-RADIATN TOPEKA, KS

MONTH	HOURS				HOURS				HOURS				COINCIDENT LOADS--			
	COOLING LOAD	HEATING LOAD	COOL-HEAT LOAD	FLOATING	HEATING AVAIL.	COOLING AVAIL.	FANS ON	FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)	FLOATING WHEN FANS ON	NIGHT VENTING	FANS ON	FANS ON
JAN	0	744	0	0	744	744	744	744	0	0	0	0	0	0	0	0
FEB	0	670	0	2	672	672	672	672	0	0	0	2	0	0	0	0
MAR	0	680	0	64	744	744	744	744	0	0	0	64	0	0	0	0
APR	0	250	0	470	720	720	720	720	0	0	0	470	0	0	0	0
MAY	0	0	0	744	360	744	360	360	0	0	0	360	0	0	0	0
JUN	0	0	0	720	0	720	0	0	0	0	0	0	0	0	0	0
JUL	0	0	0	744	0	744	0	0	0	0	0	0	0	0	0	0
AUG	0	0	0	744	0	744	0	0	0	0	0	0	0	0	0	0
SEP	0	0	0	720	0	744	0	0	0	0	0	0	0	0	0	0
OCT	0	70	0	674	720	744	720	720	0	0	0	650	0	0	0	0
NOV	0	536	0	184	720	720	720	720	0	0	0	184	0	0	0	0
DEC	0	744	0	0	744	744	744	744	0	0	0	0	0	0	0	0
ANNUAL	0	3694	0	5066	5424	8760	5424	5424	0	0	0	1730	0	0	0	0

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/11/1995 16:10:18 PDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #6 POST CHAPEL  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY TOTAL (MBTU) PEAK (KBTU) DY/HR	NATURAL-GAS TOTAL (MBTU) PEAK (KBTU) DY/HR
JAN	25.860 42.729 28/ 9	154.564 318.515 15/ 3	
FEB	23.327 42.729 3/ 6	121.305 295.812 3/ 6	
MAR	25.555 42.388 31/20	103.601 257.215 3/ 5	
APR	22.760 42.388 17/ 8	39.389 183.397 1/ 1	
MAY	27.413 107.592 22/11	8.984 110.518 5/ 6	
JUN	37.042 122.092 19/11	0.000 0.000 30/ 1	
JUL	44.491 122.739 24/11	0.000 0.000 31/ 1	
AUG	44.327 126.054 21/11	0.000 0.000 31/ 1	
SEP	30.185 116.586 5/11	0.000 0.000 30/ 1	
OCT	23.317 45.502 1/18	34.208 167.475 20/ 8	
NOV	24.303 42.388 30/20	83.896 226.136 2/ 6	
DEC	25.836 42.729 13/ 8	142.320 303.714 15/ 5	
	ONE YEAR USE/PEAK	354.417 126.054	688.268 318.515

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/11/1995 16:10:18 PDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #6 POST CHAPEL  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE	ELECTRICITY	NATURAL-GAS
IN SITE MBTU -		
CATEGORY OF USE		
SPACE HEAT	23.39	688.27
SPACE COOL	79.23	0.00
HVAC AUX	145.95	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	105.85	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	0.00	0.00
TOTAL	354.42	688.27

TOTAL SITE ENERGY 1042.68 MBTU 180.4 KBTU/SQFT-YR GROSS-AREA 180.4 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 1752.58 MBTU 303.2 KBTU/SQFT-YR GROSS-AREA 303.2 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 0.0  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.





INPUT SYSTEMS ..

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$-----$
$ E Z - D O E   S Y S T E M S   I N P U T $
$-----$

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\$ GENERAL PROJECT DATA

```

TITLE LINE-1 *   EMC   ENGINEERS   INC.   *
LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
LINE-3 *   DENVER,   CO   80227   *

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LINE-4 \*RUN #1 NIGHT SETBACK BLDG. #6 \*

LINE-5 \*POST CHAPEL \* ..

```

ABORT          ERRORS ..
DIAGNOSTIC     WARNINGS ..
SYSTEMS-REPORT VERIFICATION=(SV-A)
                SUMMARY=(SS-A,SS-C,SS-K,SS-O)
                HOURLY-DATA-SAVE = YES ..

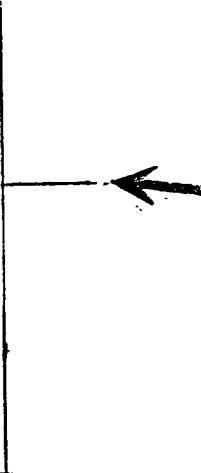
```

\$ SCHEDULES

```

SD_ON      =DAY-SCHEDULE (1,24) (1.) ..
SD_OFF     =DAY-SCHEDULE (1,24) (0.) ..
SD_WT_HT   =DAY-SCHEDULE (1,5) (55.)
                (6,21) (74.)
                (22,24) (55.) ..
SD_SM_CL   =DAY-SCHEDULE (1,5) (85.)
                (6,21) (72.)
                (22,24) (85.) ..
SD_WT_CL   =DAY-SCHEDULE (1,5) (57.)
                (6,21) (76.)
                (22,24) (57.) ..
SD_SM_HT   =DAY-SCHEDULE (1,5) (83.)
                (6,21) (70.)
                (22,24) (83.) ..
SD_OA%     =DAY-SCHEDULE (1,24) (0.16) ..
SD_FAN_CYC =DAY-SCHEDULE (1,5) (0.)
                (6,21) (1.)
                (22,24) (0.) ..

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SW_ON      =WEEK-SCHEDULE (ALL) SD_ON ..
SW_OFF     =WEEK-SCHEDULE (ALL) SD_OFF ..
SW_WT_HT   =WEEK-SCHEDULE (ALL) SD_WT_HT ..
SW_SM_CL   =WEEK-SCHEDULE (ALL) SD_SM_CL ..
SW_WT_CL   =WEEK-SCHEDULE (ALL) SD_WT_CL ..
SW_SM_HT   =WEEK-SCHEDULE (ALL) SD_SM_HT ..
SW_OA%     =WEEK-SCHEDULE (ALL) SD_OA% ..

```

SW\_FAN\_CYC =WEEK-SCHEDULE (ALL) SD\_FAN\_CYC ..

\$ FULL ON SYSTEM

S\_ON =SCHEDULE THRU DEC 31 SW\_ON ..

\$ FULL OFF SYSTEM

S\_OFF =SCHEDULE THRU DEC 31 SW\_OFF ..

\$ HEATING SEASON

S\_HE-SCHED =SCHEDULE THRU MAY 15 SW\_ON  
 THRU OCT 1 SW\_OFF  
 THRU DEC 31 SW\_ON ..

\$ COOLING SEASON

S\_CL\_SCHED =SCHEDULE THRU MAY 15 SW\_OFF  
 THRU OCT 1 SW\_ON  
 THRU DEC 31 SW\_OFF ..

\$ HEATING SET TEMP

S\_HT\_SET\_F =SCHEDULE THRU MAY 15 SW\_WT\_HT  
 THRU OCT 1 SW\_SM\_HT  
 THRU DEC 31 SW\_WT\_HT ..

\$ COOLING SET TEMP

S\_CL\_SET\_F =SCHEDULE THRU MAY 15 SW\_WT\_CL  
 THRU OCT 1 SW\_SM\_CL  
 THRU DEC 31 SW\_WT\_CL ..

S\_OA% =SCHEDULE THRU DEC 31 SW\_OA% ..

S\_HRLY-RPT =SCHEDULE THRU JAN 14 SW\_OFF  
 THRU JAN 15 SW\_ON  
 THRU AUG 20 SW\_OFF  
 THRU AUG 21 SW\_ON  
 THRU DEC 31 SW\_OFF ..

S\_FAN\_CYCL =SCHEDULE THRU DEC 31 SW\_FAN\_CYC ..

\$ ZONE DESCRIPTION

UP-STAIRS =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL ASSIGNED-CFM = 8000.  
 SIZING-OPTION = FROM-LOADS ..

BASEMENT =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL  
 BASEBOARD-CTRL = THERMOSTATIC  
 SIZING-OPTION = FROM-LOADS ..

\$ SYSTEM DESCRIPTION

PACK-COOLU =SYSTEM SYSTEM-TYPE = PSZ  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_HE-SCHED  
 COOLING-SCHEDULE = S\_CL\_SCHED OA-CONTROL = FIXED  
 SUPPLY-CFM = 8000. RATED-CFM = 8000.  
 MIN-AIR-SCH = S\_OA% FAN-SCHEDULE = S\_FAN\_CYCL  
 SUPPLY-DELTA-T = 1.8 SUPPLY-KW = 0.00059  
NIGHT-CYCLE-CTRL = CYCLE-ON-ANY NIGHT-VENT-DT = 0.0  
 COOLING-CAPACITY = 240000. COOL-SH-CAP = 180000.  
 COOL-FT-MIN = 0. HEATING-CAPACITY = -800000.  
 CRANKCASE-MAX-T = 0. OUTSIDE-FAN-T = 45.  
 HEAT-SOURCE = HOT-WATER  
 BASEBOARD-SOURCE = HOT-WATER  
 SIZING-OPTION = COINCIDENT  
 ZONE-NAMES = (UP-STAIRS) ..

BB-RADIATN =SYSTEM SYSTEM-TYPE = FPH  
 HEATING-SCHEDULE = S\_HE-SCHED  
 ZONE-NAMES = (BASEMENT) ..

\$ HOURLY REPORT DESCRIPTION

ZONE-UP-BK =REPORT-BLOCK VARIABLE-TYPE = UP-STAIRS  
 VARIABLE-LIST = (17,18,7,6) ..  
 ZONE-BS-BK =REPORT-BLOCK VARIABLE-TYPE = BASEMENT  
 VARIABLE-LIST = (17,18,7,6) ..  
 AHU-BLK =REPORT-BLOCK VARIABLE-TYPE = PACK-COOLU  
 VARIABLE-LIST = (3,5,6,17) ..  
 BB-BASE-BK =REPORT-BLOCK VARIABLE-TYPE = BB-RADIATN  
 VARIABLE-LIST = (7) ..  
 ZONES-HRLY = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (ZONE-UP-BK,ZONE-BS-BK)  
 ..  
 SYS-HRLY = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (AHU-BLK, BB-BASE-BK)  
 ..  
 END ..  
 COMPUTE SYSTEMS ..  
 INPUT PLANT ..

\$-----\$  
 \$ E Z - D O E P L A N T S I N P U T \$  
 \$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
 LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
 LINE-3 \* DENVER, CO 80227 \*

EMC ENGINEERS INC. E2DOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/11/1995 16:34:56 SDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SETBACK BLDG. #6 POST CHAPEL TOPEKA, KS  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR PACK-COOLU

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-82.543	28	-2. F	-3. F	4309.	-279.291	7.709
FEB	0.00000				-62.178	3	-1. F	-2. F	3941.	-263.889	7.709
MAR	0.00000				-50.703	3	15. F	12. F	4625.	-218.655	7.609
APR	0.00000				-17.652	5	31. F	28. F	4658.	-147.942	7.609
MAY	15.02411	30	11	74. F	-3.822	5	44. F	40. F	6285.	-89.738	29.324
JUN	41.79997	26	11	82. F	0.000				8762.	0.000	33.092
JUL	57.81033	24	11	82. F	0.000				10448.	0.000	33.070
AUG	55.58031	21	11	88. F	0.000				10395.	0.000	33.860
SEP	25.08428	5	11	78. F	0.000				7144.	0.000	31.813
OCT	0.06926	1	18	83. F	-15.445	20	24. F	23. F	4831.	-154.202	10.438
NOV	0.00000				-41.006	3	13. F	12. F	4517.	-203.021	7.609
DEC	0.00000				-74.744	13	2. F	1. F	4385.	-262.964	7.709
TOTAL MAX	195.368				-348.092				74299.	-279.291	33.860

EMC ENGINEERS INC. E2DOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/11/1995 16:34:56 SDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SETBACK BLDG. #6 POST CHAPEL TOPEKA, KS  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR PACK-COOLU

MONTH	H O U R S				H O U R S				H O U R S				C O I N C I D E N T		
	COOLING LOAD	HEATING LOAD	FLOATING	HEATING AVAIL.	COOLING AVAIL.	FANS ON	FANS ON CYCLE	NIGHT VENTING	FLOATING WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)	COINCIDENT HEATING LOAD AT COOLING PEAK (KBTU/HR)	COINCIDENT ELECTRIC LOAD AT COOLING PEAK (KW)	ANNUAL	ANNUAL
JAN	0	633	111	744	0	633	137	0	0	-8.440	4.720	-8.440	4.720	2060	4755
FEB	0	583	89	672	0	583	135	0	0	-6.526	4.720	-6.526	4.720	2060	4755
MAR	0	701	43	744	0	701	205	0	0	-6.900	4.720	-6.900	4.720	2060	4755
APR	0	634	86	720	0	717	237	0	83	-4.271	4.720	-4.271	4.720	2060	4755
MAY	242	265	237	360	245	744	248	0	237	0.000	29.015	0.000	29.015	2060	4755
JUN	467	0	253	0	468	720	240	0	253	0.000	32.956	0.000	32.956	2060	4755
JUL	496	0	248	0	498	742	246	0	246	0.000	33.070	0.000	33.070	2060	4755
AUG	496	0	248	0	512	728	232	0	232	0.000	33.860	0.000	33.860	2060	4755
SEP	355	0	365	0	355	720	240	0	365	0.000	31.813	0.000	31.813	2060	4755
OCT	4	608	132	0	4	743	247	0	131	0.000	10.438	0.000	10.438	2060	4755
NOV	0	681	39	720	0	687	207	0	6	-7.160	4.720	-7.160	4.720	2060	4755
DEC	0	650	94	744	0	650	154	0	0	0.000	0.000	0.000	0.000	2060	4755
ANNUAL	2060	4755	1945	5424	2082	8368	2528	0	1553					2060	4755

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/11/1995 16:34:56 SDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SETBACK BLDG. #6 POST CHAPEL  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR BB-RADIATN TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C			
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	MAXIMUM COOLING LOAD (KBTU/HR)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-10.996	29	6	11.F	9.F	-37.420	1316.	2.889
FEB	0.00000				-8.162	3	6	-1.F	-2.F	-37.420	1189.	2.889
MAR	0.00000				-5.954	3	6	15.F	12.F	-37.420	1316.	2.889
APR	0.00000				-1.253	1	6	54.F	50.F	-22.512	1274.	2.889
MAY	0.00000				0.000					0.000	1316.	2.889
JUN	0.00000				0.000					0.000	1274.	2.889
JUL	0.00000				0.000					0.000	1316.	2.889
AUG	0.00000				0.000					0.000	1316.	2.889
SEP	0.00000				0.000					0.000	1274.	2.889
OCT	0.00000				-0.190	31	6	44.F	39.F	-16.793	1316.	2.889
NOV	0.00000				-3.499	2	6	15.F	14.F	-27.520	1274.	2.889
DEC	0.00000				-9.708	30	6	21.F	18.F	-37.420	1316.	2.889
TOTAL	0.000				-39.761					-37.420	15499.	2.889
MAX												

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/11/1995 16:34:56 SDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SETBACK BLDG. #6 POST CHAPEL  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR BB-RADIATN TOPEKA, KS

MONTH	HOURS COOLING LOAD				HOURS HEATING LOAD				HOURS COINCIDENT COOL-HEAT LOAD				HOURS HEATING COOLING AVAIL.				HOURS FANS ON CYCLE ON VENTING FANS ON				HOURS FLOATING WHEN FANS ON				COINCIDENT LOADS-- HEATING COOLING PEAK (KBTU/HR)				ELECTRIC LOAD AT COOLING PEAK (KW)			
	HOURS COOLING LOAD	HOURS HEATING LOAD	HOURS COINCIDENT COOL-HEAT LOAD	HOURS FLOATING LOAD	HOURS HEATING AVAIL.	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.	HOURS COOLING AVAIL.	HOURS HEATING AVAIL.	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.	HOURS COOLING AVAIL.	HOURS FANS ON	HOURS FANS ON	HOURS FANS ON	HOURS FANS ON	HOURS FLOATING WHEN FANS ON	HOURS FLOATING WHEN FANS ON	HEATING COOLING PEAK (KBTU/HR)	HEATING COOLING PEAK (KBTU/HR)	HEATING COOLING PEAK (KBTU/HR)	HEATING COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)	ELECTRIC LOAD AT COOLING PEAK (KW)	ELECTRIC LOAD AT COOLING PEAK (KW)	ELECTRIC LOAD AT COOLING PEAK (KW)						
JAN	0	496	0	248	744	744	744	744	744	744	744	744	0	0	0	248	248	0.000	0.000	0.000	0.000	0.000	0.000	0.000								
FEB	0	448	0	224	672	672	672	672	672	672	672	672	0	0	0	224	224	0.000	0.000	0.000	0.000	0.000	0.000	0.000								
MAR	0	484	0	260	744	744	744	744	744	744	744	744	0	0	0	260	260	0.000	0.000	0.000	0.000	0.000	0.000	0.000								
APR	0	182	0	538	720	720	720	720	720	720	720	720	0	0	0	538	538	0.000	0.000	0.000	0.000	0.000	0.000	0.000								
MAY	0	0	0	744	360	360	744	744	744	744	744	360	0	0	0	360	360	0.000	0.000	0.000	0.000	0.000	0.000	0.000								
JUN	0	0	0	744	0	0	744	744	744	744	744	0	0	0	0	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000								
JUL	0	0	0	744	0	0	744	744	744	744	744	0	0	0	0	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000								
AUG	0	0	0	744	0	0	744	744	744	744	744	0	0	0	0	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000								
SEP	0	0	0	744	0	0	744	744	744	744	744	0	0	0	0	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000								
OCT	0	43	0	701	720	720	744	744	744	744	744	720	0	0	0	677	677	0.000	0.000	0.000	0.000	0.000	0.000	0.000								
NOV	0	379	0	341	720	720	744	744	744	744	744	720	0	0	0	341	341	0.000	0.000	0.000	0.000	0.000	0.000	0.000								
DEC	0	496	0	248	744	744	744	744	744	744	744	744	0	0	0	248	248	0.000	0.000	0.000	0.000	0.000	0.000	0.000								
ANNUAL	0	2528	0	6232	5424	5424	8760	8760	8760	8760	8760	5424	0	0	0	2896	2896															

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY TOTAL (MBTU) PEAK (KBTU) DY/HR	NATURAL-GAS TOTAL (MBTU) PEAK (KBTU) DY/HR
JAN	23.845 398.527 28/ 9	44.373 21.585 44.373	130.799 398.527 28/ 6
FEB	21.585 382.319 3/ 6	44.373 24.528 44.032	101.427 382.319 3/ 6
MAR	24.528 31.846 31/20	44.032 22.544 44.032	86.040 333.863 3/ 6
APR	22.544 237.581 17/ 8	44.032 26.648 109.987	31.846 237.581 5/ 6
MAY	26.648 144.731 22/11	109.987 34.268 122.855	7.150 144.731 5/ 6
JUN	34.268 30/ 1 19/11	122.855 40.170 122.778	0.000 30/ 1 0.000
JUL	40.170 31/ 1 24/11	122.778 39.987 125.477	0.000 31/ 1 0.000
AUG	39.987 31/ 1 21/11	125.477 28.743 118.488	0.000 31/ 1 0.000
SEP	28.743 30/ 1 5/11	118.488 23.099 45.503	0.000 30/ 1 27.165
OCT	23.099 20/ 6 1/18	45.503 23.466 44.032	27.165 220.072 20/ 6
NOV	23.466 299.928 30/20	44.032 30.067 44.373	69.073 299.928 2/ 6
DEC	30.067 381.340 13/ 8	44.373 332.949 125.477	120.223 381.340 13/ 6
	ONE YEAR USE/PEAK	332.949 125.477	573.724 398.527

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOB-2.1D 5/11/1995 16:34:56 PDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SETBACK BLDG. #6 POST CHAPEL  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE	ELECTRICITY	NATURAL-GAS
IN SITE MBTU -		
CATEGORY OF USE		
SPACE HEAT	20.75	573.72
SPACE COOL	65.91	0.00
HVAC AUX	140.45	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	105.85	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	0.00	0.00
TOTAL	332.96	573.72

TOTAL SITE ENERGY 906.67 MBTU 156.9 KBTU/SQFT-YR GROSS-AREA 156.9 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 1573.57 MBTU 272.2 KBTU/SQFT-YR GROSS-AREA 272.2 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 0.2  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.





INPUT SYSTEMS ..

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$-----$
$ E Z - D O E   S Y S T E M S   I N P U T $
$-----$

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\$ GENERAL PROJECT DATA

```

TITLE  LINE-1 *      EMC      ENGINEERS      INC.      *
LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
LINE-3 *      DENVER,      CO      80227      *

LINE-4 *RUN #2 DDC CONTROL FOR BLDG. #6      *
LINE-5 *POST CHAPEL      * ..

ABORT      ERRORS      ..
DIAGNOSTIC      WARNINGS      ..
SYSTEMS-REPORT      VERIFICATION=(SV-A)
SUMMARY=(SS-A,SS-C,SS-K,SS-O)
HOURLY-DATA-SAVE = YES      ..

```


\$ SCHEDULES

```

SD_ON      =DAY-SCHEDULE (1,24) (1.) ..
SD_OFF     =DAY-SCHEDULE (1,24) (0.) ..
SD_WT_HT   =DAY-SCHEDULE (1,24) (70.) ..
SD_SM_CL   =DAY-SCHEDULE (1,24) (76.) ..
SD_WT_CL   =DAY-SCHEDULE (1,24) (72.) ..
SD_SM_HT   =DAY-SCHEDULE (1,24) (74.) ..
SD_OA%     =DAY-SCHEDULE (1,24) (0.16) ..

SW_ON      =WEEK-SCHEDULE (ALL) SD_ON      ..
SW_OFF     =WEEK-SCHEDULE (ALL) SD_OFF     ..
SW_WT_HT   =WEEK-SCHEDULE (ALL) SD_WT_HT   ..
SW_SM_CL   =WEEK-SCHEDULE (ALL) SD_SM_CL   ..
SW_WT_CL   =WEEK-SCHEDULE (ALL) SD_WT_CL   ..
SW_SM_HT   =WEEK-SCHEDULE (ALL) SD_SM_HT   ..
SW_OA%     =WEEK-SCHEDULE (ALL) SD_OA%     ..

```



\$ FULL ON SYSTEM

S\_ON =SCHEDULE THRU DEC 31 SW\_ON ..

\$ FULL OFF SYSTEM

S\_OFF =SCHEDULE THRU DEC 31 SW\_OFF ..

\$ HEATING SEASON

```

S_HE-SCHED =SCHEDULE THRU MAY 15 SW_ON
            THRU OCT 1 SW_OFF

```

THRU DEC 31 SW\_ON ..

\$ COOLING SEASON

S\_CL\_SCHED =SCHEDULE THRU MAY 15 SW\_OFF  
 THRU OCT 1 SW\_ON  
 THRU DEC 31 SW\_OFF ..

\$ HEATING SET TEMP

S\_HT\_SET\_F =SCHEDULE THRU MAY 15 SW\_WT\_HT  
 THRU OCT 1 SW\_SM\_HT  
 THRU DEC 31 SW\_WT\_HT ..

\$ COOLING SET TEMP

S\_CL\_SET\_F =SCHEDULE THRU MAY 15 SW\_WT\_CL  
 THRU OCT 1 SW\_SM\_CL  
 THRU DEC 31 SW\_WT\_CL ..

S\_OA% =SCHEDULE THRU DEC 31 SW\_OA% ..

S\_HRLY-RPT =SCHEDULE THRU JAN 14 SW\_OFF  
 THRU JAN 15 SW\_ON  
 THRU AUG 20 SW\_OFF  
 THRU AUG 21 SW\_ON  
 THRU DEC 31 SW\_OFF ..

\$ ZONE DESCRIPTION

UP-STAIRS =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL ASSIGNED-CFM = 8000.  
 SIZING-OPTION = FROM-LOADS ..

BASEMENT =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL  
 BASEBOARD-CTRL = THERMOSTATIC  
 SIZING-OPTION = FROM-LOADS ..

\$ SYSTEM DESCRIPTION

PACK-COOLU =SYSTEM SYSTEM-TYPE = PSZ  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_HE-SCHED  
 COOLING-SCHEDULE = S\_CL\_SCHED OA-CONTROL = FIXED  
 SUPPLY-CFM = 8000. RATED-CFM = 8000.  
 MIN-AIR-SCH = S\_OA% SUPPLY-DELTA-T = 1.8  
 SUPPLY-KW = 0.00059 NIGHT-CYCLE-CTRL = STAY-OFF  
 NIGHT-VENT-DT = 0.0 COOLING-CAPACITY = 240000.  
 COOL-SH-CAP = 180000. COOL-FT-MIN = 0.  
 HEATING-CAPACITY = -800000. CRANKCASE-MAX-T = 0.  
 OUTSIDE-FAN-T = 45. HEAT-SOURCE = HOT-WATER

BASEBOARD-SOURCE = HOT-WATER  
 SIZING-OPTION = COINCIDENT  
 ZONE-NAMES = (UP-STAIRS) ..

BB-RADIATN =SYSTEM SYSTEM-TYPE = FPH  
 HEATING-SCHEDULE = S\_HE-SCHED  
 ZONE-NAMES = (BASEMENT) ..

\$ HOURLY REPORT DESCRIPTION

ZONE-UP-BK =REPORT-BLOCK VARIABLE-TYPE = UP-STAIRS  
 VARIABLE-LIST = (17,18,7,6) ..  
 ZONE-BS-BK =REPORT-BLOCK VARIABLE-TYPE = BASEMENT  
 VARIABLE-LIST = (17,18,7,6) ..  
 AHU-BLK =REPORT-BLOCK VARIABLE-TYPE = PACK-COOLU  
 VARIABLE-LIST = (3,5,6,17) ..  
 BB-BASE-BK =REPORT-BLOCK VARIABLE-TYPE = BB-RADIATN  
 VARIABLE-LIST = (7) ..  
 ZONES-HRLY = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (ZONE-UP-BK,ZONE-BS-BK)  
 ..  
 SYS-HRLY = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (AHU-BLK,BB-BASE-BK)  
 ..  
 END ..  
 COMPUTE SYSTEMS ..

INPUT PLANT ..

\$-----\$  
 \$ E Z - D O E P L A N T S I N P U T \$  
 \$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
 LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
 LINE-3 \* DENVER, CO 80227 \*  
 LINE-4 \*RUN #2 DDC CONTROL FOR BLDG. #6 \*  
 LINE-5 \*POST CHAPEL \* ..

ABORT ERRORS ..  
 DIAGNOSTIC WARNINGS ..  
 PLANT-REPORT VERIFICATION=(PV-A)  
 SUMMARY=(PS-B,BEPS)  
 HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

PD\_ON =DAY-SCHEDULE (1,24) (1.) ..  
 PD\_OFF =DAY-SCHEDULE (1,24) (0.) ..

EMC ENGINEERS INC. ESDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/11/1995 16:17:11 SDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. #6 POST CHAPEL  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR PACK-COOLU TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-91.728	15	-8.F	-9.F	4833.	-214.177	7.709
FEB	0.00000				-68.459	3	-1.F	-2.F	4361.	-193.897	7.709
MAR	0.00000				-53.636	3	15.F	13.F	4828.	-155.016	7.609
APR	0.00000				-15.672	1	32.F	29.F	4672.	-101.829	7.609
MAY	11.12077	30	11	74.F	-2.816	5	44.F	40.F	5941.	-53.946	26.702
JUN	36.97848	26	11	82.F	0.000				8373.	0.000	31.701
JUL	55.90189	24	11	82.F	0.000				10382.	0.000	32.574
AUG	53.67009	21	11	88.F	0.000				10355.	0.000	34.044
SEP	19.23550	5	11	78.F	0.000				6619.	0.000	29.400
OCT	0.00000				-13.213	20	23.F	22.F	4828.	-103.539	7.609
NOV	0.00000				-42.501	3	13.F	12.F	4672.	-140.504	7.609
DEC	0.00000				-82.140	15	3.F	2.F	4828.	-197.033	7.709
TOTAL	176.907				-370.164				74692.	-214.177	34.044
MAX					288.588						

EMC ENGINEERS INC. ESDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/11/1995 16:17:11 SDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. #6 POST CHAPEL  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR PACK-COOLU TOPEKA, KS

MONTH	HOURS				HOURS				HOURS				COINCIDENT LOADS		
	COOLING LOAD	HEATING LOAD	COINCIDENT COOL-HEAT LOAD	FLOATING	HEATING AVAIL.	COOLING AVAIL.	FANS ON	FANS ON	FANS ON	NIGHT VENTING	FLOATING WHEN	HEATING LOAD AT PEAK	ELECTRIC LOAD AT PEAK	COOLING PEAK	(KW)
JAN	0	744	0	0	744	0	744	0	0	0	0	-110.061	4.720	4.720	4.720
FEB	0	671	0	1	672	0	672	0	0	1	0	-100.305	4.720	4.720	4.720
MAR	0	739	0	5	744	0	744	0	0	5	0	-100.927	4.720	4.720	4.720
APR	0	548	0	172	720	0	720	0	0	172	0	-14.313	4.720	4.720	4.720
MAY	256	223	0	265	257	0	744	0	0	265	0	0.000	26.311	26.311	26.311
JUN	629	0	0	91	631	0	744	0	0	91	0	0.000	31.701	31.701	31.701
JUL	739	0	0	5	740	0	744	0	0	5	0	0.000	32.574	32.574	32.574
AUG	732	0	0	12	732	0	744	0	0	12	0	0.000	34.044	34.044	34.044
SEP	392	0	0	328	397	0	720	0	0	328	0	0.000	29.400	29.400	29.400
OCT	0	547	0	197	0	0	744	0	0	197	0	-67.015	4.720	4.720	4.720
NOV	0	686	0	34	720	0	720	0	0	34	0	-115.155	4.720	4.720	4.720
DEC	0	744	0	0	744	0	744	0	0	0	0	-122.576	4.720	4.720	4.720
ANNUAL	2748	4902	0	1110	2757	0	8760	0	0	1110	0				

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/11/1995 16:17:11 SDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. #6 POST CHAPEL TOPEKA, KS  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR BB-RADIATN

MONTH	COOLING ENERGY (MBTU)			HEATING ENERGY (MBTU)			H E A T I N G			E L E C				
	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000	0.0000	0.0000	4	3	8.F 7.F	0.000	-10.284	4	3	8.F 7.F	-31.708	1316.	2.889
FEB	0.00000	0.0000	0.0000	2	3	13.F 11.F	0.000	-7.348	2	3	13.F 11.F	-26.082	1189.	2.889
MAR	0.00000	0.0000	0.0000	3	4	16.F 13.F	0.000	-4.953	3	4	16.F 13.F	-25.214	1316.	2.889
APR	0.00000	0.0000	0.0000	1	3	36.F 32.F	0.000	-0.651	1	3	36.F 32.F	-13.282	1274.	2.889
MAY	0.00000	0.0000	0.0000				0.000	0.000				0.000	1316.	2.889
JUN	0.00000	0.0000	0.0000				0.000	0.000				0.000	1274.	2.889
JUL	0.00000	0.0000	0.0000				0.000	0.000				0.000	1316.	2.889
AUG	0.00000	0.0000	0.0000				0.000	0.000				0.000	1274.	2.889
SEP	0.00000	0.0000	0.0000				0.000	0.000				0.000	1316.	2.889
OCT	0.00000	0.0000	0.0000	31	5	45.F 40.F	0.000	-0.003	31	5	45.F 40.F	-1.125	1274.	2.889
NOV	0.00000	0.0000	0.0000	30	5	29.F 26.F	0.000	-2.507	30	5	29.F 26.F	-15.696	1274.	2.889
DEC	0.00000	0.0000	0.0000	15	5	8.F 7.F	0.000	-8.907	15	5	8.F 7.F	-27.475	1316.	2.889
TOTAL	0.000						0.000	-34.653				-31.708	15499.	2.889
MAX														

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/11/1995 16:17:11 SDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. #6 POST CHAPEL TOPEKA, KS  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR BB-RADIATN

MONTH	HOURS COOLING LOAD		HOURS HEATING LOAD		HOURS COINCIDENT COOL-HEAT LOAD		HOURS FLOATING		HOURS HEATING AVAIL.		HOURS COOLING AVAIL.		HOURS FANS ON CYCLE ON		HOURS NIGHT VENTING		HOURS FLOATING WHEN FANS ON		HEATING LOAD AT COOLING PEAK (KBTU/HR)		ELECTRIC LOAD AT COOLING PEAK (KW)	
	COOLING LOAD	HEATING LOAD	COINCIDENT COOL-HEAT LOAD	HEATING AVAIL.	HEATING AVAIL.	COOLING AVAIL.	COOLING AVAIL.	COOLING AVAIL.	COOLING AVAIL.	COOLING AVAIL.	COOLING AVAIL.	COOLING AVAIL.	COOLING AVAIL.	COOLING AVAIL.	COOLING AVAIL.	COOLING AVAIL.	COOLING AVAIL.	COOLING AVAIL.	COOLING AVAIL.	COOLING AVAIL.	COOLING AVAIL.	COOLING AVAIL.
JAN	0	744	0	744	0	744	0	744	744	744	0	0	0	0	0	0	0	0	-13.558	0.000		
FEB	0	661	0	672	0	672	0	672	672	672	0	0	0	0	0	0	0	11	-11.869	0.000		
MAR	0	601	0	744	0	744	0	744	744	744	0	0	0	0	0	0	0	143	-12.469	0.000		
APR	0	149	0	720	0	720	0	720	720	720	0	0	0	0	0	0	0	571	0.000	0.000		
MAY	0	0	0	360	0	360	0	360	360	360	0	0	0	0	0	0	0	360	0.000	0.000		
JUN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	0.000		
JUL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	0.000		
AUG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	0.000		
SEP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	0.000		
OCT	0	4	0	720	0	720	0	720	720	720	0	0	0	0	0	0	0	716	-0.881	0.000		
NOV	0	416	0	744	0	744	0	744	744	744	0	0	0	0	0	0	0	304	-12.379	0.000		
DEC	0	741	0	744	0	744	0	744	744	744	0	0	0	0	0	0	0	3	-14.920	0.000		
ANNUAL	0	3316	0	5444	0	5444	0	5444	8760	8760	0	0	0	0	0	0	0	2108				

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOF-2.1D 5/11/1995 16:17:11 PDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. #6 POST CHAPEL  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY TOTAL (MBTU) PEAK (KBTU) DY/HR	NATURAL-GAS TOTAL (MBTU) PEAK (KBTU) DY/HR
JAN	25.578 42.364 28/ 9	140.406 300.728 15/ 3	
FEB	23.046 42.364 3/ 8	108.252 277.847 3/ 6	
MAR	25.069 42.022 31/20	88.053 237.353 3/ 5	
APR	22.117 42.022 17/ 7	27.155 164.139 1/ 1	
MAY	25.256 101.035 22/11	5.183 90.757 5/ 6	
JUN	32.938 118.105 26/11	0.000 0.000 30/ 1	
JUL	39.942 121.087 24/11	0.000 0.000 31/ 1	
AUG	39.851 126.106 21/11	0.000 0.000 31/ 1	
SEP	26.950 110.248 5/11	0.000 0.000 30/ 1	
OCT	22.650 42.022 31/ 9	22.744 151.271 20/ 8	
NOV	23.760 42.022 30/20	69.024 207.461 3/ 3	
DEC	25.532 42.364 13/ 8	127.892 284.665 15/ 5	
	ONE YEAR USE/PEAK	332.690 126.106	588.708 300.728

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/11/1995 16:17:11 PDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. #6 POST CHAPEL  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE	ELECTRICITY	NATURAL-GAS
IN SITE MBTU -		
CATEGORY OF USE		
SPACE HEAT	20.39	588.71
SPACE COOL	60.93	0.00
HVAC AUX	145.53	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	105.85	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	0.00	0.00
TOTAL	332.69	588.71

TOTAL SITE ENERGY 921.40 MBTU 159.4 KBTU/SQFT-YR GROSS-AREA 159.4 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 1587.78 MBTU 274.7 KBTU/SQFT-YR GROSS-AREA 274.7 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 0.0  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.





## INPUT SYSTEMS ..

```

$-----$
$ E Z - D O E   S Y S T E M S   I N P U T $
$-----$

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## \$ GENERAL PROJECT DATA

```

TITLE  LINE-1 *      EMC      ENGINEERS      INC.      *
        LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
        LINE-3 *      DENVER,      CO      80227      *

        LINE-4 *RUN #3 ECONOMIZER BLDG. #6      *
        LINE-5 *POST CHAPEL      * ..

ABORT      ERRORS ..
DIAGNOSTIC  WARNINGS ..
SYSTEMS-REPORT  VERIFICATION=(SV-A)
                SUMMARY=(SS-A,SS-C,SS-K,SS-O)
                HOURLY-DATA-SAVE = YES ..

```

## \$ SCHEDULES

```

SD_ON      =DAY-SCHEDULE (1,24) (1.) ..
SD_OFF     =DAY-SCHEDULE (1,24) (0.) ..
SD_WT_HT   =DAY-SCHEDULE (1,5) (55.)
                (6,21) (74.)
                (22,24) (55.) ..
SD_SM_CL   =DAY-SCHEDULE (1,5) (85.)
                (6,21) (72.)
                (22,24) (85.) ..
SD_WT_CL   =DAY-SCHEDULE (1,5) (57.)
                (6,21) (76.)
                (22,24) (57.) ..
SD_SM_HT   =DAY-SCHEDULE (1,5) (83.)
                (6,21) (70.)
                (22,24) (83.) ..
SD_OA%     =DAY-SCHEDULE (1,24) (0.16) ..
SD_FAN_CYC =DAY-SCHEDULE (1,5) (0.)
                (6,21) (1.)
                (22,24) (0.) ..

SW_ON      =WEEK-SCHEDULE (ALL) SD_ON ..
SW_OFF     =WEEK-SCHEDULE (ALL) SD_OFF ..
SW_WT_HT   =WEEK-SCHEDULE (ALL) SD_WT_HT ..
SW_SM_CL   =WEEK-SCHEDULE (ALL) SD_SM_CL ..
SW_WT_CL   =WEEK-SCHEDULE (ALL) SD_WT_CL ..
SW_SM_HT   =WEEK-SCHEDULE (ALL) SD_SM_HT ..
SW_OA%     =WEEK-SCHEDULE (ALL) SD_OA% ..

```

SW\_FAN\_CYC =WEEK-SCHEDULE (ALL) SD\_FAN\_CYC ..

\$ FULL ON SYSTEM

S\_ON =SCHEDULE THRU DEC 31 SW\_ON ..

\$ FULL OFF SYSTEM

S\_OFF =SCHEDULE THRU DEC 31 SW\_OFF ..

\$ HEATING SEASON

S\_HE-SCHED =SCHEDULE THRU MAY 15 SW\_ON  
 THRU OCT 1 SW\_OFF  
 THRU DEC 31 SW\_ON ..

\$ COOLING SEASON

S\_CL\_SCHED =SCHEDULE THRU MAY 15 SW\_OFF  
 THRU OCT 1 SW\_ON  
 THRU DEC 31 SW\_OFF ..

\$ HEATING SET TEMP

S\_HT\_SET\_F =SCHEDULE THRU MAY 15 SW\_WT\_HT  
 THRU OCT 1 SW\_SM\_HT  
 THRU DEC 31 SW\_WT\_HT ..

\$ COOLING SET TEMP

S\_CL\_SET\_F =SCHEDULE THRU MAY 15 SW\_WT\_CL  
 THRU OCT 1 SW\_SM\_CL  
 THRU DEC 31 SW\_WT\_CL ..

S\_OA% =SCHEDULE THRU DEC 31 SW\_OA% ..

S\_HRLY-RPT =SCHEDULE THRU JAN 14 SW\_OFF  
 THRU JAN 15 SW\_ON  
 THRU AUG 20 SW\_OFF  
 THRU AUG 21 SW\_ON  
 THRU DEC 31 SW\_OFF ..

S\_FAN\_CYCL =SCHEDULE THRU DEC 31 SW\_FAN\_CYC ..

\$ ZONE DESCRIPTION

UP-STAIRS =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL ASSIGNED-CFM = 8000.  
 SIZING-OPTION = FROM-LOADS ..

BASEMENT =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL  
 BASEBOARD-CTRL = THERMOSTATIC  
 SIZING-OPTION = FROM-LOADS ..

\$ SYSTEM DESCRIPTION

PACK-COOLU =SYSTEM SYSTEM-TYPE = PSZ  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_HE-SCHED  
 COOLING-SCHEDULE = S\_CL\_SCHED ECONO-LIMIT-T = 69.0 ←  
 SUPPLY-CFM = 8000. RATED-CFM = 8000.  
 MIN-OUTSIDE-AIR = 0.16 FAN-SCHEDULE = S\_FAN\_CYCL  
 SUPPLY-DELTA-T = 1.8 SUPPLY-KW = 0.00059  
 NIGHT-CYCLE-CTRL = CYCLE-ON-ANY NIGHT-VENT-DT = 0.0  
 COOLING-CAPACITY = 240000. COOL-SH-CAP = 180000.  
 COOL-FT-MIN = 0. HEATING-CAPACITY = -800000.  
 CRANKCASE-MAX-T = 0. OUTSIDE-FAN-T = 45.  
 HEAT-SOURCE = HOT-WATER  
 BASEBOARD-SOURCE = HOT-WATER  
 SIZING-OPTION = COINCIDENT  
 ZONE-NAMES = (UP-STAIRS) ..

BB-RADIATN =SYSTEM SYSTEM-TYPE = FPH  
 HEATING-SCHEDULE = S\_HE-SCHED  
 ZONE-NAMES = (BASEMENT) ..

\$ HOURLY REPORT DESCRIPTION

ZONE-UP-BK =REPORT-BLOCK VARIABLE-TYPE = UP-STAIRS  
 VARIABLE-LIST = (17,18,7,6) ..  
 ZONE-BS-BK =REPORT-BLOCK VARIABLE-TYPE = BASEMENT  
 VARIABLE-LIST = (17,18,7,6) ..  
 AHU-BLK =REPORT-BLOCK VARIABLE-TYPE = PACK-COOLU  
 VARIABLE-LIST = (3,5,6,17) ..  
 BB-BASE-BK =REPORT-BLOCK VARIABLE-TYPE = BB-RADIATN  
 VARIABLE-LIST = (7) ..  
 ZONES-HRLY = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (ZONE-UP-BK,ZONE-BS-BK)  
 ..  
 SYS-HRLY = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (AHU-BLK,BB-BASE-BK)  
 ..  
 END ..  
 COMPUTE SYSTEMS ..

INPUT PLANT ..

\$-----\$  
 \$ E Z - D O E P L A N T S I N P U T \$  
 \$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
 LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
 LINE-3 \* DENVER, CO 80227 \*

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/11/1995 16:43:43 SDL RUN 1  
 DENVER, CO 80227 RUN #3 ECONOMIZER BLDG. #6 POST CHAPEL  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR PACK-COOLU TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	TRICAL ENERGY (KWH)	MAXIMUM HEATING (KBTU/HR)	ELEC LOAD (KW)
JAN	0.00000				-81.556	28	-2. F	-3. F	4125.	-279.321	7.709
FEB	0.00000				-61.129	3	-1. F	-2. F	3724.	-263.886	7.709
MAR	0.00000				-50.344	3	15. F	12. F	4205.	-220.044	7.609
APR	0.00000				-19.991	5	31. F	28. F	4441.	-152.387	7.609
MAY	12.75226	30	11	74. F	-5.326	5	44. F	40. F	6050.	-105.476	29.323
JUN	38.66085	26	11	82. F	0.000				8481.	0.000	33.092
JUL	56.66064	24	11	82. F	0.000				10349.	0.000	33.070
AUG	53.86172	21	11	88. F	0.000				10243.	0.000	33.860
SEP	22.85937	5	11	78. F	0.000				6945.	0.000	31.813
OCT	0.09829	1	18	83. F	-18.325	20	24. F	23. F	4612.	-158.405	10.843
NOV	0.00000				-41.293	3	13. F	12. F	4186.	-203.622	7.609
DEC	0.00000				-73.809	13	2. F	1. F	4158.	-262.159	7.709
TOTAL	184.893				-351.773				71520.	-279.321	33.860
MAX											

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/11/1995 16:43:43 SDL RUN 1  
 DENVER, CO 80227 RUN #3 ECONOMIZER BLDG. #6 POST CHAPEL  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR PACK-COOLU TOPEKA, KS

MONTH	HOURS OF HOURS				HOURS OF HOURS				COINCIDENT LOADS		
	COOLING LOAD	HEATING LOAD	FLOATING	HEATING AVAIL.	COOLING AVAIL.	FANS ON	FANS ON CYCLE	NIGHT VENTING	FLOATING WHEN FANS ON	HEATING LOAD AT PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)
JAN	0	563	181	744	0	594	98	0	31	-2.118	4.720
FEB	0	495	177	672	0	537	89	0	42	0.000	4.720
MAR	0	525	219	744	0	612	116	0	87	0.000	4.720
APR	0	413	307	720	0	671	191	0	258	0.000	4.720
MAY	175	160	409	360	245	736	240	0	401	0.000	29.014
JUN	394	0	326	0	468	720	240	0	326	0.000	32.956
JUL	479	0	265	0	498	742	246	0	263	0.000	33.070
AUG	469	0	275	0	512	728	232	0	259	0.000	33.860
SEP	294	0	426	0	355	720	240	0	426	0.000	31.813
OCT	5	383	356	720	5	696	200	0	308	0.000	10.843
NOV	0	500	220	720	0	617	137	0	117	-6.959	4.720
DEC	0	559	185	744	0	602	106	0	43	-1.1314	4.720
ANNUAL	1816	3598	3346	5424	2083	7975	2135	0	2561		

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/11/1995 16:43:43 SDL RUN 1  
 DENVER, CO 80227 RUN #3 ECONOMIZER BLDG. #6 POST CHAPEL  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR BB-RADIATN TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	ELEC- TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-10.996	29	6	11.F	9.F	1316.	2.889
FEB	0.00000				-8.162	3	6	-1.F	-2.F	1189.	2.889
MAR	0.00000				-5.954	3	6	15.F	12.F	1316.	2.889
APR	0.00000				-1.253	1	6	54.F	50.F	1274.	2.889
MAY	0.00000				0.000					1316.	2.889
JUN	0.00000				0.000					1274.	2.889
JUL	0.00000				0.000					1316.	2.889
AUG	0.00000				0.000					1316.	2.889
SEP	0.00000				0.000					1274.	2.889
OCT	0.00000				-0.190	31	6	44.F	39.F	1316.	2.889
NOV	0.00000				-3.499	2	6	15.F	14.F	1274.	2.889
DEC	0.00000				-9.708	30	6	21.F	18.F	1316.	2.889
TOTAL	0.000				-39.761					15499.	2.889
MAX					0.000					-37.420	

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/11/1995 16:43:43 SDL RUN 1  
 DENVER, CO 80227 RUN #3 ECONOMIZER BLDG. #6 POST CHAPEL  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR BB-RADIATN TOPEKA, KS

MONTH	HOURS				HOURS				HOURS				COINCIDENT LOADS	
	COOLING LOAD	HEATING LOAD	COOL-HEAT LOAD	FLOATING	HEATING AVAIL.	HEATING AVAIL.	COOLING AVAIL.	FANS ON	FANS ON	FANS ON	FANS ON	FANS ON	FANS ON	HEATING LOAD AT PEAK (KBTU/HR)
JAN	0	496	0	248	744	744	744	744	0	0	248	0	0.000	0.000
FEB	0	448	0	224	672	672	672	672	0	0	224	0	0.000	0.000
MAR	0	484	0	260	744	744	744	744	0	0	260	0	0.000	0.000
APR	0	182	0	538	720	720	720	720	0	0	538	0	0.000	0.000
MAY	0	0	0	744	360	744	744	360	0	0	360	0	0.000	0.000
JUN	0	0	0	720	0	720	720	0	0	0	0	0	0.000	0.000
JUL	0	0	0	744	0	744	744	0	0	0	0	0	0.000	0.000
AUG	0	0	0	744	0	744	744	0	0	0	0	0	0.000	0.000
SEP	0	0	0	720	0	720	720	0	0	0	0	0	0.000	0.000
OCT	0	43	0	701	720	744	744	720	0	0	677	0	0.000	0.000
NOV	0	379	0	341	720	720	720	720	0	0	341	0	0.000	0.000
DEC	0	496	0	248	744	744	744	744	0	0	248	0	0.000	0.000
ANNUAL	0	2528	0	6232	5424	8760	8760	5424	0	0	2896			

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY	NATURAL-GAS
JAN	23.001 44.374 28/ 9	23.001 44.374 28/ 9	128.765 398.565 28/ 6
FEB	20.591 44.374 3/ 8	20.591 44.374 3/ 8	99.180 382.322 3/ 6
MAR	22.735 44.033 31/20	22.735 44.033 31/20	84.382 335.375 3/ 6
APR	21.643 44.033 25/ 7	21.643 44.033 25/ 7	34.568 242.642 5/ 6
MAY	25.817 109.986 22/11	25.817 109.986 22/11	9.148 163.367 5/ 6
JUN	33.308 122.855 19/11	33.308 122.855 19/11	0.000 0.000 30/ 1
JUL	39.830 122.778 24/11	39.830 122.778 24/11	0.000 0.000 31/ 1
AUG	39.470 125.477 21/11	39.470 125.477 21/11	0.000 0.000 31/ 1
SEP	28.063 118.488 5/11	28.063 118.488 5/11	0.000 0.000 30/ 1
OCT	22.228 46.887 1/18	22.228 46.887 1/18	30.728 224.899 20/ 6
NOV	22.045 44.033 30/20	22.045 44.033 30/20	68.539 302.110 2/ 6
DEC	23.042 44.374 13/ 8	23.042 44.374 13/ 8	118.134 380.494 13/ 6
	ONE YEAR USE/PEAK	321.773 125.477	573.444 398.565

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/11/1995 16:43:43 PDL RUN 1  
 DENVER, CO 80227 RUN #3 ECONOMIZER BLDG. #6 POST CHAPEL  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE	ELECTRICITY	NATURAL-GAS
IN SITE MBTU -		
CATEGORY OF USE		
SPACE HEAT	20.42	573.44
SPACE COOL	62.75	0.00
HVAC AUX	132.76	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	105.85	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	0.00	0.00
TOTAL	321.78	573.44

TOTAL SITE ENERGY 895.22 MBTU 154.9 KBTU/SQFT-YR GROSS-AREA 154.9 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 1539.73 MBTU 266.4 KBTU/SQFT-YR GROSS-AREA 266.4 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 4.7  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.





INPUT SYSTEMS ..

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$-----$
$ E Z - D O E   S Y S T E M S   I N P U T $
$-----$

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\$ GENERAL PROJECT DATA

```

TITLE LINE-1 *      EMC      ENGINEERS      INC.      *
LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
LINE-3 *      DENVER,      CO      80227      *

LINE-4 *RUN #4 NIGHT INFILTRATION FOR BLDG. #6 *
LINE-5 *POST CHAPEL * ..

ABORT      ERRORS ..
DIAGNOSTIC WARNINGS ..
SYSTEMS-REPORT VERIFICATION=(SV-A)
SUMMARY=(SS-A,SS-C,SS-K,SS-O)
HOURLY-DATA-SAVE = YES ..

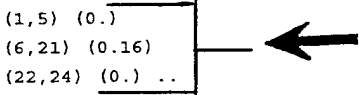
```

\$ SCHEDULES

```

SD_ON      =DAY-SCHEDULE (1,24) (1.) ..
SD_OFF     =DAY-SCHEDULE (1,24) (0.) ..
SD_WT_HT   =DAY-SCHEDULE (1,24) (74.) ..
SD_SM_CL   =DAY-SCHEDULE (1,24) (72.) ..
SD_WT_CL   =DAY-SCHEDULE (1,24) (76.) ..
SD_SM_HT   =DAY-SCHEDULE (1,24) (70.) ..
SD_OA%     =DAY-SCHEDULE (1,5) (0.)
           (6,21) (0.16)
           (22,24) (0.) ..

```



```

SW_ON      =WEEK-SCHEDULE (ALL) SD_ON ..
SW_OFF     =WEEK-SCHEDULE (ALL) SD_OFF ..
SW_WT_HT   =WEEK-SCHEDULE (ALL) SD_WT_HT ..
SW_SM_CL   =WEEK-SCHEDULE (ALL) SD_SM_CL ..
SW_WT_CL   =WEEK-SCHEDULE (ALL) SD_WT_CL ..
SW_SM_HT   =WEEK-SCHEDULE (ALL) SD_SM_HT ..
SW_OA%     =WEEK-SCHEDULE (ALL) SD_OA% ..

```

\$ FULL ON SYSTEM

S\_ON =SCHEDULE THRU DEC 31 SW\_ON ..

\$ FULL OFF SYSTEM

S\_OFF =SCHEDULE THRU DEC 31 SW\_OFF ..

\$ HEATING SEASON

S\_HE-SCHED =SCHEDULE THRU MAY 15 SW\_ON  
THRU OCT 1 SW\_OFF  
THRU DEC 31 SW\_ON ..

\$ COOLING SEASON

S\_CL\_SCHED =SCHEDULE THRU MAY 15 SW\_OFF  
THRU OCT 1 SW\_ON  
THRU DEC 31 SW\_OFF ..

\$ HEATING SET TEMP

S\_HT\_SET\_F =SCHEDULE THRU MAY 15 SW\_WT\_HT  
THRU OCT 1 SW\_SM\_HT  
THRU DEC 31 SW\_WT\_HT ..

\$ COOLING SET TEMP

S\_CL\_SET\_F =SCHEDULE THRU MAY 15 SW\_WT\_CL  
THRU OCT 1 SW\_SM\_CL  
THRU DEC 31 SW\_WT\_CL ..

S\_OA% =SCHEDULE THRU DEC 31 SW\_OA% ..

S\_HRLY-RPT =SCHEDULE THRU JAN 14 SW\_OFF  
THRU JAN 15 SW\_ON  
THRU AUG 20 SW\_OFF  
THRU AUG 21 SW\_ON  
THRU DEC 31 SW\_OFF ..

\$ ZONE DESCRIPTION

UP-STAIRS =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL ASSIGNED-CFM = 8000.  
SIZING-OPTION = FROM-LOADS ..

BASEMENT =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL  
BASEBOARD-CTRL = THERMOSTATIC  
SIZING-OPTION = FROM-LOADS ..

\$ SYSTEM DESCRIPTION

PACK-COOLU =SYSTEM SYSTEM-TYPE = PSZ  
MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
HEATING-SCHEDULE = S\_HE-SCHED  
COOLING-SCHEDULE = S\_CL\_SCHED OA-CONTROL = FIXED  
SUPPLY-CFM = 8000. RATED-CFM = 8000.  
MIN-AIR-SCH = S\_OA% SUPPLY-DELTA-T = 1.8  
SUPPLY-KW = 0.00059 NIGHT-CYCLE-CTRL = STAY-OFF  
NIGHT-VENT-DT = 0.0 COOLING-CAPACITY = 240000.  
COOL-SH-CAP = 180000. COOL-FT-MIN = 0.

HEATING-CAPACITY = -800000. CRANKCASE-MAX-T = 0.  
 OUTSIDE-FAN-T = 45. HEAT-SOURCE = HOT-WATER  
 BASEBOARD-SOURCE = HOT-WATER  
 SIZING-OPTION = COINCIDENT  
 ZONE-NAMES = (UP-STAIRS) ..

BB-RADIATN =SYSTEM SYSTEM-TYPE = FPH  
 HEATING-SCHEDULE = S\_HE-SCHED  
 ZONE-NAMES = (BASEMENT) ..

\$ HOURLY REPORT DESCRIPTION

ZONE-UP-BK =REPORT-BLOCK VARIABLE-TYPE = UP-STAIRS  
 VARIABLE-LIST = (17,18,7,6) ..  
 ZONE-BS-BK =REPORT-BLOCK VARIABLE-TYPE = BASEMENT  
 VARIABLE-LIST = (17,18,7,6) ..  
 AHU-BLK =REPORT-BLOCK VARIABLE-TYPE = PACK-COOLU  
 VARIABLE-LIST = (3,5,6,17) ..  
 BB-BASE-BK =REPORT-BLOCK VARIABLE-TYPE = BB-RADIATN  
 VARIABLE-LIST = (7) ..  
 ZONES-HRLY = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (ZONE-UP-BK,ZONE-BS-BK)  
 ..  
 SYS-HRLY = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (AHU-BLK,BB-BASE-BK)  
 ..

END ..  
 COMPUTE SYSTEMS ..  
 INPUT PLANT ..

\$-----\$  
 \$ E Z - D O E P L A N T S I N P U T \$  
 \$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
 LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
 LINE-3 \* DENVER, CO 80227 \*  
 LINE-4 \*RUN #4 NIGHT INFILTRATION FOR BLDG. #6 \*  
 LINE-5 \*POST CHAPEL \* ..

ABORT ERRORS ..  
 DIAGNOSTIC WARNINGS ..  
 PLANT-REPORT VERIFICATION=(PV-A)  
 SUMMARY=(PS-B,BEPS)  
 HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

PD\_ON =DAY-SCHEDULE (1,24) (1.) ..

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/11/1995 16:54: 3 SDL RUN 1  
 DENVER, CO 80227 RUN #4 NIGHT INFILTRATION FOR BLDG. #6 POST CHAPEL  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR PACK-COOLU TOPEKA, KS

MONTH	COOLING			HEATING			H E A T I N G			E L E C			
	HOURS COOLING LOAD	ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0	0.00000				0.000	-83.140	15	6	-8.F	-9.F	4833.	7.709
FEB	0	0.00000				0.000	-62.451	3	6	-1.F	-2.F	4361.	7.709
MAR	0	0.00000				0.000	-49.599	3	8	15.F	12.F	4828.	7.609
APR	0	0.00000				0.000	-15.466	5	6	31.F	28.F	4672.	7.609
MAY	17.91902	0.00000	30	11	74.F	69.F	-2.839	5	6	44.F	40.F	6549.	28.625
JUN	46.83541	0.00000	26	11	82.F	74.F	0.000			0.000	0.000	9278.	32.859
JUL	63.72333	0.00000	24	11	82.F	75.F	0.000			0.000	0.000	11117.	33.055
AUG	61.64609	0.00000	21	11	88.F	76.F	0.000			0.000	0.000	11140.	34.031
SEP	29.05516	0.00000	5	11	78.F	73.F	0.000			0.000	0.000	7534.	31.257
OCT	0.15188	0.00000	1	18	83.F	68.F	-13.291	20	8	23.F	22.F	4845.	11.486
NOV	0.00000	0.00000				0.000	-39.470	3	6	13.F	12.F	4672.	7.609
DEC	0.00000	0.00000				0.000	-75.114	13	6	2.F	1.F	4828.	7.709
TOTAL	219.331						-341.370					78657.	
MAX						305.603							34.031

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/11/1995 16:54: 3 SDL RUN 1  
 DENVER, CO 80227 RUN #4 NIGHT INFILTRATION FOR BLDG. #6 POST CHAPEL  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR PACK-COOLU TOPEKA, KS

MONTH	COOLING			HEATING			H O U R S			HOURS			--COINCIDENT LOADS--		
	HOURS COOLING LOAD	ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)
JAN	0	0.00000				0.000	-83.140	15	6	-8.F	-9.F	4833.	7.709	-63.749	4.720
FEB	0	0.00000				0.000	-62.451	3	6	-1.F	-2.F	4361.	7.709	-52.652	4.720
MAR	0	0.00000				0.000	-49.599	3	8	15.F	12.F	4828.	7.609	-54.935	4.720
APR	0	0.00000				0.000	-15.466	5	6	31.F	28.F	4672.	7.609	-1.655	4.720
MAY	362	0.00000	30	11	74.F	69.F	365	744	720	0	0	0.000	28.527	0.000	28.527
JUN	704	0.00000	26	11	82.F	74.F	705	720	720	0	0	0.000	32.755	0.000	32.755
JUL	744	0.00000	24	11	82.F	75.F	744	744	744	0	0	0.000	33.055	0.000	33.055
AUG	744	0.00000	21	11	88.F	76.F	744	744	744	0	0	0.000	34.031	0.000	34.031
SEP	576	0.00000	5	11	78.F	73.F	577	720	720	0	0	0.000	31.257	0.000	31.257
OCT	9	0.00000	1	18	83.F	68.F	10	744	744	0	0	0.000	11.486	0.000	11.486
NOV	0	0.00000				0.000	-39.470	3	6	13.F	12.F	4672.	7.609	-59.754	4.720
DEC	0	0.00000				0.000	-75.114	13	6	2.F	1.F	4828.	7.709	-70.455	4.720
ANNUAL	3139		4998			5424	3145	8760	0	0	0				

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/11/1995 16:54: 3 SDL RUN 1  
 DENVER, CO 80227 RUN #4 NIGHT INFILTRATION FOR BLDG. #6 POST CHAPEL  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR BB-RADIATN TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC-TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-11.865	4	3	8.F	7.F	1316.	2.889
FEB	0.00000				-8.782	2	3	13.F	11.F	1189.	2.889
MAR	0.00000				-6.536	3	4	16.F	13.F	1316.	2.889
APR	0.00000				-1.436	1	3	36.F	32.F	1274.	2.889
MAY	0.00000				0.000				0.000	1316.	2.889
JUN	0.00000				0.000				0.000	1274.	2.889
JUL	0.00000				0.000				0.000	1316.	2.889
AUG	0.00000				0.000				0.000	1274.	2.889
SEP	0.00000				0.000				0.000	1316.	2.889
OCT	0.00000				-0.269	31	5	45.F	40.F	1316.	2.889
NOV	0.00000				-3.923	30	5	29.F	26.F	1274.	2.889
DEC	0.00000				-10.505	15	5	8.F	7.F	1316.	2.889
TOTAL	0.000				-43.315					15499.	
MAX									-34.457		2.889

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/11/1995 16:54: 3 SDL RUN 1  
 DENVER, CO 80227 RUN #4 NIGHT INFILTRATION FOR BLDG. #6 POST CHAPEL  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR BB-RADIATN TOPEKA, KS

MONTH	HOURS OF				HOURS				HOURS				COINCIDENT LOADS			
	COOLING LOAD	HEATING LOAD	COOL-HEAT LOAD	FLOATING	HEATING AVAIL.	COOLING AVAIL.	FANS ON CYCLE	NIGHT VENTING	FLOATING WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)	
JAN	0	744	0	0	744	744	0	0	0	-15.660	0.000	-15.660	0.000	-15.660	0.000	
FEB	0	670	0	2	672	672	0	0	2	-13.959	0.000	-13.959	0.000	-13.959	0.000	
MAR	0	680	0	64	744	744	0	0	64	-14.686	0.000	-14.686	0.000	-14.686	0.000	
APR	0	250	0	470	720	720	0	0	470	0.000	0.000	0.000	0.000	0.000	0.000	
MAY	0	0	0	744	360	744	0	0	360	0.000	0.000	0.000	0.000	0.000	0.000	
JUN	0	0	0	720	0	720	0	0	0	0.000	0.000	0.000	0.000	0.000	0.000	
JUL	0	0	0	744	0	744	0	0	0	0.000	0.000	0.000	0.000	0.000	0.000	
AUG	0	0	0	744	0	744	0	0	0	0.000	0.000	0.000	0.000	0.000	0.000	
SEP	0	0	0	720	0	720	0	0	0	0.000	0.000	0.000	0.000	0.000	0.000	
OCT	0	70	0	674	744	744	0	0	650	-8.919	0.000	-8.919	0.000	-8.919	0.000	
NOV	0	536	0	184	720	720	0	0	184	-14.610	0.000	-14.610	0.000	-14.610	0.000	
DEC	0	744	0	0	744	744	0	0	0	-16.786	0.000	-16.786	0.000	-16.786	0.000	
ANNUAL	0	3694	0	5066	8760	8760	0	0	1730							

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOB-2.1D 5/11/1995 16:54: 3 PDL RUN 1  
 DENVER, CO 80227 RUN #4 NIGHT INFILTRATION FOR BLDG. #6 POST CHAPEL  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY 25.708 42.530 28/ 9 23.180 42.530 3/ 8 25.230 42.189 31/20 22.257 42.189 17/ 8 27.347 107.601 22/11 36.030 122.057 19/11 42.452 122.727 24/11 42.531 126.058 21/11 30.074 116.587 5/11 22.752 49.081 1/18 23.916 42.189 30/20 25.671 42.530 13/ 8	NATURAL-GAS 133.165 308.832 28/ 6 103.638 295.821 3/ 6 85.981 252.719 3/ 6 28.392 173.989 5/ 6 5.254 109.447 5/ 6 0.000 0.000 30/ 1 0.000 0.000 31/ 1 0.000 0.000 31/ 1 0.000 0.000 30/ 1 23.296 165.917 20/ 8 67.838 225.499 2/ 6 122.386 294.457 14/ 8
JAN	TOTAL (MBTU) PEAK (KBTU) DY/HR	25.708 42.530 28/ 9	133.165 308.832 28/ 6
FEB	TOTAL (MBTU) PEAK (KBTU) DY/HR	23.180 42.530 3/ 8	103.638 295.821 3/ 6
MAR	TOTAL (MBTU) PEAK (KBTU) DY/HR	25.230 42.189 31/20	85.981 252.719 3/ 6
APR	TOTAL (MBTU) PEAK (KBTU) DY/HR	22.257 42.189 17/ 8	28.392 173.989 5/ 6
MAY	TOTAL (MBTU) PEAK (KBTU) DY/HR	27.347 107.601 22/11	5.254 109.447 5/ 6
JUN	TOTAL (MBTU) PEAK (KBTU) DY/HR	36.030 122.057 19/11	0.000 0.000 30/ 1
JUL	TOTAL (MBTU) PEAK (KBTU) DY/HR	42.452 122.727 24/11	0.000 0.000 31/ 1
AUG	TOTAL (MBTU) PEAK (KBTU) DY/HR	42.531 126.058 21/11	0.000 0.000 31/ 1
SEP	TOTAL (MBTU) PEAK (KBTU) DY/HR	30.074 116.587 5/11	0.000 0.000 30/ 1
OCT	TOTAL (MBTU) PEAK (KBTU) DY/HR	22.752 49.081 1/18	23.296 165.917 20/ 8
NOV	TOTAL (MBTU) PEAK (KBTU) DY/HR	23.916 42.189 30/20	67.838 225.499 2/ 6
DEC	TOTAL (MBTU) PEAK (KBTU) DY/HR	25.671 42.530 13/ 8	122.386 294.457 14/ 8
	ONE YEAR USE/PEAK	347.149 126.058	569.951 308.832

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/11/1995 16:54: 3 PDL RUN 1  
 DENVER, CO 80227 RUN #4 NIGHT INFILTRATION FOR BLDG. #6 POST CHAPEL  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE	ELECTRICITY	NATURAL-GAS
IN SITE MBTU -		
CATEGORY OF USE		
SPACE HEAT	21.11	569.95
SPACE COOL	74.47	0.00
HVAC AUX	145.73	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	105.85	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	0.00	0.00
TOTAL	347.16	569.95

TOTAL SITE ENERGY 917.10 MBTU 158.7 KBTU/SQFT-YR GROSS-AREA 158.7 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 1612.44 MBTU 279.0 KBTU/SQFT-YR GROSS-AREA 279.0 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 0.0  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.





INPUT SYSTEMS ..

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$-----$
$ E Z - D O E   S Y S T E M S   I N P U T $
$-----$

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\$ GENERAL PROJECT DATA

```

TITLE  LINE-1 *      EMC      ENGINEERS      INC.      *
        LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
        LINE-3 *      DENVER,      CO      80227      *

        LINE-4 *RUN #5 DAYTIME INFILTRATION FOR BLDG. #6*
        LINE-5 *POST CHAPEL      * ..

ABORT      ERRORS      ..
DIAGNOSTIC      WARNINGS ..
SYSTEMS-REPORT      VERIFICATION=(SV-A)
                        SUMMARY=(SS-A,SS-C,SS-K,SS-O)
                        HOURLY-DATA-SAVE = YES      ..


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\$ SCHEDULES

```

SD_ON      =DAY-SCHEDULE (1,24) (1.) ..
SD_OFF     =DAY-SCHEDULE (1,24) (0.) ..
SD_WT_HT   =DAY-SCHEDULE (1,24) (74.) ..
SD_SM_CL   =DAY-SCHEDULE (1,24) (72.) ..
SD_WT_CL   =DAY-SCHEDULE (1,24) (76.) ..
SD_SM_HT   =DAY-SCHEDULE (1,24) (70.) ..
SD_OA%     =DAY-SCHEDULE (1,5) (0.16)
                        (6,21) (0.)
                        (22,24) (0.16) ..

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SW_ON      =WEEK-SCHEDULE (ALL) SD_ON      ..
SW_OFF     =WEEK-SCHEDULE (ALL) SD_OFF     ..
SW_WT_HT   =WEEK-SCHEDULE (ALL) SD_WT_HT   ..
SW_SM_CL   =WEEK-SCHEDULE (ALL) SD_SM_CL   ..
SW_WT_CL   =WEEK-SCHEDULE (ALL) SD_WT_CL   ..
SW_SM_HT   =WEEK-SCHEDULE (ALL) SD_SM_HT   ..
SW_OA%     =WEEK-SCHEDULE (ALL) SD_OA%     ..

```

```

$ FULL ON SYSTEM
S_ON      =SCHEDULE THRU DEC 31 SW_ON      ..

```

```

$ FULL OFF SYSTEM
S_OFF     =SCHEDULE THRU DEC 31 SW_OFF     ..

```

\$ HEATING SEASON

S\_HE-SCHED =SCHEDULE THRU MAY 15 SW\_ON  
THRU OCT 1 SW\_OFF  
THRU DEC 31 SW\_ON ..

\$ COOLING SEASON

S\_CL\_SCHED =SCHEDULE THRU MAY 15 SW\_OFF  
THRU OCT 1 SW\_ON  
THRU DEC 31 SW\_OFF ..

\$ HEATING SET TEMP

S\_HT\_SET\_F =SCHEDULE THRU MAY 15 SW\_WT\_HT  
THRU OCT 1 SW\_SM\_HT  
THRU DEC 31 SW\_WT\_HT ..

\$ COOLING SET TEMP

S\_CL\_SET\_F =SCHEDULE THRU MAY 15 SW\_WT\_CL  
THRU OCT 1 SW\_SM\_CL  
THRU DEC 31 SW\_WT\_CL ..

S\_OA% =SCHEDULE THRU DEC 31 SW\_OA% ..

S\_HRLY-RPT =SCHEDULE THRU JAN 14 SW\_OFF  
THRU JAN 15 SW\_ON  
THRU AUG 20 SW\_OFF  
THRU AUG 21 SW\_ON  
THRU DEC 31 SW\_OFF ..

\$ ZONE DESCRIPTION

UP-STAIRS =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL ASSIGNED-CFM = 8000.  
SIZING-OPTION = FROM-LOADS ..

BASEMENT =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL  
BASEBOARD-CTRL = THERMOSTATIC  
SIZING-OPTION = FROM-LOADS ..

\$ SYSTEM DESCRIPTION

PACK-COOLU =SYSTEM SYSTEM-TYPE = PSZ  
MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
HEATING-SCHEDULE = S\_HE-SCHED  
COOLING-SCHEDULE = S\_CL\_SCHED OA-CONTROL = FIXED  
SUPPLY-CFM = 8000. RATED-CFM = 8000.  
MIN-AIR-SCH = S\_OA% SUPPLY-DELTA-T = 1.8  
SUPPLY-KW = 0.00059 NIGHT-CYCLE-CTRL = STAY-OFF  
NIGHT-VENT-DT = 0.0 COOLING-CAPACITY = 240000.  
COOL-SH-CAP = 180000. COOL-FT-MIN = 0.

HEATING-CAPACITY = -800000. CRANKCASE-MAX-T = 0.  
 OUTSIDE-FAN-T = 45. HEAT-SOURCE = HOT-WATER  
 BASEBOARD-SOURCE = HOT-WATER  
 SIZING-OPTION = COINCIDENT  
 ZONE-NAMES = (UP-STAIRS) ..

BB-RADIATN =SYSTEM SYSTEM-TYPE = FPH  
 HEATING-SCHEDULE = S\_HE-SCHED  
 ZONE-NAMES = (BASEMENT) ..

§ HOURLY REPORT DESCRIPTION

ZONE-UP-BK =REPORT-BLOCK VARIABLE-TYPE = UP-STAIRS  
 VARIABLE-LIST = (17,18,7,6) ..  
 ZONE-BS-BK =REPORT-BLOCK VARIABLE-TYPE = BASEMENT  
 VARIABLE-LIST = (17,18,7,6) ..  
 AHU-BLK =REPORT-BLOCK VARIABLE-TYPE = PACK-COOLU  
 VARIABLE-LIST = (3,5,6,17) ..  
 BB-BASE-BK =REPORT-BLOCK VARIABLE-TYPE = BB-RADIATN  
 VARIABLE-LIST = (7) ..  
 ZONES-HRLY = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (ZONE-UP-BK,ZONE-BS-BK)  
 ..  
 SYS-HRLY = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (AHU-BLK,BB-BASE-BK)  
 ..  
 END ..  
 COMPUTE SYSTEMS ..  
 INPUT PLANT ..

\$-----\$  
 \$ E Z - D O E P L A N T S I N P U T \$  
 \$-----\$

§ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
 LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
 LINE-3 \* DENVER, CO 80227 \*  
 LINE-4 \*RUN #5 DAYTIME INFILTRATION FOR BLDG. #6\*  
 LINE-5 \*POST CHAPEL \* ..

ABORT ERRORS ..  
 DIAGNOSTIC WARNINGS ..  
 PLANT-REPORT VERIFICATION=(PV-A)  
 SUMMARY=(PS-B,BEPS)  
 HOURLY-DATA-SAVE = YES ..

§ SCHEDULES

PD\_ON =DAY-SCHEDULE (1,24) (1.) ..

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC. DOE-2.1D 5/11/1995 16:59:14 SDL RUN 1  
 DENVER, CO 80227 RUN #5 DAYTIME INFILTRATION FOR BLDG. #6POST CHAPEL  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR TOPEKA, KS  
 PACK-COOLU

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-68.372	15	-8.F	-9.F	4833.	-225.819	7.709
FEB	0.00000				-51.462	3	0.F	-1.F	4361.	-201.794	7.709
MAR	0.00000				-41.278	3	15.F	13.F	4828.	-168.135	7.609
APR	0.00000				-13.526	1	32.F	29.F	4672.	-114.287	7.609
MAY	15.47526	22	11	76.F	-2.596	5	44.F	40.F	6328.	-66.043	29.836
JUN	38.22856	26	11	82.F	0.000				8494.	0.000	32.041
JUL	51.51688	24	11	82.F	0.000				9986.	0.000	32.253
AUG	49.07655	21	11	88.F	0.000				9920.	0.000	33.356
SEP	24.76225	5	11	78.F	0.000				7131.	0.000	30.604
OCT	0.03261	1	18	83.F	-11.183	20	25.F	25.F	4832.	-110.709	8.780
NOV	0.00000				-32.886	3	13.F	12.F	4672.	-151.900	7.609
DEC	0.00000				-61.681	15	3.F	2.F	4828.	-209.061	7.709
TOTAL	179.092				-282.985				74886.	-225.819	33.356
MAX											

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC. DOE-2.1D 5/11/1995 16:59:14 SDL RUN 1  
 DENVER, CO 80227 RUN #5 DAYTIME INFILTRATION FOR BLDG. #6POST CHAPEL  
 REPORT- SS-C SYSTEM MONTHLY LOADS SUMMARY FOR TOPEKA, KS  
 PACK-COOLU

MONTH	HOURS COOLING LOAD		HOURS COINCIDENT COOL-HEAT LOAD		HOURS HEATING LOAD		HOURS HEATING AVAIL.		HOURS COOLING AVAIL.		HOURS FANS ON CYCLE ON VENTING		HOURS FLOATING WHEN FANS ON		HEATING LOAD AT COOLING PEAK (KBTU/HR)		ELECTRIC LOAD AT COOLING PEAK (KW)	
	COOLING LOAD	HEATING LOAD	COOLING LOAD	HEATING LOAD	HEATING AVAIL.	COOLING AVAIL.	HEATING AVAIL.	COOLING AVAIL.	FANS ON	CYCLE ON	VENTING	FANS ON	FLOATING WHEN	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)			
JAN	0	741	0	0	744	0	744	0	0	0	0	3	-122.454	4.720				
FEB	0	667	0	0	672	0	672	0	0	0	0	5	-112.616	4.720				
MAR	0	733	0	0	744	0	744	0	0	0	0	11	-113.403	4.720				
APR	0	494	0	0	720	0	720	0	0	0	0	226	-24.124	4.720				
MAY	359	182	0	0	362	362	744	744	0	0	0	203	0.000	29.836				
JUN	695	0	0	0	697	720	720	744	0	0	0	25	0.000	31.934				
JUL	744	0	0	0	744	744	744	744	0	0	0	0	0.000	32.253				
AUG	744	0	0	0	744	744	744	744	0	0	0	0	0.000	33.356				
SEP	545	0	0	0	550	720	720	720	0	0	0	175	0.000	30.604				
OCT	4	486	0	0	4	720	744	744	0	0	0	254	0.000	8.780				
NOV	0	676	0	0	0	720	720	744	0	0	0	44	-127.211	4.720				
DEC	0	740	0	0	744	0	744	744	0	0	0	4	-134.176	4.720				
ANNUAL	3091	4719	0	0	3101	8760	5424	8760	0	0	0	950						

EMC ENGINEERS INC. DOE-2.1D 5/11/1995 16:59:14 SDL RUN 1  
 DENVER, CO 80227 RUN #5 DAYTIME INFILTRATION FOR BLDG. #6POST CHAPEL  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR BB-RADIATN TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING LOAD (KBTU/HR)	ELEC-TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000		0.000	7.0	-11.865	4	3	8.F	7.F	1316.	2.889
FEB	0.00000		0.000	11.F	-8.782	2	3	13.F	11.F	1189.	2.889
MAR	0.00000		0.000	13.F	-6.536	3	4	16.F	13.F	1316.	2.889
APR	0.00000		0.000	32.F	-1.436	1	3	36.F	32.F	1274.	2.889
MAY	0.00000		0.000		0.000					1316.	2.889
JUN	0.00000		0.000		0.000					1274.	2.889
JUL	0.00000		0.000		0.000					1316.	2.889
AUG	0.00000		0.000		0.000					1316.	2.889
SEP	0.00000		0.000		0.000					1274.	2.889
OCT	0.00000		0.000	40.F	-0.269	31	5	45.F	40.F	1316.	2.889
NOV	0.00000		0.000	26.F	-3.923	30	5	29.F	26.F	1274.	2.889
DEC	0.00000		0.000	7.F	-10.505	15	5	8.F	7.F	1316.	2.889
TOTAL	0.000		0.000		-43.315					15499.	
MAX											2.889

EMC ENGINEERS INC. DOE-2.1D 5/11/1995 16:59:14 SDL RUN 1  
 DENVER, CO 80227 RUN #5 DAYTIME INFILTRATION FOR BLDG. #6POST CHAPEL  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR BB-RADIATN TOPEKA, KS

MONTH	HOURS OF				HOURS				COINCIDENT LOADS				
	COOLING LOAD	HEATING LOAD	COOL-HEAT LOAD	FLOATING	HEATING AVAIL.	COOLING AVAIL.	FANS ON	NIGHT VENTING	FLOATING WHEN FANS ON	HEATING AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)	MAXIMUM HEATING LOAD (KBTU/HR)	MAXIMUM ELEC LOAD (KW)
JAN	0	744	0	0	744	744	744	0	0	0	-15.660	-34.457	2.889
FEB	0	670	0	2	672	672	672	0	0	2	-13.959	-28.572	2.889
MAR	0	680	0	64	744	744	744	0	0	64	-14.686	-27.845	2.889
APR	0	250	0	470	720	720	720	0	0	470	0.000	-15.543	2.889
MAY	0	0	0	744	360	744	360	0	0	360	0.000	0.000	2.889
JUN	0	0	0	720	0	720	0	0	0	0	0.000	0.000	2.889
JUL	0	0	0	744	0	744	0	0	0	0	0.000	0.000	2.889
AUG	0	0	0	744	0	744	0	0	0	0	0.000	0.000	2.889
SEP	0	0	0	720	0	744	0	0	0	0	0.000	0.000	2.889
OCT	0	70	0	674	720	744	720	0	0	650	-8.919	-12.874	2.889
NOV	0	536	0	184	720	720	720	0	0	184	-14.610	-18.718	2.889
DEC	0	744	0	0	744	744	744	0	0	0	-16.786	-29.776	2.889
ANNUAL	0	3694	0	5066	5424	8760	5424	0	0	1730		-34.457	2.889

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/11/1995 16:59:14 PDL RUN 1  
 DENVER, CO 80227 RUN #5 DAYTIME INFILTRATION FOR BLDG. #6POST CHAPEL  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY TOTAL (MBTU) PEAK (KBTU) DY/HR	NATURAL-GAS TOTAL (MBTU) PEAK (KBTU) DY/HR
JAN	25.666 42.715 28/9	25.666 42.715 28/9	115.828 317.809 15/3
FEB	23.038 42.715 3/8	23.038 42.715 3/8	89.934 290.749 3/4
MAR	24.765 42.373 31/10	24.765 42.373 31/10	73.714 256.792 3/5
APR	21.972 42.326 1/7	21.972 42.326 1/7	24.848 182.822 1/1
MAY	26.526 111.737 22/11	26.526 111.737 22/11	4.739 108.843 5/5
JUN	33.352 119.264 19/11	33.352 119.264 19/11	0.000 0.000 30/1
JUL	38.593 119.988 24/11	38.593 119.988 24/11	0.000 0.000 31/1
AUG	38.367 123.755 21/11	38.367 123.755 21/11	0.000 0.000 31/1
SEP	28.698 114.359 5/11	28.698 114.359 5/11	0.000 0.000 30/1
OCT	22.469 41.233 31/7	22.469 41.233 31/7	19.751 161.357 20/5
NOV	23.470 42.373 30/11	23.470 42.373 30/11	57.764 224.784 3/3
DEC	25.513 42.715 13/8	25.513 42.715 13/8	105.912 303.206 15/5
	ONE YEAR USE/PEAK	332.428 123.755	492.490 317.809

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/11/1995 16:59:14 PDL RUN 1  
 DENVER, CO 80227 RUN #5 DAYTIME INFILTRATION FOR BLDG. #6POST CHAPEL  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
IN SITE MBTU -		
SPACE HEAT	19.36	492.49
SPACE COOL	61.59	0.00
HVAC AUX	145.62	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	105.85	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	0.00	0.00
TOTAL	332.43	492.49

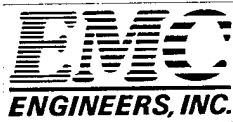
TOTAL SITE ENERGY 824.92 MBTU 142.7 KBTU/SQFT-YR GROSS-AREA 142.7 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 1490.77 MBTU 257.9 KBTU/SQFT-YR GROSS-AREA 257.9 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 0.0  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.





**COMPUTER ENERGY SIMULATIONS**

**BLDG. 7665  
CLINIC BUILDINGS**



DENVER - ATLANTA

PROJECT: FEASIBILITY STUDY FOR  
INSTALLATION OF UMCS  
LOCATION: FORT RILEY, KANSAS

EMC NO: 1406-001  
CALC. BY: AJN  
CHECKED BY: CEL  
DATE: 05-Jul-95

BUILDING NO.: 7665  
BLDG. TYPE: DENTAL CLINIC

**ENERGY CONSTANT CALCULATIONS**

	BASERUN	RUN1	RUN2	RUN3	RUN4	RUN5
HEATING (MBtu)	345.8	234.6	221.2	569.1	149.9	281.2
COOLING (KWH)	284,840	266,223	279,159	251,360	280,117	282,411

SUPPLY AIR FAN	20,280 CFM
FLOOR AREA	9,645 FT <sup>2</sup>
CFMI	608 CFM
UA	3089 BTU/HR-°F
BLDG CONSTR.	2 (1 FOR LIGHT) (2 FOR HEAVY)

EZDOE COMPUTER RUN DEFINITION:	
BASERUN	EXISTING OPERATION
RUN1	NIGHT SETBACK
RUN2	DDC CONTROL
RUN3	ECONOMIZER
RUN4	NIGHTTIME INFILTRATION (OA)
RUN5	DAYTIME INFILTRATION (OA)

HOURS OF OCCUPANCY			ANNUAL HEATING & COOLING HOURS	
M-F	800	1700	45 HR	HR. ON HEATING 1459 HR/YR
SAT.	0	0	0 HR	HR. ON COOLING 887 HR/YR
SUN.	0	0	0 HR	HR. OFF HEATING 3989 HR/YR
	TOTAL OCCUPY HR.		45 HR/WK	HR. OFF COOLING 2425 HR/YR
	TOTAL UNOCC. HR.		123 HR/WK	
	ANNUAL OCCUPY HR.		2346 HR/YR	
	ANNUAL UNOCC. HR.		6414 HR/YR	

PRESENT HR. OF OPERATION FOR SYS. WITH HEATING AND COOLING 8760 HR/YR  
 PRESENT HR. OF OPERATION FOR SYS. WITH HEATING ONLY 5448 HR/YR  
 PRESENT HR. OF OPERATION FOR SYS. WITH COOLING ONLY 3312 HR/YR  
 HRS SAVED (HTG ONLY) 5448 - 1459 = 3989 HR/YR  
 HRS SAVED (CLG ONLY) 3312 - 887 = 2425 HR/YR

HOAUHC	345.82 MBtu	-	149.92 MBtu	=	5.02E+01 Btu/CFM-HR
	608.4 CFM	x	6414 HR/YR	=	
HOAUH	345.82 MBtu	-	149.92 MBtu	=	8.07E+01 Btu/CFM-HR
	608.4 CFM	x	3989 HR/YR	=	
COAUHC	284,840.3 KWH	-	280,117.2 KWH	=	1.21E-03 KWH/CFM-HR
	608.4 CFM	x	6414 HR/YR	=	
COAUH	284,840.3 KWH	-	280,117.2 KWH	=	3.20E-03 KWH/CFM-HR
	608.4 CFM	x	2425 HR/YR	=	
HOAOHC	345.82 MBtu	-	281.22 MBtu	=	4.53E+01 Btu/CFM-HR
	608.4 CFM	x	2346 HR/YR	=	
HOAOH	345.82 MBtu	-	281.22 MBtu	=	7.28E+01 Btu/CFM-HR
	608.4 CFM	x	1459 HR/YR	=	
COAOHC	284,840.3 KWH	-	282,411.4 KWH	=	1.70E-03 KWH/CFM-HR
	608.4 CFM	x	2346 HR/YR	=	
COAOH	284,840.3 KWH	-	282,411.4 KWH	=	4.50E-03 KWH/CFM-HR
	608.4 CFM	x	887 HR/YR	=	
DC DUTY	1 / 6 (10 MINUTES PER HOUR)			=	0.17
DC DEMAND	1 / 6 (10 MINUTES PER HOUR)			=	0.17
ECC	266,223.3 KWH	-	251,359.5 KWH	=	8.26E-04 KWH/CFM-HR
	20280 CFM	x	887 HR/YR	=	
ECHC	266,223.3 KWH	-	251,359.5 KWH	=	3.12E-04 KWH/CFM-HR
	20280 CFM	x	2346 HR/YR	=	
NSUCHC	284,840.3 KWH	-	266,223.3 KWH	=	1.43E-04 KWH/CFM-HR
	20280 CFM	x	6414 HR/YR	=	
NSUCC	284,840.3 KWH	-	266,223.3 KWH	=	3.79E-04 KWH/CFM-HR
	20280 CFM	x	2425 HR/YR	=	
DDCCHC	284,840.3 KWH	-	279,159.1 KWH	=	1.19E-04 KWH/CFM-HR
	20280 CFM	x	2346 HR/YR	=	
DDCCC	284,840.3 KWH	-	279,159.1 KWH	=	3.16E-04 KWH/CFM-HR
	20280 CFM	x	887 HR/YR	=	
NSC	345.82 MBtu	-	234.55 MBtu	=	3.60E+04 Btu/UA
	3088.631 UA			=	
DDCH	345.82 MBtu	-	221.22 MBtu	=	4.03E+04 Btu/UA
	3088.631 UA			=	
OPT	(2 HR/DAY X 240 DAY/YR)		175 HR/YR	=	305 HR/YR
CHWR	(1.10 kW X 0.012 Eff. X 664 HRS X 2 Degrees of Reset)			=	17.5 KWH/TON
OAR	567 HR/YR	x	0.01	=	5.67 HR/YR



INPUT LOADS ..

```

$-----$
$ EZ - DOE LOADS INPUT $
$-----$

```

\$ GENERAL PROJECT DATA

```

TITLE LINE-1 *   EMC      ENGINEERS    INC.    *
LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
LINE-3 *   DENVER,      CO      80227    *

LINE-4 *BASELINE SIMULATION FOR BLDG.#7665    *
LINE-5 *DENTAL CLINIC                          * ..

```

```

ABORT          ERRORS ..
DIAGNOSTIC     WARNINGS ...
LOADS-REPORT   VERIFICATION=(LV-D)
               SUMMARY=(LS-C,LS-D)
               HOURLY-DATA-SAVE = YES ..
BUILDING-LOCATION LATITUDE = 39.0
                LONGITUDE = 96.5
                ALTITUDE = 1065.
                TIME-ZONE = 6
                GROSS-AREA = 9660
                SHIELDING-COEF = 0.29
                X-REF = 0.0
                Y-REF = 0.0 ..
RUN-PERIOD     JAN 1 1994 THRU DEC 31 1994 ..

```

\$ SCHEDULES

LD\_OFF =DAY-SCHEDULE (1,24) (0.) ..

LD\_FULL\_ON =DAY-SCHEDULE (1,24) (1.) ..

```

LD_7545M-F =DAY-SCHEDULE (1,6) (0.)
                (7) (0.5)
                (8,16) (1.)
                (17) (0.5)
                (18,24) (0.) ..

```

LW\_OFF =WEEK-SCHEDULE (ALL) LD\_OFF ..

LW\_FULL\_ON =WEEK-SCHEDULE (ALL) LD\_FULL\_ON ..

```

LW_7545M-F =WEEK-SCHEDULE (WD) LD_7545M-F
                (WEH) LD_OFF ..

```

L\_FULL-OFF =SCHEDULE THRU DEC 31 LW\_OFF ..

L\_FULL\_ON =SCHEDULE THRU DEC 31 LW\_FULL\_ON ..

\$ M-F\_7:30-4:30

L\_M-F7545 =SCHEDULE THRU DEC 31 LW\_7545M-F ..

\$ CONSTRUCTION TYPES

\$ BUILT UP ROOF ON METAL DECKING

ROOF-1 =CONSTRUCTION LAYERS = ASHR-17  
 ABSORPTANCE = 0.500  
 ROUGHNESS = 1 ..

\$ EXTERIOR WALL CONSTRUCTION

WALL-1 =LAYERS MATERIAL=(CM03,AL11,PW05,IN23,GP02) I-F-R= 0.6100  
 THICKNESS=(0.083,0.000,0.063,0.167,0.052) ..  
 EXWALL-1 =CONSTRUCTION LAYERS = WALL-1  
 ROUGHNESS = 2 ..

\$ INTERIOR WALL CONSTRUCTION

IW\_LAYER =LAYERS MATERIAL=(GP01,WD01,AL21,GP01)  
 THICKNESS=(0.042,0.063,0.000,0.042) ..  
 INWALL =CONSTRUCTION LAYERS = IW\_LAYER  
 ROUGHNESS = 5 ..

\$ DOOR CONSTRUCTION

DOORCON =CONSTRUCTION U-VALUE = 0.400 ..

\$ SLAB FLOOR

FLOOR =CONSTRUCTION U-VALUE = 0.020  
 ABSORPTANCE = 0.750  
 ROUGHNESS = 5 ..

\$ HEAVY CONCRETE WALL

VAULT =CONSTRUCTION LAYERS = ASHI-21 ..

\$ BUILT UP ROOF W/OUT DROP CEILING

ASHR-17A =LAYERS MATERIAL=(HF-E2, HF-E3, HF-B6, HF-A3)  
 THICKNESS=(0.042,0.031,0.167,0.005) ..  
 ROOF-2 =CONSTRUCTION LAYERS = ASHR-17A  
 ABSORPTANCE = 0.500  
 ROUGHNESS = 1 ..

\$ BUILT UP ROOF W/ INSUL ON DROP CL

ASHR-17B =LAYERS MATERIAL=(HF-E2, HF-E3, HF-A3, HF-E4, IN01, HF-E5)  
 THICKNESS=(0.042,0.031,0.005,0.000,0.188,0.063) ..  
 ROOF-3 =CONSTRUCTION LAYERS = ASHR-17B  
 ABSORPTANCE = 0.850  
 ROUGHNESS = 1 ..

\$ EXTERIOR WALL CONSTRUCTION TYPE-2

WALL-2 =LAYERS MATERIAL=(BK01,AL11,CB06,AL11,GP01) I-F-R= 0.6100

```

THICKNESS=(0.333,0.000,0.500,0.000,0.042) ..
EXWALL-2 =CONSTRUCTION  LAYERS = WALL-2
                        ABSORPTANCE = 0.880
                        ROUGHNESS = 2 ..

1_PN_STD =GLASS-TYPE   GLASS-TYPE-CODE = 1
                        PANES = 1 ..
GTYPE_2  =GLASS-TYPE   SHADING-COEF = 0.300
                        PANES = 1
                        GLASS-CONDUCTANCE = 0.790 ..
GTYPE_3  =GLASS-TYPE   SHADING-COEF = 0.400
                        PANES = 1
                        GLASS-CONDUCTANCE = 0.360 ..
2_PN_STD =GLASS-TYPE   GLASS-TYPE-CODE = 1
                        PANES = 2 ..

```

\$ SPACE DESCRIPTION

```

SPACE_1  =SPACE  AREA = 2295.0  VOLUME = 18360.0
              TEMPERATURE = (73.)  ZONE-TYPE = CONDITIONED
              PEOPLE-SCHEDULE = L_M-F7545  AREA/PERSON = 420.0
              PEOPLE-HG-LAT = 625.0  PEOPLE-HG-SENS = 375.0
              LIGHTING-TYPE = SUS-FLUOR  LIGHTING-KW = 9.73
              LIGHT-TO-SPACE = 1.0  LIGHTING-SCHEDULE = L_M-F7545
              EQUIP-SCHEDULE = L_M-F7545  EQUIPMENT-W/SQFT = 1.8
              FURN-WEIGHT = 1.  INF-METHOD = NONE ..

E-W  HEIGHT = 8.0  WIDTH = 168.0  CONS = EXWALL-2
      AZIMUTH = 295 ..

WINDOW HEIGHT = 4.0  WIDTH = 6.0  G-T = 2_PN_STD
MULTIPLIER = 13.0  SETBACK = 0.3
SHADING-DIVISION = 8  OVERHANG-A = 4.
OVERHANG-B = 2.  OVERHANG-W = 14.  OVERHANG-D = 1.5 ..

U-W  HEIGHT = 153.0  WIDTH = 15.0  CONS = FLOOR ..

ROOF  HEIGHT = 153.0  WIDTH = 15.0  CONS = ROOF-3
      TILT = 0 ..

SPACE_2  =SPACE  AREA = 2295.0  VOLUME = 18360.0
              TEMPERATURE = (73.)  ZONE-TYPE = CONDITIONED
              PEOPLE-SCHEDULE = L_M-F7545  AREA/PERSON = 420.0
              PEOPLE-HG-LAT = 625.0  PEOPLE-HG-SENS = 375.0
              LIGHTING-TYPE = SUS-FLUOR  LIGHTING-KW = 9.76
              LIGHT-TO-SPACE = 1.0  LIGHTING-SCHEDULE = L_M-F7545
              EQUIP-SCHEDULE = L_M-F7545  EQUIPMENT-W/SQFT = 1.8
              FURN-WEIGHT = 1.  INF-METHOD = NONE ..

E-W  HEIGHT = 8.0  WIDTH = 168.0  CONS = EXWALL-2
      AZIMUTH = 115 ..

```

WINDOW HEIGHT = 4.0 WIDTH = 3.3 G-T = 2\_PN\_STD  
MULTIPLIER = 15.0 SETBACK = 0.3  
SHADING-DIVISION = 8 OVERHANG-A = 4.  
OVERHANG-B = 2. OVERHANG-W = 11.3  
OVERHANG-D = 1.5 ..

U-W HEIGHT = 153.0 WIDTH = 15.0 CONS = FLOOR ..

ROOF HEIGHT = 153.0 WIDTH = 15.0 CONS = ROOF-3  
TILT = 0 ..

SPACE\_3 =SPACE AREA = 630.0 VOLUME = 5104.0  
TEMPERATURE = (73.) ZONE-TYPE = CONDITIONED  
PEOPLE-SCHEDULE = L\_M-F7545 AREA/PERSON = 420.0  
PEOPLE-HG-LAT = 625.0 PEOPLE-HG-SENS = 375.0  
LIGHTING-TYPE = SUS-FLUOR LIGHTING-KW = 2.65  
LIGHT-TO-SPACE = 1.0 LIGHTING-SCHEDULE = L\_M-F7545  
EQUIP-SCHEDULE = L\_M-F7545 EQUIPMENT-W/SQFT = 0.36  
FURN-WEIGHT = 1. INF-METHOD = NONE ..

E-W HEIGHT = 8.0 WIDTH = 57.5 CONS = EXWALL-2  
AZIMUTH = 25 ..

WINDOW HEIGHT = 4.0 WIDTH = 3.3 G-T = 2\_PN\_STD  
MULTIPLIER = 3.0 SETBACK = 0.3  
SHADING-DIVISION = 8 OVERHANG-A = 4.  
OVERHANG-B = 2. OVERHANG-W = 11.3  
OVERHANG-D = 1.5 ..

U-W HEIGHT = 42.5 WIDTH = 15.0 CONS = FLOOR ..

ROOF HEIGHT = 42.5 WIDTH = 15.0 CONS = ROOF-3  
TILT = 0 ..

SPACE\_4 =SPACE AREA = 630.0 VOLUME = 5104.0  
TEMPERATURE = (73.) ZONE-TYPE = CONDITIONED  
PEOPLE-SCHEDULE = L\_M-F7545 AREA/PERSON = 420.0  
PEOPLE-HG-LAT = 625.0 PEOPLE-HG-SENS = 375.0  
LIGHTING-TYPE = SUS-FLUOR LIGHTING-KW = 2.36  
LIGHT-TO-SPACE = 1.0 LIGHTING-SCHEDULE = L\_M-F7545  
EQUIP-SCHEDULE = L\_M-F7545 EQUIPMENT-W/SQFT = 0.36  
FURN-WEIGHT = 1. INF-METHOD = NONE ..

E-W HEIGHT = 8.0 WIDTH = 57.5 CONS = EXWALL-2  
AZIMUTH = 205 ..

WINDOW HEIGHT = 6.5 WIDTH = 4.0 G-T = 2\_PN\_STD  
MULTIPLIER = 3.0 SETBACK = 0.3  
SHADING-DIVISION = 8 OVERHANG-A = 4.  
OVERHANG-B = 2. OVERHANG-W = 12. OVERHANG-D = 1.5 ..

U-W HEIGHT = 42.5 WIDTH = 15.0 CONS = FLOOR ..

ROOF HEIGHT = 42.5 WIDTH = 15.0 CONS = ROOF-3



TILT = 0 ..

SPACE\_5 =SPACE AREA = 3795.0 VOLUME = 30360.0  
 TEMPERATURE = (73.) ZONE-TYPE = CONDITIONED  
 PEOPLE-SCHEDULE = L\_M-F7545 AREA/PERSON = 420.0  
 PEOPLE-HG-LAT = 625.0 PEOPLE-HG-SENS = 375.0  
 LIGHTING-TYPE = SUS-FLUOR LIGHTING-KW = 11.64  
 LIGHT-TO-SPACE = 1.0 LIGHTING-SCHEDULE = L\_M-F7545  
 EQUIP-SCHEDULE = L\_M-F7545 EQUIPMENT-W/SQFT = 0.36  
 FURN-WEIGHT = 1. INF-METHOD = NONE ..

ROOF HEIGHT = 138.0 WIDTH = 27.5 CONS = ROOF-3  
 TILT = 0 ..

U-W HEIGHT = 138.0 WIDTH = 27.5 CONS = FLOOR ..

PLENUM\_6 =SPACE AREA = 9660.0 VOLUME = 28980.0  
 TEMPERATURE = (73.) ZONE-TYPE = PLENUM  
 PEOPLE-SCHEDULE = L\_FULL-OFF AREA/PERSON = 420.0  
 PEOPLE-HG-LAT = 625.0 PEOPLE-HG-SENS = 375.0  
 LIGHTING-TYPE = SUS-FLUOR LIGHT-TO-SPACE = 1.0  
 LIGHTING-SCHEDULE = L\_FULL-OFF  
 EQUIP-SCHEDULE = L\_FULL-OFF FLOOR-WEIGHT = 0.3  
 INF-METHOD = NONE ..

E-W HEIGHT = 3.0 WIDTH = 168.0 CONS = EXWALL-2  
 AZIMUTH = 295 ..

E-W HEIGHT = 3.0 WIDTH = 168.0 CONS = EXWALL-2  
 AZIMUTH = 115 ..

E-W HEIGHT = 3.0 WIDTH = 57.5 CONS = EXWALL-2  
 AZIMUTH = 205 ..

E-W HEIGHT = 3.0 WIDTH = 57.5 CONS = EXWALL-2  
 AZIMUTH = 25 ..

ROOF HEIGHT = 57.5 WIDTH = 168.0 CONS = ROOF-3  
 TILT = 0 ..

END ..  
 COMPUTE LOADS ..  
 INPUT SYSTEMS ..

-----\$  
 \$ E Z - D O E S Y S T E M S I N P U T \$  
 -----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*

LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
LINE-3 \* DENVER, CO 80227 \*

LINE-4 \*BASELINE SIMULATION FOR BLDG.#7665 \*  
LINE-5 \*DENTAL CLINIC \* ..

ABORT ERRORS ..  
DIAGNOSTIC WARNINGS ..  
SYSTEMS-REPORT VERIFICATION=(SV-A)  
SUMMARY=(SS-A,SS-C,SS-K,SS-O)  
HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

SD\_FULL =DAY-SCHEDULE (1,24) (1.) ..  
SD\_WT\_HT =DAY-SCHEDULE (1,24) (74.) ..  
SD\_SM\_CL =DAY-SCHEDULE (1,24) (72.) ..  
SD\_OA% =DAY-SCHEDULE (1,24) (0.03) ..  
SD\_OFF =DAY-SCHEDULE (1,24) (0.) ..  
SD\_WT\_CL =DAY-SCHEDULE (1,24) (74.2) ..  
SD\_SM\_HT =DAY-SCHEDULE (1,24) (71.8) ..  
SD\_OA\_% =DAY-SCHEDULE (1,24) (0.03) ..

SW\_FULL\_ON =WEEK-SCHEDULE (ALL) SD\_FULL ..

SW\_WT\_HT =WEEK-SCHEDULE (ALL) SD\_WT\_HT ..

SW\_SM\_CL =WEEK-SCHEDULE (ALL) SD\_SM\_CL ..

SW\_OA% =WEEK-SCHEDULE (ALL) SD\_OA% ..

SW\_off =WEEK-SCHEDULE (ALL) SD\_OFF ..

SW\_WT\_CL =WEEK-SCHEDULE (ALL) SD\_WT\_CL ..

SW\_SM\_HT =WEEK-SCHEDULE (ALL) SD\_SM\_HT ..

S\_FULL\_ON =SCHEDULE THRU DEC 31 SW\_FULL\_ON ..

S\_FULL\_OFF =SCHEDULE THRU DEC 31 SW\_off ..

\$ HEATING SET TEMP

S\_HEAT\_F =SCHEDULE THRU MAY 15 SW\_WT\_HT  
THRU OCT 1 SW\_SM\_HT  
THRU DEC 31 SW\_WT\_HT ..

S\_OTSIDAIR =SCHEDULE THRU DEC 31 SW\_OA% ..

S\_HE\_SCHED =SCHEDULE THRU MAY 15 SW\_FULL\_ON  
THRU OCT 1 SW\_off  
THRU DEC 31 SW\_FULL\_ON ..

S\_CL\_SCHED =SCHEDULE THRU MAY 15 SW\_off  
THRU OCT 1 SW\_FULL\_ON  
THRU DEC 31 SW\_off ..

## \$ COOLING SET TEMP

S\_COOL\_F =SCHEDULE THRU MAY 15 SW\_WT\_CL  
 THRU OCT 1 SW\_SM\_CL  
 THRU DEC 31 SW\_WT\_CL ..

S\_HRLY-RPT =SCHEDULE THRU JAN 14 SW\_off  
 THRU JAN 15 SW\_FULL\_ON  
 THRU AUG 11 SW\_off  
 THRU AUG 12 SW\_FULL\_ON  
 THRU DEC 31 SW\_off ..

## \$ ZONE DESCRIPTION

SPACE\_1 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HEAT\_F COOL-TEMP-SCH = S\_COOL\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
 SIZING-OPTION = FROM-LOADS ..

SPACE\_2 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HEAT\_F COOL-TEMP-SCH = S\_COOL\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
 SIZING-OPTION = FROM-LOADS ..

SPACE\_3 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HEAT\_F COOL-TEMP-SCH = S\_COOL\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
 SIZING-OPTION = FROM-LOADS ..

SPACE\_4 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HEAT\_F COOL-TEMP-SCH = S\_COOL\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
 SIZING-OPTION = FROM-LOADS ..

SPACE\_5 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HEAT\_F COOL-TEMP-SCH = S\_COOL\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
 SIZING-OPTION = FROM-LOADS ..

PLENUM\_6 =ZONE DESIGN-HEAT-T = 72.0 DESIGN-COOL-T = 74.0  
 ZONE-TYPE = PLENUM SIZING-OPTION = FROM-LOADS ..

## \$ SYSTEM DESCRIPTION

MZ\_W/DX =SYSTEM SYSTEM-TYPE = PMZS  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_HE\_SCHD  
 COOLING-SCHEDULE = S\_CL\_SCHD MAX-HUMIDITY = 60.0  
 MIN-HUMIDITY = 50.0 OA-CONTROL = FIXED

SUPPLY-CFM = 19500. RATED-CFM = 19500.  
 MIN-AIR-SCH = S\_OTSIDAIR FAN-SCHEDULE = S\_FULL\_ON  
 SUPPLY-DELTA-T = 2.1 SUPPLY-KW = 0.00069  
 NIGHT-CYCLE-CTRL = STAY-OFF MIN-CFM-RATIO = 1.0  
 COOLING-CAPACITY = 664700.  
 HEATING-CAPACITY = -450000. CRANKCASE-HEAT = 3.73  
 CRANKCASE-MAX-T = 0. OUTSIDE-FAN-T = 45.  
 HEAT-SOURCE = HOT-WATER HUMIDIFIER-TYPE = HOT-WATER  
 ZONE-NAMES = (SPACE\_1, SPACE\_2, SPACE\_3, SPACE\_4,  
 SPACE\_5, PLENUM\_6) ..

\$ HOURLY REPORT DESCRIPTION

AUH-BLK =REPORT-BLOCK VARIABLE-TYPE = MZ\_W/DX  
 VARIABLE-LIST = (3,5,6,17) ..  
 S\_ZON-BLK =REPORT-BLOCK VARIABLE-TYPE = SPACE\_4  
 VARIABLE-LIST = (17,18,7,6) ..  
 N\_ZON-BLK =REPORT-BLOCK VARIABLE-TYPE = SPACE\_3  
 VARIABLE-LIST = (17,18,7,6) ..  
 AHU-HRLY = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (AUH-BLK)  
 ..  
 ZONES-HRLY = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (S\_ZON-BLK,N\_ZON-BLK)  
 ..  
 END ..  
 COMPUTE SYSTEMS ..  
 INPUT PLANT ..

\$-----\$  
 \$ E Z - D O E P L A N T S I N P U T \$  
 \$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
 LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
 LINE-3 \* DENVER, CO 80227 \*  
 LINE-4 \*BASELINE SIMULATION FOR BLDG.#7665 \*  
 LINE-5 \*DENTAL CLINIC \* ..

ABORT ERRORS ..  
 DIAGNOSTIC WARNINGS ..  
 PLANT-REPORT VERIFICATION=(PV-A)  
 SUMMARY=(PS-B,BEPS)  
 HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

PD\_heaton =DAY-SCHEDULE (1,24) (1.) ..  
 Pd\_heatoff =DAY-SCHEDULE (1,24) (0.) ..

PD\_coolon =DAY-SCHEDULE (1,24) (1.) ..

PD\_cooloff =DAY-SCHEDULE (1,24) (0.) ..

PW\_heaton =WEEK-SCHEDULE (ALL) PD\_heaton ..

PW\_heatoff =WEEK-SCHEDULE (ALL) Pd\_heatoff ..

Pw\_coolon =WEEK-SCHEDULE (ALL) PD\_coolon ..

Pw\_cooloff =WEEK-SCHEDULE (ALL) PD\_cooloff ..

PHeat =SCHEDULE THRU MAY 15 PW\_heaton  
THRU OCT 1 PW\_heatoff  
THRU DEC 31 PW\_heaton ..

PCool =SCHEDULE THRU MAY 15 Pw\_cooloff  
THRU OCT 1 Pw\_coolon  
THRU DEC 31 Pw\_cooloff ..

#### \$ EQUIPMENT DESCRIPTION

STM-PLANT =PLANT-EQUIPMENT TYPE = STM-BOILER  
SIZE = -999. ..

COOL-PLANT =PLANT-EQUIPMENT TYPE = HERM-REC-CHLR  
SIZE = -999. INSTALLED-NUMBER = 2  
MAX-NUMBER-AVAIL = 2 ..

PLANT-PARAMETERS BOILER-FUEL = NATURAL-GAS STM-BOILER-HIR = 1.33  
HW-BOILER-HIR = 1.0 TWR-WTR-SET-POINT = 85.  
TWR-PUMP-HEAD = 45. TWR-FAN-LOW-CFM = 1.0  
TWR-DESIGN-WETBULB = 77. CHILL-WTR-T = 45.  
CCIRC-MOTOR-EFF = 0.75 CCIRC-HEAD = 0.0  
HCIRC-MOTOR-EFF = 0.75 HCIRC-HEAD = 0.0  
HCIRC-DESIGN-T-DROP = 20.0 ..

PART-LOAD-RATIO TYPE = STM-BOILER  
MIN-RATIO = 0.2500 MAX-RATIO = 1.0000  
OPERATING-RATIO = 1.0000 ELEC-INPUT-RATIO = 0.0220 ..

PART-LOAD-RATIO TYPE = COOLING-TWR  
ELEC-INPUT-RATIO = 0.0191 ..

ENERGY-RESOURCE RESOURCE = ELECTRICITY ..  
ENERGY-RESOURCE RESOURCE = NATURAL-GAS ..

HEAT =LOAD-ASSIGNMENT TYPE = HEATING  
OPERATION-MODE = RUN-NEEDED

LOAD-RANGE = 0.000  
PLANT-EQUIPMENT = STM-PLANT  
NUMBER = 1 ..

COOL =LOAD-ASSIGNMENT TYPE = COOLING  
OPERATION-MODE = RUN-NEEDED

LOAD-RANGE = 0.000  
PLANT-EQUIPMENT = COOL-PLANT  
NUMBER = 2 ..

END ..  
COMPUTE PLANT ..  
STOP ..

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/22/1995 8:42:27 LDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG.#7665 DENTAL CLINIC  
 REPORT- LV-D DETAILS OF EXTERIOR SURFACES IN THE PROJECT TOPEKA, KS

NUMBER OF EXTERIOR SURFACES 14 RECTANGULAR 14 OTHER 0  
 (U-VALUE INCLUDES INSIDE AIR FILM PLUS OUTSIDE AIR FILM AT 7.5 MPH WINDSPEED )

SURFACE	SPACE	U-VALUE (BTU/HR-SQFT-F)	GLASS AREA (SQFT)	U-VALUE (BTU/HR-SQFT-F)	WALL AREA (SQFT)	U-VALUE (BTU/HR-SQFT-F)	WALL + GLASS AREA (SQFT)	U-VALUE (BTU/HR-SQFT-F)	GLASS+OPAQUE AREA (SQFT)	AZIMUTH
SPACE 3		0.490	39.60	0.209	420.40	0.233	460.00	0.209	460.00	NORTH
PLENUM 6		0.000	0.00	0.209	172.50	0.209	172.50	0.209	172.50	NORTH
PLENUM 6		0.000	0.00	0.209	504.00	0.209	504.00	0.251	504.00	EAST
SPACE 2		0.490	198.00	0.209	1146.00	0.209	1344.00	0.209	1344.00	EAST
PLENUM 6		0.000	0.00	0.209	382.00	0.209	382.00	0.209	382.00	SOUTH
SPACE 4		0.490	78.00	0.209	504.00	0.209	504.00	0.209	504.00	SOUTH
PLENUM 6		0.000	0.00	0.209	1032.00	0.274	1344.00	0.209	1344.00	WEST
SPACE 1		0.490	312.00	0.087	3795.00	0.087	3795.00	0.087	3795.00	WEST
SPACE 5		0.000	0.00	0.087	2295.00	0.087	2295.00	0.087	2295.00	ROOF
SPACE 1		0.000	0.00	0.087	637.50	0.087	637.50	0.087	637.50	ROOF
SPACE 3		0.000	0.00	0.087	2295.00	0.087	2295.00	0.087	2295.00	ROOF
SPACE 2		0.000	0.00	0.087	637.50	0.087	637.50	0.087	637.50	ROOF
SPACE 4		0.000	0.00	0.087	2295.00	0.087	2295.00	0.087	2295.00	ROOF
SPACE 4		0.000	0.00	0.087	637.50	0.087	637.50	0.087	637.50	ROOF
PLENUM 6		0.000	0.00	0.020	9660.00	0.020	9660.00	0.020	9660.00	ROOF
SPACE 1		0.000	0.00	0.020	2295.00	0.020	2295.00	0.020	2295.00	UNDERGRND
SPACE 2		0.000	0.00	0.020	2295.00	0.020	2295.00	0.020	2295.00	UNDERGRND
SPACE 3		0.000	0.00	0.020	637.50	0.020	637.50	0.020	637.50	UNDERGRND
SPACE 4		0.000	0.00	0.020	637.50	0.020	637.50	0.020	637.50	UNDERGRND
SPACE 5		0.000	0.00	0.020	3795.00	0.020	3795.00	0.020	3795.00	UNDERGRND

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/22/1995 8:42:27 LDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG.#7665 DENTAL CLINIC  
 REPORT- LV-D DETAILS OF EXTERIOR SURFACES IN THE PROJECT TOPEKA, KS

	AVERAGE U-VALUE (BTU/HR-SQFT-F)	AVERAGE WALLS (BTU/HR-SQFT-F)	AVERAGE WALLS+GLASS (BTU/HR-SQFT-F)	GLASS AREA (SQFT)	OPAQUE AREA (SQFT)	GLASS+OPAQUE AREA (SQFT)
NORTH	0.490	0.209	0.227	39.60	592.90	632.50
EAST	0.490	0.209	0.239	198.00	1650.00	1848.00
SOUTH	0.490	0.209	0.244	78.00	554.50	632.50
WEST	0.490	0.209	0.257	312.00	1536.00	1848.00
ROOF	0.000	0.087	0.087	0.00	19320.00	19320.00
ALL WALLS	0.490	0.209	0.245	627.60	4333.40	4961.00
WALLS+ROOFS	0.490	0.109	0.119	627.60	23653.40	24281.00
UNDERGRND	0.000	0.020	0.020	0.00	9660.00	9660.00
BUILDING	0.490	0.083	0.091	627.60	33313.40	33941.00

\*\*\* BUILDING \*\*\*

FLOOR AREA 9645 SQFT 896 SQMT  
 VOLUME 106268 CUFT 3010 CUMT

COOLING LOAD  
 =====  
 TIME AUG 11 4PM  
 DRY-BULB TEMP 100F 38C  
 WET-BULB TEMP 71F 22C

	SENSIBLE (KBTU/H) ( KW )		LATENT (KBTU/H) ( KW )		HEATING LOAD	
					JAN 15 8AM	
WALLS	8.794	2.576	0.000	0.000	-46.897	-13.735
ROOFS	44.911	13.153	0.000	0.000	-71.534	-20.950
GLASS CONDUCTION	7.254	2.124	0.000	0.000	-24.039	-7.040
GLASS SOLAR	23.372	6.845	0.000	0.000	0.990	0.290
DOOR	0.000	0.000	0.000	0.000	0.000	0.000
INTERNAL SURFACES	0.000	0.000	0.000	0.000	0.000	0.000
UNDERGROUND SURFACES	-0.914	-0.268	0.000	0.000	-5.547	-1.625
OCCUPANTS TO SPACE	7.862	2.303	14.353	4.204	0.285	0.083
LIGHT TO SPACE	107.528	31.492	0.000	0.000	6.010	1.760
EQUIPMENT TO SPACE	31.414	9.200	0.000	0.000	1.138	0.333
PROCESS TO SPACE	0.000	0.000	0.000	0.000	0.000	0.000
INFILTRATION	0.000	0.000	0.000	0.000	0.000	0.000
TOTAL	230.221	67.426	14.353	4.204	-139.593	-40.883
TOTAL LOAD	244.573	KBTU/H	71.629	KW	-139.593	KBTU/H
TOTAL LOAD / AREA	25.36	BTU/H.SQFT	79.939	W /SQMT	14.473	BTU/H.SQFT
						45.626
						W /SQMT

\*\*\*\*\*  
 \* NOTE 1) THE ABOVE LOADS EXCLUDE OUTSIDE VENTILATION AIR \*  
 \* ---- LOADS \*  
 \* 2) TIMES GIVEN IN STANDARD TIME FOR THE LOCATION \*  
 \* IN CONSIDERATION \*  
 \*\*\*\*\*



EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/22/1995 8:42:27 SDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG.#7665 DENTAL CLINIC  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR MZ\_W/DX TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC- TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-38.011	15	8	-6.F	-7.F	19885.	63.387
FEB	0.00000				-23.798	3	6	-1.F	-2.F	17843.	63.387
MAR	0.00000				-22.495	6	7	19.F	18.F	20637.	59.657
APR	0.00000				-26.800	22	18	67.F	52.F	19390.	59.657
MAY	48.22987	16	4	60.F	-16.357	13	18	80.F	66.F	24412.	95.141
JUN	98.47421	28	16	90.F	0.000					29769.	92.743
JUL	109.91195	13	16	93.F	0.000					30552.	95.026
AUG	113.19754	22	16	96.F	0.000					32646.	97.691
SEP	78.58515	7	16	93.F	0.000					27234.	93.694
OCT	0.96727	1	18	83.F	-24.237	6	18	67.F	52.F	19352.	59.657
NOV	0.00000				-19.656	13	6	25.F	24.F	18928.	59.657
DEC	0.00000				-30.216	12	6	3.F	2.F	19717.	63.387
TOTAL	449.366				-201.571					280366.	97.691
MAX									-168.369		

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/22/1995 8:42:27 SDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG.#7665 DENTAL CLINIC  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR MZ\_W/DX TOPEKA, KS

MONTH	HOURS OF				HOURS OF				COINCIDENT LOADS				
	COOLING LOAD	HEATING LOAD	COOL-HEAT LOAD	FLOATING	HEATING AVAIL.	COOLING AVAIL.	FANS ON	FANS ON	HEATING LOAD AT PEAK (KBTU/HR)	ELECTRIC LOAD AT PEAK (KW)	COOLING PEAK (KW)	FANS ON	FANS ON
JAN	0	744	0	0	744	0	744	0	0	-29.292	13.455	0	0
FEB	0	672	0	0	672	0	672	0	0	-26.311	13.455	0	0
MAR	0	744	0	0	744	0	744	0	0	-33.254	13.455	0	0
APR	0	720	0	0	720	0	720	0	0	-49.273	13.455	0	0
MAY	384	360	0	0	360	384	744	0	0	0.000	53.245	0	0
JUN	720	0	0	0	720	720	744	0	0	0.000	92.743	0	0
JUL	744	0	0	0	744	744	744	0	0	0.000	95.026	0	0
AUG	744	0	0	0	744	744	744	0	0	0.000	96.162	0	0
SEP	709	0	0	0	720	24	744	0	0	0.000	93.694	0	0
OCT	21	720	0	3	720	744	744	0	0	0.000	23.729	0	0
NOV	0	720	0	0	720	0	744	0	0	-32.826	13.455	0	0
DEC	0	744	0	0	744	0	744	0	0	-91.653	13.455	0	0
ANNUAL	3322	5424	0	14	5424	3336	8760	0	0			14	14

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY 69.967 220.173 28/ 8	NATURAL-GAS 60.283 226.170 15/ 8
JAN	TOTAL (MBTU) PEAK (KBTU) DY/HR	62.622 219.726 3/ 8	40.586 185.192 3/ 6
FEB	TOTAL (MBTU) PEAK (KBTU) DY/HR	72.410 206.722 18/16	40.496 156.484 6/ 7
MAR	TOTAL (MBTU) PEAK (KBTU) DY/HR	68.446 207.437 29/16	47.486 134.543 22/18
APR	TOTAL (MBTU) PEAK (KBTU) DY/HR	84.564 324.850 16/15	27.949 145.624 13/18
MAY	TOTAL (MBTU) PEAK (KBTU) DY/HR	101.644 316.665 28/16	0.000 0.000 30/ 1
JUN	TOTAL (MBTU) PEAK (KBTU) DY/HR	104.317 324.458 13/16	0.000 0.000 31/ 1
JUL	TOTAL (MBTU) PEAK (KBTU) DY/HR	111.468 333.558 11/16	0.000 0.000 31/ 1
AUG	TOTAL (MBTU) PEAK (KBTU) DY/HR	92.989 319.910 7/16	0.000 0.000 30/ 1
SEP	TOTAL (MBTU) PEAK (KBTU) DY/HR	68.131 207.437 19/16	43.245 126.396 6/18
OCT	TOTAL (MBTU) PEAK (KBTU) DY/HR	66.352 207.325 18/16	35.669 133.058 13/ 6
NOV	TOTAL (MBTU) PEAK (KBTU) DY/HR	69.278 219.797 13/ 8	50.105 199.824 12/ 6
DEC	TOTAL (MBTU) PEAK (KBTU) DY/HR	972.187 333.558	345.818 226.170

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/22/1995 8:42:27 PDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG.#7665 DENTAL CLINIC  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE	ELECTRICITY	NATURAL-GAS
IN SITE MBTU -		
CATEGORY OF USE		
SPACE HEAT	14.90	345.82
SPACE COOL	157.30	0.00
HVAC AUX	402.41	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	310.84	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	86.71	0.00
TOTAL	972.16	345.82

TOTAL SITE ENERGY 1318.00 MBTU 136.4 KBTU/SQFT-YR GROSS-AREA 136.7 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 3265.30 MBTU 338.0 KBTU/SQFT-YR GROSS-AREA 338.5 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 0.6  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.



LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
LINE-3 \* DENVER, CO 80227 \*

LINE-4 \*RUN #1 NIGHT SET BACK FOR BLDG.#7665 \*  
LINE-5 \*DENTAL CLINIC \* ..

ABORT ERRORS ..  
DIAGNOSTIC WARNINGS ..  
SYSTEMS-REPORT VERIFICATION=(SV-A)  
SUMMARY=(SS-A,SS-C,SS-K,SS-O)  
HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

SD_FULL	=DAY-SCHEDULE	(1,24) (1.) ..
SD_WT_HT	=DAY-SCHEDULE	(1,6) (55.) (7,17) (74.) (18,24) (55.) ..
SD_SM_CL	=DAY-SCHEDULE	(1,6) (85.) (7,17) (72.) (18,24) (85.) ..
SD_OA%	=DAY-SCHEDULE	(1,24) (0.1) ..
SD_OFF	=DAY-SCHEDULE	(1,24) (0.) ..
SD_WT_CL	=DAY-SCHEDULE	(1,6) (57.) (7,17) (76.) (18,24) (57.) ..
SD_SM_HT	=DAY-SCHEDULE	(1,6) (83.) (7,17) (70.) (18,24) (83.) ..
SD_WT_HT_D	=DAY-SCHEDULE	(1,24) (55.) ..
SD_SM_CL_D	=DAY-SCHEDULE	(1,24) (85.) ..
SD_WT_CL_D	=DAY-SCHEDULE	(1,24) (57.) ..
SD_SM_HT_D	=DAY-SCHEDULE	(1,24) (83.) ..
SD_FAN_CYC	=DAY-SCHEDULE	(1,6) (0.) (7,17) (1.) (18,24) (0.) ..



SW_FULL_ON	=WEEK-SCHEDULE	(ALL) SD_FULL ..
SW_WT_HT	=WEEK-SCHEDULE	(WD) SD_WT_HT (WEH) SD_WT_HT_D ..
SW_SM_CL	=WEEK-SCHEDULE	(WD) SD_SM_CL (WEH) SD_SM_CL_D ..
SW_OA%	=WEEK-SCHEDULE	(ALL) SD_OA% ..
SW_off	=WEEK-SCHEDULE	(ALL) SD_OFF ..
SW_WT_CL	=WEEK-SCHEDULE	(WD) SD_WT_CL (WEH) SD_WT_CL_D ..
SW_SM_HT	=WEEK-SCHEDULE	(WD) SD_SM_HT (WEH) SD_SM_HT_D ..
SW_FAN_CYC	=WEEK-SCHEDULE	(WD) SD_FAN_CYC (WEH) SD_OFF ..

S\_FULL\_ON =SCHEDULE THRU DEC 31 SW\_FULL\_ON ..

S\_FULL\_OFF =SCHEDULE THRU DEC 31 SW\_off ..

\$ HEATING SET TEMP

S\_HEAT\_F =SCHEDULE THRU MAY 15 SW\_WT\_HT  
THRU OCT 1 SW\_SM\_HT  
THRU DEC 31 SW\_WT\_HT ..

S\_OTSIDAIR =SCHEDULE THRU DEC 31 SW\_OA% ..

S\_HE\_SCHED =SCHEDULE THRU MAY 15 SW\_FULL\_ON  
THRU OCT 1 SW\_off  
THRU DEC 31 SW\_FULL\_ON ..

S\_CL\_SCHED =SCHEDULE THRU MAY 15 SW\_off  
THRU OCT 1 SW\_FULL\_ON  
THRU DEC 31 SW\_off ..

\$ COOLING SET TEMP

S\_COOL\_F =SCHEDULE THRU MAY 15 SW\_WT\_CL  
THRU OCT 1 SW\_SM\_CL  
THRU DEC 31 SW\_WT\_CL ..

S\_HRLY-RPT =SCHEDULE THRU JAN 13 SW\_off  
THRU JAN 15 SW\_FULL\_ON  
THRU AUG 11 SW\_off  
THRU AUG 13 SW\_FULL\_ON  
THRU DEC 31 SW\_off ..

S\_FAN\_CYC =SCHEDULE THRU DEC 31 SW\_FAN\_CYC ..

\$ ZONE DESCRIPTION

SPACE\_1 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HEAT\_F COOL-TEMP-SCH = S\_COOL\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL  
SIZING-OPTION = FROM-LOADS ..

SPACE\_2 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HEAT\_F COOL-TEMP-SCH = S\_COOL\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL  
SIZING-OPTION = FROM-LOADS ..

SPACE\_3 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HEAT\_F COOL-TEMP-SCH = S\_COOL\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL  
SIZING-OPTION = FROM-LOADS ..

SPACE\_4 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HEAT\_F COOL-TEMP-SCH = S\_COOL\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL  
 SIZING-OPTION = FROM-LOADS ..

SPACE\_5 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HEAT\_F COOL-TEMP-SCH = S\_COOL\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL  
 SIZING-OPTION = FROM-LOADS ..

PLENUM\_6 =ZONE DESIGN-HEAT-T = 72.0 DESIGN-COOL-T = 74.0  
 ZONE-TYPE = PLENUM SIZING-OPTION = FROM-LOADS ..

\$ SYSTEM DESCRIPTION

MZ\_W/DX =SYSTEM SYSTEM-TYPE = PMZS  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_HE\_SCHED  
 COOLING-SCHEDULE = S\_CL\_SCHED MAX-HUMIDITY = 60.0  
 MIN-HUMIDITY = 50.0 HEAT-CONTROL = COLDEST  
 COOL-CONTROL = WARMEST OA-CONTROL = FIXED  
 SUPPLY-CFM = 19500. RATED-CFM = 19500.  
 MIN-OUTSIDE-AIR = 0.03 MAX-OA-FRACTION = 0.03  
 FAN-SCHEDULE = S\_FAN\_CYC SUPPLY-DELTA-T = 2.1  
 SUPPLY-KW = 0.00069 NIGHT-CYCLE-CTRL = CYCLE-ON-ANY ←  
 MIN-CFM-RATIO = 1.0 COOLING-CAPACITY = 664700.  
 HEATING-CAPACITY = -450000. CRANKCASE-HEAT = 3.73  
 CRANKCASE-MAX-T = 0. OUTSIDE-FAN-T = 45.  
 HEAT-SOURCE = HOT-WATER HUMIDIFIER-TYPE = HOT-WATER  
 ZONE-NAMES = (SPACE\_1, SPACE\_2, SPACE\_3, SPACE\_4,  
 SPACE\_5, PLENUM\_6) ..

\$ HOURLY REPORT DESCRIPTION

AUH-BLK =REPORT-BLOCK VARIABLE-TYPE = MZ\_W/DX  
 VARIABLE-LIST = (3,5,6,17) ..  
 S\_ZON-BLK =REPORT-BLOCK VARIABLE-TYPE = SPACE\_4  
 VARIABLE-LIST = (17,18,7,6) ..  
 N\_ZON-BLK =REPORT-BLOCK VARIABLE-TYPE = SPACE\_3  
 VARIABLE-LIST = (17,18,7,6) ..  
 AHU-HRLY = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (AUH-BLK)  
 ..  
 ZONES-HRLY = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (S\_ZON-BLK,N\_ZON-BLK)  
 ..  
 END ..  
 COMPUTE SYSTEMS ..  
 INPUT PLANT ..

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 9/1995 14:39:37 SDL RUN 1  
DENVER, CO 80227 RUN #1 NIGHT SET BACK FOR BLDG.#7665 DENTAL CLINIC  
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR MZ\_W/DX TOPEKA, KS

MONTH	COOLING				HEATING				WET-BULB				ELECTRIC			
	HOURS LOAD	ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)			
JAN	0	0.00000				0.000	-17.291	17	7	27.F	24.F	19333.	63.387			
FEB	0	0.00000			0.000	-10.768	7	7	26.F	25.F	17843.	63.387				
MAR	0	0.00000			0.000	-14.490	7	7	28.F	27.F	20637.	59.657				
APR	0	0.00000			0.000	-20.232	22	18	67.F	52.F	19390.	59.657				
MAY	38	86512	16	8	61.F	59.F	13	18	80.F	66.F	22588.	103.261				
JUN	79	12955	27	7	72.F	71.F					26342.	96.688				
JUL	83	60725	18	7	76.F	72.F					25604.	98.871				
AUG	89	43966	22	7	76.F	72.F					28114.	101.894				
SEP	65	87719	6	7	75.F	71.F					25031.	98.374				
OCT	0	0.00001	1	15	82.F	67.F		6	18	67.F	52.F	19251.	59.657			
NOV	0	0.00000				0.000	-13.481	14	7	32.F	32.F	18928.	59.657			
DEC	0	0.00000			0.000	-13.937	12	7	2.F	1.F	19676.	63.387				
TOTAL		356.919				-121.363					262730.		103.261			
MAX					506.286					-283.187						

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 9/1995 14:39:37 SDL RUN 1  
DENVER, CO 80227 RUN #1 NIGHT SET BACK FOR BLDG.#7665 DENTAL CLINIC  
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR MZ\_W/DX TOPEKA, KS

MONTH	HOURS				HOURS				HOURS				HOURS			
	COOLING LOAD	HEATING LOAD	COINCIDENT COOL-HEAT LOAD	COINCIDENT LOAD	HEATING AVAIL.	COOLING AVAIL.	COOLING AVAIL.	FANS ON	FANS ON	FANS ON	FANS ON	VENTILATING FANS ON	NIGHT VENTILATING FANS ON	FLOATING WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)
JAN	0	687	0	0	744	0	0	703	472	0	16	0	0	16	-16.734	13.455
FEB	0	641	0	0	672	0	0	672	463	0	31	0	0	31	-18.064	13.455
MAR	0	740	0	0	744	0	0	744	491	0	4	0	0	4	-26.734	13.455
APR	0	720	0	0	720	0	0	720	489	0	0	0	0	0	-38.853	13.455
MAY	210	360	0	0	360	384	0	692	461	0	122	0	0	122	0.000	103.261
JUN	466	0	0	0	0	720	0	641	399	0	175	0	0	175	68.431	68.431
JUL	514	0	0	0	0	744	0	608	388	0	94	0	0	94	0.000	72.210
AUG	524	0	0	0	0	744	0	625	372	0	101	0	0	101	0.000	73.372
SEP	361	0	0	0	0	720	0	678	447	0	317	0	0	317	0.000	70.127
OCT	6	710	0	0	24	0	0	744	524	0	28	0	0	28	0.000	13.455
NOV	0	695	0	0	720	0	0	720	500	0	25	0	0	25	-26.309	13.455
DEC	0	725	0	0	744	0	0	741	510	0	16	0	0	16	-11.023	13.455
ANNUAL	2081	5278	0	0	5424	3336	0	8288	5516	0	929	0	0	929		



EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 9/1995 14:39:37 PDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SET BACK FOR BLDG.#7665 DENTAL CLINIC  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY 67.453 222.724 28/ 9	NATURAL-GAS 31.983 378.401 17/ 7
JAN	TOTAL (MBTU) PEAK (KBTU) DY/HR	67.453 222.724 28/ 9	31.983 378.401 17/ 7
FEB	TOTAL (MBTU) PEAK (KBTU) DY/HR	61.984 222.704 3/ 8	21.619 309.783 7/ 7
MAR	TOTAL (MBTU) PEAK (KBTU) DY/HR	71.922 205.681 18/16	28.829 148.719 7/ 7
APR	TOTAL (MBTU) PEAK (KBTU) DY/HR	68.166 207.542 22/16	38.723 126.454 22/18
MAY	TOTAL (MBTU) PEAK (KBTU) DY/HR	78.315 352.576 16/ 8	23.514 135.895 13/18
JUN	TOTAL (MBTU) PEAK (KBTU) DY/HR	89.941 330.134 28/16	0.000 0.000 30/ 1
JUL	TOTAL (MBTU) PEAK (KBTU) DY/HR	87.424 337.587 22/16	0.000 0.000 31/ 1
AUG	TOTAL (MBTU) PEAK (KBTU) DY/HR	95.993 347.908 22/14	0.000 0.000 31/ 1
SEP	TOTAL (MBTU) PEAK (KBTU) DY/HR	85.465 335.889 6/16	0.000 0.000 30/ 1
OCT	TOTAL (MBTU) PEAK (KBTU) DY/HR	67.550 207.206 7/16	35.932 118.203 6/18
NOV	TOTAL (MBTU) PEAK (KBTU) DY/HR	65.988 206.068 18/16	26.861 126.450 14/ 7
DEC	TOTAL (MBTU) PEAK (KBTU) DY/HR	68.468 222.724 13/ 8	27.087 380.405 12/ 7
	ONE YEAR USE/PEAK	908.669 352.576	234.548 380.405

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 9/1995 14:39:37 PDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SET BACK FOR BLDG.#7665 DENTAL CLINIC  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
SPACE HEAT	11.57	234.55
SPACE COOL	118.79	0.00
HVAC AUX	380.72	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	310.83	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	86.71	0.00
TOTAL	908.62	234.55

TOTAL SITE ENERGY 1143.22 MBTU 118.3 KBTU/SQFT-YR GROSS-AREA 118.5 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 2963.28 MBTU 306.8 KBTU/SQFT-YR GROSS-AREA 307.2 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 14.4  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*





LINE-3 \* DENVER, CO 80227 \*

LINE-4 \*RUN #2 DDC CONTROL FOR BLDG.#7665 \*

LINE-5 \*DENTAL CLINIC \* ..

ABORT ERRORS ..  
 DIAGNOSTIC WARNINGS ..  
 SYSTEMS-REPORT VERIFICATION=(SV-A)  
 SUMMARY=(SS-A,SS-C,SS-K,SS-O)  
 HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

SD\_FULL =DAY-SCHEDULE (1,24) (1.) ..  
 SD\_WT\_HT =DAY-SCHEDULE (1,24) (70.) ..   
 SD\_SM\_CL =DAY-SCHEDULE (1,24) (76.) ..   
 SD\_OA% =DAY-SCHEDULE (1,24) (0.1) ..  
 SD\_OFF =DAY-SCHEDULE (1,24) (0.) ..  
 SD\_WT\_CL =DAY-SCHEDULE (1,24) (70.2) ..   
 SD\_SM\_HT =DAY-SCHEDULE (1,24) (75.8) .. 

SW\_FULL\_ON =WEEK-SCHEDULE (ALL) SD\_FULL ..

SW\_WT\_HT =WEEK-SCHEDULE (ALL) SD\_WT\_HT ..

SW\_SM\_CL =WEEK-SCHEDULE (ALL) SD\_SM\_CL ..

SW\_OA% =WEEK-SCHEDULE (ALL) SD\_OA% ..

SW\_off =WEEK-SCHEDULE (ALL) SD\_OFF ..

SW\_WT\_CL =WEEK-SCHEDULE (ALL) SD\_WT\_CL ..

SW\_SM\_HT =WEEK-SCHEDULE (ALL) SD\_SM\_HT ..

S\_FULL\_ON =SCHEDULE THRU DEC 31 SW\_FULL\_ON ..

S\_FULL\_OFF =SCHEDULE THRU DEC 31 SW\_off ..

\$ HEATING SET TEMP

S\_HEAT\_F =SCHEDULE THRU MAY 15 SW\_WT\_HT  
 THRU OCT 1 SW\_SM\_HT  
 THRU DEC 31 SW\_WT\_HT ..

S\_OTSIDAIR =SCHEDULE THRU DEC 31 SW\_OA% ..

S\_HE\_SCHED =SCHEDULE THRU MAY 15 SW\_FULL\_ON  
 THRU OCT 1 SW\_off  
 THRU DEC 31 SW\_FULL\_ON ..

S\_CL\_SCHED =SCHEDULE THRU MAY 15 SW\_off  
 THRU OCT 1 SW\_FULL\_ON  
 THRU DEC 31 SW\_off ..

\$ COOLING SET TEMP

S\_COOL\_F =SCHEDULE THRU MAY 15 SW\_WT\_CL  
THRU OCT 1 SW\_SM\_CL  
THRU DEC 31 SW\_WT\_CL ..

S\_HRLY-RPT =SCHEDULE THRU JAN 14 SW\_off  
THRU JAN 15 SW\_FULL\_ON  
THRU AUG 11 SW\_off  
THRU AUG 12 SW\_FULL\_ON  
THRU DEC 31 SW\_off ..

## \$ ZONE DESCRIPTION

SPACE\_1 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HEAT\_F COOL-TEMP-SCH = S\_COOL\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

SPACE\_2 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HEAT\_F COOL-TEMP-SCH = S\_COOL\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

SPACE\_3 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HEAT\_F COOL-TEMP-SCH = S\_COOL\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

SPACE\_4 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HEAT\_F COOL-TEMP-SCH = S\_COOL\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

SPACE\_5 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HEAT\_F COOL-TEMP-SCH = S\_COOL\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

PLENUM\_6 =ZONE DESIGN-HEAT-T = 72.0 DESIGN-COOL-T = 74.0  
ZONE-TYPE = PLENUM SIZING-OPTION = FROM-LOADS ..

## \$ SYSTEM DESCRIPTION

MZ\_W/DX =SYSTEM SYSTEM-TYPE = PMZS  
MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
HEATING-SCHEDULE = S\_HE\_SCHED  
COOLING-SCHEDULE = S\_CL\_SCHED MAX-HUMIDITY = 60.0  
MIN-HUMIDITY = 50.0 HEAT-CONTROL = COLDEST  
COOL-CONTROL = WARMEST OA-CONTROL = FIXED

SUPPLY-CFM = 19500. RATED-CFM = 19500.  
 MIN-OUTSIDE-AIR = 0.03 MAX-OA-FRACTION = 0.03  
 FAN-SCHEDULE = S\_FULL\_ON SUPPLY-DELTA-T = 2.1  
 SUPPLY-KW = 0.00069 NIGHT-CYCLE-CTRL = STAY-OFF  
 MIN-CFM-RATIO = 1.0 COOLING-CAPACITY = 664700.  
 HEATING-CAPACITY = -450000. CRANKCASE-HEAT = 3.73  
 CRANKCASE-MAX-T = 0. OUTSIDE-FAN-T = 45.  
 HEAT-SOURCE = HOT-WATER HUMIDIFIER-TYPE = HOT-WATER  
 ZONE-NAMES = (SPACE\_1, SPACE\_2, SPACE\_3, SPACE\_4,  
 SPACE\_5, PLENUM\_6) ..

\$ HOURLY REPORT DESCRIPTION

AUH-BLK =REPORT-BLOCK VARIABLE-TYPE = MZ\_W/DX  
 VARIABLE-LIST = (3,5,6,17) ..  
 S\_ZON-BLK =REPORT-BLOCK VARIABLE-TYPE = SPACE\_4  
 VARIABLE-LIST = (17,18,7,6) ..  
 N\_ZON-BLK =REPORT-BLOCK VARIABLE-TYPE = SPACE\_3  
 VARIABLE-LIST = (17,18,7,6) ..  
 AHU-HRLY = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (AUH-BLK)  
 ..  
 ZONES-HRLY = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (S\_ZON-BLK,N\_ZON-BLK)  
 ..  
 END ..  
 COMPUTE SYSTEMS ..

INPUT PLANT ..

\$-----\$  
 \$ E Z - D O E P L A N T S I N P U T \$  
 \$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
 LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
 LINE-3 \* DENVER, CO 80227 \*  
 LINE-4 \*RUN #2 DDC CONTROL FOR BLDG.#7665 \*  
 LINE-5 \*DENTAL CLINIC \* ..

ABORT ERRORS ..  
 DIAGNOSTIC WARNINGS ..  
 PLANT-REPORT VERIFICATION=(PV-A)  
 SUMMARY=(PS-B,BEPS)  
 HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

PD\_heaton =DAY-SCHEDULE (1,24) (1.) ..  
 Pd\_heatoff =DAY-SCHEDULE (1,24) (0.) ..

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 9/1995 14:10:35 SDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG.#7665 DENTAL CLINIC  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR MZ\_W/DX TOPEKA, KS

MONTH	COOLING				HEATING				ELECTRIC			
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	MAXIMUM COOLING LOAD (KBTU/HR)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-20.952	16	3	4.F	2.F	-117.760	19895.	63.387
FEB	0.00000				-11.929	3	6	-1.F	-2.F	-66.572	17843.	63.387
MAR	0.00000				-14.538	18	18	60.F	43.F	-49.926	20637.	59.657
APR	0.00000				-20.232	22	18	67.F	52.F	-70.345	19390.	59.657
MAY	44.64120	16	5	59.F	58.F	13	18	80.F	66.F	-77.785	24071.	95.493
JUN	89.20745	28	16	90.F	76.F					0.000	28880.	90.565
JUL	98.36989	7	16	83.F	73.F					0.000	29418.	92.645
AUG	102.36281	11	16	100.F	71.F					0.000	31552.	95.653
SEP	71.39226	7	16	93.F	76.F					0.000	26549.	91.423
OCT	0.77718	1	18	83.F	68.F					-64.495	19333.	59.657
NOV	0.00000				-13.437	18	18	41.F	34.F	-58.939	18928.	59.657
DEC	0.00000				-15.454	12	6	3.F	2.F	-108.992	19717.	63.387
TOTAL	406.751				-127.568					-117.760	276202.	95.653
MAX												

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 9/1995 14:10:35 SDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG.#7665 DENTAL CLINIC  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR MZ\_W/DX TOPEKA, KS

MONTH	COOLING LOAD		HEATING LOAD		COINCIDENT COOL-HEAT LOAD		HOURS OF FLOATING		HOURS OF COOLING AVAIL.		HOURS OF HEATING AVAIL.		HOURS OF FANS ON		HOURS OF NIGHT VENTING		HOURS OF FLOATING WHEN FANS ON		COINCIDENT LOADS-- HEATING COOLING PEAK (KBTU/HR)		ELECTRIC LOAD AT COOLING PEAK (KW)	
	HOURS	LOAD	HOURS	LOAD	HOURS	LOAD	HOURS	FLOATING	HOURS	AVAIL.	HOURS	AVAIL.	HOURS	CYCLE ON	HOURS	NIGHT	HOURS	FANS ON	HEATING	COOLING	HEATING	ELECTRIC
JAN	0	0	0	0	0	0	50	0	0	0	0	744	0	0	0	0	0	0	-19.080	13.455		
FEB	0	0	0	0	0	0	46	0	0	0	0	672	0	0	0	0	0	0	-17.946	13.455		
MAR	0	0	0	0	0	0	6	744	0	0	0	744	0	0	0	0	0	0	-26.734	13.455		
APR	0	0	0	0	0	0	0	720	0	0	0	720	0	0	0	0	0	0	-38.853	13.455		
MAY	384	0	0	0	0	0	0	0	384	0	0	744	0	0	0	0	0	0	0.000	56.825		
JUN	720	0	0	0	0	0	0	0	720	0	0	720	0	0	0	0	0	0	0.000	90.565		
JUL	744	0	0	0	0	0	0	0	744	0	0	744	0	0	0	0	0	0	0.000	89.336		
AUG	744	0	0	0	0	0	0	0	744	0	0	744	0	0	0	0	0	0	0.000	95.653		
SEP	697	0	0	0	0	0	23	0	720	0	0	720	0	0	0	0	0	0	0.000	91.423		
OCT	18	0	0	0	0	0	18	0	24	0	0	744	0	0	0	0	0	0	0.000	22.155		
NOV	0	0	0	0	0	0	27	0	0	0	0	720	0	0	0	0	0	0	-26.309	13.455		
DEC	0	0	0	0	0	0	36	0	0	0	0	744	0	0	0	0	0	0	-47.574	13.455		
ANNUAL	3307	0	0	0	0	0	206	0	3336	0	0	8760	0	0	0	0	0	0				

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 9/1995 14:10:35 PDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG.#7665 DENTAL CLINIC  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY TOTAL (KWH) PEAK (KW) DY/HR	NATURAL-GAS TOTAL (MBTU) PEAK (KBTU) DY/HR
JAN	217.733 69.121 28/ 8	217.733 69.121 28/ 8	158.187 33.868 16/ 3
FEB	216.818 61.914 3/ 8	216.818 61.914 3/ 8	98.808 21.344 3/ 6
MAR	205.533 71.761 18/16	205.533 71.761 18/16	78.496 26.470 18/18
APR	206.313 67.795 29/16	206.313 67.795 29/16	103.343 35.208 22/18
MAY	326.053 83.053 16/ 8	326.053 83.053 16/ 8	20.973 20.973 13/18
JUN	309.228 98.608 28/16	309.228 98.608 28/16	0.000 0.000 30/ 1
JUL	316.330 100.447 13/16	316.330 100.447 13/16	0.000 0.000 31/ 1
AUG	326.600 107.732 11/16	326.600 107.732 11/16	0.000 0.000 31/ 1
SEP	90.649 312.156 7/16	90.649 312.156 7/16	0.000 0.000 30/ 1
OCT	206.313 67.488 19/16	206.313 67.488 19/16	32.427 96.301 6/18
NOV	205.916 65.810 18/16	205.916 65.810 18/16	24.390 89.555 18/18
DEC	217.160 68.443 13/ 8	217.160 68.443 13/ 8	26.537 148.346 12/ 6
	ONE YEAR USE/PEAK	952.822 326.600	221.218 158.187

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 9/1995 14:10:35 PDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG.#7665 DENTAL CLINIC  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE	ELECTRICITY	NATURAL-GAS
IN SITE MBTU -		
CATEGORY OF USE		
SPACE HEAT	9.75	221.22
SPACE COOL	143.08	0.00
HVAC AUX	402.40	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	310.83	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	86.71	0.00
TOTAL	952.77	221.22

TOTAL SITE ENERGY 1174.04 MBTU 121.5 KBTU/SQFT-YR GROSS-AREA 121.7 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 3082.54 MBTU 319.1 KBTU/SQFT-YR GROSS-AREA 319.6 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 0.9  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.



LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*

LINE-3 \* DENVER, CO 80227 \*

LINE-4 \*RUN #3 ECONOMIZER FOR BLDG.#7665 \*

LINE-5 \*DENTAL CLINIC \* ..

ABORT ERRORS ..  
 DIAGNOSTIC WARNINGS ..  
 SYSTEMS-REPORT VERIFICATION=(SV-A)  
 SUMMARY=(SS-A,SS-C,SS-K,SS-O)  
 HOURLY-DATA-SAVE = YES ..

§ SCHEDULES

SD\_FULL =DAY-SCHEDULE (1,24) (1.) ..  
 SD\_WT\_HT =DAY-SCHEDULE (1,6) (55.)  
 (7,17) (74.)  
 (18,24) (55.) ..  
 SD\_SM\_CL =DAY-SCHEDULE (1,6) (85.)  
 (7,17) (72.)  
 (18,24) (85.) ..  
 SD\_OA% =DAY-SCHEDULE (1,24) (0.1) ..  
 SD\_OFF =DAY-SCHEDULE (1,24) (0.) ..  
 SD\_WT\_CL =DAY-SCHEDULE (1,6) (57.)  
 (7,17) (76.)  
 (18,24) (57.) ..  
 SD\_SM\_HT =DAY-SCHEDULE (1,6) (83.)  
 (7,17) (70.)  
 (18,24) (83.) ..  
 SD\_WT\_HT\_D =DAY-SCHEDULE (1,24) (55.) ..  
 SD\_SM\_CL\_D =DAY-SCHEDULE (1,24) (85.) ..  
 SD\_WT\_CL\_D =DAY-SCHEDULE (1,24) (57.) ..  
 SD\_SM\_HT\_D =DAY-SCHEDULE (1,24) (83.) ..  
 SD\_FAN\_CYC =DAY-SCHEDULE (1,6) (0.)  
 (7,17) (1.)  
 (18,24) (0.) ..  
 SW\_FULL\_ON =WEEK-SCHEDULE (ALL) SD\_FULL ..  
 SW\_WT\_HT =WEEK-SCHEDULE (WD) SD\_WT\_HT  
 (WEH) SD\_WT\_HT\_D ..  
 SW\_SM\_CL =WEEK-SCHEDULE (WD) SD\_SM\_CL  
 (WEH) SD\_SM\_CL\_D ..  
 SW\_OA% =WEEK-SCHEDULE (ALL) SD\_OA% ..  
 SW\_off =WEEK-SCHEDULE (ALL) SD\_OFF ..  
 SW\_WT\_CL =WEEK-SCHEDULE (WD) SD\_WT\_CL  
 (WEH) SD\_WT\_CL\_D ..  
 SW\_SM\_HT =WEEK-SCHEDULE (WD) SD\_SM\_HT  
 (WEH) SD\_SM\_HT\_D ..  
 SW\_FAN\_CYC =WEEK-SCHEDULE (WD) SD\_FAN\_CYC  
 (WEH) SD\_OFF ..

S\_FULL\_ON =SCHEDULE THRU DEC 31 SW\_FULL\_ON ..

S\_FULL\_OFF =SCHEDULE THRU DEC 31 SW\_off ..

\$ HEATING SET TEMP

S\_HEAT\_F =SCHEDULE THRU MAY 15 SW\_WT\_HT  
THRU OCT 1 SW\_SM\_HT  
THRU DEC 31 SW\_WT\_HT ..

S\_OTSIDAIR =SCHEDULE THRU DEC 31 SW\_OA% ..

S\_HE\_SCHED =SCHEDULE THRU MAY 15 SW\_FULL\_ON  
THRU OCT 1 SW\_off  
THRU DEC 31 SW\_FULL\_ON ..

S\_CL\_SCHED =SCHEDULE THRU MAY 15 SW\_off  
THRU OCT 1 SW\_FULL\_ON  
THRU DEC 31 SW\_off ..

\$ COOLING SET TEMP

S\_COOL\_F =SCHEDULE THRU MAY 15 SW\_WT\_CL  
THRU OCT 1 SW\_SM\_CL  
THRU DEC 31 SW\_WT\_CL ..

S\_HRLY-RPT =SCHEDULE THRU JAN 13 SW\_off  
THRU JAN 15 SW\_FULL\_ON  
THRU AUG 11 SW\_off  
THRU AUG 13 SW\_FULL\_ON  
THRU DEC 31 SW\_off ..

S\_FAN\_CYC =SCHEDULE THRU DEC 31 SW\_FAN\_CYC ..

\$ ZONE DESCRIPTION

SPACE\_1 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HEAT\_F COOL-TEMP-SCH = S\_COOL\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL  
SIZING-OPTION = FROM-LOADS ..

SPACE\_2 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HEAT\_F COOL-TEMP-SCH = S\_COOL\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL  
SIZING-OPTION = FROM-LOADS ..

SPACE\_3 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HEAT\_F COOL-TEMP-SCH = S\_COOL\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL  
SIZING-OPTION = FROM-LOADS ..

SPACE\_4 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HEAT\_F COOL-TEMP-SCH = S\_COOL\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL  
 SIZING-OPTION = FROM-LOADS ..

SPACE\_5 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HEAT\_F COOL-TEMP-SCH = S\_COOL\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL  
 SIZING-OPTION = FROM-LOADS ..

PLENUM\_6 =ZONE DESIGN-HEAT-T = 72.0 DESIGN-COOL-T = 74.0  
 ZONE-TYPE = PLENUM SIZING-OPTION = FROM-LOADS ..

## \$ SYSTEM DESCRIPTION

MZ\_W/DX =SYSTEM SYSTEM-TYPE = PMZS  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_HE\_SCHD  
 COOLING-SCHEDULE = S\_CL\_SCHD MAX-HUMIDITY = 60.0  
 MIN-HUMIDITY = 50.0 ECONO-LIMIT-T = 69.0 ←  
 HEAT-CONTROL = COLDEST COOL-CONTROL = WARMEST  
 SUPPLY-CFM = 19500. RATED-CFM = 19500.  
 MIN-OUTSIDE-AIR = 0.03 FAN-SCHEDULE = S\_FAN\_CYC  
 SUPPLY-DELTA-T = 2.1 SUPPLY-KW = 0.00069  
 NIGHT-CYCLE-CTRL = CYCLE-ON-ANY MIN-CFM-RATIO = 1.0  
 COOLING-CAPACITY = 664700.  
 HEATING-CAPACITY = -450000. CRANKCASE-HEAT = 3.73  
 CRANKCASE-MAX-T = 0. OUTSIDE-FAN-T = 45.  
 HEAT-SOURCE = HOT-WATER HUMIDIFIER-TYPE = HOT-WATER  
 ZONE-NAMES = (SPACE\_1, PLENUM\_2, SPACE\_3, SPACE\_4,  
 SPACE\_5, PLENUM\_6) ..

## \$ HOURLY REPORT DESCRIPTION

AUH-BLK =REPORT-BLOCK VARIABLE-TYPE = MZ\_W/DX  
 VARIABLE-LIST = (3,5,6,17) ..  
 S\_ZON-BLK =REPORT-BLOCK VARIABLE-TYPE = SPACE\_4  
 VARIABLE-LIST = (17,18,7,6) ..  
 N\_ZON-BLK =REPORT-BLOCK VARIABLE-TYPE = SPACE\_3  
 VARIABLE-LIST = (17,18,7,6) ..  
 AHU-HRLY = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (AUH-BLK)  
 ..  
 ZONES-HRLY = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (S\_ZON-BLK,N\_ZON-BLK)  
 ..  
 END ..  
 COMPUTE SYSTEMS ..  
 INPUT PLANT ..

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 9/1995 15: 0: 8 SDL RUN 1  
 DENVER, CO 80227 RUN #3 ECONOMIZER FOR BLDG.#7665 DENTAL CLINIC  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR MZ\_W/DX TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C				
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	MAXIMUM COOLING LOAD (KBTU/HR)	ELEC LOAD (KW)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-53.952	31 7	24.F	21.F	16978.	-544.720	0.000	63.387	63.387
FEB	0.00000				-44.277	22 7	26.F	24.F	15327.	-537.696	0.000	59.657	59.657
MAR	0.00000				-64.302	18 18	60.F	43.F	18390.	-536.156	0.000	59.657	59.657
APR	0.00000				-50.168	5 18	56.F	41.F	18502.	-532.530	0.000	95.253	95.253
MAY	23.34469	31 7	75.F	69.F	-9.827	5 7	44.F	40.F	21118.	-393.744	0.000	96.688	96.688
JUN	66.11934	27 7	72.F	71.F	0.000				25224.	0.000	0.000	101.893	101.893
JUL	81.69007	18 7	76.F	72.F	0.000				27826.	0.000	0.000	98.375	98.375
AUG	86.00661	22 7	76.F	72.F	0.000				23529.	0.000	0.000	59.657	59.657
SEP	48.79244	6 7	75.F	71.F	-19.246	6 18	67.F	52.F	18350.	-563.530	0.000	59.657	59.657
OCT	0.00001	1 13	79.F	66.F	-39.997	28 7	28.F	26.F	16762.	-540.462	0.000	59.657	59.657
NOV	0.00000				-49.815	5 7	21.F	18.F	16864.	-546.543	0.000	63.387	63.387
DEC	0.00000				-331.583				244317.				
TOTAL	305.953									-563.530	398.337		101.893
MAX													

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 9/1995 15: 0: 8 SDL RUN 1  
 DENVER, CO 80227 RUN #3 ECONOMIZER FOR BLDG.#7665 DENTAL CLINIC  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR MZ\_W/DX TOPEKA, KS

MONTH	HOURS				HOURS				HOURS				HOURS			
	COOLING LOAD	HEATING LOAD	COINCIDENT COOL-HEAT LOAD	FLOATING	HEATING AVAIL.	COOLING AVAIL.	FANS ON CYCLE	FANS ON	FANS ON	FANS ON	VENTING	NIGHT	FLOATING WHEN	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)	
JAN	0	526	0	218	744	0	528	297	0	0	0	2	0.000	0.000		
FEB	0	479	0	193	672	0	485	276	0	0	0	6	0.000	0.000		
MAR	0	553	0	191	744	0	577	324	0	0	0	24	-99.492	13.455		
APR	0	492	0	228	720	0	654	423	0	0	0	162	0.000	13.455		
MAY	140	157	0	447	360	384	683	452	0	0	0	386	0.000	69.072		
JUN	403	0	0	317	0	720	641	399	0	0	0	238	0.000	68.430		
JUL	491	0	0	253	0	744	609	389	0	0	0	118	0.000	72.207		
AUG	503	0	0	241	0	744	625	372	0	0	0	122	0.000	73.372		
SEP	265	0	0	455	0	720	678	447	0	0	0	413	0.000	70.101		
OCT	5	284	0	275	720	24	677	457	0	0	0	388	0.000	13.455		
NOV	0	445	0	275	720	0	559	339	0	0	0	114	-98.255	13.455		
DEC	0	532	0	212	744	0	532	301	0	0	0	0	-76.836	13.455		
ANNUAL	1807	3468	0	3485	5424	3336	7248	4476	0	0	0	1973				

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 9/1995 15: 0: 8 PDL RUN 1  
 DENVER, CO 80227 RUN #3 ECONOMIZER FOR BLDG.#7665 DENTAL CLINIC  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY 61.977 228.954 28/ 9	NATURAL-GAS 93.149 735.959 31/ 7
JAN	TOTAL (MBTU) PEAK (KBTU) DY/HR	55.585 224.389 3/ 8	76.557 728.071 22/ 7
FEB	TOTAL (MBTU) PEAK (KBTU) DY/HR	67.077 216.218 31/ 9	107.755 726.340 18/18
MAR	TOTAL (MBTU) PEAK (KBTU) DY/HR	66.513 216.218 22/14	84.521 722.259 5/18
APR	TOTAL (MBTU) PEAK (KBTU) DY/HR	72.818 325.235 31/16	17.326 562.401 5/ 7
MAY	TOTAL (MBTU) PEAK (KBTU) DY/HR	86.127 330.134 28/16	0.000 0.000 30/ 1
JUN	TOTAL (MBTU) PEAK (KBTU) DY/HR	86.907 337.587 22/16	0.000 0.000 31/ 1
JUL	TOTAL (MBTU) PEAK (KBTU) DY/HR	95.009 347.908 22/14	0.000 0.000 31/ 1
AUG	TOTAL (MBTU) PEAK (KBTU) DY/HR	80.339 335.894 6/16	0.000 0.000 30/ 1
SEP	TOTAL (MBTU) PEAK (KBTU) DY/HR	64.104 216.218 31/ 9	34.048 756.989 6/18
OCT	TOTAL (MBTU) PEAK (KBTU) DY/HR	60.172 216.218 30/ 9	69.318 731.180 28/ 7
NOV	TOTAL (MBTU) PEAK (KBTU) DY/HR	61.302 227.787 13/ 8	86.408 738.002 5/ 7
DEC	TOTAL (MBTU) PEAK (KBTU) DY/HR		
	ONE YEAR USE/PEAK	857.931 347.908	569.081 756.989

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 9/1995 15: 0: 8 PDL RUN 1  
 DENVER, CO 80227 RUN #3 ECONOMIZER FOR BLDG.#7665 DENTAL CLINIC  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
SPACE HEAT	23.71	569.08
SPACE COOL	103.70	0.00
HVAC AUX	332.94	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	310.83	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	86.71	0.00
TOTAL	857.89	569.08

TOTAL SITE ENERGY 1427.01 MBTU 147.7 KBTU/SQFT-YR GROSS-AREA 148.0 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 3145.45 MBTU 325.6 KBTU/SQFT-YR GROSS-AREA 326.1 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 20.0  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
LINE-3 \* DENVER, CO 80227 \*

LINE-4 \*RUN #4 NIGHT INFILTRATION FOR BLDG.#7665\*  
LINE-5 \*DENTAL CLINIC \* ..

ABORT ERRORS ..  
DIAGNOSTIC WARNINGS ..  
SYSTEMS-REPORT VERIFICATION=(SV-A)  
SUMMARY=(SS-A,SS-C,SS-K,SS-O)  
HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

SD\_FULL =DAY-SCHEDULE (1,24) (1.) ..  
SD\_WT\_HT =DAY-SCHEDULE (1,24) (74.) ..  
SD\_SM\_CL =DAY-SCHEDULE (1,24) (72.) ..  
SD\_OA% =DAY-SCHEDULE (1,5) (0.)  
(6,17) (0.03) ←  
(18,24) (0.) ..

SD\_OFF =DAY-SCHEDULE (1,24) (0.) ..  
SD\_WT\_CL =DAY-SCHEDULE (1,24) (74.2) ..  
SD\_SM\_HT =DAY-SCHEDULE (1,24) (71.8) ..

SW\_FULL\_ON =WEEK-SCHEDULE (ALL) SD\_FULL ..

SW\_WT\_HT =WEEK-SCHEDULE (ALL) SD\_WT\_HT ..

SW\_SM\_CL =WEEK-SCHEDULE (ALL) SD\_SM\_CL ..

SW\_OA% =WEEK-SCHEDULE (WD) SD\_OA%  
(WEH) SD\_OFF ..

SW\_off =WEEK-SCHEDULE (ALL) SD\_OFF ..

SW\_WT\_CL =WEEK-SCHEDULE (ALL) SD\_WT\_CL ..

SW\_SM\_HT =WEEK-SCHEDULE (ALL) SD\_SM\_HT ..

S\_FULL\_ON =SCHEDULE THRU DEC 31 SW\_FULL\_ON ..

S\_FULL\_OFF =SCHEDULE THRU DEC 31 SW\_off ..

\$ HEATING SET TEMP

S\_HEAT\_F =SCHEDULE THRU MAY 15 SW\_WT\_HT  
THRU OCT 1 SW\_SM\_HT  
THRU DEC 31 SW\_WT\_HT ..

S\_OTSIDAIR =SCHEDULE THRU DEC 31 SW\_OA% ..

S\_HE\_SCHED =SCHEDULE THRU MAY 15 SW\_FULL\_ON  
THRU OCT 1 SW\_off  
THRU DEC 31 SW\_FULL\_ON ..

S\_CL\_SCHED =SCHEDULE THRU MAY 15 SW\_off  
THRU OCT 1 SW\_FULL\_ON

THRU DEC 31 SW\_off ..

\$ COOLING SET TEMP

S\_COOL\_F =SCHEDULE THRU MAY 15 SW\_WT\_CL  
THRU OCT 1 SW\_SM\_CL  
THRU DEC 31 SW\_WT\_CL ..

S\_HRLY-RPT =SCHEDULE THRU JAN 14 SW\_off  
THRU JAN 15 SW\_FULL\_ON  
THRU AUG 11 SW\_off  
THRU AUG 12 SW\_FULL\_ON  
THRU DEC 31 SW\_off ..

\$ ZONE DESCRIPTION

SPACE\_1 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HEAT\_F COOL-TEMP-SCH = S\_COOL\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

SPACE\_2 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HEAT\_F COOL-TEMP-SCH = S\_COOL\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

SPACE\_3 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HEAT\_F COOL-TEMP-SCH = S\_COOL\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

SPACE\_4 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HEAT\_F COOL-TEMP-SCH = S\_COOL\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

SPACE\_5 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HEAT\_F COOL-TEMP-SCH = S\_COOL\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

PLENUM\_6 =ZONE DESIGN-HEAT-T = 72.0 DESIGN-COOL-T = 74.0  
ZONE-TYPE = PLENUM SIZING-OPTION = FROM-LOADS ..

\$ SYSTEM DESCRIPTION

MZ\_W/DX =SYSTEM SYSTEM-TYPE = PMZS  
MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
HEATING-SCHEDULE = S\_HE\_SCHED



COOLING-SCHEDULE = S\_CL\_SCHED MAX-HUMIDITY = 60.0  
 MIN-HUMIDITY = 50.0 OA-CONTROL = FIXED  
 SUPPLY-CFM = 19500. RATED-CFM = 19500.  
 MIN-AIR-SCH = S\_OTSIDAIR MAX-OA-FRACTION = 0.03  
 FAN-SCHEDULE = S\_FULL\_ON SUPPLY-DELTA-T = 2.1  
 SUPPLY-KW = 0.00069 NIGHT-CYCLE-CTRL = STAY-OFF  
 MIN-CFM-RATIO = 1.0 COOLING-CAPACITY = 664700.  
 HEATING-CAPACITY = -450000. CRANKCASE-HEAT = 3.73  
 CRANKCASE-MAX-T = 0. OUTSIDE-FAN-T = 45.  
 HEAT-SOURCE = HOT-WATER HUMIDIFIER-TYPE = HOT-WATER  
 ZONE-NAMES = (SPACE\_1, SPACE\_2, SPACE\_3, SPACE\_4,  
 SPACE\_5, PLENUM\_6) ..



\$ HOURLY REPORT DESCRIPTION

AUH-BLK =REPORT-BLOCK VARIABLE-TYPE = MZ\_W/DX  
 VARIABLE-LIST = (3,5,6,17) ..  
 S\_ZON-BLK =REPORT-BLOCK VARIABLE-TYPE = SPACE\_4  
 VARIABLE-LIST = (17,18,7,6) ..  
 N\_ZON-BLK =REPORT-BLOCK VARIABLE-TYPE = SPACE\_3  
 VARIABLE-LIST = (17,18,7,6) ..  
 AHU-HRLY = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (AUH-BLK)  
 ..  
 ZONES-HRLY = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (S\_ZON-BLK,N\_ZON-BLK)  
 ..  
 END ..  
 COMPUTE SYSTEMS ..  
 INPUT PLANT ..

\$-----\$  
 \$ E Z - D O E P L A N T S I N P U T \$  
 \$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
 LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
 LINE-3 \* DENVER, CO 80227 \*  
 LINE-4 \*RUN #4 NIGHT INFILTRATION FOR BLDG.#7665\*  
 LINE-5 \*DENTAL CLINIC \* ..

ABORT ERRORS ..  
 DIAGNOSTIC WARNINGS ..  
 PLANT-REPORT VERIFICATION=(PV-A)  
 SUMMARY=(PS-B,BEPS)  
 HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

PD\_heaton =DAY-SCHEDULE (1,24) (1.) ..

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 9/1995 15:13:59 SDL RUN 1  
 DENVER, CO 80227 RUN #4 NIGHT INFILTRATION FOR BLDG.#7665DENTAL CLINIC  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR MZ\_W/DX TOPEKA, KS

C O O L I N G				H E A T I N G				E L E C				
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC- TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				0.000	-15.229	28	6	-2.F	-3.F	19885.	63.387
FEB	0.00000				0.000	-7.344	3	6	-1.F	-2.F	17843.	63.387
MAR	0.00000				0.000	-9.198	22	6	27.F	23.F	20637.	59.657
APR	0.00000				0.000	-12.278	29	17	69.F	54.F	19390.	59.657
MAY	48.73689	16	61.F	59.F	567.298	-7.460	13	17	82.F	65.F	24443.	99.046
JUN	93.26552	28	90.F	76.F	304.380	0.000				0.000	29238.	92.743
JUL	100.51900	13	93.F	77.F	314.276	0.000				0.000	29589.	95.025
AUG	105.79280	22	96.F	77.F	313.245	0.000				0.000	31873.	97.690
SEP	77.55887	7	93.F	76.F	302.548	0.000				0.000	27114.	93.693
OCT	1.00734	1	83.F	68.F	79.598	-11.061	7	17	73.F	56.F	19355.	59.657
NOV	0.00000				0.000	-8.256	18	17	44.F	36.F	18928.	59.657
DEC	0.00000				0.000	-10.523	12	6	3.F	2.F	19717.	63.387
TOTAL	426.881					-81.349					278012.	
MAX					567.298					-151.545		99.046

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 9/1995 15:13:59 SDL RUN 1  
 DENVER, CO 80227 RUN #4 NIGHT INFILTRATION FOR BLDG.#7665DENTAL CLINIC  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR MZ\_W/DX TOPEKA, KS

C O O L I N G				H E A T I N G				E L E C			
MONTH	HOURS COOLING LOAD	HOURS HEATING LOAD	HOURS COINCIDENT COOL-HEAT LOAD	HOURS FLOATING	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.	HOURS FANS ON CYCLE	HOURS NIGHT VENTING	HOURS FLOATING WHEN FANS ON	COINCIDENT HEATING LOAD AT COOLING PEAK (KBTU/HR)	COINCIDENT ELECTRIC LOAD AT COOLING PEAK (KW)
JAN	0	744	0	0	744	0	0	0	0	-3.594	13.455
FEB	0	672	0	0	672	0	0	0	0	-3.927	13.455
MAR	0	744	0	0	744	0	0	0	0	-4.619	13.455
APR	0	720	0	0	720	0	0	0	0	-5.180	13.455
MAY	384	358	0	2	744	384	0	0	2	0.000	62.083
JUN	720	0	0	0	720	720	0	0	0	0.000	92.743
JUL	744	0	0	0	744	744	0	0	0	0.000	92.743
AUG	744	0	0	0	744	744	0	0	0	0.000	95.025
SEP	719	0	0	1	720	720	0	0	1	0.000	96.160
OCT	24	720	0	0	744	24	0	0	0	0.000	93.693
NOV	0	720	0	0	720	0	0	0	0	0.000	22.388
DEC	0	744	0	0	744	0	0	0	0	-4.859	13.455
ANNUAL	3335	5422	0	3	5424	3336	8760	0	3	-29.735	13.455

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY 69.077 219.799 28/ 8 61.628 218.764 3/ 8 71.337 207.063 25/16 67.193 207.063 29/16 83.955 338.187 16/ 8 99.831 316.664 28/16 101.031 324.454 13/16 108.828 333.554 11/16 92.579 319.907 7/16 66.991 207.063 28/16 65.406 207.063 25/16 68.224 219.760 13/ 8	NATURAL-GAS 27.005 203.570 28/ 6 14.370 145.089 3/ 6 17.765 93.345 22/ 6 29.210 132.202 22/17 12.763 150.275 13/17 0.000 0.000 30/ 1 0.000 0.000 31/ 1 0.000 0.000 31/ 1 0.000 0.000 30/ 1 20.228 116.769 7/17 16.006 105.092 18/17 19.569 196.108 12/ 6
JAN	TOTAL (MBTU) 69.077 PEAK (KBTU) 219.799 DY/HR 28/ 8	69.077 219.799 28/ 8	27.005 203.570 28/ 6
FEB	TOTAL (MBTU) 61.628 PEAK (KBTU) 218.764 DY/HR 3/ 8	61.628 218.764 3/ 8	14.370 145.089 3/ 6
MAR	TOTAL (MBTU) 71.337 PEAK (KBTU) 207.063 DY/HR 25/16	71.337 207.063 25/16	17.765 93.345 22/ 6
APR	TOTAL (MBTU) 67.193 PEAK (KBTU) 207.063 DY/HR 29/16	67.193 207.063 29/16	29.210 132.202 22/17
MAY	TOTAL (MBTU) 83.955 PEAK (KBTU) 338.187 DY/HR 16/ 8	83.955 338.187 16/ 8	12.763 150.275 13/17
JUN	TOTAL (MBTU) 99.831 PEAK (KBTU) 316.664 DY/HR 28/16	99.831 316.664 28/16	0.000 0.000 30/ 1
JUL	TOTAL (MBTU) 101.031 PEAK (KBTU) 324.454 DY/HR 13/16	101.031 324.454 13/16	0.000 0.000 31/ 1
AUG	TOTAL (MBTU) 108.828 PEAK (KBTU) 333.554 DY/HR 11/16	108.828 333.554 11/16	0.000 0.000 31/ 1
SEP	TOTAL (MBTU) 92.579 PEAK (KBTU) 319.907 DY/HR 7/16	92.579 319.907 7/16	0.000 0.000 30/ 1
OCT	TOTAL (MBTU) 66.991 PEAK (KBTU) 207.063 DY/HR 28/16	66.991 207.063 28/16	20.228 116.769 7/17
NOV	TOTAL (MBTU) 65.406 PEAK (KBTU) 207.063 DY/HR 25/16	65.406 207.063 25/16	16.006 105.092 18/17
DEC	TOTAL (MBTU) 68.224 PEAK (KBTU) 219.760 DY/HR 13/ 8	68.224 219.760 13/ 8	19.569 196.108 12/ 6
	ONE YEAR USE/PEAK	956.081 338.187	149.916 203.570

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 9/1995 15:13:59 PDL RUN 1  
 DENVER, CO 80227 RUN #4 NIGHT INFILTRATION FOR BLDG.#7665DENTAL CLINIC  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE	ELECTRICITY	NATURAL-GAS
IN SITE MBTU -		
CATEGORY OF USE		
SPACE HEAT	6.83	149.92
SPACE COOL	149.26	0.00
HVAC AUX	402.41	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	310.83	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	86.71	0.00
TOTAL	956.04	149.92

TOTAL SITE ENERGY 1106.00 MBTU 114.5 KBTU/SQFT-YR GROSS-AREA 114.7 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 3021.03 MBTU 312.7 KBTU/SQFT-YR GROSS-AREA 313.2 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTILING RANGE = 0.3  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
LINE-3 \* DENVER, CO 80227 \*

LINE-4 \*RUN #5 DAY INFILTRATION FOR BLDG.#7665 \*  
LINE-5 \*DENTAL CLINIC \* ..

ABORT ERRORS ..  
DIAGNOSTIC WARNINGS ..  
SYSTEMS-REPORT VERIFICATION=(SV-A)  
SUMMARY=(SS-A,SS-C,SS-K,SS-O)  
HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

SD\_FULL =DAY-SCHEDULE (1,24) (1.) ..  
SD\_WT\_HT =DAY-SCHEDULE (1,24) (74.) ..  
SD\_SM\_CL =DAY-SCHEDULE (1,24) (72.) ..  
SD\_OA% =DAY-SCHEDULE (1,5) (0.03) ..  
(6,17) (0.) ..  
(18,24) (0.03) ..  
SD\_OFF =DAY-SCHEDULE (1,24) (0.) ..  
SD\_WT\_CL =DAY-SCHEDULE (1,24) (74.2) ..  
SD\_SM\_HT =DAY-SCHEDULE (1,24) (71.8) ..  
SD\_OA%\_D =DAY-SCHEDULE (1,24) (0.03) ..



SW\_FULL\_ON =WEEK-SCHEDULE (ALL) SD\_FULL ..  
SW\_WT\_HT =WEEK-SCHEDULE (ALL) SD\_WT\_HT ..  
SW\_SM\_CL =WEEK-SCHEDULE (ALL) SD\_SM\_CL ..  
SW\_OA% =WEEK-SCHEDULE (WD) SD\_OA%  
(WEH) SD\_OA%\_D ..  
SW\_off =WEEK-SCHEDULE (ALL) SD\_OFF ..  
SW\_WT\_CL =WEEK-SCHEDULE (ALL) SD\_WT\_CL ..  
SW\_SM\_HT =WEEK-SCHEDULE (ALL) SD\_SM\_HT ..

S\_FULL\_ON =SCHEDULE THRU DEC 31 SW\_FULL\_ON ..  
S\_FULL\_OFF =SCHEDULE THRU DEC 31 SW\_off ..

\$ HEATING SET TEMP  
S\_HEAT\_F =SCHEDULE THRU MAY 15 SW\_WT\_HT  
THRU OCT 1 SW\_SM\_HT  
THRU DEC 31 SW\_WT\_HT ..

S\_OTSIDAIR =SCHEDULE THRU DEC 31 SW\_OA% ..

S\_HE\_SCHED =SCHEDULE THRU MAY 15 SW\_FULL\_ON  
THRU OCT 1 SW\_off  
THRU DEC 31 SW\_FULL\_ON ..

S\_CL\_SCHED =SCHEDULE THRU MAY 15 SW\_off

THRU OCT 1 SW\_FULL\_ON  
THRU DEC 31 SW\_off ..

## \$ COOLING SET TEMP

S\_COOL\_F =SCHEDULE THRU MAY 15 SW\_WT\_CL  
THRU OCT 1 SW\_SM\_CL  
THRU DEC 31 SW\_WT\_CL ..

S\_HRLY-RPT =SCHEDULE THRU JAN 14 SW\_off  
THRU JAN 15 SW\_FULL\_ON  
THRU AUG 11 SW\_off  
THRU AUG 12 SW\_FULL\_ON  
THRU DEC 31 SW\_off ..

## \$ ZONE DESCRIPTION

SPACE\_1 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HEAT\_F COOL-TEMP-SCH = S\_COOL\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

SPACE\_2 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HEAT\_F COOL-TEMP-SCH = S\_COOL\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

SPACE\_3 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HEAT\_F COOL-TEMP-SCH = S\_COOL\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

SPACE\_4 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HEAT\_F COOL-TEMP-SCH = S\_COOL\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

SPACE\_5 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HEAT\_F COOL-TEMP-SCH = S\_COOL\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

PLENUM\_6 =ZONE DESIGN-HEAT-T = 72.0 DESIGN-COOL-T = 74.0  
ZONE-TYPE = PLENUM SIZING-OPTION = FROM-LOADS ..

## \$ SYSTEM DESCRIPTION

MZ\_W/DX =SYSTEM SYSTEM-TYPE = PMZS  
MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0

```

HEATING-SCHEDULE = S_HE_SCHED
COOLING-SCHEDULE = S_CL_SCHED  MAX-HUMIDITY = 60.0
MIN-HUMIDITY = 50.0  OA-CONTROL = FIXED
SUPPLY-CFM = 19500.  RATED-CFM = 19500.
MIN-AIR-SCH = S_OTSIDAIR  MAX-OA-FRACTION = 0.03
FAN-SCHEDULE = S_FULL_ON  SUPPLY-DELTA-T = 2.1
SUPPLY-KW = 0.00069  NIGHT-CYCLE-CTRL = STAY-OFF
MIN-CFM-RATIO = 1.0  COOLING-CAPACITY = 664700.
HEATING-CAPACITY = -450000.  CRANKCASE-HEAT = 3.73
CRANKCASE-MAX-T = 0.  OUTSIDE-FAN-T = 45.
HEAT-SOURCE = HOT-WATER  HUMIDIFIER-TYPE = HOT-WATER
ZONE-NAMES = (SPACE_1, SPACE_2, SPACE_3, SPACE_4,
              SPACE_5, PLENUM_6) ..

```

\$ HOURLY REPORT DESCRIPTION

```

AUH-BLK  =REPORT-BLOCK VARIABLE-TYPE = MZ_W/DX
          VARIABLE-LIST = (3,5,6,17) ..
S_ZON-BLK =REPORT-BLOCK VARIABLE-TYPE = SPACE_4
          VARIABLE-LIST = (17,18,7,6) ..
N_ZON-BLK =REPORT-BLOCK VARIABLE-TYPE = SPACE_3
          VARIABLE-LIST = (17,18,7,6) ..
AHU-HRLY  = HOURLY-REPORT  REPORT-SCHEDULE = S_HRLY-RPT
          REPORT-BLOCK = (AUH-BLK)
..
ZONES-HRLY = HOURLY-REPORT  REPORT-SCHEDULE = S_HRLY-RPT
          REPORT-BLOCK = (S_ZON-BLK,N_ZON-BLK)
..
END ..
COMPUTE SYSTEMS ..

INPUT PLANT ..

```

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$-----$
$ E Z - D O E   P L A N T S   I N P U T $
$-----$

```

\$ GENERAL PROJECT DATA

```

TITLE  LINE-1 *   EMC      ENGINEERS      INC.      *
        LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
        LINE-3 *   DENVER,      CO      80227      *

        LINE-4 *RUN #5 DAY INFILTRATION FOR BLDG.#7665 *
        LINE-5 *DENTAL CLINIC                          * ..

```

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ABORT      ERRORS ..
DIAGNOSTIC WARNINGS ..
PLANT-REPORT VERIFICATION=(PV-A)
            SUMMARY=(PS-B,BEPS)
            HOURLY-DATA-SAVE = YES ..

```

\$ SCHEDULES

EMC ENGINEERS INC. EZZOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 9/1995 15:29:48 SDL RUN 1  
 DENVER, CO 80227 RUN #5 DAY INFILTRATION FOR BLDG.#7665 DENTAL CLINIC  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR MZ\_W/DX TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C			
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	MAXIMUM COOLING LOAD (KBTU/HR)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-30.868	16 3	4. F	2. F	19885.	-154.344	0.000	63.387
FEB	0.00000				-19.151	28 5	14. F	13. F	17843.	-111.937	0.000	63.387
MAR	0.00000				-18.459	6 7	19. F	18. F	20637.	-100.505	0.000	59.657
APR	0.00000				-22.664	22 18	67. F	52. F	19390.	-114.138	0.000	59.657
MAY	47.87705	16 5	59. F	58. F	-13.674	13 18	80. F	66. F	24385.	-122.542	0.000	96.902
JUN	94.97421	29 16	89. F	75. F	0.000				29460.	0.000	0.000	89.425
JUL	105.07058	7 16	83. F	73. F	0.000				30124.	0.000	91.273	
AUG	108.14583	11 16	100. F	71. F	0.000				32172.	0.000	95.221	
SEP	76.59960	7 16	93. F	76. F	0.000				27062.	0.000	90.273	
OCT	0.96750	1 18	83. F	68. F	-20.627	7 18	71. F	55. F	19352.	-101.116	0.000	59.657
NOV	0.00000				-16.911	18 18	41. F	34. F	18928.	-95.491	0.000	59.657
DEC	0.00000				-23.781	12 5	4. F	3. F	19717.	-142.251	0.000	63.387
TOTAL MAX	433.635				-166.133				278956.	-154.344		96.902

EMC ENGINEERS INC. EZZOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 9/1995 15:29:48 SDL RUN 1  
 DENVER, CO 80227 RUN #5 DAY INFILTRATION FOR BLDG.#7665 DENTAL CLINIC  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR MZ\_W/DX TOPEKA, KS

MONTH	HOURS				HOURS				HOURS				HOURS			
	COOLING LOAD	HEATING LOAD	COINCIDENT COOL-HEAT LOAD	FLOATING	HEATING AVAIL.	COOLING AVAIL.	FANS ON CYCLE	FANS ON VENTING	FANS ON	FLOATING WHEN	NIGHT	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)	
JAN	0	744	0	0	744	0	0	0	0	0	-30.755	13.455	-30.755	13.455		
FEB	0	672	0	0	672	0	0	0	0	0	-27.730	13.455	-27.730	13.455		
MAR	0	744	0	0	744	0	0	0	0	0	-39.428	13.455	-39.428	13.455		
APR	0	697	0	23	720	0	0	0	23	0	-54.948	13.455	-54.948	13.455		
MAY	384	333	0	27	360	384	0	0	27	0	0.000	53.867	0.000	53.867		
JUN	720	0	0	0	720	720	0	0	0	0	0.000	89.191	0.000	89.191		
JUL	744	0	0	0	744	744	0	0	0	0	0.000	88.607	0.000	88.607		
AUG	744	0	0	0	744	744	0	0	0	0	0.000	95.221	0.000	95.221		
SEP	710	0	0	10	720	720	0	0	10	0	0.000	90.273	0.000	90.273		
OCT	21	710	0	13	744	24	0	0	13	0	0.000	23.730	0.000	23.730		
NOV	0	720	0	0	720	0	0	0	0	0	-37.985	13.455	-37.985	13.455		
DEC	0	744	0	0	744	0	0	0	0	0	-84.271	13.455	-84.271	13.455		
ANNUAL	3323	5364	0	73	5424	3336	0	0	73	0						



EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.ID 5/ 9/1995 15:29:48 PDL RUN 1  
 DENVER, CO 80227 RUN #5 DAY INFILTRATION FOR BLDG.#7665 DENTAL CLINIC  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY TOTAL (MBTU) PEAK (KBTU) DY/HR	NATURAL-GAS TOTAL (MBTU) PEAK (KBTU) DY/HR
JAN	69.544 217.112 28/ 8	48.920 207.330 16/ 3	
FEB	62.302 216.684 3/ 8	32.892 158.846 28/ 5	
MAR	71.976 203.834 30/16	32.920 145.358 6/ 7	
APR	67.792 203.834 11/11	38.514 161.423 22/18	
MAY	84.091 330.865 16/ 8	22.344 171.199 13/18	
JUN	100.590 305.336 28/16	0.000 30/ 1	
JUL	102.857 311.644 13/16	0.000 31/ 1	
AUG	109.851 325.124 11/16	0.000 31/ 1	
SEP	92.402 308.232 7/16	0.000 30/ 1	
OCT	67.584 203.834 31/14	35.547 146.084 7/18	
NOV	66.015 203.834 30/16	30.245 139.387 18/18	
DEC	68.897 216.913 13/ 8	39.838 193.753 12/ 5	
	ONE YEAR USE/PEAK	963.901 330.865	281.220 207.330

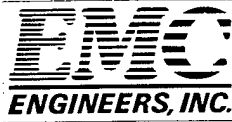
EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 9/1995 15:29:48 PDL RUN 1  
 DENVER, CO 80227 RUN #5 DAY INFILTRATION FOR BLDG.#7665 DENTAL CLINIC  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
SPACE HEAT	11.43	281.22
SPACE COOL	152.49	0.00
HVAC AUX	402.41	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	310.84	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	86.71	0.00
TOTAL	963.87	281.22

TOTAL SITE ENERGY 1245.12 MBTU 128.9 KBTU/SQFT-YR GROSS-AREA 129.1 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 3175.82 MBTU 328.8 KBTU/SQFT-YR GROSS-AREA 329.3 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 0.6  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 .NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

**COMPUTER ENERGY SIMULATIONS**

**BLDG. 7245A/B  
DINING (KITCHEN) BUILDINGS**



DENVER - ATLANTA

PROJECT: FEASIBILITY STUDY FOR  
 INSTALLATION OF UMCS  
 LOCATION: FORT RILEY, KANSAS

EMC NO: 1406-001  
 CALC. BY: AJN  
 CHECKED BY: CEL  
 DATE: 05-Jul-95

BUILDING NO.: 7245  
 BLDG. TYPE: ENL PERS DINING FACILITY - DINING AREA

**ENERGY CONSTANT CALCULATIONS**

	BASERUN	RUN1	RUN2	RUN3	RUN4	RUN5
HEATING (MBtu)	1112.1	655.3	932.1	673.6	697.6	419.7
COOLING (kWH)	205,819	191,685	192,197	185,719	196,727	192,561

SUPPLY AIR FAN	14,820 CFM
FLOOR AREA	7,353 FT <sup>2</sup>
CFMI	4001 CFM
UA	7988 BTU/HR-°F
BLDG CONSTR.	2 (1 FOR LIGHT ) (2 FOR HEAVY)

EZDOE COMPUTER RUN DEFINITION:	
BASERUN	EXISTING OPERATION
RUN1	NIGHT SETBACK
RUN2	DDC CONTROL
RUN3	ECONOMIZER
RUN4	NIGHTTIME INFILTRATION (OA)
RUN5	DAYTIME INFILTRATION (OA)

HOURS OF OCCUPANCY			ANNUAL HEATING & COOLING HOURS	
M-F	600	2000	70 HR	HR. ON HEATING 3178 HR/YR
SAT.	600	2000	14 HR	HR. ON COOLING 1932 HR/YR
SUN.	600	2000	14 HR	HR. OFF HEATING 2270 HR/YR
	TOTAL OCCUPY HR.		98 HR/WK	HR. OFF COOLING 1380 HR/YR
	TOTAL UNOCC. HR.		70 HR/WK	
	ANNUAL OCCUPY HR.		5110 HR/YR	
	ANNUAL UNOCC. HR.		3650 HR/YR	

PRESENT HR. OF OPERATION FOR SYS. WITH HEATING AND COOLING 8760 HR/YR  
 PRESENT HR. OF OPERATION FOR SYS. WITH HEATING ONLY 5448 HR/YR  
 PRESENT HR. OF OPERATION FOR SYS. WITH COOLING ONLY 3312 HR/YR  
 HRS SAVED (HTG ONLY) 5448 - 3178 = 2270 HR/YR  
 HRS SAVED (CLG ONLY) 3312 - 1932 = 1380 HR/YR

HOAUHC	1112.07 MBtu	-	697.57 MBtu	=	2.84E+01 Btu/CFM-HR
	4001.4 CFM	x	3650 HR/YR		
HOAUH	1112.07 MBtu	-	697.57 MBtu	=	4.56E+01 Btu/CFM-HR
	4001.4 CFM	x	2270 HR/YR		
COAUHC	205,818.9 kWH	-	196,727.2 kWH	=	6.23E-04 kWH/CFM-HR
	4001.4 CFM	x	3650 HR/YR		
COAUC	205,818.9 kWH	-	196,727.2 kWH	=	1.65E-03 kWH/CFM-HR
	4001.4 CFM	x	1380 HR/YR		
HOAOHC	1112.07 MBtu	-	419.68 MBtu	=	3.39E+01 Btu/CFM-HR
	4001.4 CFM	x	5110 HR/YR		
HOAOH	1112.07 MBtu	-	419.68 MBtu	=	5.44E+01 Btu/CFM-HR
	4001.4 CFM	x	3178 HR/YR		
COAOHC	205,818.9 kWH	-	192,560.8 kWH	=	6.48E-04 kWH/CFM-HR
	4001.4 CFM	x	5110 HR/YR		
COAOC	205,818.9 kWH	-	192,560.8 kWH	=	1.71E-03 kWH/CFM-HR
	4001.4 CFM	x	1932 HR/YR		
DC DUTY	1 / 6 (10 MINUTES PER HOUR)			=	0.17
DC DEMAND	1 / 6 (10 MINUTES PER HOUR)			=	0.17
ECC	191,684.7 kWH	-	185,719.3 kWH	=	2.08E-04 kWH/CFM-HR
	14820 CFM	x	1932 HR/YR		
ECHC	191,684.7 kWH	-	185,719.3 kWH	=	7.88E-05 kWH/CFM-HR
	14820 CFM	x	5110 HR/YR		
NSUCHC	205,818.9 kWH	-	191,684.7 kWH	=	2.61E-04 kWH/CFM-HR
	14820 CFM	x	3650 HR/YR		
NSUCC	205,818.9 kWH	-	191,684.7 kWH	=	6.91E-04 kWH/CFM-HR
	14820 CFM	x	1380 HR/YR		
DDCCHC	205,818.9 kWH	-	192,197.5 kWH	=	1.80E-04 kWH/CFM-HR
	14820 CFM	x	5110 HR/YR		
DDCCC	205,818.9 kWH	-	192,197.5 kWH	=	4.76E-04 kWH/CFM-HR
	14820 CFM	x	1932 HR/YR		
NSC	1112.07 MBtu	-	655.33 MBtu	=	5.72E+04 Btu/UA
	7987.75158 UA				
DDCH	1112.07 MBtu	-	932.11 MBtu	=	2.25E+04 Btu/UA
	7987.75158 UA				
OPT	(2 HR/DAY X 240 DAY/YR)		175 HR/YR	=	305 HR/YR
CHWR	(1.10 kW X 0.012 Eff. X 664 HRS X 2 Degrees of Reset)			=	17.5 kWH/TON
OAR	567 HR/YR	x	0.01	=	5.67 HR/YR



INPUT LOADS ..

```

$-----$
$ E Z - D O E   L O A D S   I N P U T $
$-----$

```

\$ GENERAL PROJECT DATA

```

TITLE  LINE-1 *      EMC      ENGINEERS      INC.      *
LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
LINE-3 *      DENVER,      CO      80227      *

LINE-4 *BASELINE SIMULATION FOR BLDG. 7245      *
LINE-5 *DINING AREA                                * ..

```

```

ABORT          ERRORS ..
DIAGNOSTIC     WARNINGS ..
LOADS-REPORT   VERIFICATION=(LV-D)
                SUMMARY=(LS-C,LS-D)
                HOURLY-DATA-SAVE = YES ..
BUILDING-LOCATION  LATITUDE = 39.0
                LONGITUDE = 96.5
                ALTITUDE = 1065.
                TIME-ZONE = 6
                GROSS-AREA = 7353.4
                SHIELDING-COEF = 0.29
                X-REF = 0.0
                Y-REF = 0.0 ..
RUN-PERIOD      JAN 1 1994 THRU DEC 31 1994 ..

```

\$ SCHEDULES

```

LD_ON          =DAY-SCHEDULE (1,24) (1.) ..
LD_OFF         =DAY-SCHEDULE (1,24) (0.) ..
LD_7-4         =DAY-SCHEDULE (1,6) (0.)
                (7,16) (1.)
                (17,24) (0.) ..
LD_7:3-5:3    =DAY-SCHEDULE (1,6) (0.)
                (7) (0.5)
                (8,16) (1.)
                (17) (0.5)
                (18,24) (0.) ..
LD_DIN_PEO    =DAY-SCHEDULE (1,4) (0.)
                (5) (0.5)
                (6,7) (1.)
                (8) (0.5)
                (9,10) (0.)
                (11,13) (0.5,1.,0.5)
                (14,16) (0.)

```

(17) (0.5)  
(18,19) (1.)  
(20) (0.5)  
(21,24) (0.) ..

LD\_DIN\_LIG =DAY-SCHEDULE (1,4) (0.)  
(5) (0.5)  
(6,20) (1.)  
(21,24) (0.) ..

LW\_ON =WEEK-SCHEDULE (ALL) LD\_ON ..

LW\_OFF =WEEK-SCHEDULE (ALL) LD\_OFF ..

LW\_7-4M-F =WEEK-SCHEDULE (WD) LD\_7-4  
(WEH) LD\_OFF ..

LW\_7343M-F =WEEK-SCHEDULE (WD) LD\_7:3-5:3  
(WEH) LD\_OFF ..

LW\_DIN\_PEO =WEEK-SCHEDULE (ALL) LD\_DIN\_PEO ..

LW\_DIN\_LIG =WEEK-SCHEDULE (ALL) LD\_DIN\_LIG ..

L\_FULL\_ON =SCHEDULE THRU DEC 31 LW\_ON ..

L\_FULL\_OFF =SCHEDULE THRU DEC 31 LW\_OFF ..

\$ OPERATIONS=7-4 M-F

L\_7-4M-F =SCHEDULE THRU DEC 31 LW\_7-4M-F ..

\$ INFILT IN WINTER ONLY

L\_WINTINFL =SCHEDULE THRU MAY 15 LW\_ON  
THRU OCT 1 LW\_OFF  
THRU DEC 31 LW\_ON ..

\$ M-F\_7:30-4:30

L\_M-F7343 =SCHEDULE THRU DEC 31 LW\_7343M-F ..

\$ DINING AREA PEOPLE LOAD

L\_DINING\_P =SCHEDULE THRU DEC 31 LW\_DIN\_PEO ..

\$ DINING AREA LIGHT LOAD

L\_DININ\_LI =SCHEDULE THRU DEC 31 LW\_DIN\_LIG ..

\$ CONSTRUCTION TYPES

\$ BUILT-UP ROOF ON METAL DECKING

ROOF-1 =CONSTRUCTION LAYERS = ASHR-17

ABSORPTANCE = 0.800  
ROUGHNESS = 1 ..

\$ BUILT-UP ROOF W/INS W/NO DROP CEI

ASHR-17A =LAYERS MATERIAL=(HF-E2,HF-E3,HF-B6,HF-A3)  
THICKNESS=(0.042,0.031,0.167,0.005) ..  
ROOF-2 =CONSTRUCTION LAYERS = ASHR-17A  
ABSORPTANCE = 0.800  
ROUGHNESS = 1 ..

\$ BUILT-UP ROOF W/NO DROP CEILING

ASHR-17B =LAYERS MATERIAL=(HF-E2,HF-E3,HF-A3)  
THICKNESS=(0.042,0.031,0.005) ..  
ROOF-3 =CONSTRUCTION LAYERS = ASHR-17B  
ABSORPTANCE = 0.800  
ROUGHNESS = 1 ..

\$ FACIA BORD W/ INS & GYP

WALL-1 =LAYERS MATERIAL=(CM03,AL11,PW05,IN23,GP02) I-F-R= 0.6100  
THICKNESS=(0.083,0.000,0.063,0.167,0.052) ..  
EXWALL-1 =CONSTRUCTION LAYERS = WALL-1  
ROUGHNESS = 2 ..

\$ EXTERIOR WALL BRICK, INSL, BRICK

WALL-2 =LAYERS MATERIAL=(BK01,AL11,IN35,CB06,GP01) I-F-R= 0.6100  
THICKNESS=(0.333,0.000,0.167,0.500,0.042) ..  
EXWALL-2 =CONSTRUCTION LAYERS = WALL-2  
ABSORPTANCE = 0.880  
ROUGHNESS = 2 ..

\$ STD INTER WALL CONST

IW-LAYER =LAYERS MATERIAL=(GP01,WD01,AL21,GP01)  
THICKNESS=(0.042,0.063,0.000,0.042) ..  
INWALL =CONSTRUCTION LAYERS = IW-LAYER  
ROUGHNESS = 5 ..

\$ HEAVY CONCRETE WALL

VAULT =CONSTRUCTION LAYERS = ASHI-21 ..  
DOORCON =CONSTRUCTION U-VALUE = 0.400 ..

\$ SLAB FLOOR

FLOOR =CONSTRUCTION U-VALUE = 0.020  
ABSORPTANCE = 0.610  
ROUGHNESS = 5 ..

\$ DROP CEIL W/ INSL @ R-19

INSL-CEL =LAYERS MATERIAL=(AC02,IN03) I-F-R= 0.8000  
THICKNESS=(0.042,0.511) ..  
DROPCEIL =CONSTRUCTION LAYERS = INSL-CEL  
ROUGHNESS = 2 ..

1\_PN\_STD =GLASS-TYPE GLASS-TYPE-CODE = 1  
PANES = 1 ..  
2\_PN\_STD =GLASS-TYPE GLASS-TYPE-CODE = 1  
PANES = 2 ..



## \$ SPACE DESCRIPTION

```

diningarea =SPACE  AREA = 7353.4  VOLUME = 78436.0
                    TEMPERATURE = (73.)  ZONE-TYPE = CONDITIONED
                    PEOPLE-SCHEDULE = L_DINING_P  AREA/PERSON = 39.0
                    PEOPLE-HG-LAT = 625.0  PEOPLE-HG-SENS = 375.0
                    LIGHTING-TYPE = SUS-FLUOR  LIGHTING-W/SQFT = 2.0
                    LIGHT-TO-SPACE = 1.0  LIGHTING-SCHEDULE = L_DININ_LI
                    EQUIP-SCHEDULE = L_DINING_P  EQUIPMENT-W/SQFT = 1.0
                    FURN-FRACTION = 0.3  FURN-WEIGHT = 0.6
                    INF-METHOD = NONE  ..

E-W  HEIGHT = 10.6  WIDTH = 97.0  CONS = EXWALL-2
     AZIMUTH = 135  SKY-FORM-FACTOR = 0.5
     GND-FORM-FACTOR = 0.5  ..

WINDOW HEIGHT = 8.0  WIDTH = 4.0  G-T = 1_PN_STD
MULTIPLIER = 18.0  SETBACK = 0.3
SKY-FORM-FACTOR = 0.5  GND-FORM-FACTOR = 0.5  ..

E-W  HEIGHT = 10.6  WIDTH = 86.3  CONS = EXWALL-2
     AZIMUTH = 45  SKY-FORM-FACTOR = 0.5
     GND-FORM-FACTOR = 0.5  ..

WINDOW HEIGHT = 8.0  WIDTH = 4.0  G-T = 1_PN_STD
MULTIPLIER = 6.0  SETBACK = 0.3
SKY-FORM-FACTOR = 0.5  GND-FORM-FACTOR = 0.5  ..

E-W  HEIGHT = 10.6  WIDTH = 97.0  CONS = EXWALL-2
     AZIMUTH = 315  SKY-FORM-FACTOR = 0.5
     GND-FORM-FACTOR = 0.5  ..

WINDOW HEIGHT = 8.0  WIDTH = 4.0  G-T = 1_PN_STD
MULTIPLIER = 18.0  SETBACK = 0.3
SKY-FORM-FACTOR = 0.5  GND-FORM-FACTOR = 0.5  ..

U-W  HEIGHT = 86.0  WIDTH = 85.5  CONS = FLOOR  ..

I-W  HEIGHT = 86.0  WIDTH = 85.5  CONS = DROPCEIL
     NEXT-TO = dining-plm  ..

dining-plm =SPACE  AREA = 7353.4  VOLUME = 58827.2
                    TEMPERATURE = (73.)  ZONE-TYPE = UNCONDITIONED
                    PEOPLE-HG-LAT = 625.0  PEOPLE-HG-SENS = 375.0
                    LIGHTING-TYPE = SUS-FLUOR  LIGHT-TO-SPACE = 1.0
                    FURN-FRACTION = 0.3  FURN-WEIGHT = 0.6
                    INF-METHOD = NONE  ..

E-W  HEIGHT = 8.0  WIDTH = 86.3  CONS = EXWALL-2
     AZIMUTH = 45  SKY-FORM-FACTOR = 0.5
     GND-FORM-FACTOR = 0.5  ..

```

```

E-W      HEIGHT = 8.0  WIDTH = 97.0  CONS = EXWALL-2
        AZIMUTH = 135  SKY-FORM-FACTOR = 0.5
        GND-FORM-FACTOR = 0.5  ..

E-W      HEIGHT = 8.0  WIDTH = 97.0  CONS = EXWALL-2
        AZIMUTH = 315  SKY-FORM-FACTOR = 0.5
        GND-FORM-FACTOR = 0.5  ..

ROOF     HEIGHT = 86.0  WIDTH = 85.5  CONS = ROOF-3
        TILT = 0  SKY-FORM-FACTOR = 1.0  ..

```

```

END ..
COMPUTE LOADS ..

INPUT SYSTEMS ..

```

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$-----$
$ E Z - D O E   S Y S T E M S   I N P U T $
$-----$

```

\$ GENERAL PROJECT DATA

```

TITLE  LINE-1 *   EMC      ENGINEERS   INC.      *
        LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
        LINE-3 *   DENVER,    CO      80227      *

        LINE-4 *BASELINE SIMULATION FOR BLDG. 7245   *
        LINE-5 *DINING AREA                          * ..

ABORT      ERRORS ..
DIAGNOSTIC WARNINGS ..
SYSTEMS-REPORT VERIFICATION=(SV-A)
              SUMMARY=(SS-A,SS-B,SS-C,SS-K,SS-O)
              HOURLY-DATA-SAVE = YES ..

```

\$ SCHEDULES

```

SD_ON      =DAY-SCHEDULE (1,24) (1.) ..
SD_W_HT_F  =DAY-SCHEDULE (1,24) (74.) ..
SD_S_CL_F  =DAY-SCHEDULE (1,24) (72.) ..
SD_27%_OA  =DAY-SCHEDULE (1,24) (0.27) ..
SD_OFF     =DAY-SCHEDULE (1,24) (0.) ..
SD_10%_OA  =DAY-SCHEDULE (1,24) (0.1) ..
SD_W_CL_F  =DAY-SCHEDULE (1,24) (76.) ..
SD_S_HT_F  =DAY-SCHEDULE (1,24) (70.) ..

SW_ON      =WEEK-SCHEDULE (ALL) SD_ON ..

SW_W_HT_F  =WEEK-SCHEDULE (ALL) SD_W_HT_F ..

SW_S_CL_F  =WEEK-SCHEDULE (ALL) SD_S_CL_F ..

SW_27%_OA  =WEEK-SCHEDULE (ALL) SD_27%_OA ..

SW_OFF     =WEEK-SCHEDULE (ALL) SD_OFF ..

```

SW\_10%\_OA =WEEK-SCHEDULE (ALL) SD\_10%\_OA ..

SW\_W\_CL\_F =WEEK-SCHEDULE (ALL) SD\_W\_CL\_F ..

SW\_S\_HT\_F =WEEK-SCHEDULE (ALL) SD\_S\_HT\_F ..

S\_FULL\_ON =SCHEDULE THRU DEC 31 SW\_ON ..

S\_FULL\_OFF =SCHEDULE THRU DEC 31 SW\_OFF ..

\$ OUTSIDE AIR AT .27%

S\_OTSIDAIR =SCHEDULE THRU DEC 31 SW\_27%\_OA ..

\$ HEATING SEASON

S\_HE\_SCHED =SCHEDULE THRU MAY 15 SW\_ON  
 THRU OCT 1 SW\_OFF  
 THRU DEC 31 SW\_ON ..

\$ COOLING SEASON

S\_CL\_SCHED =SCHEDULE THRU MAY 15 SW\_OFF  
 THRU OCT 1 SW\_ON  
 THRU DEC 31 SW\_OFF ..

\$ 10%OA\_WINTER\_100%OA\_SUM

S\_S/W\_VET =SCHEDULE THRU MAY 15 SW\_10%\_OA  
 THRU OCT 1 SW\_ON  
 THRU DEC 31 SW\_10%\_OA ..

S\_VENT@27% =SCHEDULE THRU DEC 31 SW\_27%\_OA ..

\$ HEATING SET TEMP

S\_HT\_SET\_F =SCHEDULE THRU MAY 15 SW\_W\_HT\_F  
 THRU OCT 1 SW\_S\_HT\_F  
 THRU DEC 31 SW\_W\_HT\_F ..

\$ COOLING SET TEMP

S\_CL\_SET\_F =SCHEDULE THRU MAY 15 SW\_W\_CL\_F  
 THRU OCT 1 SW\_S\_CL\_F  
 THRU DEC 31 SW\_W\_CL\_F ..

S\_HRLY-RPT =SCHEDULE THRU JAN 10 SW\_OFF  
 THRU JAN 11 SW\_ON  
 THRU JUN 17 SW\_OFF  
 THRU JUN 18 SW\_ON  
 THRU DEC 31 SW\_OFF ..

\$ ZONE DESCRIPTION

diningarea =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL

BASEBOARD-CTRL = THERMOSTATIC  
BASEBOARD-RATING = -235200. OUTSIDE-AIR-CFM = 3847.5  
SIZING-OPTION = FROM-LOADS ..

dining-plm =ZONE DESIGN-HEAT-T = 64.0 DESIGN-COOL-T = 82.0  
ZONE-TYPE = UNCONDITIONED SIZING-OPTION = FROM-LOADS ..

\$ SYSTEM DESCRIPTION

VAV-SPEED =SYSTEM SYSTEM-TYPE = VAVS  
MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
HEATING-SCHEDULE = S\_HE\_SCHED  
COOLING-SCHEDULE = S\_CL\_SCHED PREHEAT-T = 0.0  
OA-CONTROL = FIXED SUPPLY-CFM = 14250.  
RATED-CFM = 14250. MIN-OUTSIDE-AIR = 0.27  
MAX-OA-FRACTION = 0.27 FAN-CONTROL = SPEED  
SUPPLY-DELTA-T = 2.4 SUPPLY-KW = 0.00078  
FAN-PLACEMENT = BLOW-THROUGH MAX-FAN-RATIO = 1.0  
MIN-FAN-RATIO = 0.27 NIGHT-CYCLE-CTRL = STAY-OFF  
NIGHT-VENT-DT = 0.0 MIN-CFM-RATIO = 0.27  
REHEAT-DELTA-T = 70. COOLING-CAPACITY = 819545.  
COOL-SH-CAP = 672000. COOL-FT-MIN = 0.  
HEATING-CAPACITY = -51855200.  
SIZING-OPTION = COINCIDENT  
ZONE-NAMES = (diningarea, dining-plm) ..

\$ HOURLY REPORT DESCRIPTION

ZONES-RPT =REPORT-BLOCK VARIABLE-TYPE = diningarea  
VARIABLE-LIST = (17,18,7,31) ..  
NEW-VAV =REPORT-BLOCK VARIABLE-TYPE = VAV-SPEED  
VARIABLE-LIST = (3,5,6,9,17,20,39) ..  
HRLY-RPT-1 = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
REPORT-BLOCK = (ZONES-RPT)  
..  
HRLY-RPT-2 = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
REPORT-BLOCK = (NEW-VAV)  
..  
END ..  
COMPUTE SYSTEMS ..

INPUT PLANT ..

\$-----\$  
\$ E Z - D O E P L A N T S I N P U T \$  
\$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
LINE-3 \* DENVER, CO 80227 \*

LINE-4 \*BASELINE SIMULATION FOR BLDG. 7245 \*  
LINE-5 \*DINING AREA \* ..

ABORT ERRORS ..  
DIAGNOSTIC WARNINGS ..  
PLANT-REPORT VERIFICATION=(PV-A)  
SUMMARY=(PS-B,BEPS)  
HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

PD\_ON =DAY-SCHEDULE (1,24) (1.) ..

PD\_OFF =DAY-SCHEDULE (1,24) (0.) ..

PW\_HEATOFF =WEEK-SCHEDULE (ALL) PD\_OFF ..

PW\_HEATON =WEEK-SCHEDULE (ALL) PD\_ON ..

PW\_COOLOFF =WEEK-SCHEDULE (ALL) PD\_OFF ..

PW\_COOLON =WEEK-SCHEDULE (ALL) PD\_ON ..

\$ HEATING SEASON

P\_HEAT =SCHEDULE THRU MAY 15 PW\_HEATON  
THRU OCT 1 PW\_HEATOFF  
THRU DEC 31 PW\_HEATON ..

\$ COOLING SEASON

P\_COOL =SCHEDULE THRU MAY 15 PW\_COOLOFF  
THRU OCT 1 PW\_COOLON  
THRU DEC 31 PW\_COOLOFF ..

\$ EQUIPMENT DESCRIPTION

BOILER-STM =PLANT-EQUIPMENT TYPE = STM-BOILER  
SIZE = -999. ..

CHILLER-RC =PLANT-EQUIPMENT TYPE = HERM-REC-CHLR  
SIZE = -999. ..

PLANT-PARAMETERS BOILER-FUEL = NATURAL-GAS STM-BOILER-HIR = 1.33  
HERM-CENT-COND-TYPE = AIR HERM-REC-COND-TYPE = AIR  
CCIRC-HEAD = 0.0 HCIRC-HEAD = 30.0 ..

ENERGY-RESOURCE RESOURCE = ELECTRICITY ..  
ENERGY-RESOURCE RESOURCE = NATURAL-GAS ..

HEATINGSEA =LOAD-ASSIGNMENT TYPE = HEATING  
OPERATION-MODE = RUN-NEEDED

LOAD-RANGE = 0.000  
PLANT-EQUIPMENT = BOILER-STM  
NUMBER = 1 ..

COOLINGSEA =LOAD-ASSIGNMENT TYPE = COOLING  
OPERATION-MODE = RUN-NEEDED

LOAD-RANGE = 0.000  
PLANT-EQUIPMENT = CHILLER-RC  
NUMBER = 1 ..

END ..  
COMPUTE PLANT ..  
STOP ..

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 11:33:43 LDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. 7245 DINING AREA  
 REPORT- LV-D DETAILS OF EXTERIOR SURFACES IN THE PROJECT TOPEKA, KS

NUMBER OF EXTERIOR SURFACES 7 RECTANGULAR 7 OTHER 0  
 (U-VALUE INCLUDES INSIDE AIR FILM PLUS OUTSIDE AIR FILM AT 7.5 MPH WINDSPEED )

SURFACE	SPACE	U-VALUE (BTU/HR-SQFT-F)	GLASS AREA (SQFT)	U-VALUE (BTU/HR-SQFT-F)	WALL AREA (SQFT)	U-VALUE (BTU/HR-SQFT-F)	WALL+GLASS AREA (SQFT)	U-VALUE (BTU/HR-SQFT-F)	WALL+GLASS AREA (SQFT)	AZIMUTH
diningarea		1.021	192.00	0.082	722.78	0.279	914.78	0.608	914.78	NORTH-EAST
dining-plm		0.000	0.00	0.082	690.40	0.082	690.40	0.608	690.40	NORTH-EAST
diningarea		1.021	576.00	0.082	452.20	0.608	1028.20	0.608	1028.20	SOUTH-EAST
dining-plm		0.000	0.00	0.082	776.00	0.082	776.00	0.608	776.00	SOUTH-EAST
diningarea		1.021	576.00	0.082	452.20	0.608	1028.20	0.608	1028.20	SOUTH-EAST
dining-plm		0.000	0.00	0.082	776.00	0.082	776.00	0.608	776.00	NORTH-WEST
dining-plm		0.000	0.00	0.838	7353.00	0.838	7353.00	0.838	7353.00	ROOF
diningarea		0.000	0.00	0.020	7353.00	0.020	7353.00	0.020	7353.00	UNDERGRND

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 11:33:43 LDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. 7245 DINING AREA  
 REPORT- LV-D DETAILS OF EXTERIOR SURFACES IN THE PROJECT TOPEKA, KS

NORTH-EAST	SOUTH-EAST	NORTH-WEST	ROOF	ALL WALLS	WALLS+ROOFS	UNDERGRND	BUILDING
1.021	1.021	1.021	0.000	1.021	1.021	0.000	1.021
192.00	576.00	576.00	0.00	1344.00	1344.00	0.00	1344.00
0.082	0.382	0.382	0.838	0.324	0.625	0.020	0.401
0.082	0.382	0.382	0.838	0.324	0.625	0.020	0.401
1413.18	1228.20	1228.20	7353.00	3869.58	11222.58	7353.00	18575.58
1605.18	1804.20	1804.20	7353.00	5213.58	12566.58	7353.00	19919.58

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 11:33:43 LDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. 7245 DINING AREA TOPEKA, KS  
 REPORT- LS-C BUILDING PEAK LOAD COMPONENTS

\*\*\* BUILDING \*\*\*

FLOOR AREA 7353 SQFT 683 SQMT  
 VOLUME 78436 CUFT 2221 CUMT

COOLING LOAD HEATING LOAD  
 TIME JUL 23 7PM JAN 28 4AM  
 DRY-BULB TEMP 94F 34C OF -18C  
 WET-BULB TEMP 78F 26C -2F -19C

	SENSIBLE (KBTU/H)	( KW )	LATENT (KBTU/H)	( KW )	SENSIBLE (KBTU/H)	( KW )
WALLS	2.101	0.615	0.000	0.000	-9.047	-2.650
ROOFS	0.000	0.000	0.000	0.000	0.000	0.000
GLASS CONDUCTION	23.361	6.842	0.000	0.000	-108.011	-31.634
GLASS SOLAR	71.431	20.920	0.000	0.000	2.054	0.601
DOOR	0.000	0.000	0.000	0.000	0.000	0.000
INTERNAL SURFACES	0.000	0.000	0.000	0.000	0.000	0.000
UNDERGROUND SURFACES	-1.320	-0.387	0.000	0.000	-4.222	-1.237
OCCUPANTS TO SPACE	57.211	16.756	117.843	34.513	4.102	1.202
LIGHT TO SPACE	47.596	13.940	0.000	0.000	8.158	2.389
EQUIPMENT TO SPACE	20.307	5.947	0.000	0.000	1.456	0.426
PROCESS TO SPACE	0.000	0.000	0.000	0.000	0.000	0.000
INFILTRATION	0.000	0.000	0.000	0.000	0.000	0.000
TOTAL	220.687	64.634	117.843	34.513	-105.509	-30.901
TOTAL LOAD	338.530	KBTU/H	99.147	KW	-105.509	KBTU/H
TOTAL LOAD / AREA	46.04BTU/H.SQFT	145.131	W /SQMT	14.348BTU/H.SQFT	45.233	W /SQMT

\*\*\*\*\*  
 \* NOTE 1) THE ABOVE LOADS EXCLUDE OUTSIDE VENTILATION AIR \*  
 \* LOADS \*  
 \* 2) TIMES GIVEN IN STANDARD TIME FOR THE LOCATION \*  
 \* IN CONSIDERATION \*  
 \*\*\*\*\*



EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 11:33:43 SDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. 7245 DINING AREA TOPEKA, KS  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR VAV-SPEED

MONTH	C O O L I N G				H E A T I N G				E L E C			
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC LOAD (KW)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-176.577	15	3	-8.F	-9.F	-531.225	9564.	23.931
FEB	0.00000				-128.939	3	4	0.F	-1.F	-472.075	8675.	30.359
MAR	0.00000				-97.346	3	4	16.F	13.F	-368.587	10264.	33.155
APR	0.00000				-24.256	5	4	32.F	29.F	-241.324	13782.	33.155
MAY	46.51511	31	18	90.F	-4.302	5	4	45.F	41.F	-135.301	13048.	33.155
JUN	115.57044	28	18	89.F	0.000					0.000	10158.	29.107
JUL	146.65900	23	18	95.F	0.000					0.000	10661.	29.805
AUG	144.33791	21	19	95.F	0.000					0.000	10664.	29.440
SEP	75.50708	6	18	91.F	0.000					0.000	9779.	28.828
OCT	1.62142	1	18	83.F	-23.425	20	3	25.F	25.F	-276.908	13934.	33.155
NOV	0.00000				-80.243	3	4	13.F	12.F	-363.117	10742.	33.155
DEC	0.00000				-157.569	15	2	3.F	2.F	-450.325	9560.	22.956
TOTAL MAX	530.210				-692.657					-531.225	130833.	33.155

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 11:33:43 SDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. 7245 DINING AREA TOPEKA, KS  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR VAV-SPEED

MONTH	N U M B E R O F H O U R S				C O I N C I D E N T L O A D S			
	HOURS HEATING LOAD	HOURS COOLING LOAD	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.
JAN	742	0	744	0	744	0	744	0
FEB	662	0	672	0	672	0	672	0
MAR	662	0	744	0	744	0	744	0
APR	455	0	720	0	720	0	720	0
MAY	192	0	360	0	744	0	744	0
JUN	714	0	720	0	720	0	720	0
JUL	744	0	744	0	744	0	744	0
AUG	744	0	744	0	744	0	744	0
SEP	612	0	720	0	744	0	744	0
OCT	17	0	24	0	744	0	744	0
NOV	617	0	720	0	720	0	720	0
DEC	742	0	744	0	744	0	744	0
ANNUAL	3211	0	5424	0	8760	0	8760	0

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY 40.835 90.187 31/7	NATURAL-GAS 269.527 713.594 15/3
JAN	TOTAL (MBTU) PEAK (KBTU) DY/HR	36.755 103.659 26/18	204.942 646.978 3/4
FEB	TOTAL (MBTU) PEAK (KBTU) DY/HR	41.200 114.590 7/19	160.197 527.115 3/4
MAR	TOTAL (MBTU) PEAK (KBTU) DY/HR	49.121 114.365 3/19	44.838 373.939 5/4
APR	TOTAL (MBTU) PEAK (KBTU) DY/HR	64.394 245.846 31/18	9.250 241.462 5/4
MAY	TOTAL (MBTU) PEAK (KBTU) DY/HR	81.558 247.935 28/19	0.000 0.000 30/1
JUN	TOTAL (MBTU) PEAK (KBTU) DY/HR	94.585 269.717 23/18	0.000 0.000 31/1
JUL	TOTAL (MBTU) PEAK (KBTU) DY/HR	95.336 264.432 21/19	0.000 0.000 31/1
AUG	TOTAL (MBTU) PEAK (KBTU) DY/HR	65.677 248.220 6/18	0.000 0.000 30/1
SEP	TOTAL (MBTU) PEAK (KBTU) DY/HR	50.466 174.332 1/18	44.248 417.411 20/3
OCT	TOTAL (MBTU) PEAK (KBTU) DY/HR	41.896 113.933 7/19	133.389 520.663 3/4
NOV	TOTAL (MBTU) PEAK (KBTU) DY/HR	40.646 90.187 31/19	245.676 622.136 15/2
DEC	TOTAL (MBTU) PEAK (KBTU) DY/HR	702.468 269.717	1112.067 713.594
	ONE YEAR USE/PEAK		

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 11:33:43 PDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. 7245 DINING AREA TOPEKA, KS  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
SPACE HEAT	39.34	1112.07
SPACE COOL	216.41	0.00
HVAC AUX	89.46	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	283.97	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	73.28	0.00
TOTAL	702.46	1112.07

TOTAL SITE ENERGY 1814.53 MBTU 246.8 KBTU/SQFT-YR GROSS-AREA 246.8 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 3221.58 MBTU 438.1 KBTU/SQFT-YR GROSS-AREA 438.1 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 13.7  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

```

E-W      HEIGHT = 8.0  WIDTH = 97.0  CONS = EXWALL-2
        AZIMUTH = 135  SKY-FORM-FACTOR = 0.5
        GND-FORM-FACTOR = 0.5  ..

E-W      HEIGHT = 8.0  WIDTH = 97.0  CONS = EXWALL-2
        AZIMUTH = 315  SKY-FORM-FACTOR = 0.5
        GND-FORM-FACTOR = 0.5  ..

ROOF     HEIGHT = 86.0  WIDTH = 85.5  CONS = ROOF-3
        TILT = 0  SKY-FORM-FACTOR = 1.0  ..

```

```

END ..
COMPUTE LOADS ..
INPUT SYSTEMS ..

```

```

$-----$
$ E Z - D O E   S Y S T E M S   I N P U T $
$-----$

```

\$ GENERAL PROJECT DATA

```

TITLE  LINE-1 *   EMC      ENGINEERS      INC.      *
        LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
        LINE-3 *   DENVER,      CO      80227      *

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        LINE-4 *RUN #1 NIGHT SETBACK FOR BLDG. 7245      *
        LINE-5 *DINING AREA                                * ..

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ABORT          ERRORS ..
DIAGNOSTIC     WARNINGS ..
SYSTEMS-REPORT VERIFICATION=(SV-A)
                SUMMARY=(SS-A,SS-B,SS-C,SS-K,SS-O)
                HOURLY-DATA-SAVE = YES ..

```

\$ SCHEDULES

```

SD_ON      =DAY-SCHEDULE (1,24) (1.) ..
SD_W_HT_F  =DAY-SCHEDULE (1,4) (55.)
                (5,20) (74.)
                (21,24) (55.) ..
SD_S_CL_F  =DAY-SCHEDULE (1,4) (85.)
                (5,20) (72.)
                (21,24) (85.) ..
SD_27%_OA  =DAY-SCHEDULE (1,24) (0.27) ..
SD_OFF     =DAY-SCHEDULE (1,24) (0.) ..
SD_10%_OA  =DAY-SCHEDULE (1,24) (0.1) ..
SD_W_CL_F  =DAY-SCHEDULE (1,4) (57.)
                (5,20) (76.)
                (21,24) (57.) ..
SD_S_HT_F  =DAY-SCHEDULE (1,4) (83.)
                (5,20) (70.)
                (21,24) (83.) ..
SD_FAN_CYC =DAY-SCHEDULE (1,4) (0.)
                (5,20) (1.)

```



(21,24) (0.) ..

```

SW_ON      =WEEK-SCHEDULE (ALL) SD_ON  ..

SW_W_HT_F  =WEEK-SCHEDULE (ALL) SD_W_HT_F ..

SW_S_CL_F  =WEEK-SCHEDULE (ALL) SD_S_CL_F ..

SW_27%_OA  =WEEK-SCHEDULE (ALL) SD_27%_OA ..

SW_OFF     =WEEK-SCHEDULE (ALL) SD_OFF  ..

SW_10%_OA  =WEEK-SCHEDULE (ALL) SD_10%_OA ..

SW_W_CL_F  =WEEK-SCHEDULE (ALL) SD_W_CL_F ..

SW_S_HT_F  =WEEK-SCHEDULE (ALL) SD_S_HT_F ..

SW_FAN_CYC =WEEK-SCHEDULE (ALL) SD_FAN_CYC ..

S_FULL_ON  =SCHEDULE THRU DEC 31 SW_ON  ..

S_FULL_OFF =SCHEDULE THRU DEC 31 SW_OFF  ..

$ OUTSIDE AIR AT .27%
S_OTSIDAIR =SCHEDULE THRU DEC 31 SW_27%_OA ..

$ HEATING SEASON
S_HE_SCHED =SCHEDULE THRU MAY 15 SW_ON
              THRU OCT  1 SW_OFF
              THRU DEC 31 SW_ON  ..

$ COOLING SEASON
S_CL_SCHED =SCHEDULE THRU MAY 15 SW_OFF
              THRU OCT  1 SW_ON
              THRU DEC 31 SW_OFF  ..

$ 10%OA_WINTER_100%OA_SUM
S_S/W_VET  =SCHEDULE THRU MAY 15 SW_10%_OA
              THRU OCT  1 SW_ON
              THRU DEC 31 SW_10%_OA ..

S_VENT@27% =SCHEDULE THRU DEC 31 SW_27%_OA ..

$ HEATING SET TEMP
S_HT_SET_F =SCHEDULE THRU MAY 15 SW_W_HT_F
              THRU OCT  1 SW_S_HT_F
              THRU DEC 31 SW_W_HT_F ..

$ COOLING SET TEMP
S_CL_SET_F =SCHEDULE THRU MAY 15 SW_W_CL_F
              THRU OCT  1 SW_S_CL_F
              THRU DEC 31 SW_W_CL_F ..

S_HRLY-RPT =SCHEDULE THRU JAN 14 SW_OFF

```

THRU JAN 15 SW\_ON  
 THRU JUL 22 SW\_OFF  
 THRU JUL 23 SW\_ON  
 THRU DEC 31 SW\_OFF ..

S\_FAN\_CYCL =SCHEDULE THRU DEC 31 SW\_FAN\_CYC ..

\$ ZONE DESCRIPTION

diningarea =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL  
 BASEBOARD-CTRL = THERMOSTATIC  
 BASEBOARD-RATING = -235200. OUTSIDE-AIR-CFM = 3847.5  
 SIZING-OPTION = FROM-LOADS ..

dining-plm =ZONE DESIGN-HEAT-T = 64.0 DESIGN-COOL-T = 82.0  
 ZONE-TYPE = UNCONDITIONED SIZING-OPTION = FROM-LOADS ..

\$ SYSTEM DESCRIPTION

VAV-SPEED =SYSTEM SYSTEM-TYPE = VAVS  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_HE\_SCHED  
 COOLING-SCHEDULE = S\_CL\_SCHED PREHEAT-T = 0.0  
 COOL-CONTROL = WARMEST OA-CONTROL = FIXED  
 SUPPLY-CFM = 14250. RATED-CFM = 14250.  
 MIN-OUTSIDE-AIR = 0.27 MAX-OA-FRACTION = 0.27  
 FAN-SCHEDULE = S\_FAN\_CYCL FAN-CONTROL = SPEED  
 SUPPLY-DELTA-T = 2.4 SUPPLY-KW = 0.00078  
 FAN-PLACEMENT = BLOW-THROUGH MAX-FAN-RATIO = 1.0  
 MIN-FAN-RATIO = 0.27 NIGHT-CYCLE-CTRL = STAY-OFF  
 NIGHT-VENT-DT = 0.0 MIN-CFM-RATIO = 0.27  
 REHEAT-DELTA-T = 70. COOLING-CAPACITY = 819545.  
 COOL-SH-CAP = 672000. COOL-FT-MIN = 0.  
 HEATING-CAPACITY = -51855200.  
 SIZING-OPTION = COINCIDENT  
 ZONE-NAMES = (diningarea, dining-plm) ..

\$ HOURLY REPORT DESCRIPTION

ZONES-RPT =REPORT-BLOCK VARIABLE-TYPE = diningarea  
 VARIABLE-LIST = (17,18,7,6) ..

NEW-VAV =REPORT-BLOCK VARIABLE-TYPE = VAV-SPEED  
 VARIABLE-LIST = (3,5,6,9,17,20,39) ..

HRLY-RPT-1 = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (ZONES-RPT)

..

HRLY-RPT-2 = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (NEW-VAV)

..

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 13: 9:31 SDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SETBACK FOR BLDG. 7245 DINING AREA TOPEKA, KS  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR VAV-SPEED

MONTH	C O O L I N G				H E A T I N G				E L E C				
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	MAXIMUM ELEC LOAD (KW)	MAXIMUM HEATING LOAD (KBTU/HR)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-112.867	15	5	-8.F	-9.F	9337.	23.592	-549.511	23.592
FEB	0.00000				-78.993	3	5	-1.F	-2.F	8446.	25.186	-472.811	25.186
MAR	0.00000				-52.957	3	5	15.F	13.F	9981.	33.155	-367.356	33.155
APR	0.00000				-8.426	5	5	31.F	29.F	12260.	33.155	-210.532	33.155
MAY	47.95139	31	18	90.F	76.F	5	9	49.F	43.F	12111.	33.155	-48.461	33.155
JUN	115.30379	28	18	89.F	76.F					10453.	29.883	0.000	29.883
JUL	143.86469	23	18	95.F	79.F					11019.	30.665	0.000	30.665
AUG	140.15866	21	12	91.F	77.F					11009.	30.231	0.000	30.231
SEP	77.55123	6	18	91.F	75.F					9957.	29.645	0.000	29.645
OCT	1.67102	1	18	83.F	68.F					12525.	33.155	-247.785	33.155
NOV	0.00000				-42.488	3	5	13.F	12.F	10116.	33.155	-345.743	33.155
DEC	0.00000				-99.660	13	5	5.F	4.F	9336.	22.956	-451.426	22.956
TOTAL	526.500				-404.189					126550.		-549.511	
MAX													33.155

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 13: 9:31 SDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SETBACK FOR BLDG. 7245 DINING AREA TOPEKA, KS  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR VAV-SPEED

MONTH	HOURS COINCIDENT COOL-HEAT LOAD				HOURS HEATING AVAIL.				HOURS COOLING AVAIL.				HOURS FANS ON				HOURS FLOATING WHEN FANS ON				COINCIDENT LOADS-- HEATING LOAD AT COOLING PEAK (KBTU/HR)				ELECTRIC LOAD AT COOLING PEAK (KW)			
	HOURS COOLING LOAD	HOURS HEATING LOAD	HOURS COINCIDENT COOL-HEAT LOAD	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.	HOURS FANS ON	HOURS FANS ON CYCLE ON	HOURS NIGHT VENTING	HOURS FLOATING WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)																	
JAN	0	494	0	744	0	496	0	0	2	0.000	0.000																	
FEB	0	442	0	672	0	448	0	0	6	0.000	0.000																	
MAR	0	416	0	744	0	496	0	0	80	0.000	0.000																	
APR	0	190	0	720	0	480	0	0	290	0.000	0.000																	
MAY	254	56	0	360	384	496	0	0	186	0.000	29.241																	
JUN	478	0	0	242	720	480	0	0	2	0.000	29.607																	
JUL	496	0	0	248	744	496	0	0	0	0.000	30.440																	
AUG	496	0	0	0	744	496	0	0	0	0.000	29.956																	
SEP	411	0	0	0	720	480	0	0	69	0.000	29.545																	
OCT	10	202	0	720	24	496	0	0	284	0.000	25.889																	
NOV	0	368	0	720	0	480	0	0	112	0.000	0.000																	
DEC	0	496	0	744	0	496	0	0	0	0.000	0.000																	
ANNUAL	2145	2664	0	5424	3336	5840	0	0	1031																			

EMC ENGINEERS INC. E2DOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 13: 9:31 PDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SETBACK FOR BLDG. 7245 DINING AREA  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY TOTAL (KWH) PEAK (KW) DY/HR	NATURAL-GAS TOTAL (MBTU) PEAK (KBTU) DY/HR
JAN	37.422 174.347 31/7	37.422 90.593 31/7	174.347 738.159 15/5
FEB	33.601 128.154 28/7	33.601 90.593 28/7	128.154 651.549 3/5
MAR	37.714 114.596 7/19	37.714 114.596 7/19	89.243 528.818 3/5
APR	42.651 114.384 3/19	42.651 114.384 3/19	16.226 338.480 5/5
MAY	60.196 256.095 31/18	60.196 256.095 31/18	1.336 93.816 5/9
JUN	78.864 258.493 28/18	78.864 258.493 28/18	0.000 0.000 30/1
JUL	89.645 281.323 23/18	89.645 281.323 23/18	0.000 0.000 31/1
AUG	90.220 274.738 21/19	90.220 274.738 21/19	0.000 0.000 31/1
SEP	64.824 258.338 6/18	64.824 258.338 6/18	0.000 0.000 30/1
OCT	44.283 192.449 1/18	44.283 192.449 1/18	16.139 384.542 20/8
NOV	37.570 113.949 7/19	37.570 113.949 7/19	72.508 503.143 3/5
DEC	37.230 90.593 31/19	37.230 90.593 31/19	157.377 627.004 13/5
	ONE YEAR USE/PEAK	654.220 281.323	655.330 738.159



EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 13: 9:31 PDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SETBACK FOR BLDG. 7245 DINING AREA  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
SPACE HEAT	23.96	655.33
SPACE COOL	198.17	0.00
HVAC AUX	74.84	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	283.97	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	73.28	0.00
TOTAL	654.22	655.33

TOTAL SITE ENERGY 1309.55 MBTU 178.1 KBTU/SQFT-YR GROSS-AREA 178.1 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 2619.96 MBTU 356.3 KBTU/SQFT-YR GROSS-AREA 356.3 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 15.2  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

```

E-W      HEIGHT = 8.0  WIDTH = 97.0  CONS = EXWALL-2
        AZIMUTH = 135  SKY-FORM-FACTOR = 0.5
        GND-FORM-FACTOR = 0.5  ..

E-W      HEIGHT = 8.0  WIDTH = 97.0  CONS = EXWALL-2
        AZIMUTH = 315  SKY-FORM-FACTOR = 0.5
        GND-FORM-FACTOR = 0.5  ..

ROOF     HEIGHT = 86.0  WIDTH = 85.5  CONS = ROOF-3
        TILT = 0  SKY-FORM-FACTOR = 1.0  ..

```

```

END ..
COMPUTE LOADS ..

INPUT SYSTEMS ..

```

```

$-----$
$ EZ - DOE SYSTEMS INPUT $
$-----$

```

\$ GENERAL PROJECT DATA

```

TITLE  LINE-1 *      EMC      ENGINEERS      INC.      *
        LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
        LINE-3 *      DENVER,      CO      80227      *

```

```

LINE-4 *RUN #2 DDC CONTROL FOR BLDG. 7245      *
LINE-5 *DINING AREA      * ..

```

```

ABORT      ERRORS      ..
DIAGNOSTIC  WARNINGS  ..
SYSTEMS-REPORT  VERIFICATION=(SV-A)
                SUMMARY=(SS-A,SS-B,SS-C,SS-K,SS-O)
                HOURLY-DATA-SAVE = YES  ..

```

\$ SCHEDULES

```

SD_ON      =DAY-SCHEDULE  (1,24) (1.)  ..
SD_W_HT_F  =DAY-SCHEDULE  (1,24) (70.) ..
SD_S_CL_F  =DAY-SCHEDULE  (1,24) (76.) ..
SD_27%_OA  =DAY-SCHEDULE  (1,24) (0.27) ..
SD_OFF     =DAY-SCHEDULE  (1,24) (0.)  ..
SD_10%_OA  =DAY-SCHEDULE  (1,24) (0.1) ..
SD_W_CL_F  =DAY-SCHEDULE  (1,24) (72.) ..
SD_S_HT_F  =DAY-SCHEDULE  (1,24) (74.) ..

SW_ON      =WEEK-SCHEDULE  (ALL) SD_ON  ..

SW_W_HT_F  =WEEK-SCHEDULE  (ALL) SD_W_HT_F ..

SW_S_CL_F  =WEEK-SCHEDULE  (ALL) SD_S_CL_F ..

SW_27%_OA  =WEEK-SCHEDULE  (ALL) SD_27%_OA ..

SW_OFF     =WEEK-SCHEDULE  (ALL) SD_OFF  ..

```



SW\_10%\_OA =WEEK-SCHEDULE (ALL) SD\_10%\_OA ..

SW\_W\_CL\_F =WEEK-SCHEDULE (ALL) SD\_W\_CL\_F ..

SW\_S\_HT\_F =WEEK-SCHEDULE (ALL) SD\_S\_HT\_F ..

S\_FULL\_ON =SCHEDULE THRU DEC 31 SW\_ON ..

S\_FULL\_OFF =SCHEDULE THRU DEC 31 SW\_OFF ..

\$ OUTSIDE AIR AT .27%

S\_OTSIDAIR =SCHEDULE THRU DEC 31 SW\_27%\_OA ..

\$ HEATING SEASON

S\_HE\_SCHED =SCHEDULE THRU MAY 15 SW\_ON  
 THRU OCT 1 SW\_OFF  
 THRU DEC 31 SW\_ON ..

\$ COOLING SEASON

S\_CL\_SCHED =SCHEDULE THRU MAY 15 SW\_OFF  
 THRU OCT 1 SW\_ON  
 THRU DEC 31 SW\_OFF ..

\$ 10%OA\_WINTER\_100%OA\_SUM

S\_S/W\_VET =SCHEDULE THRU MAY 15 SW\_10%\_OA  
 THRU OCT 1 SW\_ON  
 THRU DEC 31 SW\_10%\_OA ..

S\_VENT@27% =SCHEDULE THRU DEC 31 SW\_27%\_OA ..

\$ HEATING SET TEMP

S\_HT\_SET\_F =SCHEDULE THRU MAY 15 SW\_W\_HT\_F  
 THRU OCT 1 SW\_S\_HT\_F  
 THRU DEC 31 SW\_W\_HT\_F ..

\$ COOLING SET TEMP

S\_CL\_SET\_F =SCHEDULE THRU MAY 15 SW\_W\_CL\_F  
 THRU OCT 1 SW\_S\_CL\_F  
 THRU DEC 31 SW\_W\_CL\_F ..

S\_HRLY-RPT =SCHEDULE THRU JAN 10 SW\_OFF  
 THRU JAN 11 SW\_ON  
 THRU JUN 17 SW\_OFF  
 THRU JUN 18 SW\_ON  
 THRU DEC 31 SW\_OFF ..

\$ ZONE DESCRIPTION

diningarea =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL

BASEBOARD-CTRL = THERMOSTATIC  
 BASEBOARD-RATING = -235200. OUTSIDE-AIR-CFM = 3847.5  
 SIZING-OPTION = FROM-LOADS ..

dining-plm =ZONE DESIGN-HEAT-T = 64.0 DESIGN-COOL-T = 82.0  
 ZONE-TYPE = UNCONDITIONED SIZING-OPTION = FROM-LOADS ..

\$ SYSTEM DESCRIPTION

VAV-SPEED =SYSTEM SYSTEM-TYPE = VAVS  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_HE\_SCHED  
 COOLING-SCHEDULE = S\_CL\_SCHED PREHEAT-T = 0.0  
 COOL-CONTROL = WARMEST OA-CONTROL = FIXED  
 SUPPLY-CFM = 14250. RATED-CFM = 14250.  
 MIN-OUTSIDE-AIR = 0.27 MAX-OA-FRACTION = 0.27  
 FAN-CONTROL = SPEED SUPPLY-DELTA-T = 2.4  
 SUPPLY-KW = 0.00078 FAN-PLACEMENT = BLOW-THROUGH  
 MAX-FAN-RATIO = 1.0 MIN-FAN-RATIO = 0.27  
 NIGHT-CYCLE-CTRL = STAY-OFF NIGHT-VENT-DT = 0.0  
 MIN-CFM-RATIO = 0.27 REHEAT-DELTA-T = 70.  
 COOLING-CAPACITY = 819545. COOL-SH-CAP = 672000.  
 COOL-FT-MIN = 0. HEATING-CAPACITY = -51855200.  
 SIZING-OPTION = COINCIDENT  
 ZONE-NAMES = (diningarea, dining-plm) ..

\$ HOURLY REPORT DESCRIPTION

ZONES-RPT =REPORT-BLOCK VARIABLE-TYPE = diningarea  
 VARIABLE-LIST = (17,18,7,31) ..  
 NEW-VAV =REPORT-BLOCK VARIABLE-TYPE = VAV-SPEED  
 VARIABLE-LIST = (3,5,6,9,17,20,39) ..  
 HRLY-RPT-1 = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (ZONES-RPT)  
 ..  
 HRLY-RPT-2 = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (NEW-VAV)  
 ..  
 END ..  
 COMPUTE SYSTEMS ..  
 INPUT PLANT ..

\$-----\$  
 \$ E Z - D O E P L A N T S I N P U T \$  
 \$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
 LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
 LINE-3 \* DENVER, CO 80227 \*

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 13:13:30 SDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. 7245 DINING AREA  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR VAV-SPEED TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	ELEC-TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-155.512	15	3	-8.F	-9.F	9594.	26.098
FEB	0.00000				-110.647	3	4	0.F	-1.F	8769.	33.155
MAR	0.00000				-78.886	3	4	16.F	13.F	10721.	33.155
APR	0.00000				-15.722	5	4	32.F	29.F	14839.	33.155
MAY	34.24094	31	18	90.F	-1.914	5	4	45.F	41.F	13190.	33.155
JUN	89.94861	28	18	89.F	0.000					9795.	26.776
JUL	117.22208	23	18	95.F	0.000					10224.	27.233
AUG	117.13194	21	19	95.F	0.000					10237.	26.965
SEP	55.42989	6	18	91.F	-13.349	20	3	25.F	25.F	9570.	26.562
OCT	0.75739	1	18	83.F	-63.977	3	4	13.F	12.F	11304.	33.155
NOV	0.00000				-136.924	15	2	3.F	2.F	9579.	26.410
DEC	0.00000										
TOTAL MAX	414.731				-576.931					132799.	33.155

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 13:13:30 SDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. 7245 DINING AREA  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR VAV-SPEED TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C			
	HOURS COOLING LOAD	HOURS HEATING LOAD	HOURS COINCIDENT COOL-HEAT LOAD	HOURS FLOATING LOAD	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.	HOURS FANS ON CYCLE ON	HOURS NIGHT VENTING	HOURS FLOATING WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELEC-TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0	737	0	7	0	0	0	0	0	-201.684	9594.	26.098
FEB	0	645	0	27	0	0	0	0	0	-202.409	8769.	33.155
MAR	0	629	0	115	0	0	0	0	0	-195.483	10721.	33.155
APR	0	423	0	297	0	0	0	0	0	-9.426	14839.	33.155
MAY	281	177	0	286	384	0	0	0	0	0.000	13190.	33.155
JUN	630	0	0	90	720	0	0	0	0	0.000	9795.	26.776
JUL	725	0	0	19	744	0	0	0	0	0.000	10224.	27.233
AUG	705	0	0	39	744	0	0	0	0	0.000	10237.	26.965
SEP	449	0	0	271	720	0	0	0	0	0.000	9570.	26.562
OCT	9	447	0	288	24	0	0	0	0	0.000	11304.	33.155
NOV	0	599	0	121	0	0	0	0	0	0.000	9579.	26.410
DEC	0	728	0	16	0	0	0	0	0			
ANNUAL	2799	4385	0	1576	3336	8760	0	0	0	-498.022	132799.	33.155

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 13:13:30 PDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. 7245 DINING AREA  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY TOTAL (MBTU) PEAK (KBTU) DY/HR	NATURAL-GAS TOTAL (MBTU) PEAK (KBTU) DY/HR
JAN	40.170 89.981 18/18	238.847 668.993 15/3	
FEB	36.339 114.294 26/19	177.687 600.867 3/4	
MAR	41.774 114.524 7/19	131.201 482.666 3/4	
APR	52.094 114.328 3/19	30.238 332.828 5/4	
MAY	59.456 220.263 31/18	4.861 145.732 5/4	
JUN	69.878 221.955 28/19	0.000 0.000 30/1	
JUL	81.649 241.116 23/18	0.000 0.000 31/1	
AUG	82.798 236.533 21/19	0.000 0.000 31/1	
SEP	56.183 222.332 6/18	0.000 0.000 30/1	
OCT	52.768 153.582 1/18	26.515 374.028 20/3	
NOV	42.882 113.882 7/19	107.525 478.659 3/4	
DEC	39.917 90.175 28/18	215.241 577.595 15/2	
	ONE YEAR USE/PEAK	655.911 241.116	932.115 668.993

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 13:13:30 PDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. 7245 DINING AREA TOPEKA, KS  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE

ENERGY TYPE	ELECTRICITY	NATURAL-GAS
IN SITE MBTU -		
CATEGORY OF USE		
SPACE HEAT	33.41	932.11
SPACE COOL	169.06	0.00
HVAC AUX	96.17	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	283.97	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	73.28	0.00
TOTAL	655.90	932.11

TOTAL SITE ENERGY 1588.03 MBTU 216.0 KBTU/SQFT-YR GROSS-AREA 216.0 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 2901.82 MBTU 394.6 KBTU/SQFT-YR GROSS-AREA 394.6 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 18.0  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

E-W HEIGHT = 8.0 WIDTH = 97.0 CONS = EXWALL-2  
 AZIMUTH = 135 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 8.0 WIDTH = 97.0 CONS = EXWALL-2  
 AZIMUTH = 315 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

ROOF HEIGHT = 86.0 WIDTH = 85.5 CONS = ROOF-3  
 TILT = 0 SKY-FORM-FACTOR = 1.0 ..

END ..

COMPUTE LOADS ..

INPUT SYSTEMS ..

\$-----\$  
 \$ E Z - D O E S Y S T E M S I N P U T \$  
 \$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
 LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
 LINE-3 \* DENVER, CO 80227 \*

LINE-4 \*RUN #3 ECONOMIZER FOR BLDG. 7245 \*

LINE-5 \*DINING AREA \* ..

ABORT ERRORS ..  
 DIAGNOSTIC WARNINGS ..  
 SYSTEMS-REPORT VERIFICATION=(SV-A)  
 SUMMARY=(SS-A,SS-B,SS-C,SS-K,SS-O)  
 HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

SD\_ON =DAY-SCHEDULE (1,24) (1.) ..  
 SD\_W\_HT\_F =DAY-SCHEDULE (1,4) (55.)  
 (5,20) (74.)  
 (21,24) (55.) ..  
 SD\_S\_CL\_F =DAY-SCHEDULE (1,4) (85.)  
 (5,20) (72.)  
 (21,24) (85.) ..  
 SD\_27%\_OA =DAY-SCHEDULE (1,24) (0.27) ..  
 SD\_OFF =DAY-SCHEDULE (1,24) (0.) ..  
 SD\_10%\_OA =DAY-SCHEDULE (1,24) (0.1) ..  
 SD\_W\_CL\_F =DAY-SCHEDULE (1,4) (57.)  
 (5,20) (76.)  
 (21,24) (57.) ..  
 SD\_S\_HT\_F =DAY-SCHEDULE (1,4) (83.)  
 (5,20) (70.)  
 (21,24) (83.) ..  
 SD\_FAN\_CYC =DAY-SCHEDULE (1,4) (0.)  
 (5,20) (1.)



(21,24) (0.) ..

SW\_ON =WEEK-SCHEDULE (ALL) SD\_ON ..

SW\_W\_HT\_F =WEEK-SCHEDULE (ALL) SD\_W\_HT\_F ..

SW\_S\_CL\_F =WEEK-SCHEDULE (ALL) SD\_S\_CL\_F ..

SW\_27%\_OA =WEEK-SCHEDULE (ALL) SD\_27%\_OA ..

SW\_OFF =WEEK-SCHEDULE (ALL) SD\_OFF ..

SW\_10%\_OA =WEEK-SCHEDULE (ALL) SD\_10%\_OA ..

SW\_W\_CL\_F =WEEK-SCHEDULE (ALL) SD\_W\_CL\_F ..

SW\_S\_HT\_F =WEEK-SCHEDULE (ALL) SD\_S\_HT\_F ..

SW\_FAN\_CYC =WEEK-SCHEDULE (ALL) SD\_FAN\_CYC ..

S\_FULL\_ON =SCHEDULE THRU DEC 31 SW\_ON ..

S\_FULL\_OFF =SCHEDULE THRU DEC 31 SW\_OFF ..

\$ OUTSIDE AIR AT .27%

S\_OTSIDAIR =SCHEDULE THRU DEC 31 SW\_27%\_OA ..

\$ HEATING SEASON

S\_HE\_SCHED =SCHEDULE THRU MAY 15 SW\_ON  
THRU OCT 1 SW\_OFF  
THRU DEC 31 SW\_ON ..

\$ COOLING SEASON

S\_CL\_SCHED =SCHEDULE THRU MAY 15 SW\_OFF  
THRU OCT 1 SW\_ON  
THRU DEC 31 SW\_OFF ..

\$ 10%OA WINTER 100%OA SUM

S\_S/W\_VET =SCHEDULE THRU MAY 15 SW\_10%\_OA  
THRU OCT 1 SW\_ON  
THRU DEC 31 SW\_10%\_OA ..

S\_VENT@27% =SCHEDULE THRU DEC 31 SW\_27%\_OA ..

\$ HEATING SET TEMP

S\_HT\_SET\_F =SCHEDULE THRU MAY 15 SW\_W\_HT\_F  
THRU OCT 1 SW\_S\_HT\_F  
THRU DEC 31 SW\_W\_HT\_F ..

\$ COOLING SET TEMP

S\_CL\_SET\_F =SCHEDULE THRU MAY 15 SW\_W\_CL\_F  
THRU OCT 1 SW\_S\_CL\_F  
THRU DEC 31 SW\_W\_CL\_F ..

S\_HRLY-RPT =SCHEDULE THRU JAN 14 SW\_OFF

THRU JAN 15 SW\_ON  
 THRU JUL 22 SW\_OFF  
 THRU JUL 23 SW\_ON  
 THRU DEC 31 SW\_OFF ..


S\_FAN\_CYCL =SCHEDULE THRU DEC 31 SW\_FAN\_CYC ..

\$ ZONE DESCRIPTION

diningarea =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL  
 BASEBOARD-CTRL = THERMOSTATIC  
 BASEBOARD-RATING = -235200. OUTSIDE-AIR-CFM = 3847.5  
 SIZING-OPTION = FROM-LOADS ..

dining-plm =ZONE DESIGN-HEAT-T = 64.0 DESIGN-COOL-T = 82.0  
 ZONE-TYPE = UNCONDITIONED SIZING-OPTION = FROM-LOADS ..

\$ SYSTEM DESCRIPTION

VAV-SPEED =SYSTEM SYSTEM-TYPE = VAVS  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_HE\_SCHED  
 COOLING-SCHEDULE = S\_CL\_SCHED PREHEAT-T = 0.0  
ECONO-LIMIT-T = 75.0 COOL-CONTROL = WARMEST   
 SUPPLY-CFM = 14250. RATED-CFM = 14250.  
 MIN-OUTSIDE-AIR = 0.27 FAN-SCHEDULE = S\_FAN\_CYCL  
 FAN-CONTROL = SPEED SUPPLY-DELTA-T = 2.4  
 SUPPLY-KW = 0.00078 FAN-PLACEMENT = BLOW-THROUGH  
 MAX-FAN-RATIO = 1.0 MIN-FAN-RATIO = 0.27  
 NIGHT-CYCLE-CTRL = STAY-OFF NIGHT-VENT-DT = 0.0  
 MIN-CFM-RATIO = 0.27 REHEAT-DELTA-T = 70.  
 COOLING-CAPACITY = 819545. COOL-SH-CAP = 672000.  
 COOL-FT-MIN = 0. HEATING-CAPACITY = -51855200.  
 SIZING-OPTION = COINCIDENT  
 ZONE-NAMES = (diningarea, dining-plm) ..

\$ HOURLY REPORT DESCRIPTION

ZONES-RPT =REPORT-BLOCK VARIABLE-TYPE = diningarea  
 VARIABLE-LIST = (17,18,7,6) ..  
 NEW-VAV =REPORT-BLOCK VARIABLE-TYPE = VAV-SPEED  
 VARIABLE-LIST = (3,5,6,9,17,20,39) ..  
 HRLY-RPT-1 = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (ZONES-RPT)  
 ..  
 HRLY-RPT-2 = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (NEW-VAV)  
 ..  
 END ..

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 13:29:47 SDL RUN 1  
 DENVER, CO 80227 RUN #3 ECONOMIZER FOR BLDG. 7245 DINING AREA TOPEKA, KS  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR VAV-SPEED

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-112.858	15	-8.F	-9.F	9337.	-549.511	23.592
FEB	0.00000				-79.024	3	-1.F	-2.F	8435.	-472.811	23.800
MAR	0.00000				-54.457	3	15.F	13.F	9487.	-367.356	33.155
APR	0.00000				-11.409	5	31.F	29.F	10752.	-218.186	33.155
MAY	43.22185	31	18	90.F	-1.830	5	44.F	40.F	11386.	-125.123	33.155
JUN	110.92410	28	18	89.F	0.000				10444.	0.000	29.882
JUL	141.68686	23	18	95.F	0.000				11014.	0.000	30.665
AUG	137.57155	21	12	91.F	0.000				11003.	0.000	30.231
SEP	74.55426	6	18	91.F	0.000				9953.	0.000	29.645
OCT	1.66097	1	18	83.F	-11.876	20	23.F	22.F	11242.	-250.028	33.155
NOV	0.00000				-44.361	3	13.F	12.F	9494.	-345.746	33.155
DEC	0.00000				-99.660	13	5.F	4.F	9336.	-451.426	22.956
TOTAL	509.620				-415.476				121881.	-549.511	33.155
MAX											

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 13:29:47 SDL RUN 1  
 DENVER, CO 80227 RUN #3 ECONOMIZER FOR BLDG. 7245 DINING AREA TOPEKA, KS  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR VAV-SPEED

MONTH	HOURS COINCIDENT COOL-HEAT LOAD				HOURS COINCIDENT HEATING COOLING LOAD AT PEAK				HOURS COINCIDENT HEATING COOLING LOAD AT PEAK			
	HOURS COOLING LOAD	HOURS HEATING LOAD	HOURS COINCIDENT COOL-HEAT LOAD	HOURS FLOATING	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.	HOURS FANS ON	HOURS NIGHT VENTING	HOURS FANS ON	HOURS FLOATING WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)
JAN	0	494	0	250	0	0	496	0	0	2	0.000	0.000
FEB	0	441	0	231	0	0	448	0	0	7	0.000	0.000
MAR	0	415	0	329	0	0	496	0	0	81	0.000	0.000
APR	0	155	0	565	0	0	480	0	0	325	0.000	0.000
MAY	251	48	0	445	384	0	496	0	0	197	0.000	29.241
JUN	478	0	0	242	720	0	480	0	0	2	0.000	29.606
JUL	496	0	0	248	744	0	496	0	0	0	0.000	30.440
AUG	496	0	0	248	744	0	496	0	0	0	0.000	29.956
SEP	410	0	0	310	720	0	480	0	0	70	0.000	29.544
OCT	10	173	0	561	24	0	496	0	0	313	0.000	25.888
NOV	0	356	0	364	0	0	480	0	0	124	0.000	0.000
DEC	0	496	0	248	744	0	496	0	0	0	0.000	0.000
ANNUAL	2141	2578	0	4041	3336	0	5840	0	0	1121		

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOB-2.1D 5/15/1995 13:29:47 PDL RUN 1  
 DENVER, CO 80227 RUN #3 ECONOMIZER FOR BLDG. 7245 DINING AREA TOPEKA, KS  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY 37.420 90.593 31/7	NATURAL-GAS 174.332 738.159 15/5
JAN	TOTAL (MBTU) PEAK (KBTU) DY/HR	37.420 90.593 31/7	174.332 738.159 15/5
FEB	TOTAL (MBTU) PEAK (KBTU) DY/HR	33.564 90.593 28/7	128.187 651.549 3/5
MAR	TOTAL (MBTU) PEAK (KBTU) DY/HR	36.112 113.205 28/12	91.578 528.818 3/5
APR	TOTAL (MBTU) PEAK (KBTU) DY/HR	37.715 113.205 30/18	20.909 347.987 5/5
MAY	TOTAL (MBTU) PEAK (KBTU) DY/HR	56.308 256.093 31/18	3.640 227.109 5/5
JUN	TOTAL (MBTU) PEAK (KBTU) DY/HR	77.435 258.484 28/18	0.000 0.000 30/1
JUL	TOTAL (MBTU) PEAK (KBTU) DY/HR	89.047 281.323 23/18	0.000 0.000 31/1
AUG	TOTAL (MBTU) PEAK (KBTU) DY/HR	89.427 274.738 21/19	0.000 0.000 31/1
SEP	TOTAL (MBTU) PEAK (KBTU) DY/HR	63.754 258.336 6/18	0.000 0.000 30/1
OCT	TOTAL (MBTU) PEAK (KBTU) DY/HR	40.194 192.437 1/18	21.989 387.298 20/8
NOV	TOTAL (MBTU) PEAK (KBTU) DY/HR	35.592 113.205 23/12	75.572 503.147 3/5
DEC	TOTAL (MBTU) PEAK (KBTU) DY/HR	37.230 90.593 31/19	157.377 627.004 13/5
	ONE YEAR USE/PEAK	633.797 281.323	673.584 738.159

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 13:29:47 PDL RUN 1  
 DENVER, CO 80227 RUN #3 ECONOMIZER FOR BLDG. 7245 DINING AREA  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE	ELECTRICITY	NATURAL-GAS
IN SITE MBTU -		
CATEGORY OF USE		
SPACE HEAT	24.81	673.58
SPACE COOL	192.83	0.00
HVAC AUX	58.90	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	283.97	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	73.28	0.00
TOTAL	633.80	673.58

TOTAL SITE ENERGY 1307.38 MBTU 177.8 KBTU/SQFT-YR GROSS-AREA 177.8 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 2576.88 MBTU 350.4 KBTU/SQFT-YR GROSS-AREA 350.4 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 5.5  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

E-W HEIGHT = 8.0 WIDTH = 97.0 CONS = EXWALL-2  
AZIMUTH = 135 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 8.0 WIDTH = 97.0 CONS = EXWALL-2  
AZIMUTH = 315 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

ROOF HEIGHT = 86.0 WIDTH = 85.5 CONS = ROOF-3  
TILT = 0 SKY-FORM-FACTOR = 1.0 ..

END ..  
COMPUTE LOADS ..

INPUT SYSTEMS ..

-----\$  
\$EZ - DOE SYSTEMS INPUT \$  
-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
LINE-3 \* DENVER, CO 80227 \*

LINE-4 \*RUN #4 NIGHT INFILTRATION FOR BLDG. 7245\*

LINE-5 \*DINING AREA \* ..

ABORT ERRORS ..  
DIAGNOSTIC WARNINGS ..  
SYSTEMS-REPORT VERIFICATION=(SV-A)  
SUMMARY=(SS-A,SS-B,SS-C,SS-K,SS-O)  
HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

SD\_ON =DAY-SCHEDULE (1,24) (1.) ..

SD\_W\_HT\_F =DAY-SCHEDULE (1,24) (74.) ..

SD\_S\_CL\_F =DAY-SCHEDULE (1,24) (72.) ..

SD\_27%\_OA =DAY-SCHEDULE (1,4) (0.)

(5,20) (0.27)

(21,24) (0.) ..

SD\_OFF =DAY-SCHEDULE (1,24) (0.) ..

SD\_10%\_OA =DAY-SCHEDULE (1,24) (0.1) ..

SD\_W\_CL\_F =DAY-SCHEDULE (1,24) (76.) ..

SD\_S\_HT\_F =DAY-SCHEDULE (1,24) (70.) ..

SW\_ON =WEEK-SCHEDULE (ALL) SD\_ON ..

SW\_W\_HT\_F =WEEK-SCHEDULE (ALL) SD\_W\_HT\_F ..

SW\_S\_CL\_F =WEEK-SCHEDULE (ALL) SD\_S\_CL\_F ..

SW\_27%\_OA =WEEK-SCHEDULE (ALL) SD\_27%\_OA ..



SW\_OFF =WEEK-SCHEDULE (ALL) SD\_OFF ..

SW\_10%\_OA =WEEK-SCHEDULE (ALL) SD\_10%\_OA ..

SW\_W\_CL\_F =WEEK-SCHEDULE (ALL) SD\_W\_CL\_F ..

SW\_S\_HT\_F =WEEK-SCHEDULE (ALL) SD\_S\_HT\_F ..

S\_FULL\_ON =SCHEDULE THRU DEC 31 SW\_ON ..

S\_FULL\_OFF =SCHEDULE THRU DEC 31 SW\_OFF ..

\$ OUTSIDE AIR AT .27%

S\_OTSIDAIR =SCHEDULE THRU DEC 31 SW\_27%\_OA ..

\$ HEATING SEASON

S\_HE\_SCHED =SCHEDULE THRU MAY 15 SW\_ON  
 THRU OCT 1 SW\_OFF  
 THRU DEC 31 SW\_ON ..

\$ COOLING SEASON

S\_CL\_SCHED =SCHEDULE THRU MAY 15 SW\_OFF  
 THRU OCT 1 SW\_ON  
 THRU DEC 31 SW\_OFF ..

\$ 10%OA\_WINTER\_100%OA\_SUM

S\_S/W\_VET =SCHEDULE THRU MAY 15 SW\_10%\_OA  
 THRU OCT 1 SW\_ON  
 THRU DEC 31 SW\_10%\_OA ..

S\_VENT@27% =SCHEDULE THRU DEC 31 SW\_27%\_OA ..

\$ HEATING SET TEMP

S\_HT\_SET\_F =SCHEDULE THRU MAY 15 SW\_W\_HT\_F  
 THRU OCT 1 SW\_S\_HT\_F  
 THRU DEC 31 SW\_W\_HT\_F ..

\$ COOLING SET TEMP

S\_CL\_SET\_F =SCHEDULE THRU MAY 15 SW\_W\_CL\_F  
 THRU OCT 1 SW\_S\_CL\_F  
 THRU DEC 31 SW\_W\_CL\_F ..

S\_HRLY-RPT =SCHEDULE THRU JAN 10 SW\_OFF  
 THRU JAN 11 SW\_ON  
 THRU JUN 17 SW\_OFF  
 THRU JUN 18 SW\_ON  
 THRU DEC 31 SW\_OFF ..

\$ ZONE DESCRIPTION

diningarea =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F

ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL  
 BASEBOARD-CTRL = THERMOSTATIC  
 BASEBOARD-RATING = -235200. OUTSIDE-AIR-CFM = 3847.5  
 SIZING-OPTION = FROM-LOADS ..

dining-plm =ZONE DESIGN-HEAT-T = 64.0 DESIGN-COOL-T = 82.0  
 ZONE-TYPE = UNCONDITIONED SIZING-OPTION = FROM-LOADS ..

\$ SYSTEM DESCRIPTION

VAV-SPEED =SYSTEM SYSTEM-TYPE = VAVS  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_HE\_SCHED  
 COOLING-SCHEDULE = S\_CL\_SCHED PREHEAT-T = 0.0  
 OA-CONTROL = FIXED SUPPLY-CFM = 14250.  
 RATED-CFM = 14250. MIN-AIR-SCH = S\_OTSIDAIR ←  
 MAX-OA-FRACTION = 0.27 FAN-CONTROL = SPEED  
 SUPPLY-DELTA-T = 2.4 SUPPLY-KW = 0.00078  
 FAN-PLACEMENT = BLOW-THROUGH MAX-FAN-RATIO = 1.0  
 MIN-FAN-RATIO = 0.27 NIGHT-CYCLE-CTRL = STAY-OFF  
 NIGHT-VENT-DT = 0.0 MIN-CFM-RATIO = 0.27  
 REHEAT-DELTA-T = 70. COOLING-CAPACITY = 819545.  
 COOL-SH-CAP = 672000. COOL-FT-MIN = 0.  
 HEATING-CAPACITY = -51855200.  
 SIZING-OPTION = COINCIDENT  
 ZONE-NAMES = (diningarea, dining-plm) ..

\$ HOURLY REPORT DESCRIPTION

ZONES-RPT =REPORT-BLOCK VARIABLE-TYPE = diningarea  
 VARIABLE-LIST = (17,18,7,31) ..  
 NEW-VAV =REPORT-BLOCK VARIABLE-TYPE = VAV-SPEED  
 VARIABLE-LIST = (3,5,6,9,17,20,39) ..  
 HRLY-RPT-1 = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (ZONES-RPT)  
 ..  
 HRLY-RPT-2 = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (NEW-VAV)  
 ..  
 END ..  
 COMPUTE SYSTEMS ..

INPUT PLANT ..

\$-----\$  
 \$ E Z - D O E P L A N T S I N P U T \$  
 \$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
 LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*



EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1LD 5/15/1995 13:36:56 SDL RUN 1  
 DENVER, CO 80227 RUN #4 NIGHT INFILTRATION FOR BLDG. 7245 DINING AREA  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR VAV-SPEED TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-117.212	15 9	-5.F	-6.F	9564.	-476.353	23.958
FEB	0.00000				-81.886	3 8	-2.F	-3.F	8689.	-419.430	31.360
MAR	0.00000				-54.733	3 5	15.F	13.F	10315.	-320.985	33.155
APR	0.00000				-8.899	5 5	31.F	29.F	12630.	-195.922	33.155
MAY	48.70527	31 18	90.F	76.F	-0.754	5 9	49.F	43.F	12155.	-45.718	33.155
JUN	111.64474	28 18	89.F	76.F	0.000				10155.	0.000	29.102
JUL	137.07169	23 18	95.F	79.F	0.000				10652.	0.000	29.799
AUG	135.10039	21 19	95.F	76.F	0.000				10657.	0.000	29.433
SEP	78.45740	6 18	91.F	75.F	0.000				9787.	0.000	28.820
OCT	1.82346	1 18	83.F	68.F	-9.112	20 8	23.F	22.F	12852.	-235.089	33.155
NOV	0.00000				-44.366	3 5	13.F	12.F	10475.	-307.049	33.155
DEC	0.00000				-103.573	12 9	4.F	3.F	9560.	-405.050	22.956
TOTAL	512.803				-420.533				127494.	-476.353	33.155
MAX											

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1LD 5/15/1995 13:36:56 SDL RUN 1  
 DENVER, CO 80227 RUN #4 NIGHT INFILTRATION FOR BLDG. 7245 DINING AREA  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR VAV-SPEED TOPEKA, KS

MONTH	HOURS				HOURS				HOURS				COINCIDENT LOADS	
	COOLING LOAD	HEATING LOAD	COINCIDENT COOL-HEAT LOAD	FLOATING	COOLING AVAIL.	HEATING AVAIL.	HEATING AVAIL.	FLOATING	FANS ON CYCLE	FANS ON NIGHT VENTING	FANS ON WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)	
JAN	0	742	0	2	0	744	0	744	0	0	2	-40.446	0.905	
FEB	0	659	0	13	0	672	0	672	0	0	13	-37.087	0.905	
MAR	0	638	0	106	0	744	0	744	0	0	106	-34.075	0.905	
APR	0	417	0	303	0	720	0	720	0	0	303	-1.432	0.905	
MAY	380	177	0	187	384	744	0	744	0	0	187	0.000	28.458	
JUN	717	0	0	3	720	720	0	720	0	0	3	0.000	28.745	
JUL	744	0	0	0	744	744	0	744	0	0	0	0.000	29.504	
AUG	744	0	0	0	744	744	0	744	0	0	0	0.000	29.433	
SEP	664	0	0	56	720	720	0	720	0	0	56	0.000	28.755	
OCT	20	448	0	276	24	744	0	744	0	0	276	0.000	24.884	
NOV	0	600	0	120	0	720	0	720	0	0	120	-55.977	0.905	
DEC	0	742	0	2	0	744	0	744	0	0	2	-63.014	0.905	
ANNUAL	3269	4423	0	1068	3336	8760	0	8760	0	0	1068			

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 13:36:56 PDL RUN 1  
 DENVER, CO 80227 RUN #4 NIGHT INFILTRATION FOR BLDG. 7245 DINING AREA  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY TOTAL (MBTU) PEAK (KBTU) DY/HR	NATURAL-GAS TOTAL (MBTU) PEAK (KBTU) DY/HR
JAN	38.910 88.968 31/7	38.910 88.968 31/7	184.685 639.885 15/9
FEB	34.836 107.077 26/18	34.836 107.077 26/18	134.878 575.728 3/8
MAR	39.068 114.543 7/19	39.068 114.543 7/19	93.587 461.417 3/5
APR	44.021 114.322 3/19	44.021 114.322 3/19	18.606 310.065 5/5
MAY	61.805 245.752 31/18	61.805 245.752 31/18	2.776 87.774 5/9
JUN	80.023 247.874 28/19	80.023 247.874 28/19	0.000 0.000 30/1
JUL	90.753 269.631 23/18	90.753 269.631 23/18	0.000 0.000 31/1
AUG	91.612 264.343 21/19	91.612 264.343 21/19	0.000 0.000 31/1
SEP	67.091 248.110 6/18	67.091 248.110 6/18	0.000 0.000 30/1
OCT	45.679 178.548 1/18	45.679 178.548 1/18	19.236 358.203 20/8
NOV	39.033 113.898 7/19	39.033 113.898 7/19	77.199 444.891 3/5
DEC	38.603 88.968 31/19	38.603 88.968 31/19	166.598 559.295 12/9
	ONE YEAR USE/PEAK	671.435 269.631	697.566 639.885

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 13:36:56 PDL RUN 1  
 DENVER, CO 80227 RUN #4 NIGHT INFILTRATION FOR BLDG. 7245DINING AREA  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
SPACE HEAT	26.47	697.57
SPACE COOL	209.65	0.00
HVAC AUX	78.06	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	283.97	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	73.28	0.00
TOTAL	671.43	697.57

TOTAL SITE ENERGY 1369.00 MBTU 186.2 KBTU/SQFT-YR GROSS-AREA 186.2 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 2713.89 MBTU 369.1 KBTU/SQFT-YR GROSS-AREA 369.1 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 17.0  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

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E-W    HEIGHT = 8.0  WIDTH = 97.0  CONS = EXWALL-2
      AZIMUTH = 135  SKY-FORM-FACTOR = 0.5
      GND-FORM-FACTOR = 0.5  ..

E-W    HEIGHT = 8.0  WIDTH = 97.0  CONS = EXWALL-2
      AZIMUTH = 315  SKY-FORM-FACTOR = 0.5
      GND-FORM-FACTOR = 0.5  ..

ROOF   HEIGHT = 86.0  WIDTH = 85.5  CONS = ROOF-3
      TILT = 0  SKY-FORM-FACTOR = 1.0  ..

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END ..
COMPUTE LOADS ..

INPUT SYSTEMS ..

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$-----$
$ E Z - D O E   S Y S T E M S   I N P U T $
$-----$

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\$ GENERAL PROJECT DATA

```

TITLE LINE-1 *   EMC      ENGINEERS      INC.      *
      LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
      LINE-3 *   DENVER,      CO      80227      *

      LINE-4 *RUN #5 DAY INFILTRATION FOR BLDG. 7245 *
      LINE-5 *DINING AREA * ..

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```

ABORT      ERRORS ..
DIAGNOSTIC WARNINGS ..
SYSTEMS-REPORT VERIFICATION=(SV-A)
            SUMMARY=(SS-A,SS-B,SS-C,SS-K,SS-O)
            HOURLY-DATA-SAVE = YES ..

```

\$ SCHEDULES

```

SD_ON      =DAY-SCHEDULE (1,24) (1.) ..
SD_W_HT_F  =DAY-SCHEDULE (1,24) (74.) ..
SD_S_CL_F  =DAY-SCHEDULE (1,24) (72.) ..
SD_27%_OA  =DAY-SCHEDULE (1,4) (0.27)
            (5,20) (0.)
            (21,24) (0.27) ..
SD_OFF     =DAY-SCHEDULE (1,24) (0.) ..
SD_10%_OA  =DAY-SCHEDULE (1,24) (0.1) ..
SD_W_CL_F  =DAY-SCHEDULE (1,24) (76.) ..
SD_S_HT_F  =DAY-SCHEDULE (1,24) (70.) ..

SW_ON      =WEEK-SCHEDULE (ALL) SD_ON ..

SW_W_HT_F  =WEEK-SCHEDULE (ALL) SD_W_HT_F ..

SW_S_CL_F  =WEEK-SCHEDULE (ALL) SD_S_CL_F ..

SW_27%_OA  =WEEK-SCHEDULE (ALL) SD_27%_OA ..

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SW_OFF      =WEEK-SCHEDULE (ALL) SD_OFF  ..
SW_10%_OA  =WEEK-SCHEDULE (ALL) SD_10%_OA ..
SW_W_CL_F  =WEEK-SCHEDULE (ALL) SD_W_CL_F ..
SW_S_HT_F  =WEEK-SCHEDULE (ALL) SD_S_HT_F ..

S_FULL_ON  =SCHEDULE THRU DEC 31 SW_ON  ..
S_FULL_OFF =SCHEDULE THRU DEC 31 SW_OFF ..

$ OUTSIDE AIR AT .27%
S_OTSIDAIR =SCHEDULE THRU DEC 31 SW_27%_OA ..

$ HEATING SEASON
S_HE_SCHED =SCHEDULE THRU MAY 15 SW_ON
              THRU OCT  1 SW_OFF
              THRU DEC 31 SW_ON  ..

$ COOLING SEASON
S_CL_SCHED =SCHEDULE THRU MAY 15 SW_OFF
              THRU OCT  1 SW_ON
              THRU DEC 31 SW_OFF  ..

$ 10%OA_WINTER_100%OA_SUM
S_S/W_VET  =SCHEDULE THRU MAY 15 SW_10%_OA
              THRU OCT  1 SW_ON
              THRU DEC 31 SW_10%_OA  ..

S_VENT@27% =SCHEDULE THRU DEC 31 SW_27%_OA ..

$ HEATING SET TEMP
S_HT_SET_F =SCHEDULE THRU MAY 15 SW_W_HT_F
              THRU OCT  1 SW_S_HT_F
              THRU DEC 31 SW_W_HT_F  ..

$ COOLING SET TEMP
S_CL_SET_F =SCHEDULE THRU MAY 15 SW_W_CL_F
              THRU OCT  1 SW_S_CL_F
              THRU DEC 31 SW_W_CL_F  ..

S_HRLY-RPT =SCHEDULE THRU JAN 10 SW_OFF
              THRU JAN 11 SW_ON
              THRU JUN 17 SW_OFF
              THRU JUN 18 SW_ON
              THRU DEC 31 SW_OFF  ..

```

## \$ ZONE DESCRIPTION

```

diningarea =ZONE  DESIGN-HEAT-T = 74.0  DESIGN-COOL-T = 72.0
              HEAT-TEMP-SCH = S_HT_SET_F  COOL-TEMP-SCH = S_CL_SET_F

```

ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL  
 BASEBOARD-CTRL = THERMOSTATIC  
 BASEBOARD-RATING = -235200. OUTSIDE-AIR-CFM = 3847.5  
 SIZING-OPTION = FROM-LOADS ..

dining-plm =ZONE DESIGN-HEAT-T = 64.0 DESIGN-COOL-T = 82.0  
 ZONE-TYPE = UNCONDITIONED SIZING-OPTION = FROM-LOADS ..

\$ SYSTEM DESCRIPTION

VAV-SPEED =SYSTEM SYSTEM-TYPE = VAVS  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_HE\_SCHED  
 COOLING-SCHEDULE = S\_CL\_SCHED PREHEAT-T = 0.0  
 OA-CONTROL = FIXED SUPPLY-CFM = 14250.  
 RATED-CFM = 14250. MIN-AIR-SCH = S\_OTSIDAIR ←  
 MAX-OA-FRACTION = 0.27 FAN-CONTROL = SPEED  
 SUPPLY-DELTA-T = 2.4 SUPPLY-KW = 0.00078  
 FAN-PLACEMENT = BLOW-THROUGH MAX-FAN-RATIO = 1.0  
 MIN-FAN-RATIO = 0.27 NIGHT-CYCLE-CTRL = STAY-OFF  
 NIGHT-VENT-DT = 0.0 MIN-CFM-RATIO = 0.27  
 REHEAT-DELTA-T = 70. COOLING-CAPACITY = 819545.  
 COOL-SH-CAP = 672000. COOL-FT-MIN = 0.  
 HEATING-CAPACITY = -51855200.  
 SIZING-OPTION = COINCIDENT  
 ZONE-NAMES = (diningarea, dining-plm) ..

\$ HOURLY REPORT DESCRIPTION

ZONES-RPT =REPORT-BLOCK VARIABLE-TYPE = diningarea  
 VARIABLE-LIST = (17,18,7,31) ..  
 NEW-VAV =REPORT-BLOCK VARIABLE-TYPE = VAV-SPEED  
 VARIABLE-LIST = (3,5,6,9,17,20,39) ..  
 HRLY-RPT-1 = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (ZONES-RPT)

..  
 HRLY-RPT-2 = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (NEW-VAV)

END ..  
 COMPUTE SYSTEMS ..

INPUT PLANT ..

\$-----\$  
 \$ E Z - D O E P L A N T S I N P U T \$  
 \$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
 LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 13:43:13 SDL RUN 1  
 DENVER, CO 80227 RUN #5 DAY INFILTRATION FOR BLDG. 7245 DINING AREA TOPEKA, KS  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR VAV-SPEED

MONTH	C O O L I N G				H E A T I N G				E L E C					
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	MAXIMUM COOLING LOAD (KBTU/HR)	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC-TRICAL ENERGY (KWH)	MAXIMUM ELEC-TRICAL ENERGY (KW)
JAN	0.00000				-69.555	15	-8.F	-9.F	10302.	-529.002	0.000	10302.	33.155	
FEB	0.00000				-47.931	3	0.F	-1.F	9391.	-465.109	0.000	9391.	33.155	
MAR	0.00000				-33.805	3	16.F	13.F	10517.	-352.820	0.000	10517.	33.155	
APR	0.00000				-6.469	5	32.F	29.F	11865.	-192.750	0.000	11865.	33.155	
MAY	54.52324	16	57.F	56.F	-0.743	5	45.F	41.F	11673.	-64.299	0.000	11673.	33.155	
JUN	112.72626	28	19	89.F	75.F	0.000			10127.	0.000	0.000	10127.	28.934	
JUL	127.59078	23	19	94.F	78.F	0.000			10614.	0.000	0.000	10614.	29.561	
AUG	126.62223	21	19	95.F	76.F	0.000			10613.	0.000	0.000	10613.	29.229	
SEP	89.28371	7	18	91.F	74.F	0.000			9777.	0.000	0.000	9777.	28.657	
OCT	2.29905	1	18	83.F	68.F	-5.327	20	25.F	25.F	-226.390	0.000	12334.	33.155	
NOV	0.00000				-28.134	3	13.F	12.F	10549.	-339.738	0.000	10549.	33.155	
DEC	0.00000				-60.660	15	3.F	2.F	10376.	-443.608	0.000	10376.	33.155	
TOTAL	513.046				-252.624				128140.	-529.002		128140.	33.155	
MAX														

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 13:43:13 SDL RUN 1  
 DENVER, CO 80227 RUN #5 DAY INFILTRATION FOR BLDG. 7245 DINING AREA TOPEKA, KS  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR VAV-SPEED

MONTH	HOURS COINCIDENT COOL-HEAT LOAD				HOURS COINCIDENT HEATING COOLING LOAD AT PEAK				HOURS COINCIDENT HEATING COOLING LOAD AT PEAK			
	HOURS COOLING LOAD	HOURS HEATING LOAD	HOURS COINCIDENT COOL-HEAT LOAD	HOURS COINCIDENT HEATING COOLING LOAD AT PEAK	HOURS COOLING AVAIL.	HOURS HEATING AVAIL.	HOURS COINCIDENT HEATING COOLING LOAD AT PEAK	HOURS COINCIDENT HEATING COOLING LOAD AT PEAK	HOURS COOLING AVAIL.	HOURS HEATING AVAIL.	HOURS COINCIDENT HEATING COOLING LOAD AT PEAK	HOURS COINCIDENT HEATING COOLING LOAD AT PEAK
JAN	0	570	0	744	0	744	0	744	0	744	0	744
FEB	0	480	0	672	0	672	0	672	0	672	0	672
MAR	0	453	0	744	0	744	0	744	0	744	0	744
APR	0	334	0	720	0	720	0	720	0	720	0	720
MAY	384	156	0	360	384	744	0	744	384	744	0	744
JUN	717	0	0	0	720	720	0	720	720	720	0	720
JUL	744	0	0	0	744	744	0	744	744	744	0	744
AUG	668	0	0	0	720	720	0	720	720	720	0	720
SEP	21	349	0	744	24	744	0	744	24	744	0	744
OCT	0	439	0	720	0	720	0	720	0	720	0	720
NOV	0	551	0	744	0	744	0	744	0	744	0	744
DEC	0	332	0	5424	0	8760	0	8760	0	2150	0	2150
ANNUAL	3278	3332	0	5424	3336	8760	0	8760	3336	2150	0	2150

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 13:43:13 PDL RUN 1  
 DENVER, CO 80227 RUN #5 DAY INFILTRATION FOR BLDG. 7245 DINING AREA  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY TOTAL (MBTU) PEAK (KBTU) DY/HR	NATURAL-GAS TOTAL (MBTU) PEAK (KBTU) DY/HR
JAN	38.580 113.205 21/18	108.846 710.608 15/ 3	
FEB	34.792 113.204 23/ 6	78.086 638.587 3/ 4	
MAR	38.153 113.204 21/ 6	57.675 508.105 3/ 4	
APR	41.191 113.204 21/ 6	14.073 313.486 5/ 4	
MAY	61.025 222.687 16/ 6	2.727 120.996 5/ 4	
JUN	79.042 219.717 28/19	0.000 0.000 30/ 1	
JUL	86.861 231.010 23/19	0.000 0.000 31/ 1	
AUG	87.800 231.259 11/18	0.000 0.000 31/ 1	
SEP	69.464 219.735 7/18	0.000 0.000 30/ 1	
OCT	43.686 179.602 1/18	12.315 355.228 20/ 4	
NOV	37.973 113.205 5/ 6	48.937 492.579 3/ 4	
DEC	38.657 113.205 13/18	97.019 613.988 15/ 2	
	ONE YEAR USE/PEAK	657.225 231.259	419.678 710.608



EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 13:43:13 PDL RUN 1  
 DENVER, CO 80227 RUN #5 DAY INFILTRATION FOR BLDG. 7245 DINING AREA  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
SPACE HEAT	14.98	419.68
SPACE COOL	204.72	0.00
HVAC AUX	80.26	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	283.97	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	73.28	0.00
TOTAL	657.21	419.68

TOTAL SITE ENERGY 1076.90 MBTU 146.4 KBTU/SOFT-YR GROSS-AREA 146.4 KBTU/SOFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 2393.33 MBTU 325.5 KBTU/SOFT-YR GROSS-AREA 325.5 KBTU/SOFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 34.6  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.



DENVER - ATLANTA

PROJECT: FEASIBILITY STUDY FOR  
 INSTALLATION OF UMCS  
 LOCATION: FORT RILEY, KANSAS

EMC NO: 1406-001  
 CALC. BY: AJN  
 CHECKED BY: CEL  
 DATE: 05-Jul-95

BUILDING NO.: 7245  
 BLDG. TYPE: ENL PERS DINING FACILITY - KITCHEN AREA

**ENERGY CONSTANT CALCULATIONS**

	BASERUN	RUN1	RUN2	RUN3	RUN4	RUN5
HEATING (MBtu)	806.4	0.0	798.5	0.0	0.0	0.0
COOLING (kWH)	266,156	0	265,930	0	0	0

SUPPLY AIR FAN	15,600 CFM
FLOOR AREA	3,954 FT <sup>2</sup>
CFMI	15600 CFM
UA	813 BTU/HR-°F
BLDG CONSTR.	2 (1 FOR LIGHT ) (2 FOR HEAVY)

EZDOE COMPUTER RUN DEFINITION:	
BASERUN	EXISTING OPERATION
RUN1	NIGHT SETBACK
RUN2	DDC CONTROL
RUN3	ECONOMIZER
RUN4	NIGHTTIME INFILTRATION (OA)
RUN5	DAYTIME INFILTRATION (OA)

HOURS OF OCCUPANCY			ANNUAL HEATING & COOLING HOURS	
M-F	500	2400	95 HR	HR. ON HEATING 4313 HR/YR
SAT.	500	2400	19 HR	HR. ON COOLING 2622 HR/YR
SUN.	500	2400	19 HR	HR. OFF HEATING 1135 HR/YR
	TOTAL OCCUPY HR.		133 HR/WK	HR. OFF COOLING 690 HR/YR
	TOTAL UNOCC. HR.		35 HR/WK	
	ANNUAL OCCUPY HR.		6935 HR/YR	
	ANNUAL UNOCC. HR.		1825 HR/YR	

PRESENT HR. OF OPERATION FOR SYS. WITH HEATING AND COOLING 8760 HR/YR  
 PRESENT HR. OF OPERATION FOR SYS. WITH HEATING ONLY 5448 HR/YR  
 PRESENT HR. OF OPERATION FOR SYS. WITH COOLING ONLY 3312 HR/YR  
 HRS SAVED (HTG ONLY) 5448 - 4313 = 1135 HR/YR  
 HRS SAVED (CLG ONLY) 3312 - 2622 = 690 HR/YR

HOAUHC	806.35 MBtu	-	0 MBtu	=	0.00E+00 Btu/CFM-HR
	15600 CFM	x	1825 HR/YR		
HOAUH	806.35 MBtu	-	0 MBtu	=	0.00E+00 Btu/CFM-HR
	15600 CFM	x	1135 HR/YR		
COAUHC	266,155.9 kWH	-	0.0 kWH	=	0.00E+00 kWH/CFM-HR
	15600 CFM	x	1825 HR/YR		
COAUC	266,155.9 kWH	-	0.0 kWH	=	0.00E+00 kWH/CFM-HR
	15600 CFM	x	690 HR/YR		
HOAOHC	806.35 MBtu	-	0 MBtu	=	0.00E+00 Btu/CFM-HR
	15600 CFM	x	6935 HR/YR		
HOAOH	806.35 MBtu	-	0 MBtu	=	0.00E+00 Btu/CFM-HR
	15600 CFM	x	4313 HR/YR		
COAOHC	266,155.9 kWH	-	0.0 kWH	=	0.00E+00 kWH/CFM-HR
	15600 CFM	x	6935 HR/YR		
COAOC	266,155.9 kWH	-	0.0 kWH	=	0.00E+00 kWH/CFM-HR
	15600 CFM	x	2622 HR/YR		
DC DUTY	1 / 6 (10 MINUTES PER HOUR)			=	0.17
DC DEMAND	1 / 6 (10 MINUTES PER HOUR)			=	0.17
ECC	0.0 kWH	-	0.0 kWH	=	0.00E+00 kWH/CFM-HR
	15600 CFM	x	2622 HR/YR		
ECHC	0.0 kWH	-	0.0 kWH	=	0.00E+00 kWH/CFM-HR
	15600 CFM	x	6935 HR/YR		
NSUCHC	266,155.9 kWH	-	0.0 kWH	=	0.00E+00 kWH/CFM-HR
	15600 CFM	x	1825 HR/YR		
NSUCC	266,155.9 kWH	-	0.0 kWH	=	0.00E+00 kWH/CFM-HR
	15600 CFM	x	690 HR/YR		
DDCCHC	266,155.9 kWH	-	265,930.3 kWH	=	2.09E-06 kWH/CFM-HR
	15600 CFM	x	6935 HR/YR		
DDCCC	266,155.9 kWH	-	265,930.3 kWH	=	5.52E-06 kWH/CFM-HR
	15600 CFM	x	2622 HR/YR		
NSC	806.35 MBtu	-	0 MBtu	=	9.92E+05 Btu/UA
	813.24044 UA				
DDCH	806.35 MBtu	-	798.51 MBtu	=	9.64E+03 Btu/UA
	813.24044 UA				
OPT	(2 HR/DAY X 240 DAY/YR)		175 HR/YR	=	305 HR/YR
CHWR	(1.10 kW X 0.012 Eff. X 664 HRS X 2 Degrees of Reset)			=	17.5 kWH/TON
OAR	567 HR/YR	x	0.01	=	5.67 HR/YR



INPUT LOADS ..

-----\$  
\$ E Z - D O E L O A D S I N P U T \$  
-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
LINE-3 \* DENVER, CO 80227 \*  
  
LINE-4 \*BASELINE SIMULATION FOR BULIDING 7245 \*  
LINE-5 \*KITCHEN AREA \* ..

ABORT ERRORS ..  
DIAGNOSTIC WARNINGS ..  
LOADS-REPORT VERIFICATION=(LV-D)  
SUMMARY=(LS-C,LS-D)  
HOURLY-DATA-SAVE = YES ..  
BUILDING-LOCATION LATITUDE = 39.0  
LONGITUDE = 96.5  
ALTITUDE = 1065.  
TIME-ZONE = 6  
GROSS-AREA = 3960  
SHIELDING-COEF = 0.29  
X-REF = 0.0  
Y-REF = 0.0 ..  
RUN-PERIOD JAN 1 1994 THRU DEC 31 1994 ..

\$ SCHEDULES

LD\_ON =DAY-SCHEDULE (1,24) (1.) ..  
LD\_OFF =DAY-SCHEDULE (1,24) (0.) ..  
LD\_KIT-PEO =DAY-SCHEDULE (1,4) (0.)  
(5,19) (1.)  
(20,24) (0.07) ..  
LD\_KIT-EQP =DAY-SCHEDULE (1,4) (0.)  
(5,7) (0.75)  
(8,9) (0.3)  
(10,11) (0.1,0.3)  
(12,13) (0.75)  
(14,16) (0.5,0.1,0.3)  
(17,18) (0.75)  
(19,20) (0.3,0.2)  
(21,24) (0.15) ..  
LD\_LIT-KIT =DAY-SCHEDULE (1,4) (0.1)  
(5,24) (1.) ..

LW\_ON =WEEK-SCHEDULE (ALL) LD\_ON ..  
 LW\_OFF =WEEK-SCHEDULE (ALL) LD\_OFF ..  
 LW\_KIT-PEO =WEEK-SCHEDULE (ALL) LD\_KIT-PEO ..  
 LW\_KIT-EQP =WEEK-SCHEDULE (ALL) LD\_KIT-EQP ..  
 LW\_LIT-KIT =WEEK-SCHEDULE (ALL) LD\_LIT-KIT ..

## \$ ON 100% LOADS

L\_ON =SCHEDULE THRU DEC 31 LW\_ON ..

## \$ OFF 100% LOADS

L\_OFF =SCHEDULE THRU DEC 31 LW\_OFF ..

## \$ PEOPLE LOAD FOR KITCHEN

L\_KIT-PEOP =SCHEDULE THRU DEC 31 LW\_KIT-PEO ..

## \$ EQUIPMENT LOAT FOR KITC

L\_KIT-EQUP =SCHEDULE THRU DEC 31 LW\_KIT-EQP ..

## \$ LIGHTING SCHED FOR KITC

L\_KIT-LIT =SCHEDULE THRU DEC 31 LW\_LIT-KIT ..

## \$ CONSTRUCTION TYPES

## \$ EXTERIOR WALL BRICK, INSL, BRICK

WALL-1 =LAYERS MATERIAL=(BK01,AL11,IN35,CB06,GP01) I-F-R= 0.6100  
 THICKNESS=(0.333,0.000,0.167,0.500,0.042) ..  
 EXWALL-1 =CONSTRUCTION LAYERS = WALL-1  
 ABSORPTANCE = 0.880  
 ROUGHNESS = 2 ..  
 FLOOR =CONSTRUCTION U-VALUE = 0.020  
 ABSORPTANCE = 0.610  
 ROUGHNESS = 5 ..

## \$ BUILT-UP ROOF W/INSL&amp; NO CEILING

BLT-ROOF =LAYERS MATERIAL=(HF-E2, HF-E3, HF-A3, IN02)  
 THICKNESS=(0.042,0.031,0.005,0.296) ..  
 ROOF-1 =CONSTRUCTION LAYERS = BLT-ROOF  
 ABSORPTANCE = 0.800  
 ROUGHNESS = 1 ..

## \$ CONCRETE CEILING BETW KIT &amp; MEZZ

CONC-CEL =LAYERS MATERIAL=(CC24)  
 THICKNESS=(0.333) ..  
 IN-WALL1 =CONSTRUCTION LAYERS = CONC-CEL  
 ABSORPTANCE = 0.650

ROUGHNESS = 5 ..

## \$ STANDARD METAL DOOR

DOOR-MET =CONSTRUCTION U-VALUE = 0.020  
 ABSORPTANCE = 0.860  
 ROUGHNESS = 5 ..

1\_PN\_STD =GLASS-TYPE GLASS-TYPE-CODE = 1  
 PANES = 1 ..

## \$ SPACE DESCRIPTION

KITCHEN =SPACE AREA = 3954.4 VOLUME = 41916.6  
 TEMPERATURE = (73.) ZONE-TYPE = CONDITIONED  
 PEOPLE-SCHEDULE = L\_KIT-PEOP NUMBER-OF-PEOPLE = 20.0  
 PEOPLE-HG-LAT = 625.0 PEOPLE-HG-SENS = 375.0  
 LIGHTING-TYPE = SUS-FLUOR LIGHTING-W/SQFT = 0.65  
 LIGHT-TO-SPACE = 1.0 LIGHTING-SCHEDULE = L\_KIT-LIT  
 EQUIP-SCHEDULE = L\_KIT-EQUP EQUIPMENT-W/SQFT = 8.35  
 FURN-WEIGHT = 0.8 INF-METHOD = NONE ..

E-W HEIGHT = 10.6 WIDTH = 86.3 CONS = EXWALL-1  
 AZIMUTH = 225 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 4.8 WIDTH = 6.0 G-T = 1\_PN\_STD  
 MULTIPLIER = 4.0 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

DOOR HEIGHT = 7.5 WIDTH = 3.5 CONS = DOOR-MET  
 SETBACK = 0.2 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 10.6 WIDTH = 39.0 CONS = EXWALL-1  
 AZIMUTH = 135 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 4.0 WIDTH = 5.3 G-T = 1\_PN\_STD  
 MULTIPLIER = 2.0 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 10.6 WIDTH = 39.0 CONS = EXWALL-1  
 AZIMUTH = 315 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 4.0 WIDTH = 4.0 G-T = 1\_PN\_STD  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

U-W HEIGHT = 60.0 WIDTH = 66.0 CONS = FLOOR ..

I-W HEIGHT = 60.0 WIDTH = 66.0 CONS = IN-WALL1  
 NEXT-TO = KIT-MEZZIN ..

KIT-MEZZIN =SPACE AREA = 3954.4 VOLUME = 35589.6  
 TEMPERATURE = (73.) ZONE-TYPE = UNCONDITIONED  
 PEOPLE-HG-LAT = 625.0 PEOPLE-HG-SENS = 375.0  
 LIGHTING-TYPE = SUS-FLUOR LIGHT-TO-SPACE = 1.0  
 EQUIP-SCHEDULE = L\_ON EQUIPMENT-KW = 3.68  
 FURN-WEIGHT = 0.8 INF-METHOD = NONE ..

E-W HEIGHT = 9.0 WIDTH = 86.3 CONS = EXWALL-1  
 AZIMUTH = 225 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 9.0 WIDTH = 39.0 CONS = EXWALL-1  
 AZIMUTH = 135 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 9.0 WIDTH = 39.0 CONS = EXWALL-1  
 AZIMUTH = 315 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

ROOF HEIGHT = 60.0 WIDTH = 66.0 CONS = ROOF-1  
 TILT = 0 SKY-FORM-FACTOR = 1.0 ..

END ..

COMPUTE LOADS ..

INPUT SYSTEMS ..

-----\$  
 \$ E Z - D O E S Y S T E M S I N P U T \$  
 -----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
 LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
 LINE-3 \* DENVER, CO 80227 \*  
 LINE-4 \*BASELINE SIMULATION FOR BULIDING 7245 \*  
 LINE-5 \*KITCHEN AREA \* ..

ABORT ERRORS ..  
 DIAGNOSTIC WARNINGS ..  
 SYSTEMS-REPORT VERIFICATION=(SV-A)  
 SUMMARY=(SS-A,SS-C,SS-K,SS-O)  
 HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

SD\_ON =DAY-SCHEDULE (1,24) (1.) ..  
 SD\_OFF =DAY-SCHEDULE (1,24) (0.) ..  
 SD\_W\_HT\_F =DAY-SCHEDULE (1,24) (74.) ..  
 SD\_S\_CL\_F =DAY-SCHEDULE (1,24) (72.) ..  
 SD\_EXHAUST =DAY-SCHEDULE (1,4) (0.)  
 (5,24) (1.) ..

```

SD_W_CL_F =DAY-SCHEDULE (1,24) (76.) ..
SD_S_HT_F =DAY-SCHEDULE (1,24) (70.) ..

SW_ON      =WEEK-SCHEDULE (ALL) SD_ON ..

SW_OFF     =WEEK-SCHEDULE (ALL) SD_OFF ..

SW_W_HT_F  =WEEK-SCHEDULE (ALL) SD_W_HT_F ..

SW_S_CL_F  =WEEK-SCHEDULE (ALL) SD_S_CL_F ..

SW_EXHAUST =WEEK-SCHEDULE (ALL) SD_EXHAUST ..

SW_W_CL_F  =WEEK-SCHEDULE (ALL) SD_W_CL_F ..

SW_S_HT_F  =WEEK-SCHEDULE (ALL) SD_S_HT_F ..

```

## \$ FULL ON SYSTEM

```
S_ON      =SCHEDULE THRU DEC 31 SW_ON ..
```

## \$ FULL OFF SYSTEM

```
S_OFF     =SCHEDULE THRU DEC 31 SW_OFF ..
```

## \$ HEATING SEASON

```
S_HE-SCHED =SCHEDULE THRU MAY 15 SW_ON
              THRU OCT 1 SW_OFF
              THRU DEC 31 SW_ON ..
```

## \$ COOLING SEASON

```
S_CL_SCHED =SCHEDULE THRU MAY 15 SW_OFF
              THRU OCT 1 SW_ON
              THRU DEC 31 SW_OFF ..
```

## \$ HEATING SET TEMP

```
S_HT_SET_F =SCHEDULE THRU MAY 15 SW_W_HT_F
              THRU OCT 1 SW_S_HT_F
              THRU DEC 31 SW_W_HT_F ..
```

## \$ COOLING SET TEMP

```
S_CL_SET_F =SCHEDULE THRU MAY 15 SW_W_CL_F
              THRU OCT 1 SW_S_CL_F
              THRU DEC 31 SW_W_CL_F ..
```

## \$ SCHEDULE OF EXHAUST

```
S_EXHAUST =SCHEDULE THRU DEC 31 SW_EXHAUST ..
```

```
S_HRLY-RPS =SCHEDULE THRU JAN 15 SW_OFF
              THRU JAN 16 SW_ON
              THRU AUG 26 SW_OFF
              THRU AUG 27 SW_ON
              THRU DEC 31 SW_OFF ..
```

## \$ ZONE DESCRIPTION



KITCHEN =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL  
 BASEBOARD-CTRL = THERMOSTATIC  
 BASEBOARD-RATING = -35500. SIZING-OPTION = FROM-LOADS ..

KIT-MEZZIN =ZONE DESIGN-HEAT-T = 67.0 DESIGN-COOL-T = 82.0  
 ZONE-TYPE = UNCONDITIONED SIZING-OPTION = FROM-LOADS ..

\$ SYSTEM DESCRIPTION

KIT\_H&VS =SYSTEM SYSTEM-TYPE = HVSYS  
 MAX-SUPPLY-T = 120.0 HEATING-SCHEDULE = S\_ON  
 OA-CONTROL = FIXED SUPPLY-CFM = 15000.  
 RETURN-CFM = 15000. RATED-CFM = 15000.  
 MIN-OUTSIDE-AIR = 1.0 MIN-AIR-SCH = S\_ON  
 RECOVERY-EFF = 0.7 FAN-SCHEDULE = S\_ON  
 SUPPLY-DELTA-T = 2.4 SUPPLY-KW = 0.00078  
 MOTOR-PLACEMENT = OUTSIDE-AIRFLOW  
 NIGHT-CYCLE-CTRL = STAY-OFF RETURN-STATIC = 0.25  
 RETURN-EFF = 0.75 NIGHT-VENT-DT = 0.0  
 HEATING-CAPACITY = -900000.  
 ZONE-NAMES = (KITCHEN, KIT-MEZZIN) ..

\$ HOURLY REPORT DESCRIPTION

ZONE-BLOCK =REPORT-BLOCK VARIABLE-TYPE = KITCHEN  
 VARIABLE-LIST = (17,18,7,31,15,11,14) ..  
 AHU-BLOCK =REPORT-BLOCK VARIABLE-TYPE = KIT\_H&VS  
 VARIABLE-LIST = (3,5,6,17) ..  
 ZONE-HRLY = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPS  
 REPORT-BLOCK = (ZONE-BLOCK)  
 ..  
 AHU-HRLY = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPS  
 REPORT-BLOCK = (AHU-BLOCK)  
 ..  
 END ..  
 COMPUTE SYSTEMS ..

INPUT PLANT ..

\$-----\$  
 \$ E Z - D O E P L A N T S I N P U T \$  
 \$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
 LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
 LINE-3 \* DENVER, CO 80227 \*

LINE-4 \*BASELINE SIMULATION FOR BULIDING 7245 \*  
 LINE-5 \*KITCHEN AREA \* ..

ABORT ERRORS ..  
 DIAGNOSTIC WARNINGS ..  
 PLANT-REPORT VERIFICATION=(PV-A)  
 SUMMARY=(PS-B,BEPS)  
 HOURLY-DATA-SAVE = YES ..

## \$ SCHEDULES

PD\_ON =DAY-SCHEDULE (1,24) (1.) ..

PD\_OFF =DAY-SCHEDULE (1,24) (0.) ..

PW\_OFF =WEEK-SCHEDULE (ALL) PD\_OFF ..

PW\_ON =WEEK-SCHEDULE (ALL) PD\_ON ..

## \$ HEATING SEASON

P\_HEAT =SCHEDULE THRU DEC 31 PW\_ON ..

## \$ COOLING SEASON

P\_COOL =SCHEDULE THRU MAY 15 PW\_OFF  
 THRU OCT 1 PW\_ON  
 THRU DEC 31 PW\_OFF ..

## \$ EQUIPMENT DESCRIPTION

BOILER-STM =PLANT-EQUIPMENT TYPE = STM-BOILER  
 SIZE = -999. ..

CHILLER-RC =PLANT-EQUIPMENT TYPE = HERM-REC-CHLR  
 SIZE = -999. INSTALLED-NUMBER = 2  
 MAX-NUMBER-AVAIL = 2 ..

PLANT-PARAMETERS BOILER-FUEL = NATURAL-GAS HERM-REC-COND-TYPE = AIR ..

ENERGY-RESOURCE RESOURCE = ELECTRICITY ..  
 ENERGY-RESOURCE RESOURCE = NATURAL-GAS ..

HEATINGSEA =LOAD-ASSIGNMENT TYPE = HEATING  
 OPERATION-MODE = RUN-NEEDED  
 LOAD-RANGE = 0.000  
 PLANT-EQUIPMENT = BOILER-STM  
 NUMBER = 1 ..

COOLINGSEA =LOAD-ASSIGNMENT TYPE = COOLING  
 OPERATION-MODE = RUN-NEEDED

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LOAD-RANGE = 0.000  
PLANT-EQUIPMENT = CHILLER-RC  
NUMBER = 2 ..

END ..  
COMPUTE PLANT ..  
STOP ..

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/12/1995 16:32:13 LDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BULIDING 7245 KITCHEN AREA TOPEKA, KS  
 REPORT- LV-D DETAILS OF EXTERIOR SURFACES IN THE PROJECT

NUMBER OF EXTERIOR SURFACES 7 RECTANGULAR 7 OTHER 0  
 (U-VALUE INCLUDES INSIDE AIR FILM PLUS OUTSIDE AIR FILM AT 7.5 MPH WINDSPEED )

SURFACE	SPACE	U-VALUE (BTU/HR-SQFT-F)	GLASS AREA (SQFT)	U-VALUE (BTU/HR-SQFT-F)	WALL AREA (SQFT)	U-VALUE (BTU/HR-SQFT-F)	GLASS AREA (SQFT)	U-VALUE (BTU/HR-SQFT-F)	WALL AREA (SQFT)	U-VALUE (BTU/HR-SQFT-F)	GLASS+ROOF AREA (SQFT)	AZIMUTH
KITCHEN		1.021	42.40	0.082	371.00	0.178	413.40	0.178	413.40	0.178	413.40	SOUTH-EAST
KIT-MEZZIN		0.000	0.00	0.082	351.00	0.082	351.00	0.082	351.00	0.082	351.00	SOUTH-EAST
KIT-MEZZIN		0.000	0.00	0.082	776.70	0.082	776.70	0.082	776.70	0.082	776.70	SOUTH-WEST
KITCHEN		1.021	115.20	0.082	799.58	0.200	914.78	0.200	914.78	0.200	914.78	SOUTH-WEST
KITCHEN		1.021	16.00	0.082	397.40	0.118	413.40	0.118	413.40	0.118	413.40	NORTH-WEST
KIT-MEZZIN		0.000	0.00	0.082	351.00	0.082	351.00	0.082	351.00	0.082	351.00	NORTH-WEST
KIT-MEZZIN		0.000	0.00	0.077	3960.00	0.077	3960.00	0.077	3960.00	0.077	3960.00	ROOF
KITCHEN		0.000	0.00	0.020	3960.00	0.020	3960.00	0.020	3960.00	0.020	3960.00	UNDERGRND

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/12/1995 16:32:13 LDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BULIDING 7245 KITCHEN AREA TOPEKA, KS  
 REPORT- LV-D DETAILS OF EXTERIOR SURFACES IN THE PROJECT

SURFACE	SPACE	AVERAGE U-VALUE/GLASS (BTU/HR-SQFT-F)	AVERAGE U-VALUE/WALLS (BTU/HR-SQFT-F)	AVERAGE U-VALUE WALLS+GLASS (BTU/HR-SQFT-F)	GLASS AREA (SQFT)	OPAQUE AREA (SQFT)	GLASS+OPAQUE AREA (SQFT)
SOUTH-EAST		1.021	0.082	0.134	42.40	722.00	764.40
SOUTH-WEST		1.021	0.082	0.146	115.20	1576.28	1691.48
NORTH-WEST		1.021	0.082	0.101	16.00	748.40	764.40
ROOF		0.000	0.077	0.077	0.00	3960.00	3960.00
ALL WALLS		1.021	0.082	0.132	173.60	3046.68	3220.28
WALLS+ROOFS		1.021	0.079	0.102	173.60	7006.68	7180.28
UNDERGRND		0.000	0.020	0.020	0.00	3960.00	3960.00
BUILDING		1.021	0.058	0.073	173.60	10966.68	11140.28

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/12/1995 16:32:13 LDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BUILDING 7245 KITCHEN AREA TOPEKA, KS  
 REPORT- LS-C BUILDING PEAK LOAD COMPONENTS

\*\*\* BUILDING \*\*\*

FLOOR AREA 3954 SQFT 367 SQMT  
 VOLUME 41917 CUFT 1187 CUMT

COOLING LOAD  
 AUG 24 6PM  
 DRY-BULB TEMP 93F 34C  
 WET-BULB TEMP 76F 24C

HEATING LOAD  
 JAN 28 4AM  
 OF -18C  
 -2F -19C

	COOLING LOAD		HEATING LOAD	
	SENSIBLE (KBTU/H)	LATENT (KBTU/H)	SENSIBLE (KBTU/H)	SENSIBLE (KW)
WALLS	1.904	0.558	0.000	0.000
ROOFS	0.000	0.000	0.000	0.000
GLASS CONDUCTION	3.276	0.960	0.000	0.000
GLASS SOLAR	14.150	4.144	0.000	0.000
DOOR	0.019	0.005	0.000	0.000
INTERNAL SURFACES	0.000	0.000	0.000	0.000
UNDERGROUND SURFACES	-0.375	-0.110	0.000	0.000
OCCUPANTS TO SPACE	7.218	2.114	12.500	3.661
LIGHT TO SPACE	8.504	2.491	0.000	0.000
EQUIPMENT TO SPACE	72.879	21.344	0.000	0.000
PROCESS TO SPACE	0.000	0.000	0.000	0.000
INFILTRATION	0.000	0.000	0.000	0.000
TOTAL	107.575	31.506	12.500	3.661
TOTAL LOAD	120.075 KBTU/H	35.167 KW	-13.376 KBTU/H	-3.918 KW
TOTAL LOAD / AREA	30.37BTU/H.SQFT	95.725 W /SQMT	3.383BTU/H.SQFT	10.664 W /SQMT

\*\*\*\*\*  
 \* NOTE 1) THE ABOVE LOADS EXCLUDE OUTSIDE VENTILATION AIR \*  
 \* --- LOADS \*  
 \* --- 2) TIMES GIVEN IN STANDARD TIME FOR THE LOCATION \*  
 \* IN CONSIDERATION \*  
 \*\*\*\*\*

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/12/1995 16:32:13 SDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BUILDING 7245 KITCHEN AREA TOPEKA, KS  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR KIT H&VS

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-122.144	16	10	19.F	16.F	-294.581	21944.
FEB	0.00000				-96.293	3	11	16.F	13.F	-277.715	19821.
MAR	0.00000				-74.915	3	4	16.F	13.F	-246.204	21944.
APR	0.00000				-24.267	5	4	32.F	29.F	-165.388	21236.
MAY	0.00000				-7.285	1	4	39.F	37.F	-116.566	21944.
JUN	0.00000				-2.499	23	4	67.F	66.F	-75.891	21236.
JUL	0.00000				-1.333	4	4	68.F	65.F	-59.244	21944.
AUG	0.00000				-0.844	26	10	69.F	67.F	-42.436	21944.
SEP	0.00000				-8.166	11	4	43.F	42.F	-91.949	21236.
OCT	0.00000				-20.983	20	4	25.F	25.F	-197.680	21944.
NOV	0.00000				-60.738	2	4	17.F	15.F	-240.878	21236.
DEC	0.00000				-113.182	15	9	16.F	14.F	-273.544	21944.
TOTAL	0.000				-532.649					-294.581	258360.
MAX					0.000						43.289

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/12/1995 16:32:13 SDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BUILDING 7245 KITCHEN AREA TOPEKA, KS  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR KIT H&VS

MONTH	N U M B E R O F H O U R S				C O I N C I D E N T L O A D S				
	HOURS COOLING LOAD	HOURS HEATING LOAD	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.	HOURS COOLING AVAIL.	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.
JAN	0	744	744	0	744	0	744	0	744
FEB	0	669	672	0	672	0	744	0	3
MAR	0	689	744	0	744	0	720	0	55
APR	0	419	720	0	720	0	744	0	301
MAY	0	218	744	0	744	0	720	0	526
JUN	0	105	720	0	720	0	744	0	615
JUL	0	52	744	0	744	0	744	0	692
AUG	0	46	744	0	744	0	744	0	698
SEP	0	233	720	0	720	0	744	0	487
OCT	0	430	744	0	744	0	720	0	314
NOV	0	591	720	0	720	0	744	0	129
DEC	0	744	744	0	744	0	744	0	0
ANNUAL	0	4940	8760	0	8760	0	8760	0	3820

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/12/1995 16:32:13 PDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BULDING 7245 KITCHEN AREA  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY 79.674 154.352 31/18	NATURAL-GAS 176.135 386.785 16/10
JAN	TOTAL (MBTU) PEAK (KBTU) DY/HR	71.862 154.352 28/12	142.049 368.311 3/11
FEB	TOTAL (MBTU) PEAK (KBTU) DY/HR	78.796 154.352 31/12	114.596 333.269 3/4
MAR	TOTAL (MBTU) PEAK (KBTU) DY/HR	74.286 154.352 24/7	40.820 240.247 5/4
APR	TOTAL (MBTU) PEAK (KBTU) DY/HR	75.600 154.352 6/5	13.342 181.858 1/4
MAY	TOTAL (MBTU) PEAK (KBTU) DY/HR	72.756 151.106 2/5	4.769 131.949 23/4
JUN	TOTAL (MBTU) PEAK (KBTU) DY/HR	75.058 150.371 28/5	2.525 105.691 4/4
JUL	TOTAL (MBTU) PEAK (KBTU) DY/HR	75.013 150.392 27/5	1.665 77.127 26/10
AUG	TOTAL (MBTU) PEAK (KBTU) DY/HR	73.280 154.352 11/7	15.001 151.789 11/4
SEP	TOTAL (MBTU) PEAK (KBTU) DY/HR	76.663 154.352 27/7	36.615 277.960 20/4
OCT	TOTAL (MBTU) PEAK (KBTU) DY/HR	75.797 154.352 30/18	93.941 327.277 2/4
NOV	TOTAL (MBTU) PEAK (KBTU) DY/HR	79.562 154.352 31/18	164.888 363.713 15/9
DEC	TOTAL (MBTU) PEAK (KBTU) DY/HR	908.349 154.352	806.346 386.785

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/12/1995 16:32:13 PDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BUILDING 7245 KITCHEN AREA TOPEKA, KS  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE

ENERGY TYPE	ELECTRICITY	NATURAL-GAS
IN SITE MBTU -		
CATEGORY OF USE		
SPACE HEAT	26.15	806.35
SPACE COOL	0.00	0.00
HVAC AUX	367.52	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	65.32	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	449.40	0.00
TOTAL	908.39	806.35

TOTAL SITE ENERGY 1714.69 MBTU 433.0 KBTU/SQFT-YR GROSS-AREA 433.6 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 3534.12 MBTU 892.5 KBTU/SQFT-YR GROSS-AREA 893.7 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 3.3  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.





KIT-MEZZIN =SPACE AREA = 3954.4 VOLUME = 35589.6  
 TEMPERATURE = (73.) ZONE-TYPE = UNCONDITIONED  
 PEOPLE-HG-LAT = 625.0 PEOPLE-HG-SENS = 375.0  
 LIGHTING-TYPE = SUS-FLUOR LIGHT-TO-SPACE = 1.0  
 EQUIP-SCHEDULE = L\_ON EQUIPMENT-KW = 3.68  
 FURN-WEIGHT = 0.8 INF-METHOD = NONE ..

E-W HEIGHT = 9.0 WIDTH = 86.3 CONS = EXWALL-1  
 AZIMUTH = 225 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 9.0 WIDTH = 39.0 CONS = EXWALL-1  
 AZIMUTH = 135 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 9.0 WIDTH = 39.0 CONS = EXWALL-1  
 AZIMUTH = 315 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

ROOF HEIGHT = 60.0 WIDTH = 66.0 CONS = ROOF-1  
 TILT = 0 SKY-FORM-FACTOR = 1.0 ..

END ..  
 COMPUTE LOADS ..  
 INPUT SYSTEMS ..

\$-----\$  
 \$ E Z - D O E S Y S T E M S I N P U T \$  
 \$-----\$

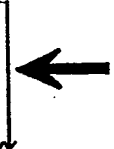
\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
 LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
 LINE-3 \* DENVER, CO 80227 \*  
 LINE-4 \*RUN #2 DDC CONTROL FOR BULIDING 7245 \*  
 LINE-5 \*KITCHEN AREA \* ..

ABORT ERRORS ..  
 DIAGNOSTIC WARNINGS ..  
 SYSTEMS-REPORT VERIFICATION=(SV-A)  
 SUMMARY=(SS-A,SS-C,SS-K,SS-O)  
 HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

SD\_ON =DAY-SCHEDULE (1,24) (1.) ..  
 SD\_OFF =DAY-SCHEDULE (1,24) (0.) ..  
 SD\_W\_HT\_F =DAY-SCHEDULE (1,24) (70.) ..  
 SD\_S\_CL\_F =DAY-SCHEDULE (1,24) (76.) ..  
 SD\_EXHAUST =DAY-SCHEDULE (1,4) (0.)  
 (5,24) (1.) ..



```

SD_W_CL_F =DAY-SCHEDULE (1,24) (72.) ..
SD_S_HT_F =DAY-SCHEDULE (1,24) (74.) ..
SW_ON      =WEEK-SCHEDULE (ALL) SD_ON ..
SW_OFF     =WEEK-SCHEDULE (ALL) SD_OFF ..
SW_W_HT_F  =WEEK-SCHEDULE (ALL) SD_W_HT_F ..
SW_S_CL_F  =WEEK-SCHEDULE (ALL) SD_S_CL_F ..
SW_EXHAUST =WEEK-SCHEDULE (ALL) SD_EXHAUST ..
SW_W_CL_F  =WEEK-SCHEDULE (ALL) SD_W_CL_F ..
SW_S_HT_F  =WEEK-SCHEDULE (ALL) SD_S_HT_F ..

```

\$ FULL ON SYSTEM

S\_ON =SCHEDULE THRU DEC 31 SW\_ON ..

\$ FULL OFF SYSTEM

S\_OFF =SCHEDULE THRU DEC 31 SW\_OFF ..

\$ HEATING SEASON

```

S_HE-SCHED =SCHEDULE THRU MAY 15 SW_ON
              THRU OCT 1 SW_OFF
              THRU DEC 31 SW_ON ..

```

\$ COOLING SEASON

```

S_CL_SCHED =SCHEDULE THRU MAY 15 SW_OFF
              THRU OCT 1 SW_ON
              THRU DEC 31 SW_OFF ..

```

\$ HEATING SET TEMP

```

S_HT_SET_F =SCHEDULE THRU MAY 15 SW_W_HT_F
              THRU OCT 1 SW_S_HT_F
              THRU DEC 31 SW_W_HT_F ..

```

\$ COOLING SET TEMP

```

S_CL_SET_F =SCHEDULE THRU MAY 15 SW_W_CL_F
              THRU OCT 1 SW_S_CL_F
              THRU DEC 31 SW_W_CL_F ..

```

\$ SCHEDULE OF EXHAUST

S\_EXHAUST =SCHEDULE THRU DEC 31 SW\_EXHAUST ..

S\_HRLY-RPS =SCHEDULE THRU JAN 15 SW\_OFF

```

              THRU JAN 16 SW_ON
              THRU AUG 26 SW_OFF
              THRU AUG 27 SW_ON
              THRU DEC 31 SW_OFF ..

```

\$ ZONE DESCRIPTION

KITCHEN =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL  
 BASEBOARD-CTRL = THERMOSTATIC  
 BASEBOARD-RATING = -35500. SIZING-OPTION = FROM-LOADS ..

KIT-MEZZIN =ZONE DESIGN-HEAT-T = 67.0 DESIGN-COOL-T = 82.0  
 ZONE-TYPE = UNCONDITIONED SIZING-OPTION = FROM-LOADS ..

\$ SYSTEM DESCRIPTION

KIT\_H&VS =SYSTEM SYSTEM-TYPE = HVSYS  
 MAX-SUPPLY-T = 120.0 HEATING-SCHEDULE = S\_ON  
 OA-CONTROL = FIXED SUPPLY-CFM = 15000.  
 RETURN-CFM = 15000. RATED-CFM = 15000.  
 MIN-OUTSIDE-AIR = 1.0 MIN-AIR-SCH = S\_ON  
 RECOVERY-EFF = 0.7 FAN-SCHEDULE = S\_ON  
 SUPPLY-DELTA-T = 2.4 SUPPLY-KW = 0.00078  
 MOTOR-PLACEMENT = OUTSIDE-AIRFLOW  
 NIGHT-CYCLE-CTRL = STAY-OFF RETURN-STATIC = 0.25  
 RETURN-EFF = 0.75 NIGHT-VENT-DT = 0.0  
 HEATING-CAPACITY = -900000.  
 ZONE-NAMES = (KITCHEN, KIT-MEZZIN) ..

\$ HOURLY REPORT DESCRIPTION

ZONE-BLOCK =REPORT-BLOCK VARIABLE-TYPE = KITCHEN  
 VARIABLE-LIST = (17,18,7,31,15,11,14) ..  
 AHU-BLOCK =REPORT-BLOCK VARIABLE-TYPE = KIT\_H&VS  
 VARIABLE-LIST = (3,5,6,17) ..  
 ZONE-HRLY = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPS  
 REPORT-BLOCK = (ZONE-BLOCK)  
 ..  
 AHU-HRLY = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPS  
 REPORT-BLOCK = (AHU-BLOCK)  
 ..

END ..  
 COMPUTE SYSTEMS ..

INPUT PLANT ..

\$-----\$  
 \$ E Z - D O E P L A N T S I N P U T \$  
 \$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
 LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
 LINE-3 \* DENVER, CO 80227 \*

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/12/1995 16:41: 0 SDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BUILDING 7245 KITCHEN AREA TOPEKA, KS  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR KIT\_H&VS

MONTH	COOLING				HEATING				H E A T I N G				E L E C			
	ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-121.405	15 4	-8.F	-9.F	0.000	-121.405	15 4	-8.F	-9.F	-283.439	21944.	43.289
FEB	0.00000				-95.881	3 10	10.F	8.F	0.000	-95.881	3 10	10.F	8.F	-260.050	19821.	43.289
MAR	0.00000				-74.701	3 2	19.F	16.F	0.000	-74.701	3 2	19.F	16.F	-235.816	21944.	43.289
APR	0.00000				-24.263	5 4	32.F	29.F	0.000	-24.263	5 4	32.F	29.F	-162.644	21236.	43.289
MAY	0.00000				-7.285	1 4	39.F	37.F	0.000	-7.285	1 4	39.F	37.F	-116.566	21944.	43.289
JUN	0.00000				-2.499	23 4	67.F	66.F	0.000	-2.499	23 4	67.F	66.F	-75.891	21236.	43.289
JUL	0.00000				-1.333	4 4	68.F	65.F	0.000	-1.333	4 4	68.F	65.F	-59.244	21944.	43.289
AUG	0.00000				-0.844	26 10	69.F	67.F	0.000	-0.844	26 10	69.F	67.F	-42.436	21944.	43.289
SEP	0.00000				-8.166	11 4	43.F	42.F	0.000	-8.166	11 4	43.F	42.F	-91.949	21236.	43.289
OCT	0.00000				-20.986	20 4	25.F	25.F	0.000	-20.986	20 4	25.F	25.F	-196.660	21944.	43.289
NOV	0.00000				-60.668	10 4	18.F	17.F	0.000	-60.668	10 4	18.F	17.F	-235.831	21236.	43.289
DEC	0.00000				-112.579	15 10	20.F	17.F	0.000	-112.579	15 10	20.F	17.F	-260.707	21944.	43.289
TOTAL	0.000				-530.608				0.000	-530.608				258360.		43.289
MAX														-283.439		

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/12/1995 16:41: 0 SDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BUILDING 7245 KITCHEN AREA TOPEKA, KS  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR KIT\_H&VS

MONTH	HOURS COOLING				HOURS HEATING				HOURS COINCIDENT				HOURS COINCIDENT			
	LOAD	HEATING	FLOATING	AVAIL.	AVAIL.	COOLING	FANS ON	CYCLE ON	FANS ON	NIGHT VENTING	FLOATING	WHEN FANS ON	HEATING	ELECTRIC	LOAD AT COOLING	LOAD AT PEAK
JAN	0	744	0	744	0	0	744	0	0	0	0	0	0	0	-153.076	23.485
FEB	0	669	3	672	0	0	672	0	0	0	3	0	0	0	-156.663	23.485
MAR	0	689	55	744	0	0	744	0	0	0	55	0	0	0	-149.267	23.485
APR	0	419	301	720	0	0	720	0	0	0	301	0	0	0	-58.487	16.222
MAY	0	218	526	744	0	0	744	0	0	0	526	0	0	0	0.000	16.222
JUN	0	105	615	720	0	0	720	0	0	0	615	0	0	0	0.000	16.222
JUL	0	52	692	744	0	0	744	0	0	0	692	0	0	0	-26.091	16.222
AUG	0	46	698	744	0	0	744	0	0	0	698	0	0	0	0.000	16.222
SEP	0	233	487	720	0	0	720	0	0	0	487	0	0	0	-68.662	16.222
OCT	0	430	314	744	0	0	744	0	0	0	314	0	0	0	-97.486	23.485
NOV	0	591	129	720	0	0	720	0	0	0	129	0	0	0	-183.738	23.485
DEC	0	744	0	744	0	0	744	0	0	0	0	0	0	0	-176.631	23.485
ANNUAL	0	4940	3820	8760	0	0	8760	0	0	0	3820	0	0	0		

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/12/1995 16:41: 0 PDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BULIDING 7245 KITCHEN AREA TOPEKA, KS  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY 79.507 154.104 31/18	NATURAL-GAS 174.077 372.156 15/ 4
JAN	TOTAL (MBTU) PEAK (KBTU) DY/HR	71.712 154.104 28/12	140.549 346.477 3/10
FEB	TOTAL (MBTU) PEAK (KBTU) DY/HR	78.681 154.104 31/12	113.557 319.455 3/ 2
MAR	TOTAL (MBTU) PEAK (KBTU) DY/HR	74.247 154.104 24/ 7	40.544 235.296 5/ 4
APR	TOTAL (MBTU) PEAK (KBTU) DY/HR	75.592 154.104 7/ 5	13.269 180.320 1/ 4
MAY	TOTAL (MBTU) PEAK (KBTU) DY/HR	72.755 151.096 2/ 5	4.747 130.518 23/ 4
JUN	TOTAL (MBTU) PEAK (KBTU) DY/HR	75.057 150.361 28/ 5	2.515 105.502 4/ 4
JUL	TOTAL (MBTU) PEAK (KBTU) DY/HR	75.013 150.382 27/ 5	1.656 76.938 26/10
AUG	TOTAL (MBTU) PEAK (KBTU) DY/HR	73.274 154.104 11/ 7	14.937 150.321 11/ 4
SEP	TOTAL (MBTU) PEAK (KBTU) DY/HR	76.633 154.104 31/ 7	36.398 274.899 20/ 4
OCT	TOTAL (MBTU) PEAK (KBTU) DY/HR	75.702 154.104 30/18	93.211 319.472 10/ 4
NOV	TOTAL (MBTU) PEAK (KBTU) DY/HR	79.401 154.104 31/18	163.047 347.204 15/10
DEC	TOTAL (MBTU) PEAK (KBTU) DY/HR	907.574 154.104	798.506 372.156

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/12/1995 16:41: 0 PDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BUILDING 7245 KITCHEN AREA TOPEKA, KS  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE

ENERGY TYPE CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
SPACE HEAT	25.37	798.51
SPACE COOL	0.00	0.00
HVAC AUX	367.53	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	65.32	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	449.40	0.00
TOTAL	907.62	798.51

TOTAL SITE ENERGY 1706.08 MBTU 430.8 KBTU/SQFT-YR GROSS-AREA 431.4 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 3523.95 MBTU 889.9 KBTU/SQFT-YR GROSS-AREA 891.1 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 2.1  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

**COMPUTER ENERGY SIMULATIONS**

**BLDG. 8300A/B  
MAINTENANCE BUILDINGS**





DENVER - ATLANTA

PROJECT: FEASIBILITY STUDY FOR  
 INSTALLATION OF UMCS  
 LOCATION: FORT RILEY, KANSAS  
 BUILDING NO.: 8300  
 BLDG. TYPE: VEH MAINT SHOP (MAINT BAY DOORS CLOSED)

EMC NO: 1406-001  
 CALC. BY: AJN  
 CHECKED BY: CEL  
 DATE: 05-Jul-95

**ENERGY CONSTANT CALCULATIONS**

	BASERUN	RUN1	RUN2	RUN3	RUN4	RUN5
HEATING (MBtu)	668.9	413.4	558.9	0.0	0.0	0.0
COOLING (kWH)	57,814	54,726	55,508	0	0	0

SUPPLY AIR FAN	4,992 CFM
FLOOR AREA	10,475 FT <sup>2</sup>
CFMI	349 CFM
UA	2709 BTU/HR-°F
BLDG CONSTR.	2 (1 FOR LIGHT ) (2 FOR HEAVY)

EZDOE COMPUTER RUN DEFINITION:	
BASERUN	EXISTING OPERATION
RUN1	NIGHT SETBACK
RUN2	DDC CONTROL
RUN3	ECONOMIZER
RUN4	NIGHTTIME INFILTRATION (OA)
RUN5	DAYTIME INFILTRATION (OA)

HOURS OF OCCUPANCY			ANNUAL HEATING & COOLING HOURS	
M-F	700	1800	55 HR	HR. ON HEATING 1784 HR/YR
SAT.	0	0	0 HR	HR. ON COOLING 1084 HR/YR
SUN.	0	0	0 HR	HR. OFF HEATING 3664 HR/YR
	TOTAL OCCUPY HR.		55 HR/WK	HR. OFF COOLING 2228 HR/YR
	TOTAL UNOCC. HR.		113 HR/WK	
	ANNUAL OCCUPY HR.		2868 HR/YR	
	ANNUAL UNOCC. HR.		5892 HR/YR	

PRESENT HR. OF OPERATION FOR SYS. WITH HEATING AND COOLING 8760 HR/YR  
 PRESENT HR. OF OPERATION FOR SYS. WITH HEATING ONLY 5448 HR/YR  
 PRESENT HR. OF OPERATION FOR SYS. WITH COOLING ONLY 3312 HR/YR  
 HRS SAVED (HTG ONLY) 5448 - 1784 = 3664 HR/YR  
 HRS SAVED (CLG ONLY) 3312 - 1084 = 2228 HR/YR

HOAUHC	668.91 MBtu	-	0 MBtu	=	0.00E+00 Btu/CFM-HR
	349.44 CFM	x	5892 HR/YR		
HOAUH	668.91 MBtu	-	0 MBtu	=	0.00E+00 Btu/CFM-HR
	349.44 CFM	x	3664 HR/YR		
COAUHC	57,814.2 kWH	-	0.0 kWH	=	0.00E+00 kWH/CFM-HR
	349.44 CFM	x	5892 HR/YR		
COAUC	57,814.2 kWH	-	0.0 kWH	=	0.00E+00 kWH/CFM-HR
	349.44 CFM	x	2228 HR/YR		
HOAOHC	668.91 MBtu	-	0 MBtu	=	0.00E+00 Btu/CFM-HR
	349.44 CFM	x	2868 HR/YR		
HOAOH	668.91 MBtu	-	0 MBtu	=	0.00E+00 Btu/CFM-HR
	349.44 CFM	x	1784 HR/YR		
COAOHC	57,814.2 kWH	-	0.0 kWH	=	0.00E+00 kWH/CFM-HR
	349.44 CFM	x	2868 HR/YR		
COAOC	57,814.2 kWH	-	0.0 kWH	=	0.00E+00 kWH/CFM-HR
	349.44 CFM	x	1084 HR/YR		
DC DUTY	1 / 6 (10 MINUTES PER HOUR)			=	0.17
DC DEMAND	1 / 6 (10 MINUTES PER HOUR)			=	0.17
ECC	54,726.0 kWH	-	0.0 kWH	=	0.00E+00 kWH/CFM-HR
	4992 CFM	x	1084 HR/YR		
ECHC	54,726.0 kWH	-	0.0 kWH	=	0.00E+00 kWH/CFM-HR
	4992 CFM	x	2868 HR/YR		
NSUCHC	57,814.2 kWH	-	54,726.0 kWH	=	1.05E-04 kWH/CFM-HR
	4992 CFM	x	5892 HR/YR		
NSUCC	57,814.2 kWH	-	54,726.0 kWH	=	2.78E-04 kWH/CFM-HR
	4992 CFM	x	2228 HR/YR		
DDCCHC	57,814.2 kWH	-	55,508.4 kWH	=	1.61E-04 kWH/CFM-HR
	4992 CFM	x	2868 HR/YR		
DDCCC	57,814.2 kWH	-	55,508.4 kWH	=	4.26E-04 kWH/CFM-HR
	4992 CFM	x	1084 HR/YR		
NSC	668.91 MBtu	-	413.44 MBtu	=	9.43E+04 Btu/UA
	2709 UA				
DDCH	668.91 MBtu	-	558.86 MBtu	=	4.06E+04 Btu/UA
	2709 UA				
OPT	(2 HR/DAY X 240 DAY/YR)	-	175 HR/YR	=	305 HR/YR
CHWR	(1.10 kW X 0.012 Eff. X 664 HRS X 2 Degrees of Reset)			=	17.5 kWH/TON
OAR	567 HR/YR	x	0.01	=	5.67 HR/YR



INPUT LOADS ..

```

$-----$
$ E Z - D O E   L O A D S   I N P U T $
$-----$

```

§ GENERAL PROJECT DATA

```

TITLE  LINE-1 *      EMC      ENGINEERS      INC.      *
        LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
        LINE-3 *      DENVER,      CO      80227      *

        LINE-4 *BASELINE SIMULATION FOR BLDG. #8300      *
        LINE-5 *VEHICAL MAINT W/ DOORS CLOSED IN BAY      * ..

```

```

ABORT          ERRORS ..
DIAGNOSTIC     WARNINGS ..
LOADS-REPORT   VERIFICATION=(LV-D)
                SUMMARY=(LS-C,LS-D)
                HOURLY-DATA-SAVE = YES ..
BUILDING-LOCATION LATITUDE = 39.0
                LONGITUDE = 96.5
                ALTITUDE = 1065.
                TIME-ZONE = 6
                GROSS-AREA = 10475
                SHIELDING-COEF = 0.29
                X-REF = 0.0
                Y-REF = 0.0 ..
RUN-PERIOD     JAN 1 1994 THRU DEC 31 1994 ..

```

§ SCHEDULES

LD\_ON =DAY-SCHEDULE (1,24) (1.) ..

LD\_OFF =DAY-SCHEDULE (1,24) (0.) ..

```

LD_PEOPLE =DAY-SCHEDULE (1,6) (0.)
                (7) (0.5)
                (8,11) (1.)
                (12) (0.5)
                (13,16) (1.)
                (17) (0.5)
                (18,24) (0.) ..

```

```

LW_PEOPLE =WEEK-SCHEDULE (WD) LD_PEOPLE
                (WEH) LD_OFF ..

```

LW\_ON =WEEK-SCHEDULE (ALL) LD\_ON ..

LW\_OFF =WEEK-SCHEDULE (ALL) LD\_OFF ..

## \$ ON 100% OF THE TIME

L\_ON =SCHEDULE THRU DEC 31 LW\_ON ..

## \$ OFF 100% OF THE TIME

L\_OFF =SCHEDULE THRU DEC 31 LW\_OFF ..

## \$ PEOPLE LOAD M-F7.5-17.5

L\_PEOPLE =SCHEDULE THRU DEC 31 LW\_PEOPLE ..

## \$ CONSTRUCTION TYPES

## \$ EXTERIOR WALL U-VALUE FROM PLANS

EXWALL-1 =CONSTRUCTION U-VALUE = 0.137  
ABSORPTANCE = 0.880

ROUGHNESS = 2 ..

FLOOR =CONSTRUCTION U-VALUE = 0.020  
ABSORPTANCE = 0.610

ROUGHNESS = 5 ..

## \$ BUILT-UP ROOF U-VALUE FROM PLANS

ROOF-1 =CONSTRUCTION U-VALUE = 0.094  
ABSORPTANCE = 0.800

ROUGHNESS = 1 ..

## \$ STANDARD METAL DOOR

DOOR-STD =LAYERS MATERIAL=(HF-A3,IN22,HF-A3) I-F-R= 0.6100  
THICKNESS=(0.005,0.083,0.005) ..DOOR-MET =CONSTRUCTION LAYERS = DOOR-STD  
ABSORPTANCE = 0.850  
ROUGHNESS = 5 ..

## \$ EXTER OFFICE WALL U-VAL FROM PLAN

EXWALL-2 =CONSTRUCTION U-VALUE = 0.094  
ABSORPTANCE = 0.880  
ROUGHNESS = 2 ..2\_PN\_STD =GLASS-TYPE GLASS-TYPE-CODE = 2  
PANES = 2 ..

## \$ SPACE DESCRIPTION

BAY-AREA =SPACE AREA = 8640.0 VOLUME = 216000.0  
TEMPERATURE = (69.) ZONE-TYPE = CONDITIONED  
PEOPLE-SCHEDULE = L\_PEOPLE NUMBER-OF-PEOPLE = 28.0  
PEOPLE-HG-LAT = 625.0 PEOPLE-HG-SENS = 375.0  
LIGHTING-TYPE = INCAND LIGHTING-W/SQFT = 1.65  
LIGHT-TO-SPACE = 1.0 LIGHTING-SCHEDULE = L\_PEOPLE  
SOURCE-SENSIBLE = 0.0 FLOOR-WEIGHT = 130.

INF-METHOD = AIR-CHANGE AIR-CHANGES/HR = 0.24  
 INF-SCHEDULE = L\_ON ..

E-W HEIGHT = 25.0 WIDTH = 144.0 CONS = EXWALL-1  
 AZIMUTH = 45 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

DOOR HEIGHT = 16.0 WIDTH = 16.0 CONS = DOOR-MET  
 MULTIPLIER = 6.0 SETBACK = 0.5  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 25.0 WIDTH = 144.0 CONS = EXWALL-1  
 AZIMUTH = 225 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

DOOR HEIGHT = 16.0 WIDTH = 16.0 CONS = DOOR-MET  
 MULTIPLIER = 5.0 SETBACK = 0.5  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 2.8 WIDTH = 5.0 G-T = 2\_PN\_STD  
 MULTIPLIER = 4.0 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 25.0 WIDTH = 60.0 CONS = EXWALL-1  
 AZIMUTH = 315 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 2.8 WIDTH = 5.0 G-T = 2\_PN\_STD  
 MULTIPLIER = 19.0 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

ROOF HEIGHT = 60.0 WIDTH = 124.0 CONS = ROOF-1  
 TILT = 0 SKY-FORM-FACTOR = 1.0 ..

U-W HEIGHT = 60.0 WIDTH = 124.0 CONS = FLOOR ..

OFFICE-ARE =SPACE AREA = 1835.0 VOLUME = 45875.0  
 TEMPERATURE = (73.) ZONE-TYPE = CONDITIONED  
 PEOPLE-SCHEDULE = L\_PEOPLE NUMBER-OF-PEOPLE = 12.0  
 PEOPLE-HG-LAT = 625.0 PEOPLE-HG-SENS = 375.0  
 LIGHTING-TYPE = SUS-FLUOR LIGHTING-W/SQFT = 1.91  
 LIGHT-TO-SPACE = 1.0 LIGHTING-SCHEDULE = L\_PEOPLE  
 EQUIP-SCHEDULE = L\_PEOPLE EQUIPMENT-W/SQFT = 0.73  
 SOURCE-SENSIBLE = 0.0 FLOOR-WEIGHT = 130.  
 FURN-WEIGHT = 1. INF-METHOD = AIR-CHANGE  
 AIR-CHANGES/HR = 0.13 INF-SCHEDULE = L\_ON ..

E-W HEIGHT = 25.0 WIDTH = 54.0 CONS = EXWALL-2  
 AZIMUTH = 135 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 2.8 WIDTH = 5.0 G-T = 2\_PN\_STD  
 MULTIPLIER = 10.0 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 25.0 WIDTH = 20.0 CONS = EXWALL-2  
AZIMUTH = 225 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 2.8 WIDTH = 5.0 G-T = 2\_PN\_STD  
MULTIPLIER = 3.0 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

U-W HEIGHT = 5.0 WIDTH = 607.0 CONS = FLOOR ..

ROOF HEIGHT = 5.0 WIDTH = 607.0 CONS = ROOF-1  
TILT = 0 SKY-FORM-FACTOR = 1.0 ..

END ..  
COMPUTE LOADS ..

INPUT SYSTEMS ..

\$-----\$  
\$ E Z - D O E S Y S T E M S I N P U T \$  
\$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
LINE-3 \* DENVER, CO 80227 \*  
  
LINE-4 \*BASELINE SIMULATION FOR BLDG. #8300 \*  
LINE-5 \*VEHICAL MAINT W/ DOORS CLOSED IN BAY \* ..

ABORT ERRORS ..  
DIAGNOSTIC WARNINGS ..  
SYSTEMS-REPORT VERIFICATION=(SV-A)  
SUMMARY=(SS-A,SS-C,SS-K,SS-O)  
HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

SD\_ON =DAY-SCHEDULE (1,24) (1.) ..  
SD\_OFF =DAY-SCHEDULE (1,24) (0.) ..  
SD\_WT\_HT =DAY-SCHEDULE (1,24) (74.) ..  
SD\_SM\_CL =DAY-SCHEDULE (1,24) (72.) ..  
SD\_WT-VENT =DAY-SCHEDULE (1,24) (0.5) ..  
SD\_HT\_69F =DAY-SCHEDULE (1,24) (69.) ..  
SD\_FORCOFF =DAY-SCHEDULE (1,24) (-1.) ..  
SD\_WT\_CL =DAY-SCHEDULE (1,24) (76.) ..  
SD\_SM\_HT =DAY-SCHEDULE (1,24) (70.) ..  
  
SW\_ON =WEEK-SCHEDULE (ALL) SD\_ON ..  
  
SW\_OFF =WEEK-SCHEDULE (ALL) SD\_OFF ..  
  
SW\_WT\_HT =WEEK-SCHEDULE (ALL) SD\_WT\_HT ..

SW\_SM\_CL =WEEK-SCHEDULE (ALL) SD\_SM\_CL ..  
SW\_WT-VENT =WEEK-SCHEDULE (ALL) SD\_WT-VENT ..  
SW\_HT\_69F =WEEK-SCHEDULE (ALL) SD\_HT\_69F ..  
SW\_FORCOFF =WEEK-SCHEDULE (ALL) SD\_FORCOFF ..  
SW\_WT\_CL =WEEK-SCHEDULE (ALL) SD\_WT\_CL ..  
SW\_SM\_HT =WEEK-SCHEDULE (ALL) SD\_SM\_HT ..

## \$ FULL ON SYSTEM

S\_ON =SCHEDULE THRU DEC 31 SW\_ON ..

## \$ FULL OFF SYSTEM

S\_OFF =SCHEDULE THRU DEC 31 SW\_OFF ..

## \$ HEATING SEASON

S\_HE-SCHED =SCHEDULE THRU MAY 15 SW\_ON  
THRU OCT 1 SW\_OFF  
THRU DEC 31 SW\_ON ..

## \$ FORCE FAN OFF DUR SUMM

S\_CL\_FANOF =SCHEDULE THRU MAY 15 SW\_OFF  
THRU OCT 1 SW\_FORCOFF  
THRU DEC 31 SW\_OFF ..

## \$ HEATING SET TEMP

S\_HT\_SET\_F =SCHEDULE THRU MAY 15 SW\_WT\_HT  
THRU OCT 1 SW\_SM\_HT  
THRU DEC 31 SW\_WT\_HT ..

## \$ COOLING SET TEMP

S\_CL\_SET\_F =SCHEDULE THRU MAY 15 SW\_WT\_CL  
THRU OCT 1 SW\_SM\_CL  
THRU DEC 31 SW\_WT\_CL ..

## \$ 50%OA IN WT-100% IN SUM

S\_VENT\_SCH =SCHEDULE THRU MAY 15 SW\_WT-VENT  
THRU OCT 1 SW\_ON  
THRU DEC 31 SW\_WT-VENT ..

## \$ HEATING SET TEMP =69F

S\_HT\_F\_69 =SCHEDULE THRU DEC 31 SW\_HT\_69F ..

S\_HRLY-RPS =SCHEDULE THRU JAN 1 SW\_OFF  
THRU JAN 2 SW\_ON  
THRU JAN 3 SW\_OFF  
THRU JAN 4 SW\_ON  
THRU AUG 6 SW\_OFF  
THRU AUG 8 SW\_ON  
THRU DEC 31 SW\_OFF ..

## \$ ZONE DESCRIPTION

BAY-AREA =ZONE DESIGN-HEAT-T = 69.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_F\_69 COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL  
 SIZING-OPTION = FROM-LOADS ..

OFFICE-ARE =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL  
 SIZING-OPTION = FROM-LOADS ..

## \$ SYSTEM DESCRIPTION

SIM-IR-HET =SYSTEM SYSTEM-TYPE = FPH  
 HEATING-SCHEDULE = S\_ON  
 ZONE-NAMES = (BAY-AREA) ..

RES-FURNCE =SYSTEM SYSTEM-TYPE = PSZ  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_ON COOLING-SCHEDULE = S\_OFF  
 OA-CONTROL = FIXED SUPPLY-CFM = 4800.  
 RATED-CFM = 4800. MIN-OUTSIDE-AIR = 0.07  
 MAX-OA-FRACTION = 0.07 FAN-SCHEDULE = S\_CL\_FANOF  
 SUPPLY-DELTA-T = 1.8 SUPPLY-KW = 0.00059  
 FAN-PLACEMENT = BLOW-THROUGH  
 NIGHT-CYCLE-CTRL = CYCLE-ON-ANY NIGHT-VENT-DT = 0.0  
 COOL-FT-MIN = 0. HEATING-CAPACITY = -300000.  
 MIN-HP-T = 0. MAX-HP-SUPP-T = 0. DEFROST-T = 0.  
 CRANKCASE-MAX-T = 65. OUTSIDE-FAN-T = 45.  
 SIZING-OPTION = COINCIDENT  
 ZONE-NAMES = (OFFICE-ARE) ..

## \$ HOURLY REPORT DESCRIPTION

BAY-ZN-BLK =REPORT-BLOCK VARIABLE-TYPE = BAY-AREA  
 VARIABLE-LIST = (17,18,7,6) ..

OFFIC-BLK =REPORT-BLOCK VARIABLE-TYPE = OFFICE-ARE  
 VARIABLE-LIST = (17,18,7,6) ..

IRHEAT-BLK =REPORT-BLOCK VARIABLE-TYPE = SIM-IR-HET  
 VARIABLE-LIST = (3,5,7) ..

R-FURN-BLK =REPORT-BLOCK VARIABLE-TYPE = RES-FURNCE  
 VARIABLE-LIST = (3,5,6,17) ..

SYSTEM-HRLY = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPS  
 REPORT-BLOCK = (IRHEAT-BLK,R-FURN-BLK)  
 ..

ZONES-HRLY = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPS  
 REPORT-BLOCK = (BAY-ZN-BLK,OFFIC-BLK)  
 ..

END ..

COMPUTE SYSTEMS ..



INPUT PLANT ..

```

$-----$
$ E Z - D O E   P L A N T S   I N P U T $
$-----$

```

## \$ GENERAL PROJECT DATA

```

TITLE  LINE-1 *   EMC      ENGINEERS      INC.      *
        LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
        LINE-3 *   DENVER,      CO      80227      *

        LINE-4 *BASELINE SIMULATION FOR BLDG. #8300      *
        LINE-5 *VEHICAL MAINT W/ DOORS CLOSED IN BAY      * ..

```

```

ABORT          ERRORS ..
DIAGNOSTIC     WARNINGS ..
PLANT-REPORT   VERIFICATION=(PV-A)
               SUMMARY=(PS-B,BEPS)
               HOURLY-DATA-SAVE = YES ..

```

## \$ SCHEDULES

```

PD_ON      =DAY-SCHEDULE (1,24) (1.) ..
PD_OFF     =DAY-SCHEDULE (1,24) (0.) ..

PW_OFF     =WEEK-SCHEDULE (ALL) PD_OFF ..
PW_ON      =WEEK-SCHEDULE (ALL) PD_ON ..

```

## \$ HEATING SEASON

```

P_HEAT     =SCHEDULE THRU MAY 15 PW_ON
            THRU OCT 1 PW_OFF
            THRU DEC 31 PW_ON ..

```

## \$ EQUIPMENT DESCRIPTION

```

FLOOR-PANL =PLANT-EQUIPMENT  TYPE = HW-BOILER
            SIZE = -999. ..

RES-FRUNCE =PLANT-EQUIPMENT  TYPE = FURNACE
            SIZE = -999. ..

PLANT-PARAMETERS  BOILER-FUEL = NATURAL-GAS  HERM-REC-COND-TYPE = AIR
                  CCIRC-HEAD = 0.0  HCIRC-HEAD = 58.0 ..

ENERGY-RESOURCE   RESOURCE = ELECTRICITY ..
ENERGY-RESOURCE   RESOURCE = NATURAL-GAS ..

```

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/16/1995 13:50:58 LDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #8300 VEHICAL MAINT W/ DOORS CLOSED IN BAY  
 REPORT- LV-D DETAILS OF EXTERIOR SURFACES IN THE PROJECT TOPEKA, KS

NUMBER OF EXTERIOR SURFACES 7 RECTANGULAR 7 OTHER 0  
 (U-VALUE INCLUDES INSIDE AIR FILM PLUS OUTSIDE AIR FILM AT 7.5 MPH WINDSPEED )

SURFACE	SPACE	U-VALUE (BTU/HR-SQFT-F)	AVERAGE U-VALUE (BTU/HR-SQFT-F)	GLASS AREA (SQFT)	AVERAGE U-VALUE WALLS+GLASS (BTU/HR-SQFT-F)	OPAQUE AREA (SQFT)	GLASS+OPAQUE AREA (SQFT)	W A L L + G L A S S - U-VALUE (BTU/HR-SQFT-F)	AREA (SQFT)	AZIMUTH
BAY-AREA		0.000	0.133	3600.00	0.133	3600.00	3600.00	0.133	3600.00	NORTH-EAST
OFFICE-ARE		0.490	0.092	140.00	0.092	1210.00	1350.00	0.133	1350.00	SOUTH-EAST
BAY-AREA		0.490	0.133	56.00	0.133	3544.00	3600.00	0.139	3600.00	SOUTH-WEST
OFFICE-ARE		0.490	0.092	42.00	0.092	458.00	500.00	0.126	500.00	SOUTH-WEST
BAY-AREA		0.490	0.133	266.00	0.133	1234.00	1500.00	0.196	1500.00	NORTH-WEST
BAY-AREA		0.000	0.000	0.00	0.092	7440.00	7440.00	0.092	7440.00	ROOF
OFFICE-ARE		0.000	0.000	0.00	0.092	3035.00	3035.00	0.092	3035.00	ROOF
BAY-AREA		0.000	0.000	0.00	0.020	7440.00	7440.00	0.020	7440.00	UNDERGRND
OFFICE-ARE		0.000	0.020	0.00	0.020	3035.00	3035.00	0.020	3035.00	UNDERGRND

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/16/1995 13:50:58 LDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #8300 VEHICAL MAINT W/ DOORS CLOSED IN BAY  
 REPORT- LV-D DETAILS OF EXTERIOR SURFACES IN THE PROJECT TOPEKA, KS

SURFACE	SPACE	AVERAGE U-VALUE (BTU/HR-SQFT-F)	AVERAGE U-VALUE WALLS+GLASS (BTU/HR-SQFT-F)	GLASS AREA (SQFT)	OPAQUE AREA (SQFT)	GLASS+OPAQUE AREA (SQFT)
NORTH-EAST		0.133	0.133	0.00	3600.00	3600.00
SOUTH-EAST		0.092	0.133	140.00	1210.00	1350.00
SOUTH-WEST		0.128	0.137	98.00	4002.00	4100.00
NORTH-WEST		0.133	0.196	266.00	1234.00	1500.00
ROOF		0.092	0.092	0.00	10475.00	10475.00
ALL WALLS		0.126	0.144	504.00	10046.00	10550.00
WALLS+ROOFS		0.109	0.118	504.00	20521.00	21025.00
UNDERGRND		0.020	0.020	0.00	10475.00	10475.00
BUILDING		0.079	0.086	504.00	30996.00	31500.00

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/16/1995 13:50:58 LLDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #8300 VEHICAL MAINT W/ DOORS CLOSED IN BAY  
 REPORT- LS-C BUILDING PEAK LOAD COMPONENTS TOPEKA, KS

\*\*\* BUILDING \*\*\*

FLOOR AREA 10475 SQFT 973 SQMT  
 VOLUME 261875 CUFT 7416 CUMT

COOLING LOAD HEATING LOAD  
 =====  
 TIME AUG 4 4PM JAN 4 3AM  
 DRY-BULB TEMP 93F 34C 8F -13C  
 WET-BULB TEMP 70F 21C 7F -14C

	COOLING LOAD		HEATING LOAD	
	SENSIBLE (KBTU/H)	LATENT (KBTU/H)	SENSIBLE (KBTU/H)	( KW )
WALLS	37.634	11.022	-54.297	-15.902
ROOFS	80.424	23.554	-59.094	-17.307
GLASS CONDUCTION	3.393	0.994	-16.272	-4.766
GLASS SOLAR	17.880	5.237	1.171	0.343
DOOR	29.695	8.697	-39.883	-11.681
INTERNAL SURFACES	0.000	0.000	0.000	0.000
UNDERGROUND SURFACES	-0.396	-0.116	-5.420	-1.587
OCCUPANTS TO SPACE	13.030	3.816	1.154	0.338
LIGHT TO SPACE	48.479	14.198	7.114	2.083
EQUIPMENT TO SPACE	3.972	1.163	0.352	0.103
PROCESS TO SPACE	0.000	0.000	0.000	0.000
INFILTRATION	0.000	0.000	-141.538	-41.453
TOTAL	234.111	68.565	-306.714	-89.829
TOTAL LOAD	259.112 KBTU/H	75.887 KW	-306.714 KBTU/H	-89.829 KW
TOTAL LOAD / AREA	24.74BTU/H.SQFT	77.980 W /SQMT	29.281BTU/H.SQFT	92.306 W /SQMT

\*\*\*\*\*  
 \* NOTE 1) THE ABOVE LOADS EXCLUDE OUTSIDE VENTILATION AIR \*  
 \* LOADS \*  
 \* 2) TIMES GIVEN IN STANDARD TIME FOR THE LOCATION \*  
 \* IN CONSIDERATION \*  
 \*\*\*\*\*

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/16/1995 13:50:58 SDL RUN 1  
DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #8300 VEHICAL MAINT W/ DOORS CLOSED IN BAY  
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR SIM-IR-HET TOPEKA, KS

MONTH	COOLING			HEATING			WET-BULB			DRY-BULB			HEATING			MAXIMUM			ELEC-TRICAL		
	ENERGY (MBTU)	OF MAX DY HR	TIME OF MAX DY HR	ENERGY (MBTU)	OF MAX DY HR	TIME OF MAX DY HR	TEMP	TEMP	TEMP	TEMP	TEMP	TEMP	TEMP	LOAD (KBTU/HR)	LOAD (KBTU/HR)	LOAD (KBTU/HR)	LOAD (KBTU/HR)	LOAD (KBTU/HR)	LOAD (KBTU/HR)	LOAD (KBTU/HR)	LOAD (KBTU/HR)
JAN	0.00000			-91.468	4	3	8.F	7.F					-245.833	2843.							14.250
FEB	0.00000			-69.070	1	23	17.F	15.F					-202.830	2572.							14.250
MAR	0.00000			-55.642	3	4	16.F	13.F					-198.295	3114.							14.250
APR	0.00000			-18.540	4	4	33.F	31.F					-131.212	2843.							14.250
MAY	0.00000			-3.138	5	6	44.F	40.F					0.000	2843.							14.250
JUN	0.00000			0.000									0.000	2978.							14.250
JUL	0.00000			0.000									0.000	2708.							14.250
AUG	0.00000			0.000									0.000	3114.							14.250
SEP	0.00000			-1.898	18	2	50.F	48.F					-56.745	2843.							14.250
OCT	0.00000			-15.435	20	6	24.F	23.F					-108.835	2708.							14.250
NOV	0.00000			-43.477	2	6	15.F	14.F					-150.000	2708.							14.250
DEC	0.00000			-82.656	11	24	10.F	9.F					-213.425	2843.							14.250
TOTAL	0.000			-381.325									-245.833	34115.							14.250
MAX																					

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/16/1995 13:50:58 SDL RUN 1  
DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #8300 VEHICAL MAINT W/ DOORS CLOSED IN BAY  
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR SIM-IR-HET TOPEKA, KS

MONTH	HOURS COOLING			HOURS HEATING			HOURS FLOATING			HOURS COINCIDENT			HOURS HEATING			HOURS COINCIDENT		
	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD
JAN	0	0	0	744	744	744	0	0	0	0	0	0	0	0	0	0	0	0
FEB	0	0	0	672	672	672	0	0	0	0	0	0	0	0	0	0	0	0
MAR	0	0	0	744	744	744	0	0	0	0	0	0	0	0	0	0	0	0
APR	0	0	0	720	720	720	0	0	0	0	0	0	0	0	0	0	0	0
MAY	0	0	0	744	744	744	0	0	0	0	0	0	0	0	0	0	0	0
JUN	0	0	0	720	720	720	0	0	0	0	0	0	0	0	0	0	0	0
JUL	0	0	0	744	744	744	0	0	0	0	0	0	0	0	0	0	0	0
AUG	0	0	0	744	744	744	0	0	0	0	0	0	0	0	0	0	0	0
SEP	0	0	0	720	720	720	0	0	0	0	0	0	0	0	0	0	0	0
OCT	0	0	0	744	744	744	0	0	0	0	0	0	0	0	0	0	0	0
NOV	0	0	0	720	720	720	0	0	0	0	0	0	0	0	0	0	0	0
DEC	0	0	0	744	744	744	0	0	0	0	0	0	0	0	0	0	0	0
ANNUAL	0	0	0	8760	8760	8760	0	0	0	0	0	0	0	0	0	0	0	0

EMC ENGINEERS INC. DOE-2.1D 5/16/1995 13:50:58 SDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #8300 VEHICAL MAINT W/ DOORS CLOSED IN BAY  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC- TRICAL ENERGY (KWH)	MAXIMUM ELEC- TRICAL ENERGY (KWH)
JAN	0.00000				-15.017	16	6	10.F	8.F	2063.	7.774
FEB	0.00000				-10.656	3	6	-1.F	-2.F	1850.	7.774
MAR	0.00000				-7.591	3	5	15.F	13.F	2086.	7.774
APR	0.00000				-1.828	5	6	31.F	28.F	2367.	7.774
MAY	0.00000				-0.281	9	5	45.F	44.F	1955.	7.774
JUN	0.00000				0.000				0.000	1024.	4.942
JUL	0.00000				0.000				0.000	923.	4.942
AUG	0.00000				0.000				0.000	1063.	4.942
SEP	0.00000				0.000				0.000	995.	4.942
OCT	0.00000				-1.084	31	6	44.F	39.F	2642.	7.774
NOV	0.00000				-5.524	2	5	16.F	15.F	2089.	7.774
DEC	0.00000				-13.335	12	6	3.F	2.F	2049.	7.774
TOTAL	0.000				-55.315					21105.	7.774
MAX									-79.690		

EMC ENGINEERS INC. DOE-2.1D 5/16/1995 13:50:58 SDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #8300 VEHICAL MAINT W/ DOORS CLOSED IN BAY  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR TOPEKA, KS

MONTH	HOURS OF HOURS				HOURS OF HOURS				COINCIDENT LOADS		
	HOURS COOLING LOAD	HOURS HEATING LOAD	HOURS COOL-HEAT LOAD	HOURS FLOATING	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.	HOURS FANS ON	HOURS NIGHT VENTING	HOURS FLOATING WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)
JAN	0	359	0	385	744	0	361	0	2	-31.937	2.932
FEB	0	320	0	352	672	0	321	0	1	0.000	0.100
MAR	0	307	0	437	744	0	337	0	30	0.000	0.100
APR	0	331	0	389	720	0	476	0	145	-1.857	2.932
MAY	0	211	0	533	744	0	336	0	125	0.000	0.100
JUN	0	0	0	720	744	0	0	0	0	0.000	0.000
JUL	0	0	0	744	744	0	0	0	0	0.000	0.000
AUG	0	0	0	744	744	0	0	0	0	0.000	0.000
SEP	0	0	0	720	744	0	0	0	0	0.000	0.000
OCT	0	383	0	361	744	0	589	0	206	0.000	0.100
NOV	0	320	0	400	744	0	389	0	69	0.000	0.100
DEC	0	353	0	391	744	0	356	0	3	0.000	0.100
ANNUAL	0	2584	0	6176	8760	0	3165	0	581		

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/16/1995 13:50:58 PDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #8300 VEHICAL MAINT W/ DOORS CLOSED IN BAY  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY TOTAL (MBTU) PEAK (KBTU) DY/HR	NATURAL-GAS TOTAL (MBTU) PEAK (KBTU) DY/HR
JAN	18.854 80.171 14/ 8	156.494 437.552 4/ 4	119.470 376.972 3/ 6
FEB	16.689 78.914 2/ 8	96.734 364.827 3/ 5	34.769 245.127 4/ 6
MAR	19.032 78.849 3/ 9	8.195 116.652 5/ 6	1.152 1.600 30/ 1
APR	18.216 77.623 4/ 8	1.190 1.600 31/ 1	1.600 1.600 31/ 1
MAY	16.456 75.615 5/ 9	88.804 18/ 2	29.690 205.198 31/ 6
JUN	13.667 65.531 22/ 8	76.628 290.292 2/ 5	142.564 406.760 11/24
JUL	12.395 65.531 29/ 8	197.318 80.171	
AUG	14.262 65.531 4/ 8		
SEP	13.148 65.970 30/ 9		
OCT	18.620 77.249 20/ 8		
NOV	17.376 77.704 30/ 9		
DEC	18.603 79.746 14/ 8		
	ONE YEAR USE/PEAK		

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/16/1995 13:50:58 PDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #8300 VEHICAL MAINT W/ DOORS CLOSED IN BAY  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE	ELECTRICITY	NATURAL-GAS
IN SITE MBTU -		
CATEGORY OF USE		
SPACE HEAT	0.00	668.91
SPACE COOL	1.88	0.00
HVAC AUX	39.38	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	145.12	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	10.95	0.00
TOTAL	197.32	668.91

TOTAL SITE ENERGY 869.69 MBTU 83.0 KBTU/SQFT-YR GROSS-AREA 83.0 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 1264.92 MBTU 120.8 KBTU/SQFT-YR GROSS-AREA 120.8 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 0.0  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.





E-W HEIGHT = 25.0 WIDTH = 20.0 CONS = EXWALL-2  
 AZIMUTH = 225 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 2.8 WIDTH = 5.0 G-T = 2\_PN\_STD  
 MULTIPLIER = 3.0 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

U-W HEIGHT = 5.0 WIDTH = 607.0 CONS = FLOOR ..

ROOF HEIGHT = 5.0 WIDTH = 607.0 CONS = ROOF-1  
 TILT = 0 SKY-FORM-FACTOR = 1.0 ..

END ..  
 COMPUTE LOADS ..  
 INPUT SYSTEMS ..

\$-----\$  
 \$ E Z - D O E S Y S T E M S I N P U T \$  
 \$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
 LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
 LINE-3 \* DENVER, CO 80227 \*  
 LINE-4 \*RUN #1 NIGHT SETBACK FOR BLDG. #8300 \*  
 LINE-5 \*VEHICAL MAINT W/ DOORS CLOSED IN BAY \* ..

ABORT ERRORS ..  
 DIAGNOSTIC WARNINGS ..  
 SYSTEMS-REPORT VERIFICATION=(SV-A)  
 SUMMARY=(SS-A,SS-C,SS-K,SS-O)  
 HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

SD\_ON =DAY-SCHEDULE (1,24) (1.) ..  
 SD\_OFF =DAY-SCHEDULE (1,24) (0.) ..  
 SD\_WT\_HT =DAY-SCHEDULE (1,6) (55.)  
 (7,17) (74.)  
 (18,24) (55.) ..  
 SD\_SM\_CL =DAY-SCHEDULE (1,6) (85.)  
 (7,17) (72.)  
 (18,24) (85.) ..  
 SD\_WT-VENT =DAY-SCHEDULE (1,24) (0.5) ..  
 SD\_HT\_69F =DAY-SCHEDULE (1,6) (50.)  
 (7,17) (69.)  
 (18,24) (50.) ..  
 SD\_FORCOFF =DAY-SCHEDULE (1,24) (-1.) ..  
 SD\_WT\_CL =DAY-SCHEDULE (1,6) (60.)  
 (7,17) (79.)  
 (18,24) (60.) ..



```

SD_SM_HT   =DAY-SCHEDULE (1,6) (80.)
              (7,17) (67.)
              (18,24) (80.) ..
SD_FAN_CYC =DAY-SCHEDULE (1,24) (0.) ..
SD_WT_HT_D =DAY-SCHEDULE (1,24) (55.) ..
SD_SM_CL_D =DAY-SCHEDULE (1,24) (85.) ..
SD_HT_BA_D =DAY-SCHEDULE (1,24) (50.) ..
SD_WT_CL_D =DAY-SCHEDULE (1,24) (60.) ..
SD_SM_HT_D =DAY-SCHEDULE (1,24) (80.) ..
SD_FAN_WK   =DAY-SCHEDULE (1,17) (0.)
              (18,24) (-1.) ..
SD_FAN_WKD  =DAY-SCHEDULE (1,24) (0.) ..

SW_ON       =WEEK-SCHEDULE (ALL) SD_ON ..

SW_OFF      =WEEK-SCHEDULE (ALL) SD_OFF ..

SW_WT_HT    =WEEK-SCHEDULE (WD) SD_WT_HT
              (WEH) SD_WT_HT_D ..

SW_SM_CL    =WEEK-SCHEDULE (WD) SD_SM_CL
              (WEH) SD_SM_CL_D ..

SW_WT-VENT  =WEEK-SCHEDULE (ALL) SD_WT-VENT ..

SW_HT_69F   =WEEK-SCHEDULE (WD) SD_HT_69F
              (WEH) SD_HT_BA_D ..

SW_FORCOFF  =WEEK-SCHEDULE (ALL) SD_FORCOFF ..

SW_WT_CL    =WEEK-SCHEDULE (WD) SD_WT_CL
              (WEH) SD_WT_CL_D ..

SW_SM_HT    =WEEK-SCHEDULE (WD) SD_SM_HT
              (WEH) SD_SM_HT_D ..

SW_FAN_CYC  =WEEK-SCHEDULE (WD) SD_FAN_WK
              (WEH) SD_FAN_WKD ..

```

## \$ FULL ON SYSTEM

```
S_ON       =SCHEDULE THRU DEC 31 SW_ON ..
```

## \$ FULL OFF SYSTEM

```
S_OFF      =SCHEDULE THRU DEC 31 SW_OFF ..
```

## \$ HEATING SEASON

```
S_HE-SCHED =SCHEDULE THRU MAY 15 SW_ON
              THRU OCT 1 SW_OFF
              THRU DEC 31 SW_ON ..
```

## \$ FORCE FAN OFF DUR SUMM

```
S_CL_FANOF =SCHEDULE THRU MAY 15 SW_FAN_CYC
              THRU OCT 1 SW_FORCOFF
              THRU DEC 31 SW_FAN_CYC ..
```

## \$ HEATING SET TEMP

S\_HT\_SET\_F =SCHEDULE THRU MAY 15 SW\_WT\_HT  
 THRU OCT 1 SW\_SM\_HT  
 THRU DEC 31 SW\_WT\_HT ..

## \$ COOLING SET TEMP

S\_CL\_SET\_F =SCHEDULE THRU MAY 15 SW\_WT\_CL  
 THRU OCT 1 SW\_SM\_CL  
 THRU DEC 31 SW\_WT\_CL ..

## \$ 50%OA IN WT-100% IN SUM

S\_VENT\_SCH =SCHEDULE THRU MAY 15 SW\_WT-VENT  
 THRU OCT 1 SW\_ON  
 THRU DEC 31 SW\_WT-VENT ..

## \$ HEATING SET TEMP =69F

S\_HT\_F\_69 =SCHEDULE THRU DEC 31 SW\_HT\_69F ..

S\_HRLY-RPS =SCHEDULE THRU JAN 1 SW\_OFF

THRU JAN 2 SW\_ON

THRU JAN 3 SW\_OFF

THRU JAN 4 SW\_ON

THRU AUG 6 SW\_OFF

THRU AUG 8 SW\_ON

THRU DEC 31 SW\_OFF ..

S\_FAN\_CYC =SCHEDULE THRU DEC 31 SW\_FAN\_CYC ..

## \$ ZONE DESCRIPTION

BAY-AREA =ZONE DESIGN-HEAT-T = 69.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_F\_69 COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL  
 SIZING-OPTION = FROM-LOADS ..

OFFICE-ARE =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 5.0  
 SIZING-OPTION = FROM-LOADS ..

## \$ SYSTEM DESCRIPTION

SIM-IR-HET =SYSTEM SYSTEM-TYPE = FPH  
 HEATING-SCHEDULE = S\_ON  
 ZONE-NAMES = (BAY-AREA) ..

RES-FURNCE =SYSTEM SYSTEM-TYPE = PSZ  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_ON COOLING-SCHEDULE = S\_OFF  
 OA-CONTROL = FIXED SUPPLY-CFM = 4800.  
 RATED-CFM = 4800. MIN-OUTSIDE-AIR = 0.07

MAX-OA-FRACTION = 0.07 FAN-SCHEDULE = S\_CL\_FANOF  
SUPPLY-DELTA-T = 1.8 SUPPLY-KW = 0.00059  
FAN-PLACEMENT = BLOW-THROUGH  
NIGHT-CYCLE-CTRL = CYCLE-ON-ANY NIGHT-VENT-DT = 0.0 ←  
COOL-FT-MIN = 0. HEATING-CAPACITY = -300000.  
MIN-HP-T = 0. MAX-HP-SUPP-T = 0. DEFROST-T = 0.  
CRANKCASE-MAX-T = 65. OUTSIDE-FAN-T = 45.  
SIZING-OPTION = COINCIDENT  
ZONE-NAMES = (OFFICE-ARE) ..

\$ HOURLY REPORT DESCRIPTION

BAY-ZN-BLK =REPORT-BLOCK VARIABLE-TYPE = BAY-AREA  
                                  VARIABLE-LIST = (17,18,7,6) ..  
OFFIC-BLK =REPORT-BLOCK VARIABLE-TYPE = OFFICE-ARE  
                                  VARIABLE-LIST = (17,18,7,6) ..  
IRHEAT-BLK =REPORT-BLOCK VARIABLE-TYPE = SIM-IR-HET  
                                  VARIABLE-LIST = (3,5,7) ..  
R-FURN-BLK =REPORT-BLOCK VARIABLE-TYPE = RES-FURNCE  
                                  VARIABLE-LIST = (3,5,6,17) ..  
SYSTEM-HRLY = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPS  
                                  REPORT-BLOCK = (IRHEAT-BLK,R-FURN-BLK)  
..  
ZONES-HRLY = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPS  
                                  REPORT-BLOCK = (BAY-ZN-BLK,OFFIC-BLK)  
..  
END ..  
COMPUTE SYSTEMS ..  
  
INPUT PLANT ..

\$-----\$  
\$ E Z - D O E P L A N T S I N P U T \$  
\$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
LINE-3 \* DENVER, CO 80227 \*  
  
LINE-4 \*RUN #1 NIGHT SETBACK FOR BLDG. #8300 \*  
LINE-5 \*VEHICAL MAINT W/ DOORS CLOSED IN BAY \* ..

ABORT ERRORS ..  
DIAGNOSTIC WARNINGS ..  
PLANT-REPORT VERIFICATION=(PV-A)  
SUMMARY=(PS-B,BEPS)  
HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

PD\_ON =DAY-SCHEDULE (1,24) (1.) ..

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 6/ 2/1995 11:17:40 SDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SETBACK FOR BLDG. #8300 VEHICAL MAINT W/ DOORS CLOSED IN BAY  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR SIM-IR-HET TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC LOAD (KW)
JAN	0.00000				-64.136	31	10	31.F	26.F	-258.259	2843.
FEB	0.00000				-45.328	28	10	33.F	30.F	-258.259	2572.
MAR	0.00000				-36.624	30	7	25.F	21.F	-258.259	3114.
APR	0.00000				-10.247	4	7	32.F	30.F	-236.739	2843.
MAY	0.00000				-0.952	9	7	43.F	43.F	-118.059	2843.
JUN	0.00000				0.000					0.000	2978.
JUL	0.00000				0.000					0.000	2708.
AUG	0.00000				0.000					0.000	3114.
SEP	0.00000				-0.359	30	7	46.F	45.F	-45.253	2843.
OCT	0.00000				-7.189	31	7	43.F	39.F	-247.797	2708.
NOV	0.00000				-25.857	28	8	30.F	28.F	-258.259	2708.
DEC	0.00000				-53.649	30	9	21.F	19.F	-258.259	2843.
TOTAL	0.000				-244.342					-258.259	34115.
MAX											14.250

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 6/ 2/1995 11:17:40 SDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SETBACK FOR BLDG. #8300 VEHICAL MAINT W/ DOORS CLOSED IN BAY  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR SIM-IR-HET TOPEKA, KS

MONTH	HOURS				HOURS				HOURS				COINCIDENT LOADS	
	COOLING LOAD	HEATING LOAD	COOL-HEAT LOAD	FLOATING	HEATING AVAIL.	COOLING AVAIL.	FANS ON CYCLE	FANS ON NIGHT	FANS ON VENTING	FLOATING WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)		
JAN	0	495	0	249	744	744	744	0	0	249	0.000	0.000		
FEB	0	328	0	344	672	672	672	0	0	344	0.000	0.000		
MAR	0	291	0	453	744	744	744	0	0	453	0.000	0.000		
APR	0	137	0	720	720	720	720	0	0	583	0.000	0.000		
MAY	0	34	0	710	744	744	744	0	0	710	0.000	0.000		
JUN	0	0	0	720	720	720	720	0	0	720	0.000	0.000		
JUL	0	0	0	744	744	744	744	0	0	744	0.000	0.000		
AUG	0	0	0	744	744	744	744	0	0	744	0.000	0.000		
SEP	0	16	0	704	720	720	720	0	0	704	0.000	0.000		
OCT	0	114	0	630	744	744	744	0	0	630	0.000	0.000		
NOV	0	236	0	484	720	720	720	0	0	484	0.000	0.000		
DEC	0	381	0	363	744	744	744	0	0	363	0.000	0.000		
ANNUAL	0	2032	0	6728	8760	8760	8760	0	0	6728	-35.506	0.000		

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOB-2.1D 6/2/1995 11:17:40 SDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SETBACK FOR BLDG. #8300 VEHICAL MAINT W/ DOORS CLOSED IN BAY  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C			
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC-TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-9.921	4	7	6.F	5.F	-107.166	1646.	7.774
FEB	0.00000				-6.420	22	7	26.F	24.F	-95.114	1426.	7.774
MAR	0.00000				-4.170	14	7	16.F	14.F	-88.608	1918.	7.774
APR	0.00000				-0.799	5	7	30.F	27.F	-49.018	2274.	7.774
MAY	0.00000				-0.122	1	13	67.F	53.F	-3.312	1715.	7.774
JUN	0.00000				0.000					0.000	1024.	4.942
JUL	0.00000				0.000					0.000	923.	4.942
AUG	0.00000				0.000					0.000	1063.	4.942
SEP	0.00000				0.000					0.000	995.	4.942
OCT	0.00000				-0.442	31	7	43.F	39.F	-38.290	2356.	7.774
NOV	0.00000				-2.475	14	7	32.F	32.F	-76.769	1902.	7.774
DEC	0.00000				-8.017	12	7	2.F	1.F	-112.694	1700.	7.774
TOTAL	0.000				-32.365					-112.694	18942.	7.774
MAX												

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 6/2/1995 11:17:40 SDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SETBACK FOR BLDG. #8300 VEHICAL MAINT W/ DOORS CLOSED IN BAY  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR TOPEKA, KS

MONTH	HOURS				HOURS				HOURS				HOURS				
	COOLING LOAD	HEATING LOAD	COINCIDENT COOL-HEAT LOAD	FLOATING	HEATING AVAIL.	COOLING AVAIL.	FANS ON	FANS ON	FANS ON	FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)	FLOATING WHEN FANS ON	NIGHT VENTING	FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)
JAN	0	212	0	532	744	0	214	214	214	0	0.000	0.100	2	0	2	0.000	0.100
FEB	0	162	0	510	672	0	171	171	171	0	0.000	0.100	9	0	9	0.000	0.100
MAR	0	224	0	520	744	0	278	278	278	0	0.000	0.100	54	0	54	0.000	0.100
APR	0	250	0	470	720	0	443	443	443	0	-1.810	2.932	193	0	193	0.000	2.932
MAY	0	136	0	608	744	0	251	251	251	0	0.000	0.100	115	0	115	0.000	0.100
JUN	0	0	0	720	720	0	0	0	0	0	0.000	0.000	0	0	0	0.000	0.000
JUL	0	0	0	744	744	0	0	0	0	0	0.000	0.000	0	0	0	0.000	0.000
AUG	0	0	0	744	744	0	0	0	0	0	0.000	0.000	0	0	0	0.000	0.000
SEP	0	0	0	720	720	0	0	0	0	0	0.000	0.100	0	0	0	0.000	0.100
OCT	0	283	0	461	744	0	488	488	488	0	0.000	0.100	205	0	205	0.000	0.100
NOV	0	238	0	482	720	0	323	323	323	0	0.000	0.100	85	0	85	0.000	0.100
DEC	0	209	0	535	744	0	233	233	233	0	-21.020	2.932	24	0	24	0.000	2.932
ANNUAL	0	1714	0	7046	8760	0	2401	2401	2401	0			687	0	687		

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 6/2/1995 11:17:40 PDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SETBACK FOR BLDG. #8300 VEHICAL MAINT W/ DOORS CLOSED IN BAY  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY TOTAL (MBTU) PEAK (KBTU) DY/HR	NATURAL-GAS TOTAL (MBTU) PEAK (KBTU) DY/HR
JAN	16.804 81.141 31/9	107.321 508.661 4/7	
FEB	14.692 81.141 28/9	75.076 492.096 22/7	
MAR	18.024 81.141 14/11	60.790 483.092 14/7	
APR	17.706 79.852 4/9	19.230 389.056 3/8	
MAY	15.583 75.201 13/8	3.856 173.464 9/7	
JUN	13.667 65.531 22/8	1.152 1.600 30/1	
JUL	12.395 65.531 29/8	1.190 1.600 31/1	
AUG	14.262 65.531 4/8	1.190 1.600 31/1	
SEP	13.113 66.245 30/9	1.768 72.928 30/7	
OCT	17.454 79.496 31/9	14.571 399.672 31/7	
NOV	16.333 81.141 14/9	43.546 466.596 14/7	
DEC	16.746 81.141 30/9	89.136 516.209 12/7	
	ONE YEAR USE/PEAK	186.779 81.141	418.827 516.209

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 6/2/1995 11:17:40 PDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SETBACK FOR BLDG. #8300 VEHICAL MAINT W/ DOORS CLOSED IN BAY  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
SPACE HEAT	0.00	413.44
SPACE COOL	1.88	0.00
HVAC AUX	28.84	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	145.12	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	10.95	0.00
TOTAL	186.78	413.44

TOTAL SITE ENERGY 605.61 MBTU 57.8 KBTU/SQFT-YR GROSS-AREA 57.8 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 979.73 MBTU 93.5 KBTU/SQFT-YR GROSS-AREA 93.5 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 2.3  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.



E-W HEIGHT = 25.0 WIDTH = 20.0 CONS = EXWALL-2  
 AZIMUTH = 225 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 2.8 WIDTH = 5.0 G-T = 2\_PN\_STD  
 MULTIPLIER = 3.0 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

U-W HEIGHT = 5.0 WIDTH = 607.0 CONS = FLOOR ..

ROOF HEIGHT = 5.0 WIDTH = 607.0 CONS = ROOF-1  
 TILT = 0 SKY-FORM-FACTOR = 1.0 ..

END ..

COMPUTE LOADS ..

INPUT SYSTEMS ..

-----\$  
 \$ E Z - D O E S Y S T E M S I N P U T \$  
 -----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
 LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
 LINE-3 \* DENVER, CO 80227 \*  
 LINE-4 \*RUN #2 DDC CONTROL FOR BLDG. #8300 \*  
 LINE-5 \*VEHICAL MAINT W/ DOORS CLOSED IN BAY \* ..

ABORT ERRORS ..  
 DIAGNOSTIC WARNINGS ..  
 SYSTEMS-REPORT VERIFICATION=(SV-A)  
 SUMMARY=(SS-A,SS-C,SS-K,SS-O)  
 HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

SD\_ON =DAY-SCHEDULE (1,24) (1.) ..  
 SD\_OFF =DAY-SCHEDULE (1,24) (0.) ..  
 SD\_WT\_HT =DAY-SCHEDULE (1,24) (70.) ..  
 SD\_SM\_CL =DAY-SCHEDULE (1,24) (76.) ..  
 SD\_WT-VENT =DAY-SCHEDULE (1,24) (0.5) ..  
 SD\_HT\_65F =DAY-SCHEDULE (1,24) (65.) ..  
 SD\_FORCOFF =DAY-SCHEDULE (1,24) (-1.) ..  
 SD\_WT\_CL =DAY-SCHEDULE (1,24) (75.) ..  
 SD\_SM\_HT =DAY-SCHEDULE (1,24) (71.) ..  
 SD\_FAN\_CYC =DAY-SCHEDULE (1,24) (0.) ..  
 SD\_WT\_HT\_D =DAY-SCHEDULE (1,24) (55.) ..  
 SD\_SM\_CL\_D =DAY-SCHEDULE (1,24) (85.) ..  
 SD\_HT\_BA\_D =DAY-SCHEDULE (1,24) (50.) ..  
 SD\_WT\_CL\_D =DAY-SCHEDULE (1,24) (57.) ..  
 SD\_SM\_HT\_D =DAY-SCHEDULE (1,24) (83.) ..  
 SD\_FAN =DAY-SCHEDULE (1,24) (0.) ..



SW\_ON =WEEK-SCHEDULE (ALL) SD\_ON ..  
SW\_OFF =WEEK-SCHEDULE (ALL) SD\_OFF ..  
SW\_WT\_HT =WEEK-SCHEDULE (ALL) SD\_WT\_HT ..  
SW\_SM\_CL =WEEK-SCHEDULE (ALL) SD\_SM\_CL ..  
SW\_WT-VENT =WEEK-SCHEDULE (ALL) SD\_WT-VENT ..  
SW\_HT\_65F =WEEK-SCHEDULE (ALL) SD\_HT\_65F ..  
SW\_FORCOFF =WEEK-SCHEDULE (ALL) SD\_FORCOFF ..  
SW\_WT\_CL =WEEK-SCHEDULE (ALL) SD\_WT\_CL ..  
SW\_SM\_HT =WEEK-SCHEDULE (ALL) SD\_SM\_HT ..  
SW\_FAN\_CYC =WEEK-SCHEDULE (ALL) SD\_FAN ..

## \$ FULL ON SYSTEM

S\_ON =SCHEDULE THRU DEC 31 SW\_ON ..

## \$ FULL OFF SYSTEM

S\_OFF =SCHEDULE THRU DEC 31 SW\_OFF ..

## \$ HEATING SEASON

S\_HE-SCHED =SCHEDULE THRU MAY 15 SW\_ON  
THRU OCT 1 SW\_OFF  
THRU DEC 31 SW\_ON ..

## \$ FORCE FAN OFF DUR SUMM

S\_CL\_FANOF =SCHEDULE THRU MAY 15 SW\_FAN\_CYC  
THRU OCT 1 SW\_FORCOFF  
THRU DEC 31 SW\_FAN\_CYC ..

## \$ HEATING SET TEMP

S\_HT\_SET\_F =SCHEDULE THRU MAY 15 SW\_WT\_HT  
THRU OCT 1 SW\_SM\_HT  
THRU DEC 31 SW\_WT\_HT ..

## \$ COOLING SET TEMP

S\_CL\_SET\_F =SCHEDULE THRU MAY 15 SW\_WT\_CL  
THRU OCT 1 SW\_SM\_CL  
THRU DEC 31 SW\_WT\_CL ..

## \$ 50%OA IN WT-100% IN SUM

S\_VENT\_SCH =SCHEDULE THRU MAY 15 SW\_WT-VENT  
THRU OCT 1 SW\_ON  
THRU DEC 31 SW\_WT-VENT ..

## \$ HEATING SET TEMP =65F

S\_HT\_F\_65 =SCHEDULE THRU DEC 31 SW\_HT\_65F ..

```
S_HRLY-RPS =SCHEDULE THRU JAN 1 SW_OFF
                THRU JAN 2 SW_ON
                THRU JAN 3 SW_OFF
                THRU JAN 4 SW_ON
                THRU AUG 6 SW_OFF
                THRU AUG 8 SW_ON
                THRU DEC 31 SW_OFF ..
```

```
S_FAN_CYC =SCHEDULE THRU DEC 31 SW_FAN_CYC ..
```

#### \$ ZONE DESCRIPTION

```
BAY-AREA =ZONE DESIGN-HEAT-T = 69.0 DESIGN-COOL-T = 72.0
HEAT-TEMP-SCH = S_HT_F_65 COOL-TEMP-SCH = S_CL_SET_F
ZONE-TYPE = CONDITIONED
THERMOSTAT-TYPE = PROPORTIONAL
SIZING-OPTION = FROM-LOADS ..
```

```
OFFICE-ARE =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0
HEAT-TEMP-SCH = S_HT_SET_F COOL-TEMP-SCH = S_CL_SET_F
ZONE-TYPE = CONDITIONED
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 5.0
SIZING-OPTION = FROM-LOADS ..
```

#### \$ SYSTEM DESCRIPTION

```
SIM-IR-HET =SYSTEM SYSTEM-TYPE = FPH
HEATING-SCHEDULE = S_ON
ZONE-NAMES = (BAY-AREA) ..
```

```
RES-FURNCE =SYSTEM SYSTEM-TYPE = PSZ
MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0
HEATING-SCHEDULE = S_ON COOLING-SCHEDULE = S_OFF
OA-CONTROL = FIXED SUPPLY-CFM = 4800.
RATED-CFM = 4800. MIN-OUTSIDE-AIR = 0.07
MAX-OA-FRACTION = 0.07 FAN-SCHEDULE = S_CL_FANOF
SUPPLY-DELTA-T = 1.8 SUPPLY-KW = 0.00059
FAN-PLACEMENT = BLOW-THROUGH
NIGHT-CYCLE-CTRL = CYCLE-ON-ANY NIGHT-VENT-DT = 0.0
COOL-FT-MIN = 0. HEATING-CAPACITY = -300000.
MIN-HP-T = 0. MAX-HP-SUPP-T = 0. DEFROST-T = 0.
CRANKCASE-MAX-T = 65. OUTSIDE-FAN-T = 45.
SIZING-OPTION = COINCIDENT
ZONE-NAMES = (OFFICE-ARE) ..
```

#### \$ HOURLY REPORT DESCRIPTION

```
BAY-ZN-BLK =REPORT-BLOCK VARIABLE-TYPE = BAY-AREA
                VARIABLE-LIST = (17,18,7,6) ..
OFFIC-BLK =REPORT-BLOCK VARIABLE-TYPE = OFFICE-ARE
                VARIABLE-LIST = (17,18,7,6) ..
IRHEAT-BLK =REPORT-BLOCK VARIABLE-TYPE = SIM-IR-HET
```

```

VARIABLE-LIST = (3,5,7) ..
R-FURN-BLK =REPORT-BLOCK VARIABLE-TYPE = RES-FURNCE
VARIABLE-LIST = (3,5,6,17) ..
SYSTEM-HRLY = HOURLY-REPORT REPORT-SCHEDULE = S_HRLY-RPS
REPORT-BLOCK = (IRHEAT-BLK,R-FURN-BLK)
..
ZONES-HRLY = HOURLY-REPORT REPORT-SCHEDULE = S_HRLY-RPS
REPORT-BLOCK = (BAY-ZN-BLK,OFFIC-BLK)
..
END ..
COMPUTE SYSTEMS ..

INPUT PLANT ..

```

```

$-----$
$ E Z - D O E   P L A N T S   I N P U T $
$-----$

```

\$ GENERAL PROJECT DATA

```

TITLE LINE-1 *   EMC      ENGINEERS      INC.      *
LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
LINE-3 *   DENVER,      CO      80227      *

LINE-4 *RUN #2 DDC CONTROL FOR BLDG. #8300      *
LINE-5 *VEHICAL MAINT W/ DOORS CLOSED IN BAY      * ..

```

```

ABORT          ERRORS ..
DIAGNOSTIC     WARNINGS ..
PLANT-REPORT   VERIFICATION=(PV-A)
               SUMMARY=(PS-B,BEPS)
               HOURLY-DATA-SAVE = YES ..

```

\$ SCHEDULES

```

PD_ON          =DAY-SCHEDULE (1,24) (1.) ..
PD_OFF         =DAY-SCHEDULE (1,24) (0.) ..

PW_OFF        =WEEK-SCHEDULE (ALL) PD_OFF ..
PW_ON         =WEEK-SCHEDULE (ALL) PD_ON ..

```

\$ HEATING SEASON

```

P_HEAT        =SCHEDULE THRU MAY 15 PW_ON
               THRU OCT  1 PW_OFF
               THRU DEC 31 PW_ON ..

```

\$ EQUIPMENT DESCRIPTION

```

FLOOR-PANL   =PLANT-EQUIPMENT  TYPE = HW-BOILER

```

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 6/2/1995 11:10:56 SDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. #8300 VEHICAL MAINT W/ DOORS CLOSED IN BAY  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR SIM-IR-HET TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C			
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC-TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-81.750	4	3	8.F	7.F	-228.361	2843.	14.250
FEB	0.00000				-60.221	1	23	17.F	15.F	-185.508	2572.	14.250
MAR	0.00000				-45.777	3	4	16.F	13.F	-181.695	3114.	14.250
APR	0.00000				-11.943	4	6	32.F	31.F	-110.892	2843.	14.250
MAY	0.00000				-0.933	9	6	44.F	44.F	-49.704	2843.	14.250
JUN	0.00000				0.000					0.000	2978.	14.250
JUL	0.00000				0.000					0.000	2708.	14.250
AUG	0.00000				0.000					0.000	3114.	14.250
SEP	0.00000				-0.133	30	1	48.F	46.F	-17.161	2843.	14.250
OCT	0.00000				-8.461	20	6	24.F	23.F	-95.454	2708.	14.250
NOV	0.00000				-34.923	2	6	15.F	14.F	-137.527	2708.	14.250
DEC	0.00000				-72.835	11	24	10.F	9.F	-197.995	2843.	14.250
TOTAL	0.000				-316.976					-228.361	34115.	14.250
MAX												

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 6/2/1995 11:10:56 SDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. #8300 VEHICAL MAINT W/ DOORS CLOSED IN BAY  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR SIM-IR-HET TOPEKA, KS

MONTH	H O U R S				H O U R S				H O U R S				C O I N C I D E N T			
	COOLING LOAD	HEATING LOAD	COOL-HEAT LOAD	FLOATING	HEATING AVAIL.	COOLING AVAIL.	FANS ON	FANS ON CYCLE	HOURS NIGHT VENTING	HOURS FLOATING WHEN FANS ON	HEATING LOAD AT PEAK (KBTU/HR)	COOLING PEAK (KW)	ELECTRIC LOAD AT PEAK (KW)	COOLING PEAK (KW)		
JAN	0	740	0	4	744	744	744	0	0	4	-95.989	0.000	0.000	0.000		
FEB	0	665	0	7	672	672	672	0	0	7	-94.810	0.000	0.000	0.000		
MAR	0	651	0	93	744	744	744	0	0	93	-95.065	0.000	0.000	0.000		
APR	0	285	0	435	720	720	720	0	0	435	0.000	0.000	0.000	0.000		
MAY	0	49	0	695	744	744	744	0	0	695	0.000	0.000	0.000	0.000		
JUN	0	0	0	720	720	720	720	0	0	720	0.000	0.000	0.000	0.000		
JUL	0	0	0	744	744	744	744	0	0	744	0.000	0.000	0.000	0.000		
AUG	0	0	0	744	744	744	744	0	0	744	0.000	0.000	0.000	0.000		
SEP	0	16	0	704	720	720	720	0	0	704	-17.161	0.000	0.000	0.000		
OCT	0	257	0	487	744	744	744	0	0	487	-67.469	0.000	0.000	0.000		
NOV	0	556	0	164	720	720	720	0	0	164	-106.039	0.000	0.000	0.000		
DEC	0	732	0	12	744	744	744	0	0	12	-109.201	0.000	0.000	0.000		
ANNUAL	0	3951	0	4809	8760	8760	8760	0	0	4809						

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 6/2/1995 11:10:56 SDL RUN 1  
DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. #8300 VEHICAL MAINT W/ DOORS CLOSED IN BAY  
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR TOPEKA, KS

MONTH	COOLING				HEATING				COOLING				HEATING				ELEC	
	ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)		
JAN	0.00000				-13.507	16	6	10.F	8.F	0.000	6	10.F	8.F	-74.676	1967.	7.774		
FEB	0.00000				-9.293	3	6	-1.F	-2.F	0.000	3	-1.F	-2.F	-66.206	1712.	7.774		
MAR	0.00000				-6.281	14	6	15.F	13.F	0.000	14	15.F	13.F	-57.859	1757.	7.774		
APR	0.00000				-1.218	5	6	31.F	28.F	0.000	5	31.F	28.F	-35.124	1974.	7.774		
MAY	0.00000				-0.256	3	18	66.F	62.F	0.000	3	66.F	62.F	-3.758	1882.	7.774		
JUN	0.00000				0.000					0.000				0.000	1024.	4.942		
JUL	0.00000				0.000					0.000				0.000	923.	4.942		
AUG	0.00000				0.000					0.000				0.000	1063.	4.942		
SEP	0.00000				0.000					0.000				0.000	995.	4.942		
OCT	0.00000				-0.658	31	6	44.F	39.F	0.000	31	44.F	39.F	-25.191	2356.	7.774		
NOV	0.00000				-4.451	2	6	15.F	14.F	0.000	2	15.F	14.F	-49.790	1655.	7.774		
DEC	0.00000				-11.912	12	6	3.F	2.F	0.000	12	3.F	2.F	-71.516	1930.	7.774		
TOTAL	0.000				-47.577					0.000				-74.676	19236.	7.774		
MAX																		

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 6/2/1995 11:10:56 SDL RUN 1  
DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. #8300 VEHICAL MAINT W/ DOORS CLOSED IN BAY  
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR TOPEKA, KS

MONTH	COOLING LOAD		HEATING LOAD		COOLING AVAIL.		HEATING AVAIL.		HOURS OF FLOATING		HOURS OF COOLING		HOURS OF HEATING		HOURS OF COOLING		HOURS OF HEATING		COINCIDENT LOADS				
	HOURS	LOAD	HOURS	LOAD	HOURS	AVAIL.	HOURS	AVAIL.	HOURS	FLOATING	HOURS	AVAIL.	HOURS	AVAIL.	HOURS	COOLING	HOURS	AVAIL.	HOURS	AVAIL.	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)	
JAN	0	0	0	0	0	0	0	0	417	744	0	0	327	744	0	0	0	0	0	0	-29.071	2.932	
FEB	0	0	0	0	0	0	0	0	400	672	0	0	272	672	0	0	0	0	0	0	0	0.100	
MAR	0	0	0	0	0	0	0	0	527	744	0	0	221	744	0	0	0	0	0	0	4	-29.223	2.932
APR	0	0	0	0	0	0	0	0	499	720	0	0	337	720	0	0	0	0	0	0	116	-1.855	2.932
MAY	0	0	0	0	0	0	0	0	547	744	0	0	310	744	0	0	0	0	0	0	113	0.100	
JUN	0	0	0	0	0	0	0	0	720	720	0	0	0	720	0	0	0	0	0	0	0	0.000	0.000
JUL	0	0	0	0	0	0	0	0	744	744	0	0	0	744	0	0	0	0	0	0	0	0.000	0.000
AUG	0	0	0	0	0	0	0	0	744	744	0	0	0	744	0	0	0	0	0	0	0	0.000	0.000
SEP	0	0	0	0	0	0	0	0	720	720	0	0	0	720	0	0	0	0	0	0	0	0.000	0.100
OCT	0	0	0	0	0	0	0	0	434	744	0	0	488	744	0	0	0	0	0	0	178	0.000	0.100
NOV	0	0	0	0	0	0	0	0	516	720	0	0	236	720	0	0	0	0	0	0	32	0.000	0.100
DEC	0	0	0	0	0	0	0	0	430	744	0	0	314	744	0	0	0	0	0	0	0	-46.549	2.932
ANNUAL	0	0	0	0	0	0	0	0	6698	8760	0	0	2505	8760	0	0	0	0	0	0	443		

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 6/2/1995 11:10:56 PDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. #8300 VEHICAL MAINT W/ DOORS CLOSED IN BAY  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY	NATURAL-GAS
JAN	18.302 79.824 14/8	18.302 79.824 14/8	140.325 406.830 4/4
FEB	16.011 78.630 3/8	16.011 78.630 3/8	104.566 353.404 3/6
MAR	17.683 78.476 3/9	17.683 78.476 3/9	79.839 336.286 3/5
APR	16.720 77.161 4/8	16.720 77.161 4/8	23.003 216.490 4/6
MAY	16.153 75.201 13/8	16.153 75.201 13/8	4.498 78.312 9/6
JUN	13.667 65.531 22/8	13.667 65.531 22/8	1.152 1.600 30/1
JUL	12.395 65.531 29/8	12.395 65.531 29/8	1.190 1.600 31/1
AUG	14.262 65.531 4/8	14.262 65.531 4/8	1.190 1.600 31/1
SEP	13.108 65.531 30/16	13.108 65.531 30/16	1.427 31.691 30/1
OCT	17.483 76.510 31/8	17.483 76.510 31/8	17.722 176.225 31/6
NOV	15.700 77.349 30/9	15.700 77.349 30/9	61.520 276.102 2/6
DEC	17.971 79.383 14/8	17.971 79.383 14/8	126.270 378.298 11/24
	ONE YEAR USE/PEAK	189.456 79.824	562.703 406.830

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 6/2/1995 11:10:56 PDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. #8300 VEHICAL MAINT W/ DOORS CLOSED IN BAY  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
SPACE HEAT	0.00	558.86
SPACE COOL	1.88	0.00
HVAC AUX	31.51	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	145.12	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	10.95	0.00
TOTAL	189.45	558.86

TOTAL SITE ENERGY 752.16 MBTU 71.8 KBTU/SQFT-YR GROSS-AREA 71.8 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 1131.64 MBTU 108.0 KBTU/SQFT-YR GROSS-AREA 108.0 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 0.0  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.





DENVER - ATLANTA

PROJECT: FEASIBILITY STUDY FOR  
INSTALLATION OF UMCS  
LOCATION: FORT RILEY, KANSAS

EMC NO: 1406-001  
CALC. BY: AJN  
CHECKED BY: CEL  
DATE: 05-Jul-95

BUILDING NO.: 8300  
BLDG. TYPE: VEH MAINT SHOP (MAINT BAY DOORS OPEN)

**ENERGY CONSTANT CALCULATIONS**

	BASERUN	RUN1	RUN2	RUN3	RUN4	RUN5
HEATING (MBtu)	2460.4	0.0	2315.6	0.0	0.0	0.0
COOLING (kWH)	49,950	0	49,226	0	0	0

SUPPLY AIR FAN	12,688 CFM
FLOOR AREA	8,640 FT <sup>2</sup>
CFMI	12688 CFM
UA	2234 BTU/HR-°F
BLDG CONSTR.	2 (1 FOR LIGHT ) (2 FOR HEAVY)

EZDOE COMPUTER RUN DEFINITION:	
BASERUN	EXISTING OPERATION
RUN1	NIGHT SETBACK
RUN2	DDC CONTROL
RUN3	ECONOMIZER
RUN4	NIGHTTIME INFILTRATION (OA)
RUN5	DAYTIME INFILTRATION (OA)

HOURS OF OCCUPANCY			ANNUAL HEATING & COOLING HOURS	
M-F	700	1800	55 HR	HR. ON HEATING 1784 HR/YR
SAT.	0	0	0 HR	HR. ON COOLING 1084 HR/YR
SUN.	0	0	0 HR	HR. OFF HEATING 3664 HR/YR
	TOTAL OCCUPY HR.		55 HR/WK	HR. OFF COOLING 2228 HR/YR
	TOTAL UNOCC. HR.		113 HR/WK	
	ANNUAL OCCUPY HR.		2868 HR/YR	
	ANNUAL UNOCC. HR.		5892 HR/YR	

PRESENT HR. OF OPERATION FOR SYS. WITH HEATING AND COOLING 8760 HR/YR  
 PRESENT HR. OF OPERATION FOR SYS. WITH HEATING ONLY 5448 HR/YR  
 PRESENT HR. OF OPERATION FOR SYS. WITH COOLING ONLY 3312 HR/YR  
 HRS SAVED (HTG ONLY) 5448 - 1784 = 3664 HR/YR  
 HRS SAVED (CLG ONLY) 3312 - 1084 = 2228 HR/YR

HOAUHC	2460.42 MBtu	-	0 MBtu	=	0.00E+00 Btu/CFM-HR
	12688 CFM	x	5892 HR/YR		
HOAUH	2460.42 MBtu	-	0 MBtu	=	0.00E+00 Btu/CFM-HR
	12688 CFM	x	3664 HR/YR		
COAUHC	49,950.2 kWH	-	0.0 kWH	=	0.00E+00 kWH/CFM-HR
	12688 CFM	x	5892 HR/YR		
COAUH	49,950.2 kWH	-	0.0 kWH	=	0.00E+00 kWH/CFM-HR
	12688 CFM	x	2228 HR/YR		
HOAOHC	2460.42 MBtu	-	0 MBtu	=	0.00E+00 Btu/CFM-HR
	12688 CFM	x	2868 HR/YR		
HOAOH	2460.42 MBtu	-	0 MBtu	=	0.00E+00 Btu/CFM-HR
	12688 CFM	x	1784 HR/YR		
COAOHC	49,950.2 kWH	-	0.0 kWH	=	0.00E+00 kWH/CFM-HR
	12688 CFM	x	2868 HR/YR		
COAOH	49,950.2 kWH	-	0.0 kWH	=	0.00E+00 kWH/CFM-HR
	12688 CFM	x	1084 HR/YR		
DC DUTY	1 / 6 (10 MINUTES PER HOUR)			=	0.17
DC DEMAND	1 / 6 (10 MINUTES PER HOUR)			=	0.17
ECC	0.0 kWH	-	0.0 kWH	=	0.00E+00 kWH/CFM-HR
	12688 CFM	x	1084 HR/YR		
ECHC	0.0 kWH	-	0.0 kWH	=	0.00E+00 kWH/CFM-HR
	12688 CFM	x	2868 HR/YR		
NSUCHC	49,950.2 kWH	-	0.0 kWH	=	0.00E+00 kWH/CFM-HR
	12688 CFM	x	5892 HR/YR		
NSUCC	49,950.2 kWH	-	0.0 kWH	=	0.00E+00 kWH/CFM-HR
	12688 CFM	x	2228 HR/YR		
DDCCHC	49,950.2 kWH	-	49,226.5 kWH	=	1.99E-05 kWH/CFM-HR
	12688 CFM	x	2868 HR/YR		
DDCCC	49,950.2 kWH	-	49,226.5 kWH	=	5.26E-05 kWH/CFM-HR
	12688 CFM	x	1084 HR/YR		
NSC	2460.42 MBtu	-	0 MBtu	=	0.00E+00 Btu/UA
	2234.4401 UA				
DDCH	2460.42 MBtu	-	2315.56 MBtu	=	6.48E+04 Btu/UA
	2234.4401 UA				
OPT	(2 HR/DAY X 240 DAY/YR)		175 HR/YR	=	305 HR/YR
CHWR	(1.10 kW X 0.012 Eff. X 664 HRS X 2 Degrees of Reset)			=	17.5 kWH/TON
OAR	567 HR/YR	x	0.01	=	5.67 HR/YR



INPUT LOADS ..

```

$-----$
$ E Z - D O E   L O A D S   I N P U T $
$-----$

```

\$ GENERAL PROJECT DATA

```

TITLE  LINE-1 *      EMC      ENGINEERS      INC.      *
        LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
        LINE-3 *      DENVER,      CO      80227      *

        LINE-4 *BASELINE SIMULATION FOR BLDG. #8300      *
        LINE-5 *VEHICAL MAINT. W/ BAY DOORS OPEN      * ..

```

```

ABORT          ERRORS ..
DIAGNOSTIC     WARNINGS ..
LOADS-REPORT   VERIFICATION=(LV-D)
               SUMMARY=(LS-C,LS-D)
               HOURLY-DATA-SAVE = YES ..
BUILDING-LOCATION  LATITUDE = 39.0
                LONGITUDE = 96.5
                ALTITUDE = 1065.
                TIME-ZONE = 6
                GROSS-AREA = 10475
                SHIELDING-COEF = 0.29
                X-REF = 0.0
                Y-REF = 0.0 ..
RUN-PERIOD     JAN 1 1994 THRU DEC 31 1994 ..

```

\$ SCHEDULES

```

LD_ON          =DAY-SCHEDULE (1,24) (1.) ..
LD_OFF         =DAY-SCHEDULE (1,24) (0.) ..

LD_PEOPLE     =DAY-SCHEDULE (1,6) (0.)
               (7) (0.5)
               (8,11) (1.)
               (12) (0.5)
               (13,16) (1.)
               (17) (0.5)
               (18,24) (0.) ..

LD_DOORS      =DAY-SCHEDULE (1,7) (0.)
               (8,17) (0.33)
               (18,24) (0.) ..

LW_ON         =WEEK-SCHEDULE (ALL) LD_ON ..
LW_OFF        =WEEK-SCHEDULE (ALL) LD_OFF ..

```

LW\_PEOPLE =WEEK-SCHEDULE (WD) LD\_PEOPLE  
(WEH) LD\_OFF ..

LW\_DOORS =WEEK-SCHEDULE (WD) LD\_DOORS  
(WEH) LD\_OFF ..

\$ ON 100% OF THE TIME

L\_ON =SCHEDULE THRU DEC 31 LW\_ON ..

\$ OFF 100% OF THE TIME

L\_OFF =SCHEDULE THRU DEC 31 LW\_OFF ..

\$ PEOPLE LOAD M-F7.5-17.5

L\_PEOPLE =SCHEDULE THRU DEC 31 LW\_PEOPLE ..

\$ BAY-DOORS OPEN SCHEDULE

L\_BAY-DOOR =SCHEDULE THRU DEC 31 LW\_DOORS ..

\$ CONSTRUCTION TYPES

\$ EXTERIOR WALL U-VALUE FROM PLANS

EXWALL-1 =CONSTRUCTION U-VALUE = 0.137  
ABSORPTANCE = 0.880  
ROUGHNESS = 2 ..  
FLOOR =CONSTRUCTION U-VALUE = 0.020  
ABSORPTANCE = 0.610  
ROUGHNESS = 5 ..

\$ BUILT-UP ROOF U-VALUE FROM PLANS

ROOF-1 =CONSTRUCTION U-VALUE = 0.094  
ABSORPTANCE = 0.800  
ROUGHNESS = 1 ..

\$ STANDARD METAL DOOR

DOOR-STD =LAYERS MATERIAL=(HF-A3,IN22,HF-A3) I-F-R= 0.6100  
THICKNESS=(0.005,0.083,0.005) ..  
DOOR-MET =CONSTRUCTION LAYERS = DOOR-STD  
ABSORPTANCE = 0.850  
ROUGHNESS = 5 ..

\$ EXTER OFFICE WALL U-VAL FROM PLAN

EXWALL-2 =CONSTRUCTION U-VALUE = 0.094  
ABSORPTANCE = 0.880  
ROUGHNESS = 2 ..

2\_PN\_STD =GLASS-TYPE GLASS-TYPE-CODE = 2  
PANES = 2 ..

## \$ SPACE DESCRIPTION

BAY-AREA =SPACE AREA = 8640.0 VOLUME = 216000.0  
 TEMPERATURE = (69.) ZONE-TYPE = CONDITIONED  
 PEOPLE-SCHEDULE = L\_PEOPLE NUMBER-OF-PEOPLE = 28.0  
 PEOPLE-HG-LAT = 625.0 PEOPLE-HG-SENS = 375.0  
 LIGHTING-TYPE = INCAND LIGHTING-W/SQFT = 1.65  
 LIGHT-TO-SPACE = 1.0 LIGHTING-SCHEDULE = L\_PEOPLE  
 SOURCE-SENSIBLE = 0.0 FLOOR-WEIGHT = 130.  
 INF-METHOD = AIR-CHANGE AIR-CHANGES/HR = 7.6  
 INF-SCHEDULE = L\_BAY-DOOR ..

END ..

COMPUTE LOADS ..

INPUT SYSTEMS ..

\$-----\$  
 \$ E Z - D O E S Y S T E M S I N P U T \$  
 \$-----\$

## \$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
 LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
 LINE-3 \* DENVER, CO 80227 \*  
 LINE-4 \*BASELINE SIMULATION FOR BLDG. #8300 \*  
 LINE-5 \*VEHICAL MAINT. W/ BAY DOORS OPEN \* ..  
 ABORT ERRORS ..  
 DIAGNOSTIC WARNINGS ..  
 SYSTEMS-REPORT VERIFICATION=(SV-A)  
 SUMMARY=(SS-A,SS-C,SS-K,SS-O)  
 HOURLY-DATA-SAVE = YES ..

## \$ SCHEDULES

SD\_ON =DAY-SCHEDULE (1,24) (1.) ..  
 SD\_OFF =DAY-SCHEDULE (1,24) (0.) ..  
 SD\_HEAT\_F =DAY-SCHEDULE (1,24) (74.) ..  
 SD\_COOL\_F =DAY-SCHEDULE (1,24) (72.) ..  
 SD\_HT\_69F =DAY-SCHEDULE (1,24) (69.) ..  
 SD\_FAN\_CYC =DAY-SCHEDULE (1,6) (-1.)  
 (7,17) (0.)  
 (18,24) (-1.) ..  
 SD\_FORC-OFF =DAY-SCHEDULE (1,24) (-1.) ..  
 SW\_ON =WEEK-SCHEDULE (ALL) SD\_ON ..  
 SW\_OFF =WEEK-SCHEDULE (ALL) SD\_OFF ..  
 SW\_HEAT\_F =WEEK-SCHEDULE (ALL) SD\_HEAT\_F ..

```

SW_COOL_F =WEEK-SCHEDULE (ALL) SD_COOL_F ..
SW_HT_69F =WEEK-SCHEDULE (ALL) SD_HT_69F ..
SW_FAN_CYC =WEEK-SCHEDULE (WD) SD_FAN_CYC
              (WEH) SD_FORC-OF ..
SW_FORC_OF =WEEK-SCHEDULE (ALL) SD_FORC-OF ..

```

## \$ FULL ON SYSTEM

```
S_ON =SCHEDULE THRU DEC 31 SW_ON ..
```

## \$ FULL OFF SYSTEM

```
S_OFF =SCHEDULE THRU DEC 31 SW_OFF ..
```

## \$ HEATING SEASON

```
S_HE-SCHED =SCHEDULE THRU MAY 15 SW_ON
              THRU OCT 1 SW_OFF
              THRU DEC 31 SW_ON ..
```

## \$ COOLING SEASON

```
S_CL_SCHED =SCHEDULE THRU MAY 15 SW_OFF
              THRU OCT 1 SW_ON
              THRU DEC 31 SW_OFF ..
```

## \$ HEATING SER TEMP = 69F

```
S_HT_69F =SCHEDULE THRU DEC 31 SW_HT_69F ..
```

## \$ COOLING SET TEMP =72F

```
S_CL_SET_F =SCHEDULE THRU DEC 31 SW_COOL_F ..
```

## \$ HEATING SET TEMP =74F

```
S_HT_SET_F =SCHEDULE THRU DEC 31 SW_HEAT_F ..
```

```
S_HRLY-RPT =SCHEDULE THRU JAN 13 SW_OFF
              THRU JAN 15 SW_ON
              THRU AUG 13 SW_OFF
              THRU AUG 15 SW_ON
              THRU DEC 31 SW_OFF ..
```

```
S_FAN_CYCL =SCHEDULE THRU MAY 15 SW_FAN_CYC
              THRU OCT 1 SW_FORC_OF
              THRU DEC 31 SW_FAN_CYC ..
```

## \$ ZONE DESCRIPTION

```

BAY-AREA =ZONE DESIGN-HEAT-T = 69.0 DESIGN-COOL-T = 72.0
HEAT-TEMP-SCH = S_HT_69F COOL-TEMP-SCH = S_CL_SET_F
ZONE-TYPE = CONDITIONED
THERMOSTAT-TYPE = PROPORTIONAL ASSIGNED-CFM = 12200.
OUTSIDE-AIR-CFM = 12200. SIZING-OPTION = FROM-LOADS ..

```

## \$ SYSTEM DESCRIPTION

```

MAKEUP-AIR =SYSTEM      SYSTEM-TYPE = HVSYS
                        MAX-SUPPLY-T = 120.0 HEATING-SCHEDULE = S_HE-SCHED
                        HEAT-SET-T = 120.0 SUPPLY-CFM = 12200.
                        RATED-CFM = 12200. MIN-OUTSIDE-AIR = 1.0
                        FAN-SCHEDULE = S_FAN_CYCL SUPPLY-DELTA-T = 2.4
                        SUPPLY-KW = 0.00078 NIGHT-CYCLE-CTRL = CYCLE-ON-ANY
                        NIGHT-VENT-DT = 0.0 HEATING-CAPACITY = -2000000.
                        HEAT-SOURCE = GAS-FURNACE
                        ZONE-NAMES = (BAY-AREA) ..

```

## \$ HOURLY REPORT DESCRIPTION

```

MAU-BLK  =REPORT-BLOCK VARIABLE-TYPE = MAKEUP-AIR
          VARIABLE-LIST = (3,5,17,1) ..
ZN-BLK   =REPORT-BLOCK VARIABLE-TYPE = BAY-AREA
          VARIABLE-LIST = (17,18,7,6) ..
MAU-HRLY = HOURLY-REPORT REPORT-SCHEDULE = S_HRLY-RPT
          REPORT-BLOCK = (MAU-BLK)
..
ZN-HRLY  = HOURLY-REPORT REPORT-SCHEDULE = S_HRLY-RPT
          REPORT-BLOCK = (ZN-BLK)
..
END ..
COMPUTE SYSTEMS ..

```

```

INPUT PLANT ..

```

```

$-----$
$ E Z - D O E   P L A N T S   I N P U T $
$-----$

```

## \$ GENERAL PROJECT DATA

```

TITLE LINE-1 *   EMC      ENGINEERS      INC.      *
      LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
      LINE-3 *   DENVER,      CO      80227      *
      LINE-4 *BASELINE SIMULATION FOR BLDG. #8300      *
      LINE-5 *VEHICAL MAINT. W/ BAY DOORS OPEN      * ..

```

```

ABORT          ERRORS ..
DIAGNOSTIC     WARNINGS ..
PLANT-REPORT   VERIFICATION=(PV-A)
                SUMMARY=(PS-B,BEPS)
                HOURLY-DATA-SAVE = YES ..

```

## \$ SCHEDULES

```

PD_ON  =DAY-SCHEDULE (1,24) (1.) ..
PD_OFF =DAY-SCHEDULE (1,24) (0.) ..

```

PW\_OFF =WEEK-SCHEDULE (ALL) PD\_OFF ..

PW\_ON =WEEK-SCHEDULE (ALL) PD\_ON ..

\$ HEATING SEASON

P\_HEAT =SCHEDULE THRU MAY 15 PW\_ON  
THRU OCT 1 PW\_OFF  
THRU DEC 31 PW\_ON ..

\$ EQUIPMENT DESCRIPTION

RES-FRUNCE =PLANT-EQUIPMENT TYPE = FURNACE  
SIZE = -999. ..

PLANT-PARAMETERS BOILER-FUEL = NATURAL-GAS HERM-REC-COND-TYPE = AIR  
CCIRC-HEAD = 0.0 HCIRC-HEAD = 58.0 ..

ENERGY-RESOURCE RESOURCE = ELECTRICITY ..  
ENERGY-RESOURCE RESOURCE = NATURAL-GAS ..

END ..  
COMPUTE PLANT ..  
STOP ..



EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/16/1995 16:53: 3 LDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #8300 VEHICAL MAINT. W/ BAY DOORS OPEN  
 REPORT- LV-D DETAILS OF EXTERIOR SURFACES IN THE PROJECT TOPEKA, KS

NUMBER OF EXTERIOR SURFACES 0 RECTANGULAR 0 OTHER 0  
 (U-VALUE INCLUDES INSIDE AIR FILM PLUS OUTSIDE AIR FILM AT 7.5 MPH WINDSPEED )

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/16/1995 16:53: 3 LDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #8300 VEHICAL MAINT. W/ BAY DOORS OPEN  
 REPORT- LV-D DETAILS OF EXTERIOR SURFACES IN THE PROJECT TOPEKA, KS

AVERAGE U-VALUE	AVERAGE	AVERAGE U-VALUE	OPAQUE	GLASS	GLASS+OPAQUE
(BTU/HR-SQFT-F)	U-VALUE/WALLS	WALLS+GLASS	AREA	AREA	AREA
	(BTU/HR-SQFT-F)	(BTU/HR-SQFT-F)	(SQFT)	(SQFT)	(SQFT)

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/16/1995 16:53: 3 LDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #8300 VEHICAL MAINT. W/ BAY DOORS OPEN  
 REPORT- LS-C BUILDING PEAK LOAD COMPONENTS TOPEKA, KS

\*\*\* BUILDING \*\*\*

FLOOR AREA 8640 SQFT 803 SQMT  
 VOLUME 216000 CUFT 6117 CUMT

COOLING LOAD  
 SEP 6 4PM  
 DRY-BULB TEMP 93F 34C  
 WET-BULB TEMP 76F 24C

HEATING LOAD  
 DEC 8 1PM  
 20F -7C  
 17F -8C

	SENSIBLE (KBTU/H)	( KW )	LATENT (KBTU/H)	( KW )	SENSIBLE (KBTU/H)	( KW )
WALLS	0.000	0.000	0.000	0.000	0.000	0.000
ROOFS	0.000	0.000	0.000	0.000	0.000	0.000
GLASS CONDUCTION	0.000	0.000	0.000	0.000	0.000	0.000
GLASS SOLAR	0.000	0.000	0.000	0.000	0.000	0.000
DOOR	0.000	0.000	0.000	0.000	0.000	0.000
INTERNAL SURFACES	0.000	0.000	0.000	0.000	0.000	0.000
UNDERGROUND SURFACES	0.000	0.000	0.000	0.000	0.000	0.000
OCCUPANTS TO SPACE	8.857	2.594	17.500	5.125	8.670	2.539
LIGHT TO SPACE	36.907	10.809	0.000	0.000	35.571	10.418
EQUIPMENT TO SPACE	0.000	0.000	0.000	0.000	0.000	0.000
PROCESS TO SPACE	0.000	0.000	0.000	0.000	0.000	0.000
INFILTRATION	507.805	148.723	647.265	189.568	-1265.722	-370.698
TOTAL	553.570	162.127	654.765	194.693	-1221.480	-357.741
TOTAL LOAD	1218.334	KBTU/H	356.820	KW	-1221.480	KBTU/H
TOTAL LOAD / AREA	141.01	BTU/H.SQFT	444.534	W / SQMT	141.375	BTU/H.SQFT

W / SQMT

\*\*\*\*\*  
 \* NOTE 1) THE ABOVE LOADS EXCLUDE OUTSIDE VENTILATION AIR \*  
 \* LOADS \*  
 \* 2) TIMES GIVEN IN STANDARD TIME FOR THE LOCATION \*  
 \* IN CONSIDERATION \*  
 \*\*\*\*\*

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/16/1995 16:53: 3 SDL RUN 1												
DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #8300 VEHICAL MAINT. W/ BAY DOORS OPEN												
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR MAKEUP-AIR TOPEKA, KS												
----- C O O L I N G ----- H E A T I N G ----- E L E C -----												
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC-TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				0.000	-274.432	14	9	-3.F	-4.F	4841.	23.766
FEB	0.00000				0.000	-251.742	3	7	-5.F	-6.F	4532.	23.766
MAR	0.00000				0.000	-258.031	4	7	14.F	12.F	5483.	23.766
APR	0.00000				0.000	-182.210	5	7	30.F	27.F	5041.	23.766
MAY	0.00000				0.000	-76.496	9	7	43.F	43.F	3890.	23.766
JUN	0.00000				0.000	0.000				0.000	2978.	14.250
JUL	0.00000				0.000	0.000				0.000	2708.	14.250
AUG	0.00000				0.000	0.000				0.000	3114.	14.250
SEP	0.00000				0.000	0.000				0.000	2843.	14.250
OCT	0.00000				0.000	-169.737	20	8	23.F	22.F	4782.	23.766
NOV	0.00000				0.000	-213.533	2	7	19.F	17.F	4801.	23.766
DEC	0.00000				0.000	-277.214	13	8	0.F	-1.F	4917.	23.766
TOTAL	0.000				0.000	-1703.394					49930.	
MAX					0.000					-1931.270		23.766

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/16/1995 16:53: 3 SDL RUN 1										
DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #8300 VEHICAL MAINT. W/ BAY DOORS OPEN										
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR MAKEUP-AIR TOPEKA, KS										
----- N U M B E R O F H O U R S -----										
MONTH	HOURS COOLING LOAD	HOURS HEATING LOAD	HOURS COINCIDENT COOL-HEAT LOAD	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.	HOURS FANS ON	HOURS FANS ON CYCLE	HOURS NIGHT VENTING	HOURS FLOATING WHEN FANS ON	COINCIDENT LOADS-- HEATING ELECTRIC LOAD AT COOLING PEAK (KBTU/HR)
JAN	0	210	0	744	0	210	210	0	0	0.000
FEB	0	206	0	672	0	206	206	0	0	0.000
MAR	0	249	0	744	0	249	249	0	0	0.000
APR	0	231	0	720	0	231	231	0	0	0.000
MAY	0	110	0	360	0	110	110	0	0	0.000
JUN	0	0	0	0	0	0	0	0	0	0.000
JUL	0	0	0	744	0	0	0	0	0	0.000
AUG	0	0	0	720	0	0	0	0	0	0.000
SEP	0	0	0	720	0	0	0	0	0	0.000
OCT	0	218	0	720	0	218	218	0	0	0.000
NOV	0	220	0	744	0	220	220	0	0	0.000
DEC	0	218	0	744	0	218	218	0	0	0.000
ANNUAL	0	1662	0	5424	0	1662	1662	0	0	0.000

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/16/1995 16:53: 3 PDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #8300 VEHICAL MAINT. W/ BAY DOORS OPEN  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY TOTAL (MBTU) PEAK (KBTU) DY/HR	NATURAL-GAS TOTAL (MBTU) PEAK (KBTU) DY/HR
JAN	16.530 81.147 31/16	16.530 81.147 31/16	388.412 2590.039 14/ 9
FEB	15.476 81.147 28/16	15.476 81.147 28/16	359.130 2619.850 3/ 7
MAR	18.722 81.147 31/16	18.722 81.147 31/16	373.408 2185.045 4/ 7
APR	17.212 81.147 29/16	17.212 81.147 29/16	270.243 1807.284 5/ 7
MAY	13.281 81.147 13/16	13.281 81.147 13/16	115.373 1510.531 9/ 7
JUN	10.169 48.656 30/16	10.169 48.656 30/16	1.152 1.600 30/ 1
JUL	9.245 48.656 29/16	9.245 48.656 29/16	1.190 1.600 31/ 1
AUG	10.631 48.656 31/16	10.631 48.656 31/16	1.190 1.600 31/ 1
SEP	9.707 48.656 30/16	9.707 48.656 30/16	1.152 1.600 30/ 1
OCT	16.328 81.147 31/16	16.328 81.147 31/16	252.021 1970.076 20/ 8
NOV	16.393 81.147 30/16	16.393 81.147 30/16	310.736 2058.549 2/ 7
DEC	16.790 81.147 30/16	16.790 81.147 30/16	393.624 2511.519 13/ 8
	ONE YEAR USE/PEAK	170.483 81.147	2467.633 2619.850

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/16/1995 16:53: 3 PDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #8300 VEHICAL MAINT. W/ BAY DOORS OPEN  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE	ELECTRICITY	NATURAL-GAS
IN SITE MBTU -		
CATEGORY OF USE		
SPACE HEAT	0.00	2460.42
SPACE COOL	0.00	0.00
HVAC AUX	54.00	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	116.48	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	0.00	0.00
TOTAL	170.48	2460.42

TOTAL SITE ENERGY 2638.12 MBTU 251.8 KBTU/SQFT-YR GROSS-AREA 305.3 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 2979.59 MBTU 284.4 KBTU/SQFT-YR GROSS-AREA 344.9 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 0.0  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.



\$ SPACE DESCRIPTION

BAY-AREA =SPACE AREA = 8640.0 VOLUME = 216000.0  
 TEMPERATURE = (69.) ZONE-TYPE = CONDITIONED  
 PEOPLE-SCHEDULE = L\_PEOPLE NUMBER-OF-PEOPLE = 28.0  
 PEOPLE-HG-LAT = 625.0 PEOPLE-HG-SENS = 375.0  
 LIGHTING-TYPE = INCAND LIGHTING-W/SQFT = 1.65  
 LIGHT-TO-SPACE = 1.0 LIGHTING-SCHEDULE = L\_PEOPLE  
 SOURCE-SENSIBLE = 0.0 FLOOR-WEIGHT = 130.  
 INF-METHOD = AIR-CHANGE AIR-CHANGES/HR = 7.6  
 INF-SCHEDULE = L\_BAY-DOOR ..

END ..  
 COMPUTE LOADS ..  
 INPUT SYSTEMS ..

-----\$  
 \$ E Z - D O E S Y S T E M S I N P U T \$  
 -----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
 LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
 LINE-3 \* DENVER, CO 80227 \*  
 LINE-4 \*RUN #2 DDC CONTROL FOR BLDG. #8300 \*  
 LINE-5 \*VEHICAL MAINT. W/ BAY DOORS OPEN \* ..  
 ABORT ERRORS ..  
 DIAGNOSTIC WARNINGS ..  
 SYSTEMS-REPORT VERIFICATION=(SV-A)  
 SUMMARY=(SS-A,SS-C,SS-K,SS-O)  
 HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

SD\_ON =DAY-SCHEDULE (1,24) (1.) ..  
 SD\_OFF =DAY-SCHEDULE (1,24) (0.) ..  
 SD\_HEAT\_F =DAY-SCHEDULE (1,24) (70.) ..  
 SD\_COOL\_F =DAY-SCHEDULE (1,24) (76.) ..  
 SD\_HT\_69F =DAY-SCHEDULE (1,24) (65.) ..  
 SD\_FAN\_CYC =DAY-SCHEDULE (1,6) (-1.) ..  
 (7,17) (0.) ..  
 (18,24) (-1.) ..  
 SD\_FORC-OFF =DAY-SCHEDULE (1,24) (-1.) ..  
 SW\_ON =WEEK-SCHEDULE (ALL) SD\_ON ..  
 SW\_OFF =WEEK-SCHEDULE (ALL) SD\_OFF ..  
 SW\_HEAT\_F =WEEK-SCHEDULE (ALL) SD\_HEAT\_F ..

SW\_COOL\_F =WEEK-SCHEDULE (ALL) SD\_COOL\_F ..  
 SW\_HT\_69F =WEEK-SCHEDULE (ALL) SD\_HT\_69F ..  
 SW\_FAN\_CYC =WEEK-SCHEDULE (WD) SD\_FAN\_CYC  
 (WEH) SD\_FORC-OF ..  
 SW\_FORC\_OF =WEEK-SCHEDULE (ALL) SD\_FORC-OF ..

## \$ FULL ON SYSTEM

S\_ON =SCHEDULE THRU DEC 31 SW\_ON ..

## \$ FULL OFF SYSTEM

S\_OFF =SCHEDULE THRU DEC 31 SW\_OFF ..

## \$ HEATING SEASON

S\_HE-SCHED =SCHEDULE THRU MAY 15 SW\_ON  
 THRU OCT 1 SW\_OFF  
 THRU DEC 31 SW\_ON ..

## \$ COOLING SEASON

S\_CL\_SCHED =SCHEDULE THRU MAY 15 SW\_OFF  
 THRU OCT 1 SW\_ON  
 THRU DEC 31 SW\_OFF ..

## \$ HEATING SER TEMP = 69F

S\_HT\_69F =SCHEDULE THRU DEC 31 SW\_HT\_69F ..

## \$ COOLING SET TEMP =72F

S\_CL\_SET\_F =SCHEDULE THRU DEC 31 SW\_COOL\_F ..

## \$ HEATING SET TEMP =74F

S\_HT\_SET\_F =SCHEDULE THRU DEC 31 SW\_HEAT\_F ..

S\_HRLY-RPT =SCHEDULE THRU JAN 13 SW\_OFF

THRU JAN 15 SW\_ON

THRU AUG 13 SW\_OFF

THRU AUG 15 SW\_ON

THRU DEC 31 SW\_OFF ..

S\_FAN\_CYCL =SCHEDULE THRU MAY 15 SW\_FAN\_CYC

THRU OCT 1 SW\_FORC\_OF

THRU DEC 31 SW\_FAN\_CYC ..

## \$ ZONE DESCRIPTION

BAY-AREA =ZONE DESIGN-HEAT-T = 69.0 DESIGN-COOL-T = 72.0

HEAT-TEMP-SCH = S\_HT\_69F COOL-TEMP-SCH = S\_CL\_SET\_F

ZONE-TYPE = CONDITIONED

THERMOSTAT-TYPE = PROPORTIONAL ASSIGNED-CFM = 12200.

OUTSIDE-AIR-CFM = 12200. SIZING-OPTION = FROM-LOADS ..



## \$ SYSTEM DESCRIPTION

```

MAKEUP-AIR =SYSTEM      SYSTEM-TYPE = HVSYS
                        MAX-SUPPLY-T = 120.0 HEATING-SCHEDULE = S_HE-SCHED
                        HEAT-SET-T = 120.0 SUPPLY-CFM = 12200.
                        RATED-CFM = 12200. MIN-OUTSIDE-AIR = 1.0
                        FAN-SCHEDULE = S_FAN_CYCL SUPPLY-DELTA-T = 2.4
                        SUPPLY-KW = 0.00078 NIGHT-CYCLE-CTRL = CYCLE-ON-ANY
                        NIGHT-VENT-DT = 0.0 HEATING-CAPACITY = -2000000.
                        HEAT-SOURCE = GAS-FURNACE
                        ZONE-NAMES = (BAY-AREA) ..

```

## \$ HOURLY REPORT DESCRIPTION

```

MAU-BLK  =REPORT-BLOCK VARIABLE-TYPE = MAKEUP-AIR
          VARIABLE-LIST = (3,5,17,1) ..
ZN-BLK   =REPORT-BLOCK VARIABLE-TYPE = BAY-AREA
          VARIABLE-LIST = (17,18,7,6) ..
MAU-HRLY = HOURLY-REPORT REPORT-SCHEDULE = S_HRLY-RPT
          REPORT-BLOCK = (MAU-BLK)
..
ZN-HRLY  = HOURLY-REPORT REPORT-SCHEDULE = S_HRLY-RPT
          REPORT-BLOCK = (ZN-BLK)
..
END ..
COMPUTE SYSTEMS ..

```

INPUT PLANT ..

```

$-----$
$ E Z - D O E   P L A N T S   I N P U T $
$-----$

```

## \$ GENERAL PROJECT DATA

```

TITLE  LINE-1 *      EMC      ENGINEERS      INC.      *
        LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
        LINE-3 *      DENVER,      CO      80227      *
        LINE-4 *RUN #2 DDC CONTROL FOR BLDG. #8300      *
        LINE-5 *VEHICAL MAINT. W/ BAY DOORS OPEN      * ..

```

```

ABORT          ERRORS ..
DIAGNOSTIC     WARNINGS ..
PLANT-REPORT   VERIFICATION=(PV-A)
               SUMMARY=(PS-B,BEPS)
               HOURLY-DATA-SAVE = YES ..

```

## \$ SCHEDULES

```

PD_ON  =DAY-SCHEDULE (1,24) (1.) ..
PD_OFF =DAY-SCHEDULE (1,24) (0.) ..

```

EMC ENGINEERS INC. DOE-2.1D 5/17/1995 8: 5: 7 SDL RUN 1  
DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. #8300 VEHICAL MAINT. W/ BAY DOORS OPEN  
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR MAKEUP-AIR TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC-TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-238.631	14	9	-3.F	-4.F	4613.	23.766
FEB	0.00000				-241.100	3	7	-5.F	-6.F	4456.	23.766
MAR	0.00000				-235.719	3	7	14.F	12.F	5302.	23.766
APR	0.00000				-177.816	5	7	30.F	27.F	5003.	23.766
MAY	0.00000				-76.496	9	7	43.F	43.F	3890.	23.766
JUN	0.00000				0.000				0.000	2978.	14.250
JUL	0.00000				0.000				0.000	2708.	14.250
AUG	0.00000				0.000				0.000	3114.	14.250
SEP	0.00000				0.000				0.000	2843.	14.250
OCT	0.00000				-168.874	20	8	23.F	22.F	4772.	23.766
NOV	0.00000				-212.357	2	7	19.F	17.F	4792.	23.766
DEC	0.00000				-249.456	13	8	0.F	-1.F	4737.	23.766
TOTAL MAX	0.000				-1600.447					49206.	23.766

EMC ENGINEERS INC. DOE-2.1D 5/17/1995 8: 5: 7 SDL RUN 1  
DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. #8300 VEHICAL MAINT. W/ BAY DOORS OPEN  
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR MAKEUP-AIR TOPEKA, KS

MONTH	HOURS				HOURS				HOURS				COINCIDENT LOADS		
	COOLING LOAD	HEATING LOAD	COOL-HEAT LOAD	COINCIDENT LOAD	FLOATING	HEATING AVAIL.	COOLING AVAIL.	FANS ON	FANS ON CYCLE	FANS ON NIGHT	FLOATING WHEN	HEATING LOAD AT COOLING PEAK	ELECTRIC LOAD AT COOLING PEAK	HEATING LOAD AT COOLING PEAK	ELECTRIC LOAD AT COOLING PEAK
JAN	0	186	0	0	558	744	0	186	186	0	0	0.000	0.000	0.000	0.000
FEB	0	198	0	0	474	672	0	198	198	0	0	0.000	0.000	0.000	0.000
MAR	0	230	0	0	514	744	0	230	230	0	0	0.000	0.000	0.000	0.000
APR	0	227	0	0	493	720	0	227	227	0	0	0.000	0.000	0.000	0.000
MAY	0	110	0	0	634	360	0	110	110	0	0	0.000	0.000	0.000	0.000
JUN	0	0	0	0	720	0	0	0	0	0	0	0.000	0.000	0.000	0.000
JUL	0	0	0	0	744	0	0	0	0	0	0	0.000	0.000	0.000	0.000
AUG	0	0	0	0	744	0	0	0	0	0	0	0.000	0.000	0.000	0.000
SEP	0	0	0	0	720	0	0	0	0	0	0	0.000	0.000	0.000	0.000
OCT	0	217	0	0	527	720	0	217	217	0	0	0.000	0.000	0.000	0.000
NOV	0	219	0	0	501	720	0	219	219	0	0	0.000	0.000	0.000	0.000
DEC	0	199	0	0	545	744	0	199	199	0	0	0.000	0.000	0.000	0.000
ANNUAL	0	1586	0	0	7174	5424	0	1586	1586	0	0	0.000	0.000	0.000	0.000

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/17/1995 8: 5: 7 PDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. #8300 VEHICAL MAINT. W/ BAY DOORS OPEN  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

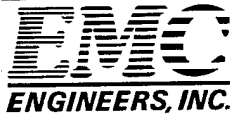
MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY	NATURAL-GAS
JAN	15.750 81.147 31/16	338.494 2590.039 14/ 9	
FEB	15.216 81.147 28/16	344.104 2619.850 3/ 7	
MAR	18.104 81.147 31/16	341.585 2178.077 3/ 7	
APR	17.082 81.147 29/16	263.924 1807.284 5/ 7	
MAY	13.281 81.147 13/16	115.373 1510.531 9/ 7	
JUN	10.169 48.656 30/16	1.152 1.600 30/ 1	
JUL	9.245 48.656 29/16	1.190 1.600 31/ 1	
AUG	10.631 48.656 31/16	1.190 1.600 31/ 1	
SEP	9.707 48.656 30/16	1.152 1.600 30/ 1	
OCT	16.295 81.147 31/16	250.754 1970.076 20/ 8	
NOV	16.360 81.147 30/16	309.055 2058.549 2/ 7	
DEC	16.173 81.147 30/16	354.799 2511.519 13/ 8	
	ONE YEAR USE/PEAK	168.014 81.147	2322.774 2619.850

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/17/1995 8: 5: 7 PDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. #8300 VEHICAL MAINT. W/ BAY DOORS OPEN  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE	ELECTRICITY	NATURAL-GAS
IN SITE MBTU -		
CATEGORY OF USE		
SPACE HEAT	0.00	2315.56
SPACE COOL	0.00	0.00
HVAC AUX	51.53	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	116.48	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	0.00	0.00
TOTAL	168.01	2315.56

TOTAL SITE ENERGY 2490.79 MBTU 237.8 KBTU/SQFT-YR GROSS-AREA 288.3 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 2827.32 MBTU 269.9 KBTU/SQFT-YR GROSS-AREA 327.2 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 0.0  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

**COMPUTER ENERGY SIMULATIONS**  
**BLDG. 8069A/B**  
**SWIMMING POOL AND GYM BUILDINGS**



DENVER - ATLANTA

PROJECT: FEASIBILITY STUDY FOR  
 INSTALLATION OF UMCS  
 LOCATION: FORT RILEY, KANSAS

EMC NO: 1406-001  
 CALC. BY: AJN  
 CHECKED BY: CEL  
 DATE: 05-Jul-95

BUILDING NO.: 8069  
 BLDG. TYPE: INDOOR SWIM POOL/GYM - POOL AREA

**ENERGY CONSTANT CALCULATIONS**

	BASERUN	RUN1	RUN2	RUN3	RUN4	RUN5
HEATING (MBtu)	1122.6	933.5	1048.2	0.0	0.0	0.0
COOLING (KWH)	186,338	163,712	185,502	0	0	0

SUPPLY AIR FAN	18,720 CFM
FLOOR AREA	6,600 FT <sup>2</sup>
CFMI	9360 CFM
UA	2173 BTU/HR-°F
BLDG CONSTR.	2 (1 FOR LIGHT ) (2 FOR HEAVY)

EZDOE COMPUTER RUN DEFINITION:	
BASERUN	EXISTING OPERATION
RUN1	NIGHT SETBACK
RUN2	DDC CONTROL
RUN3	ECONOMIZER
RUN4	NIGHTTIME INFILTRATION (OA)
RUN5	DAYTIME INFILTRATION (OA)

HOURS OF OCCUPANCY			ANNUAL HEATING & COOLING HOURS		
M-F	600	2200	80 HR	HR. ON HEATING	3308 HR/YR
SAT.	900	2000	11 HR	HR. ON COOLING	2011 HR/YR
SUN.	900	2000	11 HR	HR. OFF HEATING	2140 HR/YR
	TOTAL OCCUPY HR.		102 HR/WK	HR. OFF COOLING	1301 HR/YR
	TOTAL UNOCC. HR.		66 HR/WK		
	ANNUAL OCCUPY HR.		5319 HR/YR		
	ANNUAL UNOCC. HR.		3441 HR/YR		

PRESENT HR. OF OPERATION FOR SYS. WITH HEATING AND COOLING 8760 HR/YR  
 PRESENT HR. OF OPERATION FOR SYS. WITH HEATING ONLY 5448 HR/YR  
 PRESENT HR. OF OPERATION FOR SYS. WITH COOLING ONLY 3312 HR/YR  
 HRS SAVED (HTG ONLY) 5448 - 3308 = 2140 HR/YR  
 HRS SAVED (CLG ONLY) 3312 - 2011 = 1301 HR/YR

HOAUHC	1122.64 MBtu	-	0 MBtu	=	0.00E+00 Btu/CFM-HR	
	9360 CFM	x	3441 HR/YR			
HOAUH	1122.64 MBtu	-	0 MBtu	=	0.00E+00 Btu/CFM-HR	
	9360 CFM	x	2140 HR/YR			
COAUHC	186,337.5 KWH	-	0.0 KWH	=	0.00E+00 KWH/CFM-HR	
	9360 CFM	x	3441 HR/YR			
COAUC	186,337.5 KWH	-	0.0 KWH	=	0.00E+00 KWH/CFM-HR	
	9360 CFM	x	1301 HR/YR			
HOAOHC	1122.64 MBtu	-	0 MBtu	=	0.00E+00 Btu/CFM-HR	
	9360 CFM	x	5319 HR/YR			
HOAOH	1122.64 MBtu	-	0 MBtu	=	0.00E+00 Btu/CFM-HR	
	9360 CFM	x	3308 HR/YR			
COAOHC	186,337.5 KWH	-	0.0 KWH	=	0.00E+00 KWH/CFM-HR	
	9360 CFM	x	5319 HR/YR			
COAOC	186,337.5 KWH	-	0.0 KWH	=	0.00E+00 KWH/CFM-HR	
	9360 CFM	x	2011 HR/YR			
DC DUTY	1 / 6 (10 MINUTES PER HOUR)			=	0.17	
DC DEMAND	1 / 6 (10 MINUTES PER HOUR)			=	0.17	
ECC	163,712.3 KWH	-	0.0 KWH	=	0.00E+00 KWH/CFM-HR	
	18720 CFM	x	2011 HR/YR			
ECHC	163,712.3 KWH	-	0.0 KWH	=	0.00E+00 KWH/CFM-HR	
	18720 CFM	x	5319 HR/YR			
NSUCHC	186,337.5 KWH	-	163,712.3 KWH	=	3.51E-04 KWH/CFM-HR	
	18720 CFM	x	3441 HR/YR			
NSUCC	186,337.5 KWH	-	163,712.3 KWH	=	9.29E-04 KWH/CFM-HR	
	18720 CFM	x	1301 HR/YR			
DDCCHC	186,337.5 KWH	-	185,502.5 KWH	=	8.39E-06 KWH/CFM-HR	
	18720 CFM	x	5319 HR/YR			
DDCCC	186,337.5 KWH	-	185,502.5 KWH	=	2.22E-05 KWH/CFM-HR	
	18720 CFM	x	2011 HR/YR			
NSC	1122.64 MBtu	-	933.45 MBtu	=	8.71E+04 Btu/UA	
	2173.2367 UA					
DDCH	1122.64 MBtu	-	1048.16 MBtu	=	3.43E+04 Btu/UA	
	2173.2367 UA					
OPT	( 2 HR/DAY X 240 DAY/YR )		-	175 HR/YR		
				=	305 HR/YR	
CHWR	(1.10 kW X 0.012 Eff. X 664 HRS X 2 Degrees of Reset)				=	17.5 KWH/TON
OAR	567 HR/YR	x	0.01	=	5.67 HR/YR	



INPUT LOADS ..

```

$-----$
$ E Z - D O E   L O A D S   I N P U T $
$-----$

```

\$ GENERAL PROJECT DATA

```

TITLE  LINE-1 *      EMC      ENGINEERS      INC.      *
        LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
        LINE-3 *      DENVER,      CO      80227      *

        LINE-4 *BASELINE SIMULATION FOR BLDG. #8069-POOL*
        LINE-5 *SWIMMING POOL AREA      * ..

```

```

ABORT          ERRORS ..
DIAGNOSTIC     WARNINGS ..
LOADS-REPORT   VERIFICATION=(LV-A,LV-D)
               SUMMARY=(LS-C,LS-D)
               HOURLY-DATA-SAVE = YES ..
BUILDING-LOCATION  LATITUDE = 39.0
                LONGITUDE = 96.5
                ALTITUDE = 1065.
                TIME-ZONE = 6
                GROSS-AREA = 6600
                SHIELDING-COEF = 0.29
                X-REF = 0.0
                Y-REF = 0.0 ..
RUN-PERIOD     JAN 1 1994 THRU DEC 31 1994 ..

```

\$ SCHEDULES

```

LD_POOL-TH =DAY-SCHEDULE (1,7) (0.)
                (8,11) (0.1)
                (12,22) (1.)
                (23,24) (0.) ..

LD_PL-WKEN =DAY-SCHEDULE (1,8) (0.)
                (9,20) (1.)
                (21,24) (0.) ..

LD_ON      =DAY-SCHEDULE (1,24) (1.) ..

LD_OFF     =DAY-SCHEDULE (1,24) (0.) ..

LD_PL-MTWF =DAY-SCHEDULE (1,5) (0.)
                (6,22) (1.)
                (23,24) (0.) ..

LW_ON      =WEEK-SCHEDULE (ALL) LD_ON ..

LW_OFF     =WEEK-SCHEDULE (ALL) LD_OFF ..

```



LW\_POOL =WEEK-SCHEDULE (MON) LD\_PL-MTWF  
 (TUE) LD\_PL-MTWF  
 (WED) LD\_PL-MTWF  
 (THU) LD\_POOL-TH  
 (FRI) LD\_PL-MTWF  
 (SAT) LD\_PL-WKEN  
 (SUN) LD\_PL-WKEN  
 (HOL) LD\_PL-WKEN ..

## \$ ON 100% OF THE TIME

L\_ON =SCHEDULE THRU DEC 31 LW\_ON ..

## \$ OFF 100% OF THE TIME

L\_OFF =SCHEDULE THRU DEC 31 LW\_OFF ..

## \$ PEOPLE LOAD FOR POOL

L\_POOLAREA =SCHEDULE THRU DEC 31 LW\_POOL ..

## \$ CONSTRUCTION TYPES

## \$ EXTERIOR WALL BRICK, INSL, PLASTER

WALL-1 =LAYERS MATERIAL=(BK01,AL11,IN12,IN23,GP03) I-F-R= 0.6100  
 THICKNESS=(0.333,0.000,0.458,0.167,0.063) ..

EXWALL-1 =CONSTRUCTION LAYERS = WALL-1  
 ABSORPTANCE = 0.880  
 ROUGHNESS = 2 ..

FLOOR =CONSTRUCTION U-VALUE = 0.020  
 ABSORPTANCE = 0.610  
 ROUGHNESS = 5 ..

## \$ BUILT-UP ROOF W/INSL&amp; NO CEILING

BLT-ROOF =LAYERS MATERIAL=(HF-E2,HF-A3,IN61,IN35,IN61,HF-A3)  
 THICKNESS=(0.042,0.005,0.042,0.167,0.042,0.005) ..

ROOF-1 =CONSTRUCTION LAYERS = BLT-ROOF  
 ABSORPTANCE = 0.800  
 ROUGHNESS = 1 ..

## \$ STANDARD METAL DOOR

DOOR-MET =CONSTRUCTION U-VALUE = 0.020  
 ABSORPTANCE = 0.860  
 ROUGHNESS = 5 ..

2\_PN\_STD =GLASS-TYPE GLASS-TYPE-CODE = 2  
 PANES = 2 ..

## \$ SPACE DESCRIPTION

```

pool-area =SPACE  AREA = 6600.0  VOLUME = 211200.0
TEMPERATURE = (73.)  ZONE-TYPE = CONDITIONED
PEOPLE-SCHEDULE = L_POOLAREA  NUMBER-OF-PEOPLE = 20.0
PEOPLE-HG-LAT = 1090.0  PEOPLE-HG-SENS = 710.0
LIGHTING-TYPE = INCAND  LIGHTING-W/SQFT = 1.4
LIGHT-TO-SPACE = 1.0  LIGHTING-SCHEDULE = L_POOLAREA
SOURCE-SCHEDULE = L_ON  SOURCE-TYPE = PROCESS
SOURCE-BTU/HR = 198828.0  SOURCE-SENSIBLE = 0.0
SOURCE-LATENT = 1.0  INF-METHOD = AIR-CHANGE
AIR-CHANGES/HR = 0.23  INF-SCHEDULE = L_ON  ..

```

```

E-W  HEIGHT = 32.0  WIDTH = 110.0  CONS = EXWALL-1
      AZIMUTH = 0  SKY-FORM-FACTOR = 0.5
      GND-FORM-FACTOR = 0.5  ..

```

```

WINDOW HEIGHT = 15.0  WIDTH = 110.0  G-T = 2_PN_STD
      SKY-FORM-FACTOR = 0.5  GND-FORM-FACTOR = 0.5  ..

```

```

DOOR  HEIGHT = 7.5  WIDTH = 3.5  CONS = DOOR-MET
      MULTIPLIER = 4.0  SETBACK = 0.2
      SKY-FORM-FACTOR = 0.5  GND-FORM-FACTOR = 0.5  ..

```

```

E-W  HEIGHT = 32.0  WIDTH = 60.0  CONS = EXWALL-1
      AZIMUTH = 90  SKY-FORM-FACTOR = 0.5
      GND-FORM-FACTOR = 0.5  ..

```

```

WINDOW HEIGHT = 10.0  WIDTH = 60.0  G-T = 2_PN_STD
      SKY-FORM-FACTOR = 0.5  GND-FORM-FACTOR = 0.5  ..

```

```

E-W  HEIGHT = 32.0  WIDTH = 60.0  CONS = EXWALL-1
      AZIMUTH = 270  SKY-FORM-FACTOR = 0.5
      GND-FORM-FACTOR = 0.5  ..

```

```

WINDOW HEIGHT = 10.0  WIDTH = 60.0  G-T = 2_PN_STD
      SKY-FORM-FACTOR = 0.5  GND-FORM-FACTOR = 0.5  ..

```

```

ROOF  HEIGHT = 60.0  WIDTH = 110.0  CONS = ROOF-1
      TILT = 0  SKY-FORM-FACTOR = 1.0  ..

```

```

U-W  HEIGHT = 57.0  WIDTH = 55.3  CONS = FLOOR  ..

```

```

END ..
COMPUTE LOADS ..
INPUT SYSTEMS ..

```

```

$-----$
$ E Z - D O E   S Y S T E M S   I N P U T $
$-----$

```

\$ GENERAL PROJECT DATA

```

TITLE LINE-1 *   EMC   ENGINEERS   INC.   *

```

LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*

LINE-3 \* DENVER, CO 80227 \*

LINE-4 \*BASELINE SIMULATION FOR BLDG. #8069-PPOOL\*

LINE-5 \*SWIMMING POOL AREA \* ..

ABORT ERRORS ..  
 DIAGNOSTIC WARNINGS ..  
 SYSTEMS-REPORT VERIFICATION=(SV-A)  
 SUMMARY=(SS-A,SS-C,SS-K,SS-N,SS-O)  
 HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

SD\_ON =DAY-SCHEDULE (1,24) (1.) ..  
 SD\_OFF =DAY-SCHEDULE (1,24) (0.) ..  
 SD\_WT\_HT =DAY-SCHEDULE (1,24) (82.) ..  
 SD\_WT\_CL =DAY-SCHEDULE (1,24) (84.) ..  
 SD\_WT-VENT =DAY-SCHEDULE (1,24) (0.5) ..  
 SD\_SM\_CL =DAY-SCHEDULE (1,24) (82.) ..  
 SD\_SM\_HT =DAY-SCHEDULE (1,24) (80.) ..

SW\_ON =WEEK-SCHEDULE (ALL) SD\_ON ..

SW\_OFF =WEEK-SCHEDULE (ALL) SD\_OFF ..

SW\_WT\_HT =WEEK-SCHEDULE (ALL) SD\_WT\_HT ..

SW\_WT\_CL =WEEK-SCHEDULE (ALL) SD\_WT\_CL ..

SW\_WT-VENT =WEEK-SCHEDULE (ALL) SD\_WT-VENT ..

SW\_SM\_CL =WEEK-SCHEDULE (ALL) SD\_SM\_CL ..

SW\_SM\_HT =WEEK-SCHEDULE (ALL) SD\_SM\_HT ..

\$ FULL ON SYSTEM

S\_ON =SCHEDULE THRU DEC 31 SW\_ON ..

\$ FULL OFF SYSTEM

S\_OFF =SCHEDULE THRU DEC 31 SW\_OFF ..

\$ HEATING SEASON

S\_HE-SCHED =SCHEDULE THRU MAY 15 SW\_ON  
 THRU OCT 1 SW\_OFF  
 THRU DEC 31 SW\_ON ..

\$ COOLING SEASON

S\_CL\_SCHED =SCHEDULE THRU MAY 15 SW\_OFF  
 THRU OCT 1 SW\_ON  
 THRU DEC 31 SW\_OFF ..

\$ HEATING SET TEMP

S\_HT\_SET\_F =SCHEDULE THRU MAY 15 SW\_WT\_HT  
 THRU OCT 1 SW\_SM\_HT  
 THRU DEC 31 SW\_WT\_HT ..

## \$ COOLING SET TEMP

```
S_CL_SET_F =SCHEDULE THRU MAY 15 SW_WT_CL
              THRU OCT  1 SW_SM_CL
              THRU DEC 31 SW_WT_CL ..
```

## \$ 50%OA IN WT-100% IN SUM

```
S_VENT_SCH =SCHEDULE THRU MAY 15 SW_WT-VENT
              THRU OCT  1 SW_ON
              THRU DEC 31 SW_WT-VENT ..
```

## S\_HRLY-RPS =SCHEDULE THRU JAN 13 SW\_OFF

```
              THRU JAN 15 SW_ON
              THRU AUG 13 SW_OFF
              THRU AUG 15 SW_ON
              THRU DEC 31 SW_OFF ..
```

## \$ ZONE DESCRIPTION

```
pool-area =ZONE  DESIGN-HEAT-T = 80.0  DESIGN-COOL-T = 81.0
HEAT-TEMP-SCH = S_HT_SET_F  COOL-TEMP-SCH = S_CL_SET_F
ZONE-TYPE = CONDITIONED
THERMOSTAT-TYPE = PROPORTIONAL
BASEBOARD-RATING = -91000.  SIZING-OPTION = FROM-LOADS ..
```

## \$ SYSTEM DESCRIPTION

```
POOL-H&V'S =SYSTEM  SYSTEM-TYPE = HVSYS
MAX-SUPPLY-T = 120.0  HEATING-SCHEDULE = S_HE-SCHED
HEAT-SET-T = 120.0  HEAT-CONTROL = COLDEST
OA-CONTROL = FIXED  SUPPLY-CFM = 18000.
RATED-CFM = 18000.  MIN-OUTSIDE-AIR = 0.1
MIN-AIR-SCH = S_VENT_SCH  RECOVERY-EFF = 0.7
SUPPLY-DELTA-T = 2.4  SUPPLY-KW = 0.00078
MOTOR-PLACEMENT = OUTSIDE-AIRFLOW
NIGHT-CYCLE-CTRL = STAY-OFF  NIGHT-VENT-DT = 0.0
HEATING-CAPACITY = -979020.  RETURN-AIR-PATH = DUCT
ZONE-NAMES = (pool-area) ..
```

## \$ HOURLY REPORT DESCRIPTION

```
H&V-BLK  =REPORT-BLOCK VARIABLE-TYPE = POOL-H&V'S
              VARIABLE-LIST = (3,5,17,39,1) ..
SPACE-BLK =REPORT-BLOCK VARIABLE-TYPE = pool-area
              VARIABLE-LIST = (17,18,7,6) ..
AHU-RPTS  = HOURLY-REPORT  REPORT-SCHEDULE = S_HRLY-RPS
              REPORT-BLOCK = (H&V-BLK)
..
ZONE-RPTS = HOURLY-REPORT  REPORT-SCHEDULE = S_HRLY-RPS
              REPORT-BLOCK = (SPACE-BLK)
..
END ..
```

COMPUTE SYSTEMS ..

INPUT PLANT ..

```

$-----$
$ E Z - D O E   P L A N T S   I N P U T $
$-----$

```

\$ GENERAL PROJECT DATA

```

TITLE LINE-1 *   EMC       ENGINEERS   INC.   *
LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
LINE-3 *   DENVER,      CO       80227   *

LINE-4 *BASELINE SIMULATION FOR BLDG. #8069-POOL*
LINE-5 *SWIMMING POOL AREA                * ..

```

```

ABORT          ERRORS ..
DIAGNOSTIC     WARNINGS ..
PLANT-REPORT   VERIFICATION=(PV-A,PV-B)
               SUMMARY=(BEPS)
               HOURLY-DATA-SAVE = YES ..

```

\$ SCHEDULES

```

PD_ON    =DAY-SCHEDULE (1,24) (1.) ..
PD_OFF   =DAY-SCHEDULE (1,24) (0.) ..

PW_OFF   =WEEK-SCHEDULE (ALL) PD_OFF ..
PW_ON    =WEEK-SCHEDULE (ALL) PD_ON  ..

```

\$ HEATING SEASON

```

P_HEAT   =SCHEDULE THRU MAY 15 PW_ON
          THRU OCT  1  PW_OFF
          THRU DEC 31  PW_ON ..

```

\$ EQUIPMENT DESCRIPTION

```

MAINBOILER =PLANT-EQUIPMENT  TYPE = HW-BOILER
           SIZE = -999. ..

```

```

PLANT-PARAMETERS  BOILER-FUEL = NATURAL-GAS  HERM-REC-COND-TYPE = AIR
                  CCIRC-HEAD = 0.0  HCIRC-HEAD = 58.0 ..

```

```

ENERGY-RESOURCE  RESOURCE = ELECTRICITY ..
ENERGY-RESOURCE  RESOURCE = NATURAL-GAS ..

```

HEAT-SEASO =LOAD-ASSIGNMENT TYPE = HEATING

OPERATION-MODE = RUN-NEEDED

LOAD-RANGE = 0.000

PLANT-EQUIPMENT = MAINBOILER

NUMBER = 1 ..

END ..

COMPUTE PLANT ..

STOP ..

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 6/ 2/1995 13:26:10 LDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #8069-POOLSWIMMING POOL AREA  
 REPORT- LV-D DETAILS OF EXTERIOR SURFACES IN THE PROJECT TOPEKA, KS

NUMBER OF EXTERIOR SURFACES 4 RECTANGULAR 4 OTHER 0  
 (U-VALUE INCLUDES INSIDE AIR FILM PLUS OUTSIDE AIR FILM AT 7.5 MPH WINDSPEED )

SURFACE	SPACE	U-VALUE (BTU/HR-SQFT-F)	GLASS AREA (SQFT)	U-VALUE (BTU/HR-SQFT-F)	WALL AREA (SQFT)	U-VALUE (BTU/HR-SQFT-F)	WALL+GLASS AREA (SQFT)	U-VALUE (BTU/HR-SQFT-F)	GLASS+OPAQUE AREA (SQFT)	AZIMUTH
pool-area		0.490	1650.00	0.037	1870.00	0.249	1870.00	3520.00	0.249	NORTH
pool-area		0.490	600.00	0.037	1320.00	0.178	1320.00	1920.00	0.178	EAST
pool-area		0.490	600.00	0.037	1320.00	0.178	1320.00	1920.00	0.178	WEST
pool-area		0.000	0.00	0.084	6600.00	0.084	6600.00	6600.00	0.084	ROOF
pool-area		0.000	0.00	0.020	3152.10	0.020	3152.10	3152.10	0.020	UNDERGRND

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 6/ 2/1995 13:26:10 LDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #8069-POOLSWIMMING POOL AREA  
 REPORT- LV-D DETAILS OF EXTERIOR SURFACES IN THE PROJECT TOPEKA, KS

NORTH	EAST	WEST	ROOF	ALL WALLS	WALLS+ROOFS	UNDERGRND	BUILDING	AVERAGE U-VALUE/ GLASS (BTU/HR-SQFT-F)	AVERAGE U-VALUE/ WALLS (BTU/HR-SQFT-F)	AVERAGE U-VALUE WALLS+GLASS (BTU/HR-SQFT-F)	GLASS AREA (SQFT)	OPAQUE AREA (SQFT)	GLASS+OPAQUE AREA (SQFT)
0.490	0.490	0.490	0.000	0.490	0.490	0.000	0.490	0.037	0.249	1650.00	1870.00	1870.00	3520.00
0.490	0.490	0.490	0.000	0.490	0.490	0.000	0.490	0.037	0.178	600.00	1320.00	1320.00	1920.00
0.490	0.490	0.490	0.000	0.490	0.490	0.000	0.490	0.037	0.178	600.00	1320.00	1320.00	1920.00
0.490	0.490	0.490	0.000	0.490	0.490	0.000	0.490	0.084	0.084	6600.00	6600.00	6600.00	6600.00
0.490	0.490	0.490	0.000	0.490	0.490	0.000	0.490	0.037	0.212	2850.00	4510.00	4510.00	7360.00
0.490	0.490	0.490	0.000	0.490	0.490	0.000	0.490	0.065	0.152	2850.00	11110.00	11110.00	13960.00
0.000	0.000	0.000	0.000	0.020	0.020	0.000	0.020	0.020	0.000	3152.10	3152.10	3152.10	3152.10
0.490	0.490	0.490	0.000	0.055	0.055	0.000	0.055	0.127	0.127	2850.00	14262.10	14262.10	17112.10

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 6/ 2/1995 13:26:10 LDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #8069-POOLSWIMMING POOL AREA  
 REPORT- IS-C BUILDING PEAK LOAD COMPONENTS TOPEKA, KS

\*\*\* BUILDING \*\*\*

FLOOR AREA 6600 SQFT 613 SQMT  
 VOLUME 211200 CUFT 5981 CUMT  
 TIME JUL 23 6PM  
 DRY-BULB TEMP 95F 35C  
 WET-BULB TEMP 79F 26C

	COOLING LOAD		HEATING LOAD	
	SENSIBLE ( KBTU/H )	LATENT ( KBTU/H )	SENSIBLE ( KBTU/H )	HEATING LOAD ( KW )
WALLS	3.296	0.000	-9.624	-2.819
ROOFS	22.895	0.000	-35.393	-10.366
GLASS CONDUCTION	32.167	0.000	-97.286	-28.492
GLASS SOLAR	111.103	0.000	3.427	1.004
DOOR	0.050	0.000	-0.135	-0.040
INTERNAL SURFACES	0.000	0.000	0.000	0.000
UNDERGROUND SURFACES	-0.566	0.000	-1.810	-0.530
OCCUPANTS TO SPACE	13.207	3.868	2.410	0.706
LIGHT TO SPACE	28.080	8.224	8.390	2.457
EQUIPMENT TO SPACE	0.000	0.000	0.000	0.000
PROCESS TO SPACE	0.000	198.828	0.000	0.000
INFILTRATION	20.942	38.824	-125.891	-36.870
TOTAL	231.174	259.452	-255.910	-74.950
TOTAL LOAD	490.626 KBTU/H	143.692 KW	-255.910 KBTU/H	-74.950 KW
TOTAL LOAD / AREA	74.34 BTU/H.SQFT	234.347 W /SQMT	38.774 BTU/H.SQFT	122.235 W /SQMT

\*\*\*\*\*  
 \* NOTE 1) THE ABOVE LOADS EXCLUDE OUTSIDE VENTILATION AIR \*  
 \* LOADS \*  
 \* 2) TIMES GIVEN IN STANDARD TIME FOR THE LOCATION \*  
 \* IN CONSIDERATION \*  
 \*\*\*\*\*



EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 6/ 2/1995 13:26:10 LDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #8069-POOLSWIMMING POOL AREA  
 REPORT- LS-D BUILDING MONTHLY LOADS SUMMARY TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC- TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.24722	18	52. F	43. F	-73.182	4	8. F	7. F	-255.910	4199.	9.236
FEB	1.36480	13	58. F	48. F	-49.457	1	23	15. F	-204.686	3774.	9.236
MAR	9.20274	27	69. F	50. F	-35.871	3	8	15. F	-205.419	4239.	9.236
APR	30.67085	25	83. F	66. F	-10.922	4	4	33. F	-127.729	4088.	9.236
MAY	54.66166	31	90. F	76. F	-2.452	5	5	44. F	-81.912	4199.	9.236
JUN	70.07397	19	86. F	75. F	-0.435	2	5	50. F	-34.389	4082.	9.236
JUL	78.81918	23	95. F	79. F	-0.004	30	6	62. F	-4.167	4153.	9.236
AUG	76.94143	24	93. F	76. F	-0.080	4	6	54. F	-16.334	4291.	9.236
SEP	45.39871	6	85. F	68. F	-3.801	18	1	50. F	-70.688	4036.	9.236
OCT	23.49690	11	85. F	68. F	-12.606	20	7	23. F	-117.428	4153.	9.236
NOV	6.46319	7	73. F	58. F	-31.216	30	5	29. F	-150.566	4093.	9.236
DEC	0.33447	21	55. F	44. F	-67.893	15	5	8. F	-211.993	4147.	9.236
TOTAL	397.675				-287.917				-255.910	49454.	9.236
MAX											

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 6/ 2/1995 13:26:10 SDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #8069-POOLSWIMMING POOL AREA  
 REPORT- SV-A SYSTEM DESIGN PARAMETERS POOL-H&V'S TOPEKA, KS

SYSTEM NAME	ALTITUDE	MULTIPLIER	RETURN		OUTSIDE		COOLING		HEATING		COOLING		HEATING	
			FAN (CFM)	FAN (CFM)	AIR RATIO	AIR RATIO	CAPACITY (KBTU/HR)	CAPACITY (KBTU/HR)	EIR (BTU/BTU)	EIR (BTU/BTU)	CAPACITY (KBTU/HR)	CAPACITY (KBTU/HR)	ADDITION RATE (KBTU/HR)	MULTIPLIER
POOL-H&V'S		1.040												
SUPPLY FAN (CFM)	18720.		0.	0.	0.021	0.021	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DELTA-T (F)	2.3		0.	0.	0.0	0.0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ZONE NAME	pool-area													
SUPPLY FLOW	18720.													
EXHAUST FLOW	0.													
FAN (KW)	14.040													
DELTA-T (F)	2.3													
MINIMUM FLOW RATIO	1.000													
OUTSIDE AIR FLOW	397.													
EXTRACTION RATE (KBTU/HR)	-855.50													

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 6/ 2/1995 13:26:10 SDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #8069-POOLSWIMMING POOL AREA  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR POOL-H&V'S TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC LOAD (KW)
JAN	0.00000				-179.743	4	3	8.F	7.F	-457.224	14645.
FEB	0.00000				-133.462	3	6	-1.F	-2.F	-405.686	13209.
MAR	0.00000				-105.473	3	8	15.F	12.F	-386.559	14685.
APR	0.00000				-38.516	4	5	33.F	31.F	-252.302	14197.
MAY	0.00000				-9.581	5	6	44.F	40.F	-174.766	14645.
JUN	0.00000				0.000					0.000	14191.
JUL	0.00000				0.000					0.000	14598.
AUG	0.00000				0.000					0.000	14737.
SEP	0.00000				0.000					0.000	14145.
OCT	0.00000				-42.554	20	8	23.F	22.F	-263.787	14598.
NOV	0.00000				-92.569	2	5	16.F	15.F	-314.650	14202.
DEC	0.00000				-166.280	15	5	8.F	7.F	-409.753	14593.
TOTAL MAX	0.000				-768.179					-457.224	172450.

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 6/ 2/1995 13:26:10 SDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #8069-POOLSWIMMING POOL AREA  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR POOL-H&V'S TOPEKA, KS

MONTH	HOURS OF				HOURS OF				HOURS OF				HOURS OF			
	COOLING LOAD	HEATING LOAD	COINCIDENT COOL-HEAT LOAD	FLOATING	HEATING AVAIL.	COOLING AVAIL.	FANS ON	CYCLE ON	FANS ON	NIGHT VENTING	FLOATING WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)	
JAN	0	744	0	0	744	0	744	0	0	0	0	-212.828	14.040	-212.828	14.040	
FEB	0	671	0	1	672	0	672	0	0	0	1	-204.907	14.040	-204.907	14.040	
MAR	0	694	0	50	744	0	744	0	0	0	50	-202.820	14.040	-202.820	14.040	
APR	0	435	0	285	720	0	720	0	0	0	285	-78.394	14.040	-78.394	14.040	
MAY	0	151	0	593	360	0	744	0	0	0	593	0.000	14.040	0.000	14.040	
JUN	0	0	0	720	0	0	720	0	0	0	720	0.000	14.040	0.000	14.040	
JUL	0	0	0	744	0	0	744	0	0	0	744	0.000	14.040	0.000	14.040	
AUG	0	0	0	744	0	0	744	0	0	0	744	0.000	14.040	0.000	14.040	
SEP	0	0	0	720	0	0	720	0	0	0	720	0.000	14.040	0.000	14.040	
OCT	0	483	0	261	720	0	744	0	0	0	261	-166.305	14.040	-166.305	14.040	
NOV	0	656	0	64	720	0	720	0	0	0	64	-248.922	14.040	-248.922	14.040	
DEC	0	744	0	0	744	0	744	0	0	0	0	-238.269	14.040	-238.269	14.040	
ANNUAL	0	4578	0	4182	5424	0	8760	0	0	0	4182					

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 6/ 2/1995 13:26:10 SDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #8069-POOLSWIMMING POOL AREA  
 REPORT- SS-K SPACE TEMPERATURE SUMMARY POOL-H&V'S TOPEKA, KS

MONTH	ALL HOURS (F)	COOLING HOURS (F)	HEATING HOURS (F)	SPACE T E M P		AVERAGE TEMPERATURE DIFFERENCE		DIFFERENCE BETWEEN		SUMMED TEMP DIFFERENCE		HUMIDITY RATIO DIFFERENCE	
				FAN ON HOURS (F)	FAN OFF HOURS (F)	OUTDOOR& ROOM AIR HOURS (F)	OUTDOOR& ROOM AIR HOURS (F)	OUTDOOR& ROOM AIR HOURS (F)	OUTDOOR& ROOM AIR HOURS (F)	OUTDOOR& ROOM AIR HOURS (F)	OUTDOOR& ROOM AIR HOURS (F)	OUTDOOR& ROOM AIR HOURS (F)	OUTDOOR& ROOM AIR HOURS (F)
JAN	81.65		81.65	0.00	-55.83	0.00	1730.79	1730.79	1730.79	1730.79	-0.00453		
FEB	81.89		81.89	0.00	-50.21	0.00	1404.89	1404.89	1405.92	1405.92	-0.00454		
MAR	82.13		82.13	0.00	-41.85	0.00	1253.90	1253.90	1297.42	1297.42	-0.00452		
APR	82.82		82.82	0.00	-26.05	0.00	579.92	579.92	781.45	781.45	-0.00453		
MAY	79.57		79.57	0.00	-13.49	0.00	181.61	181.61	418.09	418.09	-0.00349		
JUN	79.92		79.92	0.00	-6.28	0.00					-0.00243		
JUL	83.52		83.52	0.00	-6.34	0.00					-0.00246		
AUG	85.00		85.00	0.00	-5.87	0.00					-0.00246		
SEP	72.90		72.90	0.00	-5.36	0.00					-0.00235		
OCT	82.34		82.34	0.00	-24.45	0.00	614.11	614.11	758.93	758.93	-0.00457		
NOV	82.20		82.20	0.00	-38.09	0.00	1100.72	1100.72	1142.80	1142.80	-0.00461		
DEC	81.81		81.81	0.00	-51.77	0.00	1604.97	1604.97	1604.97	1604.97	-0.00450		
ANNUAL	81.33	0.00	82.02	81.33	-27.03	0.00	8470.91	8470.91	9868.12	9868.12	-0.00374		

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 6/ 2/1995 13:26:10 SDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #8069-POOLSWIMMING POOL AREA  
 REPORT- SS-O TEMPERATURE SCATTER PLOT POOL-H&V'S FOR pool-area TOPEKA, KS

HOUR	TOTAL HOURS AT TEMPERATURE LEVEL AND TIME OF DAY												TOTAL												
	1AM	2	3	4	5	6	7	8	9	10	11	12													
ABOVE 85	12	9	7	3	1	0	6	13	32	47	62	87	97	110	119	119	118	107	87	60	37	26	21	15	1195
81-85	255	250	242	246	243	242	250	259	258	262	256	243	240	231	224	227	228	237	242	257	267	265	262	260	5946
76-80	37	42	40	37	40	37	47	46	36	28	26	19	15	14	14	10	6	6	14	16	28	35	36	37	666
71-75	28	24	32	32	33	38	31	20	19	16	13	10	8	6	4	3	8	10	11	19	15	12	20	21	433
66-70	16	21	22	20	19	21	12	13	12	8	4	2	2	2	2	4	3	2	8	9	12	14	12	16	256
61-65	8	9	10	13	16	13	8	7	4	1	2	2	2	1	0	0	0	1	1	2	4	9	9	9	129
BELOW 60	9	10	12	14	13	14	11	7	4	3	2	2	2	2	2	2	2	2	2	2	2	4	5	7	135

HOURLY DATA FILE 1 FROM PROG 2

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 6/ 2/1995 13:26:10 PDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #8069-POOLSWIMMING POOL AREA  
 REPORT- PV-A EQUIPMENT SIZES TOPEKA, KS

E Q U I P M E N T  
 HW-BOILER 0.460 1 1

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 6/ 2/1995 13:26:10 PDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #8069-POOLSWIMMING POOL AREA  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY-	ELECTRICITY			NATURAL-GAS		
		TOTAL (MBTU)	PEAK (KBTU)	DI/HR	TOTAL (MBTU)	PEAK (KBTU)	DI/HR
JAN		58.624	91.241	31/22	250.511	575.402	4/ 3
FEB		52.702	91.241	28/22	192.678	520.840	3/ 6
MAR		57.219	91.241	31/22	157.199	500.300	3/ 8
APR		52.007	91.241	15/ 8	61.585	351.685	4/ 5
MAY		51.088	91.241	9/ 6	16.187	262.319	5/ 6
JUN		48.455	79.475	30/22	0.000	0.000	0.000
JUL		49.845	79.475	31/20	0.000	0.000	0.000
AUG		50.318	79.475	31/22	0.000	0.000	0.000
SEP		48.297	79.475	30/22	0.000	0.000	0.000
OCT		53.969	91.241	31/11	69.190	364.703	20/ 8
NOV		55.132	91.241	30/22	140.138	421.667	2/ 5
DEC		58.379	91.241	31/20	235.154	525.187	15/ 5
	ONE YEAR	636.035	91.241		1122.642	575.402	
	USE/PEAK						

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 6/ 2/1995 13:26:10 PDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #8069-POOLSWIMMING POOL AREA TOPEKA, KS  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
SPACE HEAT	39.73	1122.64
SPACE COOL	0.00	0.00
HVAC AUX	427.39	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	168.85	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	0.00	0.00
TOTAL	635.97	1122.64

TOTAL SITE ENERGY 1758.68 MBTU 266.5 KBTU/SQFT-YR GROSS-AREA 266.5 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 3032.66 MBTU 459.5 KBTU/SQFT-YR GROSS-AREA 459.5 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 0.0  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
LINE-3 \* DENVER, CO 80227 \*

LINE-4 \*RUN #1 NIGHT SETBACK FOR BLDG. 8069-POOL\*  
LINE-5 \*SWIMMING POOL AREA \* ..

ABORT ERRORS ..  
DIAGNOSTIC WARNINGS ..  
SYSTEMS-REPORT VERIFICATION=(SV-A)  
SUMMARY=(SS-A,SS-C,SS-K,SS-N,SS-O)  
HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

SD\_ON =DAY-SCHEDULE (1,24) (1.) ..  
SD\_OFF =DAY-SCHEDULE (1,24) (0.) ..  
SD\_WT\_HT =DAY-SCHEDULE (1,5) (76.)  
(6,22) (82.)  
(23,24) (76.) ..  
SD\_WT\_CL =DAY-SCHEDULE (1,5) (78.)  
(6,22) (84.)  
(23,24) (78.) ..  
SD\_WT-VENT =DAY-SCHEDULE (1,24) (0.5) ..  
SD\_SM\_CL =DAY-SCHEDULE (1,5) (88.)  
(6,22) (82.)  
(23,24) (88.) ..  
SD\_SM\_HT =DAY-SCHEDULE (1,5) (86.)  
(6,22) (80.)  
(23,24) (86.) ..  
SD\_FAN\_CYC =DAY-SCHEDULE (1,5) (0.)  
(6,22) (1.)  
(23,24) (-1.) ..



SW\_ON =WEEK-SCHEDULE (ALL) SD\_ON ..  
SW\_OFF =WEEK-SCHEDULE (ALL) SD\_OFF ..  
SW\_WT\_HT =WEEK-SCHEDULE (ALL) SD\_WT\_HT ..  
SW\_WT\_CL =WEEK-SCHEDULE (ALL) SD\_WT\_CL ..  
SW\_WT-VENT =WEEK-SCHEDULE (ALL) SD\_WT-VENT ..  
SW\_SM\_CL =WEEK-SCHEDULE (ALL) SD\_SM\_CL ..  
SW\_SM\_HT =WEEK-SCHEDULE (ALL) SD\_SM\_HT ..  
SW\_FAN\_CYC =WEEK-SCHEDULE (ALL) SD\_FAN\_CYC ..

\$ FULL ON SYSTEM  
S\_ON =SCHEDULE THRU DEC 31 SW\_ON ..

\$ FULL OFF SYSTEM  
S\_OFF =SCHEDULE THRU DEC 31 SW\_OFF ..

\$ HEATING SEASON

S\_HE-SCHED =SCHEDULE THRU MAY 15 SW\_ON  
 THRU OCT 1 SW\_OFF  
 THRU DEC 31 SW\_ON ..

\$ COOLING SEASON

S\_CL\_SCHED =SCHEDULE THRU MAY 15 SW\_OFF  
 THRU OCT 1 SW\_ON  
 THRU DEC 31 SW\_OFF ..

\$ HEATING SET TEMP

S\_HT\_SET\_F =SCHEDULE THRU MAY 15 SW\_WT\_HT  
 THRU OCT 1 SW\_SM\_HT  
 THRU DEC 31 SW\_WT\_HT ..

\$ COOLING SET TEMP

S\_CL\_SET\_F =SCHEDULE THRU MAY 15 SW\_WT\_CL  
 THRU OCT 1 SW\_SM\_CL  
 THRU DEC 31 SW\_WT\_CL ..

\$ 50%OA IN WT-100% IN SUM

S\_VENT\_SCH =SCHEDULE THRU MAY 15 SW\_WT-VENT  
 THRU OCT 1 SW\_ON  
 THRU DEC 31 SW\_WT-VENT ..

S\_HRLY-RPS =SCHEDULE THRU JAN 13 SW\_OFF  
 THRU JAN 15 SW\_ON  
 THRU AUG 13 SW\_OFF  
 THRU AUG 15 SW\_ON  
 THRU DEC 31 SW\_OFF ..

S\_FAN\_CYC =SCHEDULE THRU DEC 31 SW\_FAN\_CYC ..

\$ ZONE DESCRIPTION

pool-area =ZONE DESIGN-HEAT-T = 80.0 DESIGN-COOL-T = 81.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL  
 BASEBOARD-RATING = -91000. SIZING-OPTION = FROM-LOADS ..

\$ SYSTEM DESCRIPTION

POOL-H&V'S =SYSTEM SYSTEM-TYPE = HVSYS  
 MAX-SUPPLY-T = 120.0 HEATING-SCHEDULE = S\_HE-SCHED  
 HEAT-SET-T = 120.0 HEAT-CONTROL = COLDEST  
 OA-CONTROL = FIXED SUPPLY-CFM = 18000.  
 RATED-CFM = 18000. MIN-OUTSIDE-AIR = 0.1  
 MIN-AIR-SCH = S\_VENT\_SCH RECOVERY-EFF = 0.7  
 FAN-SCHEDULE = S\_FAN\_CYC SUPPLY-DELTA-T = 2.4  
 SUPPLY-KW = 0.00078  
 MOTOR-PLACEMENT = OUTSIDE-AIRFLOW  
 NIGHT-CYCLE-CTRL = CYCLE-ON-ANY NIGHT-VENT-DT = 0.0  
 HEATING-CAPACITY = -979020. RETURN-AIR-PATH = DUCT



ZONE-NAMES = (pool-area) ..

\$ HOURLY REPORT DESCRIPTION

H&V-BLK =REPORT-BLOCK VARIABLE-TYPE = POOL-H&V'S  
 VARIABLE-LIST = (3,5,17,39,1) ..  
 SPACE-BLK =REPORT-BLOCK VARIABLE-TYPE = pool-area  
 VARIABLE-LIST = (17,18,7,6) ..  
 AHU-RPTS = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPS  
 REPORT-BLOCK = (H&V-BLK)  
 ..  
 ZONE-RPTS = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPS  
 REPORT-BLOCK = (SPACE-BLK)  
 ..  
 END ..  
 COMPUTE SYSTEMS ..  
 INPUT PLANT ..

\$-----\$  
 \$ E Z - D O E P L A N T S I N P U T \$  
 \$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
 LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
 LINE-3 \* DENVER, CO 80227 \*  
 LINE-4 \*RUN #1 NIGHT SETBACK FOR BLDG. 8069-POOL\*  
 LINE-5 \*SWIMMING POOL AREA \* ..

ABORT ERRORS ..  
 DIAGNOSTIC WARNINGS ..  
 PLANT-REPORT VERIFICATION=(PV-A,PV-B)  
 SUMMARY=(BEPS)  
 HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

PD\_ON =DAY-SCHEDULE (1,24) (1.) ..  
 PD\_OFF =DAY-SCHEDULE (1,24) (0.) ..  
 PW\_OFF =WEEK-SCHEDULE (ALL) PD\_OFF ..  
 PW\_ON =WEEK-SCHEDULE (ALL) PD\_ON ..

\$ HEATING SEASON

P\_HEAT =SCHEDULE THRU MAY 15 PW\_ON  
 THRU OCT 1 PW\_OFF  
 THRU DEC 31 PW\_ON ..



EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 6/ 2/1995 13:44:16 SDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SETBACK FOR BLDG. 8069-POOLSWIMMING POOL AREA  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR POOL-H&V'S TOPEKA, KS

MONTH	COOLING			HEATING			WET-TEMP			MAXIMUM			ELEC-		
	ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	LOAD (KBTU/HR)	HEATING LOAD (KBTU/HR)	MAXIMUM HEATING LOAD (KBTU/HR)	TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)			
JAN	0.00000			-154.729	16	7	12.F	9.F	-488.035	12890.	23.276				
FEB	0.00000			-113.578	2	7	7.F	5.F	-439.676	11608.	23.276				
MAR	0.00000			-85.679	3	8	15.F	12.F	-445.070	12663.	23.276				
APR	0.00000			-27.135	4	6	32.F	31.F	-282.624	12063.	23.276				
MAY	0.00000			-6.053	5	6	44.F	40.F	-220.153	13058.	23.276				
JUN	0.00000			0.000					0.000	12801.	23.276				
JUL	0.00000			0.000					0.000	13138.	23.276				
AUG	0.00000			0.000					0.000	13333.	23.276				
SEP	0.00000			0.000					0.000	13190.	23.276				
OCT	0.00000			-31.096	20	8	23.F	22.F	-301.707	12282.	23.276				
NOV	0.00000			-75.425	2	6	15.F	14.F	-356.580	12181.	23.276				
DEC	0.00000			-143.377	15	7	11.F	9.F	-464.017	12824.	23.276				
TOTAL MAX	0.000			-637.071					-488.035	152029.	23.276				

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 6/ 2/1995 13:44:16 SDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SETBACK FOR BLDG. 8069-POOLSWIMMING POOL AREA  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR POOL-H&V'S TOPEKA, KS

MONTH	COOLING LOAD			HEATING LOAD			COINCIDENT LOAD			HOURS			HEATING LOAD AT COOLING PEAK			ELECTRIC LOAD AT COOLING PEAK		
	HOURS	LOAD	AVAIL.	HOURS	LOAD	AVAIL.	HOURS	LOAD	AVAIL.	FANS ON	FANS ON	FANS ON	COOLING PEAK	COOLING PEAK	COOLING PEAK	LOAD AT COOLING PEAK	LOAD AT COOLING PEAK	
JAN	0	0	744	0	0	0	619	0	0	92	0	0	0.000	0.000	0.000	0.000	0.000	
FEB	0	0	672	0	0	0	558	0	0	82	0	0	0.000	0.000	0.000	0.000	0.000	
MAR	0	0	744	0	0	0	600	0	0	73	0	31	0.000	0.000	0.000	14.040	0.000	
APR	0	0	720	0	0	0	568	0	0	58	0	271	0.000	0.000	0.000	14.040	0.000	
MAY	0	0	360	0	0	0	631	0	0	104	0	543	0.000	0.000	0.000	14.040	0.000	
JUN	0	0	0	0	0	0	621	0	0	111	0	621	0.000	0.000	0.000	14.040	0.000	
JUL	0	0	0	0	0	0	640	0	0	113	0	640	0.000	0.000	0.000	14.040	0.000	
AUG	0	0	0	0	0	0	644	0	0	117	0	644	0.000	0.000	0.000	14.040	0.000	
SEP	0	0	0	0	0	0	652	0	0	142	0	652	0.000	0.000	0.000	14.040	0.000	
OCT	0	0	720	0	0	0	579	0	0	52	0	247	0.000	0.000	0.000	0.000	0.000	
NOV	0	0	720	0	0	0	576	0	0	66	0	47	0.000	0.000	0.000	0.000	0.000	
DEC	0	0	744	0	0	0	618	0	0	91	0	0	0.000	0.000	0.000	0.000	0.000	
ANNUAL	0	0	5424	0	0	0	7306	0	0	1101	0	3696						

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY 51.690 92.034 31/22	NATURAL-GAS 216.995 614.175 16/ 7
JAN	TOTAL (MBTU) PEAK (KBTU) DY/HR	46.386 92.034 28/22	165.353 563.045 2/ 7
FEB	TOTAL (MBTU) PEAK (KBTU) DY/HR	49.217 92.034 31/22	128.666 568.795 3/ 8
MAR	TOTAL (MBTU) PEAK (KBTU) DY/HR	43.685 92.034 16/ 9	43.370 390.479 4/ 6
APR	TOTAL (MBTU) PEAK (KBTU) DY/HR	45.248 92.034 9/ 7	10.110 319.067 5/ 6
MAY	TOTAL (MBTU) PEAK (KBTU) DY/HR	43.709 79.475 30/22	0.000 0.000 30/ 1
JUN	TOTAL (MBTU) PEAK (KBTU) DY/HR	44.859 79.475 31/20	0.000 0.000 31/ 1
JUL	TOTAL (MBTU) PEAK (KBTU) DY/HR	45.524 79.475 31/22	0.000 0.000 31/ 1
AUG	TOTAL (MBTU) PEAK (KBTU) DY/HR	45.037 79.475 30/22	0.000 0.000 30/ 1
SEP	TOTAL (MBTU) PEAK (KBTU) DY/HR	44.852 92.034 31/12	50.043 411.978 20/ 8
OCT	TOTAL (MBTU) PEAK (KBTU) DY/HR	47.200 92.034 30/22	115.069 472.981 2/ 6
NOV	TOTAL (MBTU) PEAK (KBTU) DY/HR	51.381 92.034 31/20	203.845 588.899 15/ 7
DEC	TOTAL (MBTU) PEAK (KBTU) DY/HR	558.787 92.034	933.452 614.175
	ONE YEAR USE/PEAK		

EMC ENGINEERS INC. E3DOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 6/ 2/1995 13:44:16 PDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SETBACK FOR BLDG. 8069-POOLSWIMMING POOL AREA TOPEKA, KS  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE

ENERGY TYPE	ELECTRICITY	NATURAL-GAS
IN SITE MBTU -		
CATEGORY OF USE		
SPACE HEAT	33.37	933.45
SPACE COOL	0.00	0.00
HVAC AUX	356.52	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	168.85	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	0.00	0.00
TOTAL	558.75	933.45

TOTAL SITE ENERGY 1492.24 MBTU 226.1 KBTU/SQFT-YR GROSS-AREA 226.1 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 2611.49 MBTU 395.7 KBTU/SQFT-YR GROSS-AREA 395.7 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 0.0  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
LINE-3 \* DENVER, CO 80227 \*

LINE-4 \*RUN #2 DDC CONTROL FOR BLDG. #8069-POOL \*  
LINE-5 \*SWIMMING POOL AREA \* ..

ABORT ERRORS ..  
DIAGNOSTIC WARNINGS ..  
SYSTEMS-REPORT VERIFICATION=(SV-A)  
SUMMARY=(SS-A,SS-C,SS-K,SS-N,SS-O)  
HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

SD\_ON =DAY-SCHEDULE (1,24) (1.) ..  
SD\_OFF =DAY-SCHEDULE (1,24) (0.) ..  
SD\_WT\_HT =DAY-SCHEDULE (1,24) (80.) ..  
SD\_WT\_CL =DAY-SCHEDULE (1,24) (82.) ..  
SD\_WT-VENT =DAY-SCHEDULE (1,24) (0.5) ..  
SD\_SM\_CL =DAY-SCHEDULE (1,24) (84.) ..  
SD\_SM\_HT =DAY-SCHEDULE (1,24) (82.) ..



SW\_ON =WEEK-SCHEDULE (ALL) SD\_ON ..  
SW\_OFF =WEEK-SCHEDULE (ALL) SD\_OFF ..  
SW\_WT\_HT =WEEK-SCHEDULE (ALL) SD\_WT\_HT ..  
SW\_WT\_CL =WEEK-SCHEDULE (ALL) SD\_WT\_CL ..  
SW\_WT-VENT =WEEK-SCHEDULE (ALL) SD\_WT-VENT ..  
SW\_SM\_CL =WEEK-SCHEDULE (ALL) SD\_SM\_CL ..  
SW\_SM\_HT =WEEK-SCHEDULE (ALL) SD\_SM\_HT ..

\$ FULL ON SYSTEM

S\_ON =SCHEDULE THRU DEC 31 SW\_ON ..

\$ FULL OFF SYSTEM

S\_OFF =SCHEDULE THRU DEC 31 SW\_OFF ..

\$ HEATING SEASON

S\_HE-SCHED =SCHEDULE THRU MAY 15 SW\_ON  
THRU OCT 1 SW\_OFF  
THRU DEC 31 SW\_ON ..

\$ COOLING SEASON

S\_CL\_SCHED =SCHEDULE THRU MAY 15 SW\_OFF  
THRU OCT 1 SW\_ON  
THRU DEC 31 SW\_OFF ..

\$ HEATING SET TEMP

S\_HT\_SET\_F =SCHEDULE THRU MAY 15 SW\_WT\_HT  
THRU OCT 1 SW\_SM\_HT  
THRU DEC 31 SW\_WT\_HT ..

## \$ COOLING SET TEMP

S\_CL\_SET\_F =SCHEDULE THRU MAY 15 SW\_WT\_CL  
 THRU OCT 1 SW\_SM\_CL  
 THRU DEC 31 SW\_WT\_CL ..

## \$ 50%OA IN WT-100% IN SUM

S\_VENT\_SCH =SCHEDULE THRU MAY 15 SW\_WT-VENT  
 THRU OCT 1 SW\_ON  
 THRU DEC 31 SW\_WT-VENT ..

## S\_HRLY-RPS =SCHEDULE THRU JAN 13 SW\_OFF

THRU JAN 15 SW\_ON  
 THRU AUG 13 SW\_OFF  
 THRU AUG 15 SW\_ON  
 THRU DEC 31 SW\_OFF ..

## \$ ZONE DESCRIPTION

pool-area =ZONE DESIGN-HEAT-T = 80.0 DESIGN-COOL-T = 81.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL  
 BASEBOARD-RATING = -91000. SIZING-OPTION = FROM-LOADS ..

## \$ SYSTEM DESCRIPTION

POOL-H&V'S =SYSTEM SYSTEM-TYPE = HVSYS  
 MAX-SUPPLY-T = 120.0 HEATING-SCHEDULE = S\_HE-SCHED  
 HEAT-SET-T = 120.0 HEAT-CONTROL = COLDEST  
 OA-CONTROL = FIXED SUPPLY-CFM = 18000.  
 RATED-CFM = 18000. MIN-OUTSIDE-AIR = 0.1  
 MIN-AIR-SCH = S\_VENT\_SCH RECOVERY-EFF = 0.7  
 SUPPLY-DELTA-T = 2.4 SUPPLY-KW = 0.00078  
 MOTOR-PLACEMENT = OUTSIDE-AIRFLOW  
 NIGHT-CYCLE-CTRL = STAY-OFF NIGHT-VENT-DT = 0.0  
 HEATING-CAPACITY = -979020. RETURN-AIR-PATH = DUCT  
 ZONE-NAMES = (pool-area) ..

## \$ HOURLY REPORT DESCRIPTION

H&V-BLK =REPORT-BLOCK VARIABLE-TYPE = POOL-H&V'S  
 VARIABLE-LIST = (3,5,17,39,1) ..  
 SPACE-BLK =REPORT-BLOCK VARIABLE-TYPE = pool-area  
 VARIABLE-LIST = (17,18,7,6) ..  
 AHU-RPTS = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPS  
 REPORT-BLOCK = (H&V-BLK)  
 ..  
 ZONE-RPTS = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPS  
 REPORT-BLOCK = (SPACE-BLK)  
 ..  
 END ..

EMC ENGINEERS INC. EZZOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 6/ 2/1995 13:50: 1 SDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. #8069-POOL SWIMMING POOL AREA  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR POOL-H&V'S TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-171.558	4	3	8.F	7.F	-443.821	14645.
FEB	0.00000				-125.913	3	6	-1.F	-2.F	-395.191	13209.
MAR	0.00000				-97.555	3	8	15.F	12.F	-373.653	14685.
APR	0.00000				-33.360	4	5	33.F	31.F	-239.230	14197.
MAY	0.00000				-7.866	5	6	44.F	40.F	-162.716	14645.
JUN	0.00000				0.000					0.000	14191.
JUL	0.00000				0.000					0.000	14598.
AUG	0.00000				0.000					0.000	14737.
SEP	0.00000				0.000					0.000	14145.
OCT	0.00000				-36.894	20	8	23.F	22.F	-253.369	14598.
NOV	0.00000				-85.355	2	5	16.F	15.F	-303.817	14202.
DEC	0.00000				-157.838	15	5	8.F	7.F	-397.923	14593.
TOTAL MAX	0.000				-716.337					-443.821	172450.

EMC ENGINEERS INC. EZZOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 6/ 2/1995 13:50: 1 SDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. #8069-POOL SWIMMING POOL AREA  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR POOL-H&V'S TOPEKA, KS

MONTH	N U M B E R O F H O U R S				C O I N C I D E N T L O A D S					
	HOURS HEATING LOAD	HOURS COOLING LOAD	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.	HOURS COINCIDENT COOL-HEAT LOAD	HOURS FLOATING	HOURS NIGHT VENTING	HOURS FLOATING WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)
JAN	744	0	744	0	744	0	0	0	-201.530	14.040
FEB	665	0	672	0	672	0	0	7	-193.814	14.040
MAR	677	0	744	0	744	0	0	67	-191.316	14.040
APR	397	0	720	0	720	0	0	323	-65.193	14.040
MAY	135	0	360	0	744	0	0	609	0.000	14.040
JUN	0	0	720	0	720	0	0	720	0.000	14.040
JUL	0	0	744	0	744	0	0	744	0.000	14.040
AUG	0	0	744	0	744	0	0	744	0.000	14.040
SEP	0	0	720	0	720	0	0	720	0.000	14.040
OCT	452	0	720	0	744	0	0	292	-154.770	14.040
NOV	642	0	720	0	744	0	0	78	-238.024	14.040
DEC	744	0	744	0	744	0	0	0	-228.118	14.040
ANNUAL	0	0	5424	0	8760	0	0	4304		

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 6/ 2/1995 13:50: 1 PDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. #8069-POOL SWIMMING POOL AREA  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY 58.322 90.896 31/22	NATURAL-GAS 239.504 558.534 4/ 3
JAN	TOTAL (MBTU) PEAK (KBTU) DY/HR	58.322 90.896 31/22	239.504 558.534 4/ 3
FEB	TOTAL (MBTU) PEAK (KBTU) DY/HR	52.399 90.896 28/22	182.406 507.067 3/ 6
MAR	TOTAL (MBTU) PEAK (KBTU) DY/HR	56.770 90.896 31/22	145.759 483.936 3/ 8
APR	TOTAL (MBTU) PEAK (KBTU) DY/HR	51.557 90.896 15/ 8	53.428 334.922 4/ 5
MAY	TOTAL (MBTU) PEAK (KBTU) DY/HR	50.914 90.407 9/ 6	13.357 246.518 5/ 6
JUN	TOTAL (MBTU) PEAK (KBTU) DY/HR	48.455 79.475 30/22	0.000 0.000 30/ 1
JUL	TOTAL (MBTU) PEAK (KBTU) DY/HR	49.845 79.475 31/20	0.000 0.000 31/ 1
AUG	TOTAL (MBTU) PEAK (KBTU) DY/HR	50.318 79.475 31/22	0.000 0.000 31/ 1
SEP	TOTAL (MBTU) PEAK (KBTU) DY/HR	48.297 79.475 30/22	0.000 0.000 30/ 1
OCT	TOTAL (MBTU) PEAK (KBTU) DY/HR	53.496 90.896 31/11	60.281 350.973 20/ 8
NOV	TOTAL (MBTU) PEAK (KBTU) DY/HR	54.706 90.896 30/22	129.610 407.520 2/ 5
DEC	TOTAL (MBTU) PEAK (KBTU) DY/HR	58.069 90.896 31/20	223.818 509.986 15/ 5
	ONE YEAR USE/PEAK	633.148 90.896	1048.161 558.534

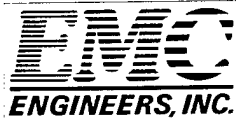
EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 6/ 2/1995 13:50: 1 PDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. #8069-POOL SWIMMING POOL AREA  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE	ELECTRICITY	NATURAL-GAS
IN SITE MBTU -		
SPACE HEAT	37.26	1048.16
SPACE COOL	0.00	0.00
HVAC AUX	427.01	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	168.86	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	0.00	0.00
TOTAL	633.12	1048.16

TOTAL SITE ENERGY 1681.31 MBTU 254.7 KBTU/SQFT-YR GROSS-AREA 254.7 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 2949.51 MBTU 446.9 KBTU/SQFT-YR GROSS-AREA 446.9 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 0.0  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.







DENVER - ATLANTA

PROJECT: FEASIBILITY STUDY FOR  
 INSTALLATION OF UMCS  
 LOCATION: FORT RILEY, KANSAS

EMC NO: 1406-001  
 CALC. BY: AJN  
 CHECKED BY: CEL  
 DATE: 05-Jul-95

BUILDING NO.: 8069  
 BLDG. TYPE: INDOOR SWIM POOL/GYM - GYM & LOCKERS

**ENERGY CONSTANT CALCULATIONS**

	BASERUN	RUN1	RUN2	RUN3	RUN4	RUN5
HEATING (MBtu)	3150.3	2080.6	3122.5	2085.1	2070.7	935.5
COOLING (kWH)	514,439	417,987	511,096	416,045	503,475	483,270

SUPPLY AIR FAN	44,000 CFM
FLOOR AREA	21,862 FT <sup>2</sup>
CFMI	14990 CFM
UA	2515 BTU/HR-°F
BLDG CONSTR.	2 (1 FOR LIGHT) (2 FOR HEAVY)

EZDOE COMPUTER RUN DEFINITION:	
BASERUN	EXISTING OPERATION
RUN1	NIGHT SETBACK
RUN2	DDC CONTROL
RUN3	ECONOMIZER
RUN4	NIGHTTIME INFILTRATION (OA)
RUN5	DAYTIME INFILTRATION (OA)

HOURS OF OCCUPANCY			ANNUAL HEATING & COOLING HOURS	
M-F	600	2200	80 HR	HR. ON HEATING 3308 HR/YR
SAT.	900	2000	11 HR	HR. ON COOLING 2011 HR/YR
SUN.	900	2000	11 HR	HR. OFF HEATING 2140 HR/YR
	TOTAL OCCUPY HR.		102 HR/WK	HR. OFF COOLING 1301 HR/YR
	TOTAL UNOCC. HR.		66 HR/WK	
	ANNUAL OCCUPY HR.		5319 HR/YR	
	ANNUAL UNOCC. HR.		3441 HR/YR	

PRESENT HR. OF OPERATION FOR SYS. WITH HEATING AND COOLING 8760 HR/YR  
 PRESENT HR. OF OPERATION FOR SYS. WITH HEATING ONLY 5448 HR/YR  
 PRESENT HR. OF OPERATION FOR SYS. WITH COOLING ONLY 3312 HR/YR  
 HRS SAVED (HTG ONLY) 5448 - 3308 = 2140 HR/YR  
 HRS SAVED (CLG ONLY) 3312 - 2011 = 1301 HR/YR

HOAUHC	3150.25 MBtu	-	2070.71 MBtu	=	2.09E+01 Btu/CFM-HR
	14990 CFM	x	3441 HR/YR		
HOAUH	3150.25 MBtu	-	2070.71 MBtu	=	3.36E+01 Btu/CFM-HR
	14990 CFM	x	2140 HR/YR		
COAUHC	514,438.9 kWH	-	503,474.9 kWH	=	2.13E-04 kWH/CFM-HR
	14990 CFM	x	3441 HR/YR		
COAUC	514,438.9 kWH	-	503,474.9 kWH	=	5.62E-04 kWH/CFM-HR
	14990 CFM	x	1301 HR/YR		
HOAOHC	3150.25 MBtu	-	935.52 MBtu	=	2.78E+01 Btu/CFM-HR
	14990 CFM	x	5319 HR/YR		
HOAOH	3150.25 MBtu	-	935.52 MBtu	=	4.47E+01 Btu/CFM-HR
	14990 CFM	x	3308 HR/YR		
COAOHC	514,438.9 kWH	-	483,269.9 kWH	=	3.91E-04 kWH/CFM-HR
	14990 CFM	x	5319 HR/YR		
COAOC	514,438.9 kWH	-	483,269.9 kWH	=	1.03E-03 kWH/CFM-HR
	14990 CFM	x	2011 HR/YR		
DC DUTY	1 / 6 (10 MINUTES PER HOUR)			=	0.17
DC DEMAND	1 / 6 (10 MINUTES PER HOUR)			=	0.17
ECC	417,987.1 kWH	-	416,044.5 kWH	=	2.20E-05 kWH/CFM-HR
	44000 CFM	x	2011 HR/YR		
ECHC	417,987.1 kWH	-	416,044.5 kWH	=	8.30E-06 kWH/CFM-HR
	44000 CFM	x	5319 HR/YR		
NSUCHC	514,438.9 kWH	-	417,987.1 kWH	=	6.37E-04 kWH/CFM-HR
	44000 CFM	x	3441 HR/YR		
NSUCC	514,438.9 kWH	-	417,987.1 kWH	=	1.68E-03 kWH/CFM-HR
	44000 CFM	x	1301 HR/YR		
DDCCHC	514,438.9 kWH	-	511,095.8 kWH	=	1.43E-05 kWH/CFM-HR
	44000 CFM	x	5319 HR/YR		
DDCCC	514,438.9 kWH	-	511,095.8 kWH	=	3.78E-05 kWH/CFM-HR
	44000 CFM	x	2011 HR/YR		
NSC	3150.25 MBtu	-	2080.63 MBtu	=	4.25E+05 Btu/UA
	2515.224 UA				
DDCH	3150.25 MBtu	-	3122.49 MBtu	=	1.10E+04 Btu/UA
	2515.224 UA				
OPT	(2 HR/DAY X 240 DAY/YR)		175 HR/YR	=	305 HR/YR
CHWR	(1.10 kW X 0.012 Eff. X 664 HRS X 2 Degrees of Reset)			=	17.5 kWH/TON
OAR	567 HR/YR	x	0.01	=	5.67 HR/YR



INPUT LOADS ..

```

$-----$
$ E Z - D O E   L O A D S   I N P U T $
$-----$

```

\$ GENERAL PROJECT DATA

```

TITLE  LINE-1 *      EMC      ENGINEERS      INC.      *
LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
LINE-3 *      DENVER,      CO      80227      *

LINE-4 *BASELINE SIMULATION FOR BLDG. 8069-REMAI*
LINE-5 *THE REMAINDER OF THE BLDG. (LESS POOL) * ..

```

```

ABORT          ERRORS ...
DIAGNOSTIC     WARNINGS ..
LOADS-REPORT   VERIFICATION=(LV-D)
               SUMMARY=(LS-C,LS-D)
               HOURLY-DATA-SAVE = YES ..
BUILDING-LOCATION  LATITUDE = 39.0
                LONGITUDE = 96.5
                ALTITUDE = 1065.
                TIME-ZONE = 6
                GROSS-AREA = 21862
                SHIELDING-COEF = 0.29
                X-REF = 0.0
                Y-REF = 0.0 ..
RUN-PERIOD     JAN 1 1994 THRU DEC 31 1994 ..

```

\$ SCHEDULES

```

LD_TH_LITE =DAY-SCHEDULE (1,7) (0.)
              (8,11) (0.5)
              (12,22) (1.)
              (23,24) (0.) ..

LD_WKEN-LT =DAY-SCHEDULE (1,8) (0.)
              (9,20) (1.)
              (21,24) (0.) ..

LD_ON       =DAY-SCHEDULE (1,24) (1.) ..

LD_OFF     =DAY-SCHEDULE (1,24) (0.) ..

LD_LT-MTWF =DAY-SCHEDULE (1,5) (0.)
              (6,22) (1.)
              (23,24) (0.) ..

LW_ON      =WEEK-SCHEDULE (ALL) LD_ON ..

LW_OFF     =WEEK-SCHEDULE (ALL) LD_OFF ..

```

LW\_PEOP/LT =WEEK-SCHEDULE (MON) LD\_LT-MTWF  
 (TUE) LD\_LT-MTWF  
 (WED) LD\_LT-MTWF  
 (THU) LD\_TH\_LITE  
 (FRI) LD\_LT-MTWF  
 (SAT) LD\_WKEN-LT  
 (SUN) LD\_WKEN-LT  
 (HOL) LD\_WKEN-LT ..

## \$ ON 100% OF THE TIME

L\_ON =SCHEDULE THRU DEC 31 LW\_ON ..

## \$ OFF 100% OF THE TIME

L\_OFF =SCHEDULE THRU DEC 31 LW\_OFF ..

## \$ PEOPLE LOAD

L\_PEOPLE =SCHEDULE THRU DEC 31 LW\_PEOP/LT ..

## \$ CONSTRUCTION TYPES

## \$ EXTERIOR WALL BRICK, INSL, PLASTER

WALL-1 =LAYERS MATERIAL=(BK01,AL11,IN12,IN23,GP03) I-F-R= 0.6100  
 THICKNESS=(0.333,0.000,0.458,0.167,0.063) ..

EXWALL-1 =CONSTRUCTION LAYERS = WALL-1  
 ABSORPTANCE = 0.880  
 ROUGHNESS = 2 ..

FLOOR =CONSTRUCTION U-VALUE = 0.020  
 ABSORPTANCE = 0.610  
 ROUGHNESS = 5 ..

## \$ BUILT-UP ROOF W/INSL&amp; NO CEILING

BLT-ROOF =LAYERS MATERIAL=(HF-E2,HF-A3,IN61,IN45,IN61,HF-A3)  
 THICKNESS=(0.042,0.005,0.042,0.167,0.042,0.005) ..

ROOF-1 =CONSTRUCTION LAYERS = BLT-ROOF  
 ABSORPTANCE = 0.800  
 ROUGHNESS = 1 ..

## \$ STANDARD METAL DOOR

DOOR-MET =CONSTRUCTION U-VALUE = 0.020  
 ABSORPTANCE = 0.860  
 ROUGHNESS = 5 ..

2\_PN\_STD =GLASS-TYPE GLASS-TYPE-CODE = 2  
 PANES = 2 ..

## \$ SPACE DESCRIPTION

B-BALL/1ST =SPACE AREA = 15141.0 VOLUME = 383733.0  
 TEMPERATURE = (73.) ZONE-TYPE = CONDITIONED  
 PEOPLE-SCHEDULE = L\_PEOPLE AREA/PERSON = 336.0  
 PEOPLE-HG-LAT = 1090.0 PEOPLE-HG-SENS = 710.0  
 LIGHTING-TYPE = INCAND LIGHTING-KW = 22.55  
 LIGHT-TO-SPACE = 1.0 LIGHTING-SCHEDULE = L\_PEOPLE  
 SOURCE-SENSIBLE = 0.0 FURN-WEIGHT = 0.5  
 INF-METHOD = AIR-CHANGE AIR-CHANGES/HR = 0.06  
 INF-SCHEDULE = L\_ON ..

E-W HEIGHT = 14.0 WIDTH = 56.0 CONS = EXWALL-1  
 AZIMUTH = 90 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 9.0 WIDTH = 32.0 G-T = 2\_PN\_STD  
 SETBACK = 0.2 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 25.0 WIDTH = 91.0 CONS = EXWALL-1  
 AZIMUTH = 90 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 27.5 WIDTH = 111.0 CONS = EXWALL-1  
 AZIMUTH = 180 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 6.0 WIDTH = 2.5 G-T = 2\_PN\_STD  
 MULTIPLIER = 4.0 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 14.0 WIDTH = 56.0 CONS = EXWALL-1  
 AZIMUTH = 270 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 25.0 WIDTH = 91.0 CONS = EXWALL-1  
 AZIMUTH = 270 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

U-W HEIGHT = 8.0 WIDTH = 91.0 CONS = FLOOR  
 AZIMUTH = 270 ..

U-W HEIGHT = 8.0 WIDTH = 90.0 CONS = FLOOR  
 AZIMUTH = 90 ..

U-W HEIGHT = 8.0 WIDTH = 94.0 CONS = FLOOR  
 AZIMUTH = 180 ..

U-W HEIGHT = 123.0 WIDTH = 123.0 CONS = FLOOR ..

ROOF HEIGHT = 123.0 WIDTH = 123.0 CONS = ROOF-1  
 TILT = 0 SKY-FORM-FACTOR = 1.0 ..

H-BALL/2ND =SPACE AREA = 6721.0 VOLUME = 105873.0  
 TEMPERATURE = (73.) ZONE-TYPE = CONDITIONED

PEOPLE-SCHEDULE = L\_PEOPLE AREA/PERSON = 336.0  
 PEOPLE-HG-LAT = 965.0 PEOPLE-HG-SENS = 635.0  
 LIGHTING-TYPE = SUS-FLUOR LIGHTING-W/SQFT = 1.3  
 LIGHT-TO-SPACE = 1.0 LIGHTING-SCHEDULE = L\_PEOPLE  
 SOURCE-SENSIBLE = 0.0 FURN-WEIGHT = 0.5  
 INF-METHOD = AIR-CHANGE AIR-CHANGES/HR = 0.06  
 INF-SCHEDULE = L\_ON ..

E-W HEIGHT = 19.0 WIDTH = 56.0 CONS = EXWALL-1  
 AZIMUTH = 90 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 9.0 WIDTH = 35.0 G-T = 2\_PN\_STD  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 7.0 WIDTH = 13.0 G-T = 2\_PN\_STD  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 20.0 WIDTH = 19.0 CONS = EXWALL-1  
 AZIMUTH = 180 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 19.0 WIDTH = 41.0 CONS = EXWALL-1  
 AZIMUTH = 270 INSIDE-VIS-REFL = 0.2 ..

U-W HEIGHT = 41.0 WIDTH = 41.0 CONS = FLOOR ..

ROOF HEIGHT = 82.0 WIDTH = 82.0 CONS = ROOF-1  
 TILT = 0 SKY-FORM-FACTOR = 1.0 ..

U-W HEIGHT = 8.0 WIDTH = 9.0 CONS = FLOOR  
 AZIMUTH = 180 ..

U-W HEIGHT = 8.0 WIDTH = 9.0 CONS = FLOOR  
 AZIMUTH = 180 ..

END ..  
 COMPUTE LOADS ..

INPUT SYSTEMS ..

\$-----\$  
 \$ E Z - D O E S Y S T E M S I N P U T \$  
 \$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
 LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
 LINE-3 \* DENVER, CO 80227 \*

LINE-4 \*BASELINE SIMULATION FOR BLDG. 8069-REMAI\*  
 LINE-5 \*THE REMAINDER OF THE BLDG. (LESS POOL) \* ..

ABORT ERRORS ..

```

DIAGNOSTIC          WARNINGS ..
SYSTEMS-REPORT     VERIFICATION=(SV-A)
                   SUMMARY=(SS-A,SS-C,SS-K,SS-O)
                   HOURLY-DATA-SAVE = YES ..

```

## \$ SCHEDULES

```

SD_ON      =DAY-SCHEDULE (1,24) (1.) ..
SD_OFF     =DAY-SCHEDULE (1,24) (0.) ..
SD_WT_HT   =DAY-SCHEDULE (1,24) (74.) ..
SD_SM_CL   =DAY-SCHEDULE (1,24) (72.) ..
SD_WINT_OA =DAY-SCHEDULE (1,24) (0.37) ..
SD_WT_CL   =DAY-SCHEDULE (1,24) (76.) ..
SD_SM_HT   =DAY-SCHEDULE (1,24) (70.) ..

SW_ON      =WEEK-SCHEDULE (ALL) SD_ON ..

SW_OFF     =WEEK-SCHEDULE (ALL) SD_OFF ..

SW_WT_HT   =WEEK-SCHEDULE (ALL) SD_WT_HT ..

SW_SM_CL   =WEEK-SCHEDULE (ALL) SD_SM_CL ..

SW_WINT_OA =WEEK-SCHEDULE (ALL) SD_WINT_OA ..

SW_WT_CL   =WEEK-SCHEDULE (ALL) SD_WT_CL ..

SW_SM_HT   =WEEK-SCHEDULE (ALL) SD_SM_HT ..

$ FULL ON SYSTEM
S_ON       =SCHEDULE THRU DEC 31 SW_ON ..

$ FULL OFF SYSTEM
S_OFF      =SCHEDULE THRU DEC 31 SW_OFF ..

$ HEATING SEASON
S_HE-SCHED =SCHEDULE THRU MAY 15 SW_ON
            THRU OCT  1 SW_OFF
            THRU DEC 31 SW_ON ..

$ COOLING SEASON
S_CL_SCHED =SCHEDULE THRU MAY 15 SW_OFF
            THRU OCT  1 SW_ON
            THRU DEC 31 SW_OFF ..

$ HEATING SET TEMP
S_HT_SET_F =SCHEDULE THRU MAY 15 SW_WT_HT
            THRU OCT  1 SW_SM_HT
            THRU DEC 31 SW_WT_HT ..

$ COOLING SET TEMP
S_CL_SET_F =SCHEDULE THRU MAY 15 SW_WT_CL
            THRU OCT  1 SW_SM_CL
            THRU DEC 31 SW_WT_CL ..

```



## \$ OUTSIDE AIR SCHEDULE

S\_OA\_SCHED =SCHEDULE THRU MAY 15 SW\_WINT\_OA  
 THRU OCT 1 SW\_ON  
 THRU DEC 31 SW\_WINT\_OA ..

S\_HRLY-RPT =SCHEDULE THRU JAN 13 SW\_OFF  
 THRU JAN 15 SW\_ON  
 THRU JUL 21 SW\_OFF  
 THRU JUL 23 SW\_ON  
 THRU DEC 31 SW\_OFF ..

## \$ ZONE DESCRIPTION

B-BALL/1ST =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL  
 SIZING-OPTION = FROM-LOADS ..

H-BALL/2ND =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL  
 SIZING-OPTION = FROM-LOADS ..

## \$ SYSTEM DESCRIPTION

H&VSYSTEMS =SYSTEM SYSTEM-TYPE = HVSYS  
 MAX-SUPPLY-T = 120.0 HEATING-SCHEDULE = S\_HE-SCHED  
 OA-CONTROL = FIXED SUPPLY-CFM = 35000.  
 RATED-CFM = 35000. MIN-OUTSIDE-AIR = 0.37  
 MIN-AIR-SCH = S\_OA\_SCHED SUPPLY-DELTA-T = 2.4  
 SUPPLY-KW = 0.00078  
 MOTOR-PLACEMENT = OUTSIDE-AIRFLOW  
 NIGHT-CYCLE-CTRL = STAY-OFF NIGHT-VENT-DT = 0.0  
 HEATING-CAPACITY = -1291523.  
 ZONE-NAMES = (B-BALL/1ST) ..

AHU'S\_1&2 =SYSTEM SYSTEM-TYPE = PSZ  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_HE-SCHED  
 COOLING-SCHEDULE = S\_CL\_SCHED OA-CONTROL = FIXED  
 SUPPLY-CFM = 7315. RATED-CFM = 7315.  
 MIN-OUTSIDE-AIR = 0.2 SUPPLY-DELTA-T = 1.8  
 SUPPLY-KW = 0.00059  
 MOTOR-PLACEMENT = OUTSIDE-AIRFLOW  
 FAN-PLACEMENT = BLOW-THROUGH  
 NIGHT-CYCLE-CTRL = STAY-OFF NIGHT-VENT-DT = 0.0  
 COOLING-CAPACITY = 171850. COOL-SH-CAP = 144543.  
 COOL-FT-MIN = 0. HEATING-CAPACITY = -100648.  
 MIN-HP-T = 0. MAX-HP-SUPP-T = 0. DEFROST-T = 0.  
 CRANKCASE-MAX-T = 0. OUTSIDE-FAN-T = 45.  
 HEAT-SOURCE = HOT-WATER SIZING-OPTION = COINCIDENT

ZONE-NAMES = (H-BALL/2ND) ..

\$ HOURLY REPORT DESCRIPTION

H&V-BLK =REPORT-BLOCK VARIABLE-TYPE = H&VSYSTEMS  
 VARIABLE-LIST = (3,5,17,39) ..

SZ-AHU-BLK =REPORT-BLOCK VARIABLE-TYPE = AHU'S\_1&2  
 VARIABLE-LIST = (3,5,6,17,39) ..

H&VZN-BLK =REPORT-BLOCK VARIABLE-TYPE = B-BALL/1ST  
 VARIABLE-LIST = (17,18,7,6) ..

SZZONE-BLK =REPORT-BLOCK VARIABLE-TYPE = H-BALL/2ND  
 VARIABLE-LIST = (17,18,7,6) ..

AHU-RPTS = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (H&V-BLK,SZ-AHU-BLK)

..

ZONE-RPTS = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (H&VZN-BLK,SZZONE-BLK)

..

END ..

COMPUTE SYSTEMS ..

INPUT PLANT ..

\$-----\$  
 \$ E Z - D O E P L A N T S I N P U T \$  
 \$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*

LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*

LINE-3 \* DENVER, CO 80227 \*

LINE-4 \*BASELINE SIMULATION FOR BLDG. 8069-REMAI\*

LINE-5 \*THE REMAINDER OF THE BLDG. (LESS POOL) \* ..

ABORT ERRORS ..

DIAGNOSTIC WARNINGS ..

PLANT-REPORT VERIFICATION=(PV-A)  
 SUMMARY=(PS-B,BEPS)  
 HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

PD\_ON =DAY-SCHEDULE (1,24) (1.) ..

PD\_OFF =DAY-SCHEDULE (1,24) (0.) ..

PW\_ON =WEEK-SCHEDULE (ALL) PD\_ON ..

PW\_OFF =WEEK-SCHEDULE (ALL) PD\_OFF ..

\$ HEATING SEASON

P\_HEAT =SCHEDULE THRU MAY 15 PW\_ON  
THRU OCT 1 PW\_OFF  
THRU DEC 31 PW\_ON ..

\$ COOLING SEASON

P\_COOL =SCHEDULE THRU MAY 15 PW\_OFF  
THRU OCT 1 PW\_ON  
THRU DEC 31 PW\_OFF ..

\$ EQUIPMENT DESCRIPTION

BOIL-HW =PLANT-EQUIPMENT TYPE = HW-BOILER  
SIZE = -999. ..

DX\_CHILLER =PLANT-EQUIPMENT TYPE = HERM-REC-CHLR  
SIZE = -999. INSTALLED-NUMBER = 2  
MAX-NUMBER-AVAIL = 2 ..

PLANT-PARAMETERS BOILER-FUEL = NATURAL-GAS HERM-REC-COND-TYPE = AIR  
CCIRC-HEAD = 0.0 HCIRC-HEAD = 58.0 ..

ENERGY-RESOURCE RESOURCE = ELECTRICITY ..  
ENERGY-RESOURCE RESOURCE = NATURAL-GAS ..

HEAT\_SEASO =LOAD-ASSIGNMENT TYPE = HEATING  
OPERATION-MODE = RUN-NEEDED  
  
LOAD-RANGE = 0.000  
PLANT-EQUIPMENT = BOIL-HW  
NUMBER = 1 ..

COOL\_SEASO =LOAD-ASSIGNMENT TYPE = COOLING  
OPERATION-MODE = RUN-NEEDED  
  
LOAD-RANGE = 0.000  
PLANT-EQUIPMENT = DX\_CHILLER  
NUMBER = 2 ..

END ..  
COMPUTE PLANT ..  
STOP ..

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/17/1995 10:48:10 LDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. 8069-REMAITHE REMAINDER OF THE BLDG. (LESS POOL)  
 REPORT- LV-D DETAILS OF EXTERIOR SURFACES IN THE PROJECT TOPEKA, KS

NUMBER OF EXTERIOR SURFACES 10 RECTANGULAR 10 OTHER 0  
 (U-VALUE INCLUDES INSIDE AIR FILM PLUS OUTSIDE AIR FILM AT 7.5 MPH WINDSPEED )

SURFACE	SPACE	U-VALUE (BTU/HR-SQFT-F)	GLASS AREA (SQFT)	U-VALUE (BTU/HR-SQFT-F)	WALL AREA (SQFT)	U-VALUE (BTU/HR-SQFT-F)	GLASS+ OPAQUE AREA (SQFT)	U-VALUE (BTU/HR-SQFT-F)	WALL+ GLASS AREA (SQFT)	U-VALUE (BTU/HR-SQFT-F)	GLASS+ OPAQUE AREA (SQFT)	AZIMUTH
B-BALL/1ST		0.490	288.00	0.037	496.00	0.203	784.00	0.037	784.00	0.037	784.00	EAST
B-BALL/1ST		0.000	0.00	0.037	2275.00	0.037	2275.00	0.037	2275.00	0.037	2275.00	EAST
H-BALL/2ND		0.490	406.00	0.037	658.00	0.210	1064.00	0.037	1064.00	0.210	1064.00	EAST
B-BALL/1ST		0.490	60.00	0.037	2992.50	0.046	3052.50	0.037	3052.50	0.046	3052.50	SOUTH
H-BALL/2ND		0.000	0.00	0.037	380.00	0.037	380.00	0.037	380.00	0.037	380.00	SOUTH
B-BALL/1ST		0.000	0.00	0.037	784.00	0.037	784.00	0.037	784.00	0.037	784.00	WEST
B-BALL/1ST		0.000	0.00	0.037	2275.00	0.037	2275.00	0.037	2275.00	0.037	2275.00	WEST
H-BALL/2ND		0.000	0.00	0.037	779.00	0.037	779.00	0.037	779.00	0.037	779.00	WEST
B-BALL/1ST		0.000	0.00	0.062	15129.00	0.062	15129.00	0.062	15129.00	0.062	15129.00	ROOF
H-BALL/2ND		0.000	0.00	0.062	6724.00	0.062	6724.00	0.062	6724.00	0.062	6724.00	ROOF
B-BALL/1ST		0.000	0.00	0.020	728.00	0.020	728.00	0.020	728.00	0.020	728.00	UNDERGRND
B-BALL/1ST		0.000	0.00	0.020	720.00	0.020	720.00	0.020	720.00	0.020	720.00	UNDERGRND
B-BALL/1ST		0.000	0.00	0.020	752.00	0.020	752.00	0.020	752.00	0.020	752.00	UNDERGRND
B-BALL/1ST		0.000	0.00	0.020	15129.00	0.020	15129.00	0.020	15129.00	0.020	15129.00	UNDERGRND
H-BALL/2ND		0.000	0.00	0.020	1681.00	0.020	1681.00	0.020	1681.00	0.020	1681.00	UNDERGRND
H-BALL/2ND		0.000	0.00	0.020	72.00	0.020	72.00	0.020	72.00	0.020	72.00	UNDERGRND
H-BALL/2ND		0.000	0.00	0.020	72.00	0.020	72.00	0.020	72.00	0.020	72.00	UNDERGRND

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/17/1995 10:48:10 LDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. 8069-REMAITHE REMAINDER OF THE BLDG. (LESS POOL)  
 REPORT- LV-D DETAILS OF EXTERIOR SURFACES IN THE PROJECT TOPEKA, KS

EAST	SOUTH	WEST	ROOF	ALL WALLS	WALLS+ROOFS	UNDERGRND	BUILDING	AVERAGE U-VALUE/GLASS (BTU/HR-SQFT-F)	AVERAGE U-VALUE/WALLS (BTU/HR-SQFT-F)	AVERAGE U-VALUE WALLS+GLASS (BTU/HR-SQFT-F)	GLASS AREA (SQFT)	OPAQUE AREA (SQFT)	GLASS+OPAQUE AREA (SQFT)
								0.490	0.037	0.113	694.00	3429.00	4123.00
								0.490	0.037	0.045	60.00	3372.50	3432.50
								0.000	0.037	0.037	0.00	3838.00	3838.00
								0.000	0.062	0.062	0.00	21853.00	21853.00
								0.490	0.037	0.067	754.00	10639.50	11393.50
								0.490	0.054	0.064	754.00	32492.50	33246.50
								0.000	0.020	0.020	0.00	19154.00	19154.00
								0.490	0.041	0.048	754.00	51646.50	52400.50

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/17/1995 10:48:10 LDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. 8069-REMAITHE REMAINDER OF THE BLDG. (LESS POOL)  
 REPORT- LS-C BUILDING PEAK LOAD COMPONENTS TOPEKA, KS

\*\*\* BUILDING \*\*\*

FLOOR AREA 21862 SQFT 2031 SQMT  
 VOLUME 489606 CUFT 13866 CUMT

COOLING LOAD HEATING LOAD  
 AUG 4 5PM JAN 16 6AM  
 92F 33C 10F -12C  
 70F 21C 8F -13C

	SENSIBLE (KBTU/H) ( KW )		LATENT (KBTU/H) ( KW )		SENSIBLE (KBTU/H) ( KW )	
WALLS	4.454	1.304	0.000	0.000	-27.560	-8.072
ROOFS	94.872	27.786	0.000	0.000	-94.240	-27.601
GLASS CONDUCTION	4.254	1.246	0.000	0.000	-26.221	-7.680
GLASS SOLAR	36.088	10.569	0.000	0.000	1.949	0.571
DOOR	0.000	0.000	0.000	0.000	0.000	0.000
INTERNAL SURFACES	0.000	0.000	0.000	0.000	0.000	0.000
UNDERGROUND SURFACES	-1.812	-0.531	0.000	0.000	-10.999	-3.221
OCCUPANTS TO SPACE	40.200	11.773	68.421	20.039	3.484	1.020
LIGHT TO SPACE	90.227	26.425	0.000	0.000	12.828	3.757
EQUIPMENT TO SPACE	0.000	0.000	0.000	0.000	0.000	0.000
PROCESS TO SPACE	0.000	0.000	0.000	0.000	0.000	0.000
INFILTRATION	2.203	0.645	1.028	0.301	-51.829	-15.179
TOTAL	270.485	79.218	69.449	20.340	-192.588	-56.404
TOTAL LOAD	339.934	KBTU/H	99.558	KW	-192.588	KBTU/H
TOTAL LOAD / AREA	15.55	BTU/H.SQFT	49.018	W /SQMT	8.809	BTU/H.SQFT

W /SQMT

\*\*\*\*\*  
 \* NOTE 1) THE ABOVE LOADS EXCLUDE OUTSIDE VENTILATION AIR \*  
 \* LOADS \*  
 \* 2) TIMES GIVEN IN STANDARD TIME FOR THE LOCATION \*  
 \* IN CONSIDERATION \*  
 \*\*\*\*\*

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOB-2.1D 5/17/1995 10:48:10 SDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. 8069-REMAITHE REMAINDER OF THE BLDG. (LESS POOL)  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR H&VSYSTEMS TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC-TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-468.267	15	-8.F	-9.F	-1224.438	30702.	49.841
FEB	0.00000				-356.345	3	-5.F	-6.F	-1153.788	27700.	49.841
MAR	0.00000				-292.756	3	14.F	12.F	-853.747	30838.	49.841
APR	0.00000				-107.186	5	31.F	29.F	-559.830	29777.	49.841
MAY	0.00000				-29.284	1	37.F	37.F	-447.491	30702.	49.841
JUN	0.00000				0.000				0.000	29799.	49.841
JUL	0.00000				0.000				0.000	30590.	49.841
AUG	0.00000				0.000				0.000	30928.	49.841
SEP	0.00000				0.000				0.000	29687.	49.841
OCT	0.00000				-99.992	20	23.F	23.F	-681.072	30590.	49.841
NOV	0.00000				-240.469	3	13.F	12.F	-838.546	29754.	49.841
DEC	0.00000				-418.510	13	0.F	-1.F	-1047.523	30612.	49.841
TOTAL	0.000				-2012.813				-1224.438	361697.	49.841
MAX											

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/17/1995 10:48:10 SDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. 8069-REMAITHE REMAINDER OF THE BLDG. (LESS POOL)  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR H&VSYSTEMS TOPEKA, KS

MONTH	H O U R S				H O U R S				C O I N C I D E N T				L O A D S			
	COOLING LOAD	HEATING LOAD	COOL-HEAT LOAD	FLOATING HOURS	HEATING AVAIL.	COOLING AVAIL.	FANS ON CYCLE	NIGHT VENTING	FLOATING WHEN FANS ON	HEATING AT PEAK (KBTU/HR)	ELECTRIC LOAD AT PEAK (KW)	COOLING AT PEAK (KBTU/HR)	HEATING AT PEAK (KBTU/HR)	COOLING AT PEAK (KBTU/HR)	ELECTRIC LOAD AT PEAK (KW)	
JAN	0	744	0	0	744	0	0	0	0	-528.694	0	0	0	27.300		
FEB	0	672	0	12	672	0	0	0	0	-542.644	0	0	0	27.300		
MAR	0	732	0	127	744	0	0	0	12	-531.315	0	0	0	27.300		
APR	0	593	0	485	720	0	0	0	127	-254.162	0	0	0	27.300		
MAY	0	259	0	744	360	0	0	0	485	0.000	0	0	0	27.300		
JUN	0	0	0	720	0	0	0	0	720	0.000	0	0	0	27.300		
JUL	0	0	0	744	0	0	0	0	744	0.000	0	0	0	27.300		
AUG	0	0	0	744	0	0	0	0	744	0.000	0	0	0	27.300		
SEP	0	0	0	720	0	0	0	0	720	0.000	0	0	0	27.300		
OCT	0	575	0	169	720	0	0	0	169	-380.771	0	0	0	27.300		
NOV	0	681	0	39	720	0	0	0	39	-630.593	0	0	0	27.300		
DEC	0	744	0	0	744	0	0	0	0	-602.493	0	0	0	27.300		
ANNUAL	0	5000	0	3760	5424	0	0	0	3760							

EMC ENGINEERS INC. DOB-2.1D 5/17/1995 10:48:10 SDL RUN 1												
DENVER, CO 80227 EZDOE - ELITE SOFTWARE DEVELOPMENT INC. REMAINDER OF THE BLDG. (LESS POOL)												
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR AHU'S_1&2 TOPEKA, KS												
----- C O O L I N G ----- H E A T I N G ----- E L E C -----												
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELECTRIC ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				0.000	-34.512	14 23	-4.F	-5.F	-102.496	7242.	13.149
FEB	0.00000				0.000	-22.984	3 6	-1.F	-2.F	-101.768	6525.	13.049
MAR	0.00000				0.000	-13.446	3 7	14.F	12.F	-87.053	7290.	13.049
APR	0.00000				0.000	-1.490	5 5	31.F	29.F	-42.874	7029.	13.049
MAY	27.48898	16 12	73.F	65.F	187.914	-0.320	14 21	70.F	65.F	-6.851	9718.	29.238
JUN	60.99599	28 16	90.F	76.F	158.037	0.000				0.000	12794.	29.476
JUL	72.79348	13 13	90.F	79.F	171.852	0.000				0.000	14180.	31.586
AUG	70.88877	23 16	96.F	77.F	163.384	0.000				0.000	14364.	30.811
SEP	42.73195	7 15	92.F	76.F	156.108	0.000				0.000	10969.	29.725
OCT	0.97947	1 18	83.F	68.F	98.851	-1.476	20 7	23.F	23.F	-44.764	7287.	23.073
NOV	0.00000				0.000	-11.390	3 6	13.F	12.F	-79.333	7020.	13.049
DEC	0.00000				0.000	-30.091	12 5	4.F	3.F	-101.208	7202.	13.149
TOTAL	275.879				187.914	-115.709				-102.496	111612.	31.586
MAX												

EMC ENGINEERS INC. DOB-2.1D 5/17/1995 10:48:10 SDL RUN 1												
DENVER, CO 80227 EZDOE - ELITE SOFTWARE DEVELOPMENT INC. REMAINDER OF THE BLDG. (LESS POOL)												
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR AHU'S_1&2 TOPEKA, KS												
----- N U M B E R O F H O U R S -----												
MONTH	HOURS COOLING LOAD	HOURS HEATING LOAD	HOURS COINCIDENT COOL-HEAT LOAD	HOURS FLOATING	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.	HOURS FANS ON	HOURS FANS ON CYCLE	HOURS NIGHT VENTING	HOURS FLOATING WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)
JAN	0	709	0	35	744	0	744	0	0	35	-40.270	4.316
FEB	0	621	0	51	672	0	672	0	0	51	-34.614	4.316
MAR	0	549	0	195	744	0	744	0	0	195	-38.900	4.316
APR	0	359	0	361	720	0	720	0	0	361	-2.657	4.316
MAY	377	169	0	198	360	378	744	0	0	198	0.000	28.466
JUN	711	0	0	9	0	712	720	0	0	9	0.000	29.476
JUL	744	0	0	0	744	744	744	0	0	0	0.000	30.433
AUG	743	0	0	1	744	744	744	0	0	1	0.000	30.811
SEP	632	0	0	88	720	635	720	0	0	88	0.000	29.640
OCT	15	384	0	345	744	15	744	0	0	345	0.000	22.898
NOV	0	523	0	197	720	0	720	0	0	197	-54.350	4.316
DEC	0	701	0	43	744	0	744	0	0	43	-58.440	4.316
ANNUAL	3222	4015	0	1523	5424	3228	8760	0	0	1523		

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/17/1995 10:48:10 PDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. 8069-REMAITHE REMAINDER OF THE BLDG. (LESS POOL)  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY	NATURAL-GAS
JAN	154.560 249.190 28/ 9	179.667 872.121 5/ 5	705.446 1668.341 15/ 5
FEB	139.172 248.849 28/22	1254.135 3/ 7	551.450 1593.961 3/ 7
MAR	151.987 248.849 31/22	179.667 872.121 5/ 5	462.732 1254.135 3/ 7
APR	137.229 248.849 16/ 9	179.667 872.121 5/ 5	179.667 872.121 5/ 5
MAY	141.993 270.009 31/18	179.667 872.121 5/ 5	179.667 872.121 5/ 5
JUN	145.431 270.822 28/16	0.000 0.000 0.000	0.000 0.000 0.000
JUL	152.864 278.026 23/16	0.000 0.000 0.000	0.000 0.000 0.000
AUG	154.645 275.378 23/16	0.000 0.000 0.000	0.000 0.000 0.000
SEP	138.814 271.671 7/16	0.000 0.000 0.000	0.000 0.000 0.000
OCT	140.852 248.958 1/17	171.168 1013.214 20/ 7	171.168 1013.214 20/ 7
NOV	144.486 248.849 30/22	384.863 1228.773 3/ 6	384.863 1228.773 3/ 6
DEC	153.834 249.190 13/ 8	643.049 1459.380 13/ 8	643.049 1459.380 13/ 8
	ONE YEAR USE/PEAK	1755.867 278.026	3150.252 1668.341



EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/17/1995 10:48:10 PDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. 8069-REMAITHE REMAINDER OF THE BLDG. (LESS POOL)  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE	ELECTRICITY	NATURAL-GAS
IN SITE MBTU -		
CATEGORY OF USE		
SPACE HEAT	116.04	3150.25
SPACE COOL	89.92	0.00
HVAC AUX	969.36	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	580.46	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	0.00	0.00
TOTAL	1755.78	3150.25

TOTAL SITE ENERGY 4906.12 MBTU 224.4 KBTU/SQFT-YR GROSS-AREA 224.4 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 8423.13 MBTU 385.3 KBTU/SQFT-YR GROSS-AREA 385.3 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 0.4  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

PEOPLE-SCHEDULE = L\_PEOPLE AREA/PERSON = 336.0  
 PEOPLE-HG-LAT = 965.0 PEOPLE-HG-SENS = 635.0  
 LIGHTING-TYPE = SUS-FLUOR LIGHTING-W/SQFT = 1.3  
 LIGHT-TO-SPACE = 1.0 LIGHTING-SCHEDULE = L\_PEOPLE  
 SOURCE-SENSIBLE = 0.0 FURN-WEIGHT = 0.5  
 INF-METHOD = AIR-CHANGE AIR-CHANGES/HR = 0.06  
 INF-SCHEDULE = L\_ON ..

E-W HEIGHT = 19.0 WIDTH = 56.0 CONS = EXWALL-1  
 AZIMUTH = 90 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 9.0 WIDTH = 35.0 G-T = 2\_PN\_STD  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 7.0 WIDTH = 13.0 G-T = 2\_PN\_STD  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 20.0 WIDTH = 19.0 CONS = EXWALL-1  
 AZIMUTH = 180 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 19.0 WIDTH = 41.0 CONS = EXWALL-1  
 AZIMUTH = 270 INSIDE-VIS-REFL = 0.2 ..

U-W HEIGHT = 41.0 WIDTH = 41.0 CONS = FLOOR ..

ROOF HEIGHT = 82.0 WIDTH = 82.0 CONS = ROOF-1  
 TILT = 0 SKY-FORM-FACTOR = 1.0 ..

U-W HEIGHT = 8.0 WIDTH = 9.0 CONS = FLOOR  
 AZIMUTH = 180 ..

U-W HEIGHT = 8.0 WIDTH = 9.0 CONS = FLOOR  
 AZIMUTH = 180 ..

END ..

COMPUTE LOADS ..

INPUT SYSTEMS ..

\$-----\$  
 \$ E Z - D O E S Y S T E M S I N P U T \$  
 \$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
 LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
 LINE-3 \* DENVER, CO 80227 \*

LINE-4 \*RUN #1 NIGHT SETBACK BLDG. 8069-REMAI \*  
 LINE-5 \*THE REMAINDER OF THE BLDG. (LESS POOL) \* ..

ABORT ERRORS ..

```

DIAGNOSTIC      WARNINGS ..
SYSTEMS-REPORT  VERIFICATION=(SV-A)
                SUMMARY=(SS-A,SS-C,SS-K,SS-O)
                HOURLY-DATA-SAVE = YES ..

```

§ SCHEDULES

```

SD_ON      =DAY-SCHEDULE (1,24) (1.) ..
SD_OFF     =DAY-SCHEDULE (1,24) (0.) ..
SD_WT_HT   =DAY-SCHEDULE (1,5) (55.) ..
            (6,22) (74.) ..
            (23,24) (55.) ..
SD_SM_CL   =DAY-SCHEDULE (1,5) (85.) ..
            (6,22) (72.) ..
            (23,24) (85.) ..
SD_WINT_OA =DAY-SCHEDULE (1,24) (0.37) ..
SD_WT_CL   =DAY-SCHEDULE (1,5) (57.) ..
            (6,22) (76.) ..
            (23,24) (57.) ..
SD_SM_HT   =DAY-SCHEDULE (1,5) (83.) ..
            (6,22) (70.) ..
            (23,24) (83.) ..
SD_FAN_CYC =DAY-SCHEDULE (1,5) (0.) ..
            (6,22) (1.) ..
            (23,24) (0.) ..

SW_ON      =WEEK-SCHEDULE (ALL) SD_ON ..
SW_OFF     =WEEK-SCHEDULE (ALL) SD_OFF ..
SW_WT_HT   =WEEK-SCHEDULE (ALL) SD_WT_HT ..
SW_SM_CL   =WEEK-SCHEDULE (ALL) SD_SM_CL ..
SW_WINT_OA =WEEK-SCHEDULE (ALL) SD_WINT_OA ..
SW_WT_CL   =WEEK-SCHEDULE (ALL) SD_WT_CL ..
SW_SM_HT   =WEEK-SCHEDULE (ALL) SD_SM_HT ..
SW_FAN_CYC =WEEK-SCHEDULE (ALL) SD_FAN_CYC ..

```



§ FULL ON SYSTEM

S\_ON =SCHEDULE THRU DEC 31 SW\_ON ..

§ FULL OFF SYSTEM

S\_OFF =SCHEDULE THRU DEC 31 SW\_OFF ..

§ HEATING SEASON

```

S_HE-SCHED =SCHEDULE THRU MAY 15 SW_ON
            THRU OCT 1 SW_OFF
            THRU DEC 31 SW_ON ..

```

§ COOLING SEASON

S\_CL\_SCHED =SCHEDULE THRU MAY 15 SW\_OFF

THRU OCT 1 SW\_ON  
THRU DEC 31 SW\_OFF ..

## \$ HEATING SET TEMP

S\_HT\_SET\_F =SCHEDULE THRU MAY 15 SW\_WT\_HT  
THRU OCT 1 SW\_SM\_HT  
THRU DEC 31 SW\_WT\_HT ..

## \$ COOLING SET TEMP

S\_CL\_SET\_F =SCHEDULE THRU MAY 15 SW\_WT\_CL  
THRU OCT 1 SW\_SM\_CL  
THRU DEC 31 SW\_WT\_CL ..

## \$ OUTSIDE AIR SCHEDULE

S\_OA\_SCH =SCHEDULE THRU MAY 15 SW\_WINT\_OA  
THRU OCT 1 SW\_ON  
THRU DEC 31 SW\_WINT\_OA ..

S\_HRLY-RPT =SCHEDULE THRU JAN 13 SW\_OFF  
THRU JAN 15 SW\_ON  
THRU JUL 21 SW\_OFF  
THRU JUL 23 SW\_ON  
THRU DEC 31 SW\_OFF ..

S\_FAN\_CYCL =SCHEDULE THRU DEC 31 SW\_FAN\_CYC ..

## \$ ZONE DESCRIPTION

B-BALL/1ST =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL  
SIZING-OPTION = FROM-LOADS ..

H-BALL/2ND =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL  
SIZING-OPTION = FROM-LOADS ..

## \$ SYSTEM DESCRIPTION

H&VSYSTEMS =SYSTEM SYSTEM-TYPE = HVSYS  
MAX-SUPPLY-T = 120.0 HEATING-SCHEDULE = S\_HE-SCHED  
OA-CONTROL = FIXED SUPPLY-CFM = 35000.  
RATED-CFM = 35000. MIN-OUTSIDE-AIR = 0.37  
MIN-AIR-SCH = S\_OA\_SCH FAN-SCHEDULE = S\_FAN\_CYCL  
SUPPLY-DELTA-T = 2.4 SUPPLY-KW = 0.00078  
MOTOR-PLACEMENT = OUTSIDE-AIRFLOW  
NIGHT-CYCLE-CTRL = STAY-OFF NIGHT-VENT-DT = 0.0  
HEATING-CAPACITY = -1291523.  
ZONE-NAMES = (B-BALL/1ST) ..

AHU'S\_1&2 =SYSTEM SYSTEM-TYPE = PSZ  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_HE-SCHED  
 COOLING-SCHEDULE = S\_CL\_SCHED OA-CONTROL = FIXED  
 SUPPLY-CFM = 7315. RATED-CFM = 7315.  
 MIN-OUTSIDE-AIR = 0.2 FAN-SCHEDULE = S\_FAN\_CYCL  
 SUPPLY-DELTA-T = 1.8 SUPPLY-KW = 0.00059  
 MOTOR-PLACEMENT = OUTSIDE-AIRFLOW  
 FAN-PLACEMENT = BLOW-THROUGH  
 NIGHT-CYCLE-CTRL = STAY-OFF NIGHT-VENT-DT = 0.0  
 COOLING-CAPACITY = 171850. COOL-SH-CAP = 144543.  
 COOL-FT-MIN = 0. HEATING-CAPACITY = -100648.  
 MIN-HP-T = 0. MAX-HP-SUPP-T = 0. DEFROST-T = 0.  
 CRANKCASE-MAX-T = 0. OUTSIDE-FAN-T = 45.  
 HEAT-SOURCE = HOT-WATER SIZING-OPTION = COINCIDENT  
 ZONE-NAMES = (H-BALL/2ND) ..



\$ HOURLY REPORT DESCRIPTION

H&V-BLK =REPORT-BLOCK VARIABLE-TYPE = H&VSYSTEMS  
 VARIABLE-LIST = (3,5,17,39) ..  
 SZ-AHU-BLK =REPORT-BLOCK VARIABLE-TYPE = AHU'S\_1&2  
 VARIABLE-LIST = (3,5,6,17,39) ..  
 H&VZN-BLK =REPORT-BLOCK VARIABLE-TYPE = B-BALL/1ST  
 VARIABLE-LIST = (17,18,7,6) ..  
 SZZONE-BLK =REPORT-BLOCK VARIABLE-TYPE = H-BALL/2ND  
 VARIABLE-LIST = (17,18,7,6) ..  
 AHU-RPTS = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (H&V-BLK,SZ-AHU-BLK)  
 ..  
 ZONE-RPTS = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (H&VZN-BLK,SZZONE-BLK)  
 ..  
 END ..  
 COMPUTE SYSTEMS ..

INPUT PLANT ..

\$-----\$  
 \$ E Z - D O E P L A N T S I N P U T \$  
 \$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
 LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
 LINE-3 \* DENVER, CO 80227 \*  
 LINE-4 \*RUN #1 NIGHT SETBACK BLDG. 8069-REMAI \*  
 LINE-5 \*THE REMAINDER OF THE BLDG. (LESS POOL) \* ..

ABORT ERRORS ..  
 DIAGNOSTIC WARNINGS ..  
 PLANT-REPORT VERIFICATION=(PV-A)

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/17/1995 11: 8:55 SDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SETBACK BLDG. 8069-REMAI THE REMAINDER OF THE BLDG. (LESS POOL)  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR H&VSYSTEMS TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	ELEC- TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-323.171	15	7	-7.F	-8.F	-1240.048	24778.
FEB	0.00000				-241.228	3	7	-5.F	-6.F	-1164.511	22349.
MAR	0.00000				-189.086	3	6	15.F	12.F	-890.203	24913.
APR	0.00000				-58.657	5	6	31.F	28.F	-568.303	24044.
MAY	0.00000				-14.101	1	6	37.F	37.F	-434.264	24778.
JUN	0.00000				0.000					0.000	24066.
JUL	0.00000				0.000					0.000	24666.
AUG	0.00000				0.000					25004.	49.841
SEP	0.00000				0.000					23954.	49.841
OCT	0.00000				-55.869	20	8	23.F	22.F	-680.747	24666.
NOV	0.00000				-152.014	3	6	13.F	12.F	-870.373	24021.
DEC	0.00000				-287.836	13	6	2.F	1.F	-1091.635	24688.
TOTAL	0.000				-1321.962					-1240.048	291938.
MAX											49.841

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/17/1995 11: 8:55 SDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SETBACK BLDG. 8069-REMAI THE REMAINDER OF THE BLDG. (LESS POOL)  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR H&VSYSTEMS TOPEKA, KS

MONTH	HOURS				HOURS				HOURS				COINCIDENT LOADS	
	COOLING LOAD	HEATING LOAD	COOL-HEAT LOAD	FLOATING	HEATING AVAIL.	COOLING AVAIL.	FANS ON CYCLE	NIGHT VENTING	FLOATING WHEN FANS ON	HEATING LOAD AT PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)	HEATING LOAD AT PEAK (KBTU/HR)	COOLING LOAD AT PEAK (KW)	HEATING LOAD AT PEAK (KBTU/HR)
JAN	0	527	0	217	744	0	527	0	0	0	0.000	0.000	0.000	0.000
FEB	0	476	0	196	672	0	476	0	0	0	0.000	0.000	0.000	0.000
MAR	0	515	0	229	744	0	527	0	0	12	0.000	0.000	0.000	0.000
APR	0	388	0	332	720	0	510	0	0	122	0.000	0.000	0.000	0.000
MAY	0	151	0	593	360	0	527	0	0	376	0.000	0.000	0.000	0.000
JUN	0	0	0	720	0	0	510	0	0	510	0.000	0.000	0.000	0.000
JUL	0	0	0	744	0	0	527	0	0	527	0.000	0.000	0.000	0.000
AUG	0	0	0	744	0	0	527	0	0	527	0.000	0.000	0.000	0.000
SEP	0	0	0	720	0	0	510	0	0	510	0.000	0.000	0.000	0.000
OCT	0	365	0	379	720	0	527	0	0	162	0.000	0.000	0.000	0.000
NOV	0	468	0	252	720	0	510	0	0	42	0.000	0.000	0.000	0.000
DEC	0	527	0	217	744	0	527	0	0	0	0.000	0.000	0.000	0.000
ANNUAL	0	3417	0	5343	5424	0	6205	0	0	2788				

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/17/1995 11: 8:55 SDL RUN 1  
DENVER, CO 80227 RUN #1 NIGHT SETBACK BLDG. 8069-REMAI THE REMAINDER OF THE BLDG. (LESS POOL)  
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR AHU'S\_1&2 TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-24.802	15 21	3. F	1. F	6305.	-104.144	13.149
FEB	0.00000				-15.524	3 7	-5. F	-6. F	5679.	-99.682	13.049
MAR	0.00000				-7.482	3 7	14. F	12. F	6353.	-98.368	13.049
APR	0.00000				-0.359	1 7	48. F	44. F	6122.	-19.926	13.049
MAY	25.99297	16 12	73. F	65. F	-0.156	1 6	37. F	37. F	8643.	-9.149	29.850
JUN	55.73210	28 12	87. F	76. F	0.000				11376.	0.000	30.041
JUL	65.26513	13 13	90. F	79. F	0.000				12515.	0.000	31.824
AUG	63.97572	23 13	93. F	77. F	0.000				12735.	0.000	31.330
SEP	40.22445	7 15	92. F	76. F	0.000				9804.	0.000	30.323
OCT	0.99082	1 18	83. F	68. F	-0.464	2 6	53. F	51. F	6351.	-41.302	23.410
NOV	0.00000				-6.148	3 7	19. F	17. F	6114.	-91.726	13.049
DEC	0.00000				-21.494	14 8	9. F	7. F	6266.	-99.727	13.149
TOTAL	252.181				-76.428				98259.	-104.144	31.824
MAX											

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/17/1995 11: 8:55 SDL RUN 1  
DENVER, CO 80227 RUN #1 NIGHT SETBACK BLDG. 8069-REMAI THE REMAINDER OF THE BLDG. (LESS POOL)  
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR AHU'S\_1&2 TOPEKA, KS

MONTH	HOURS				HOURS				HOURS				COINCIDENT LOADS	
	COOLING LOAD	HEATING LOAD	COOL-HEAT LOAD	COINCIDENT LOAD	FLOATING	HEATING AVAIL.	COOLING AVAIL.	FANS ON CYCLE	FANS ON NIGHT	FLOATING WHEN FANS ON	HEATING AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)	HEATING AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)
JAN	0	509	0	0	235	744	0	0	0	18	0.000	0.000	0.000	0.000
FEB	0	437	0	0	235	672	0	0	0	39	0.000	0.000	0.000	0.000
MAR	0	341	0	0	403	744	0	0	0	186	0.000	0.000	0.000	0.000
APR	0	165	0	0	555	720	0	0	0	345	0.000	0.000	0.000	0.000
MAY	272	78	0	0	394	360	384	0	0	177	0.000	0.000	0.000	29.210
JUN	510	0	0	0	210	0	720	0	0	0	0.000	0.000	0.000	29.751
JUL	527	0	0	0	217	0	744	0	0	0	0.000	0.000	0.000	31.946
AUG	485	0	0	0	235	0	744	0	0	0	0.000	0.000	0.000	31.045
SEP	13	193	0	0	538	720	20	0	0	25	0.000	0.000	0.000	30.301
OCT	0	325	0	0	395	720	0	0	0	321	0.000	0.000	0.000	23.190
NOV	0	498	0	0	246	744	0	0	0	185	0.000	0.000	0.000	0.000
DEC	0	2546	0	0	3880	5424	0	0	0	29	0.000	0.000	0.000	0.000
ANNUAL	2334	2546	0	0	3880	5424	3309	6205	0	1325				

EMC ENGINEERS INC. E2DOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/17/1995 11: 8:55 PDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SETBACK BLDG. 8069-REMAI THE REMAINDER OF THE BLDG. (LESS POOL)  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY TOTAL (MBTU) PEAK (KBTU) DY/HR	NATURAL-GAS TOTAL (MBTU) PEAK (KBTU) DY/HR
JAN	123.961 249.562 28/9	123.961 249.562 28/9	490.876 1686.519 15/7
FEB	111.523 249.220 28/22	111.523 249.220 28/22	376.822 1606.538 3/7
MAR	121.608 249.220 31/22	121.608 249.220 31/22	300.879 1300.684 3/6
APR	109.848 249.220 16/9	109.848 249.220 16/9	99.545 847.009 5/6
MAY	116.189 272.098 16/16	116.189 272.098 16/16	25.412 688.030 1/6
JUN	121.014 272.751 28/15	121.014 272.751 28/15	0.000 0.000 30/1
JUL	126.952 278.838 23/16	126.952 278.838 23/16	0.000 0.000 31/1
AUG	128.857 277.149 23/16	128.857 277.149 23/16	0.000 0.000 31/1
SEP	115.261 273.712 7/16	115.261 273.712 7/16	0.000 0.000 30/1
OCT	112.619 250.108 1/17	112.619 250.108 1/17	95.974 975.021 20/8
NOV	115.579 249.220 30/22	115.579 249.220 30/22	245.322 1279.169 3/6
DEC	123.229 249.562 13/8	123.229 249.562 13/8	445.796 1517.083 13/6
	ONE YEAR USE/PEAK	1426.641 278.838	2080.626 1686.519



EMC ENGINEERS INC. E3DOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/17/1995 11: 8:55 PDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SETBACK BLDG. 8069-REMAI THE REMAINDER OF THE BLDG. (LESS POOL)  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE	ELECTRICITY	NATURAL-GAS
IN SITE MBTU -		
CATEGORY OF USE		
SPACE HEAT	77.94	2080.63
SPACE COOL	81.97	0.00
HVAC AUX	686.22	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	580.46	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	0.00	0.00
TOTAL	1426.59	2080.63

TOTAL SITE ENERGY 3507.27 MBTU 160.4 KBTU/SQFT-YR GROSS-AREA 160.4 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 6364.83 MBTU 291.1 KBTU/SQFT-YR GROSS-AREA 291.1 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 1.1  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

PEOPLE-SCHEDULE = L\_PEOPLE AREA/PERSON = 336.0  
 PEOPLE-HG-LAT = 965.0 PEOPLE-HG-SENS = 635.0  
 LIGHTING-TYPE = SUS-FLUOR LIGHTING-W/SQFT = 1.3  
 LIGHT-TO-SPACE = 1.0 LIGHTING-SCHEDULE = L\_PEOPLE  
 SOURCE-SENSIBLE = 0.0 FURN-WEIGHT = 0.5  
 INF-METHOD = AIR-CHANGE AIR-CHANGES/HR = 0.06  
 INF-SCHEDULE = L\_ON ..

E-W HEIGHT = 19.0 WIDTH = 56.0 CONS = EXWALL-1  
 AZIMUTH = 90 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 9.0 WIDTH = 35.0 G-T = 2\_PN\_STD  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 7.0 WIDTH = 13.0 G-T = 2\_PN\_STD  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 20.0 WIDTH = 19.0 CONS = EXWALL-1  
 AZIMUTH = 180 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 19.0 WIDTH = 41.0 CONS = EXWALL-1  
 AZIMUTH = 270 INSIDE-VIS-REPL = 0.2 ..

U-W HEIGHT = 41.0 WIDTH = 41.0 CONS = FLOOR ..

ROOF HEIGHT = 82.0 WIDTH = 82.0 CONS = ROOF-1  
 TILT = 0 SKY-FORM-FACTOR = 1.0 ..

U-W HEIGHT = 8.0 WIDTH = 9.0 CONS = FLOOR  
 AZIMUTH = 180 ..

U-W HEIGHT = 8.0 WIDTH = 9.0 CONS = FLOOR  
 AZIMUTH = 180 ..

END ..

COMPUTE LOADS ..

INPUT SYSTEMS ..

\$-----\$  
 \$ E Z - D O E S Y S T E M S I N P U T \$  
 \$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
 LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
 LINE-3 \* DENVER, CO 80227 \*  
 LINE-4 \*RUN #2 DDC CONTROL FOR BLDG. 8069-REMAI \*  
 LINE-5 \*THE REMAINDER OF THE BLDG. (LESS POOL) \* ..

ABORT ERRORS ..

DIAGNOSTIC           WARNINGS ..  
 SYSTEMS-REPORT      VERIFICATION=(SV-A)  
                       SUMMARY=(SS-A,SS-C,SS-K,SS-O)  
                       HOURLY-DATA-SAVE = YES ..

§ SCHEDULES

SD\_ON        =DAY-SCHEDULE (1,24) (1.) ..  
 SD\_OFF       =DAY-SCHEDULE (1,24) (0.) ..  
 SD\_WT\_HT    =DAY-SCHEDULE (1,24) (70.) ..  
 SD\_SM\_CL    =DAY-SCHEDULE (1,24) (76.) ..  
 SD\_WINT\_OA  =DAY-SCHEDULE (1,24) (0.37) ..  
 SD\_WT\_CL    =DAY-SCHEDULE (1,24) (72.) ..  
 SD\_SM\_HT    =DAY-SCHEDULE (1,24) (74.) ..

SW\_ON        =WEEK-SCHEDULE (ALL) SD\_ON ..

SW\_OFF       =WEEK-SCHEDULE (ALL) SD\_OFF ..

SW\_WT\_HT    =WEEK-SCHEDULE (ALL) SD\_WT\_HT ..

SW\_SM\_CL    =WEEK-SCHEDULE (ALL) SD\_SM\_CL ..

SW\_WINT\_OA  =WEEK-SCHEDULE (ALL) SD\_WINT\_OA ..

SW\_WT\_CL    =WEEK-SCHEDULE (ALL) SD\_WT\_CL ..

SW\_SM\_HT    =WEEK-SCHEDULE (ALL) SD\_SM\_HT ..

§ FULL ON SYSTEM

S\_ON         =SCHEDULE THRU DEC 31 SW\_ON ..

§ FULL OFF SYSTEM

S\_OFF        =SCHEDULE THRU DEC 31 SW\_OFF ..

§ HEATING SEASON

S\_HE-SCHED  =SCHEDULE THRU MAY 15 SW\_ON  
                           THRU OCT 1 SW\_OFF  
                           THRU DEC 31 SW\_ON ..

§ COOLING SEASON

S\_CL\_SCHED  =SCHEDULE THRU MAY 15 SW\_OFF  
                           THRU OCT 1 SW\_ON  
                           THRU DEC 31 SW\_OFF ..

§ HEATING SET TEMP

S\_HT\_SET\_F  =SCHEDULE THRU MAY 15 SW\_WT\_HT  
                           THRU OCT 1 SW\_SM\_HT  
                           THRU DEC 31 SW\_WT\_HT ..

§ COOLING SET TEMP

S\_CL\_SET\_F  =SCHEDULE THRU MAY 15 SW\_WT\_CL  
                           THRU OCT 1 SW\_SM\_CL  
                           THRU DEC 31 SW\_WT\_CL ..

## \$ OUTSIDE AIR SCHEDULE

S\_OA\_SCHED =SCHEDULE THRU MAY 15 SW\_WINT\_OA  
 THRU OCT 1 SW\_ON  
 THRU DEC 31 SW\_WINT\_OA ..

S\_HRLY-RPT =SCHEDULE THRU JAN 13 SW\_OFF  
 THRU JAN 15 SW\_ON  
 THRU JUL 21 SW\_OFF  
 THRU JUL 23 SW\_ON  
 THRU DEC 31 SW\_OFF ..

## \$ ZONE DESCRIPTION

B-BALL/1ST =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL  
 SIZING-OPTION = FROM-LOADS ..

H-BALL/2ND =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL  
 SIZING-OPTION = FROM-LOADS ..

## \$ SYSTEM DESCRIPTION

H&VSYSTEMS =SYSTEM SYSTEM-TYPE = HVSYS  
 MAX-SUPPLY-T = 120.0 HEATING-SCHEDULE = S\_HE-SCHED  
 OA-CONTROL = FIXED SUPPLY-CFM = 35000.  
 RATED-CFM = 35000. MIN-OUTSIDE-AIR = 0.37  
 MIN-AIR-SCH = S\_OA\_SCHED SUPPLY-DELTA-T = 2.4  
 SUPPLY-KW = 0.00078  
 MOTOR-PLACEMENT = OUTSIDE-AIRFLOW  
 NIGHT-CYCLE-CTRL = STAY-OFF NIGHT-VENT-DT = 0.0  
 HEATING-CAPACITY = -1291523.  
 ZONE-NAMES = (B-BALL/1ST) ..

AHU'S\_1&2 =SYSTEM SYSTEM-TYPE = PSZ  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_HE-SCHED  
 COOLING-SCHEDULE = S\_CL\_SCHED OA-CONTROL = FIXED  
 SUPPLY-CFM = 7315. RATED-CFM = 7315.  
 MIN-OUTSIDE-AIR = 0.2 SUPPLY-DELTA-T = 1.8  
 SUPPLY-KW = 0.00059  
 MOTOR-PLACEMENT = OUTSIDE-AIRFLOW  
 FAN-PLACEMENT = BLOW-THROUGH  
 NIGHT-CYCLE-CTRL = STAY-OFF NIGHT-VENT-DT = 0.0  
 COOLING-CAPACITY = 171850. COOL-SH-CAP = 144543.  
 COOL-FT-MIN = 0. HEATING-CAPACITY = -100648.  
 MIN-HP-T = 0. MAX-HP-SUPP-T = 0. DEFROST-T = 0.  
 CRANKCASE-MAX-T = 0. OUTSIDE-FAN-T = 45.  
 HEAT-SOURCE = HOT-WATER SIZING-OPTION = COINCIDENT

ZONE-NAMES = (H-BALL/2ND) ..

\$ HOURLY REPORT DESCRIPTION

H&V-BLK =REPORT-BLOCK VARIABLE-TYPE = H&VSYSTEMS  
 VARIABLE-LIST = (3,5,17,39) ..

SZ-AHU-BLK =REPORT-BLOCK VARIABLE-TYPE = AHU'S\_1&2  
 VARIABLE-LIST = (3,5,6,17,39) ..

H&VZN-BLK =REPORT-BLOCK VARIABLE-TYPE = B-BALL/1ST  
 VARIABLE-LIST = (17,18,7,6) ..

SZZONE-BLK =REPORT-BLOCK VARIABLE-TYPE = H-BALL/2ND  
 VARIABLE-LIST = (17,18,7,6) ..

AHU-RPTS = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (H&V-BLK,SZ-AHU-BLK)

..

ZONE-RPTS = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (H&VZN-BLK,SZZONE-BLK)

..

END ..

COMPUTE SYSTEMS ..

INPUT PLANT ..

\$-----\$  
 \$ E Z - D O E P L A N T S I N P U T \$  
 \$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*

LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*

LINE-3 \* DENVER, CO 80227 \*

LINE-4 \*RUN #2 DDC CONTROL FOR BLDG. 8069-REMAI \*

LINE-5 \*THE REMAINDER OF THE BLDG. (LESS POOL) \* ..

ABORT ERRORS ..

DIAGNOSTIC WARNINGS ..

PLANT-REPORT VERIFICATION=(PV-A)  
 SUMMARY=(PS-B,BEPS)  
 HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

PD\_ON =DAY-SCHEDULE (1,24) (1.) ..

PD\_OFF =DAY-SCHEDULE (1,24) (0.) ..

PW\_ON =WEEK-SCHEDULE (ALL) PD\_ON ..

PW\_OFF =WEEK-SCHEDULE (ALL) PD\_OFF ..

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/17/1995 11:19:9 SDL RUN 1  
DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. 8069-REMAI THE REMAINDER OF THE BLDG. (LESS POOL)  
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR H&VSYSTEMS TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C			
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)	
JAN	0.00000				-468.267	15	6	-8.F	-9.F	-1224.438	30702.	49.841
FEB	0.00000				-356.345	3	7	-5.F	-6.F	-1153.788	27700.	49.841
MAR	0.00000				-292.756	3	7	14.F	12.F	-853.747	30838.	49.841
APR	0.00000				-107.186	5	5	31.F	29.F	-559.830	29777.	49.841
MAY	0.00000				-29.284	1	6	37.F	37.F	-447.491	30702.	49.841
JUN	0.00000				0.000				0.000	0.000	29799.	49.841
JUL	0.00000				0.000				0.000	0.000	30590.	49.841
AUG	0.00000				0.000				0.000	0.000	30928.	49.841
SEP	0.00000				0.000				0.000	0.000	29687.	49.841
OCT	0.00000				-99.992	20	7	23.F	23.F	-681.072	30590.	49.841
NOV	0.00000				-240.469	3	6	13.F	12.F	-838.546	29754.	49.841
DEC	0.00000				-418.510	13	8	0.F	-1.F	-1047.523	30612.	49.841
TOTAL MAX	0.000				-2012.812					-1224.438	361697.	49.841

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/17/1995 11:19:9 SDL RUN 1  
DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. 8069-REMAI THE REMAINDER OF THE BLDG. (LESS POOL)  
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR H&VSYSTEMS TOPEKA, KS

MONTH	N U M B E R O F H O U R S				C O I N C I D E N T L O A D S				C O I N C I D E N T L O A D S			
	HOURS HEATING LOAD	HOURS COOLING AVAIL.	HOURS HEATING AVAIL.	HOURS FLOATING	HOURS COOLING AVAIL.	HOURS HEATING AVAIL.	HOURS FLOATING	HOURS COOLING AVAIL.	HOURS HEATING LOAD AT PEAK (KBTU/HR)	HOURS COOLING PEAK (KW)	HOURS HEATING LOAD AT PEAK (KBTU/HR)	HOURS COOLING PEAK (KW)
JAN	744	0	744	0	0	744	0	0	-528.694	27.300	0	27.300
FEB	672	0	672	0	0	672	0	0	-542.645	27.300	0	27.300
MAR	732	12	744	12	0	744	0	0	-531.314	27.300	12	27.300
APR	593	127	720	127	0	720	0	0	-254.162	27.300	127	27.300
MAY	259	485	360	485	0	744	0	0	0.000	27.300	485	27.300
JUN	0	720	0	720	0	720	0	0	0.000	27.300	720	27.300
JUL	0	744	0	744	0	744	0	0	0.000	27.300	744	27.300
AUG	0	744	0	744	0	744	0	0	0.000	27.300	744	27.300
SEP	0	720	0	720	0	720	0	0	0.000	27.300	720	27.300
OCT	575	169	720	169	0	744	0	0	-380.771	27.300	169	27.300
NOV	681	39	720	39	0	744	0	0	-630.593	27.300	39	27.300
DEC	744	0	744	0	0	744	0	0	-602.493	27.300	0	27.300
ANNUAL	0	5000	5424	3760	0	8760	0	0			3760	

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/17/1995 11:19: 9 SDL RUN 1  
DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. 8069-REMAI THE REMAINDER OF THE BLDG. (LESS POOL)  
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR AHU'S\_1&2 TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C			
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC-TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)	
JAN	0.00000				-29.509	15	2	-7.F	-8.F	-102.075	7242.	13.149
FEB	0.00000				-18.467	3	6	-1.F	-2.F	-101.131	6525.	13.049
MAR	0.00000				-9.447	3	7	14.F	12.F	-79.591	7290.	13.049
APR	0.00000				-0.798	1	2	34.F	30.F	-32.445	7029.	13.049
MAY	23.35393	16	6	57.F	-0.320	14	21	70.F	65.F	-6.851	9363.	28.077
JUN	53.01609	28	16	90.F	0.000					0.000	12074.	28.342
JUL	64.15292	13	13	90.F	0.000					0.000	13380.	30.637
AUG	62.56360	23	16	96.F	0.000					0.000	13573.	29.732
SEP	35.41990	7	15	92.F	0.000					0.000	10336.	28.488
OCT	0.72218	1	18	83.F	-0.677	20	7	23.F	23.F	-14.142	7263.	21.418
NOV	0.00000				-7.798	3	6	13.F	12.F	-72.923	7020.	13.049
DEC	0.00000				-25.009	12	5	4.F	3.F	-95.998	7202.	13.149
TOTAL	239.229				-92.024					-102.075	108290.	30.637
MAX												

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/17/1995 11:19: 9 SDL RUN 1  
DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. 8069-REMAI THE REMAINDER OF THE BLDG. (LESS POOL)  
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR AHU'S\_1&2 TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C		
	HOURS COOLING LOAD	HOURS HEATING LOAD	HOURS COINCIDENT COOL-HEAT LOAD	HOURS FLOATING	HOURS COOLING AVAIL.	HOURS HEATING AVAIL.	HOURS FANS ON CYCLE ON	HOURS NIGHT VENTING	HOURS FLOATING WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)
JAN	0	689	0	55	0	744	0	0	55	-30.365	4.316
FEB	0	592	0	80	0	672	0	0	80	-22.300	4.316
MAR	0	505	0	239	0	744	0	0	239	-28.897	4.316
APR	0	344	0	376	0	720	0	0	376	-2.657	4.316
MAY	357	169	0	218	359	744	0	0	218	0.000	25.882
JUN	699	0	0	21	699	720	0	0	21	0.000	28.342
JUL	744	0	0	0	744	744	0	0	0	0.000	29.414
AUG	740	0	0	4	740	744	0	0	4	0.000	29.732
SEP	583	0	0	137	585	720	0	0	137	0.000	28.424
OCT	14	371	0	359	14	744	0	0	359	0.000	21.333
NOV	0	494	0	226	0	720	0	0	226	-47.170	4.316
DEC	0	674	0	70	0	744	0	0	70	-51.758	4.316
ANNUAL	3137	3838	0	1785	3141	8760	0	0	1785		

EMC ENGINEERS INC. EZZOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/17/1995 11:19: 9 PDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. 8069-REMAI THE REMAINDER OF THE BLDG. (LESS POOL)  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY 154.552 249.186 28/ 9	NATURAL-GAS 699.678 1668.132 15/ 5
JAN	TOTAL (MBTU) PEAK (KBTU) DY/HR	154.552 249.186 28/ 9	699.678 1668.132 15/ 5
FEB	TOTAL (MBTU) PEAK (KBTU) DY/HR	139.168 248.844 28/22	546.205 1593.714 3/ 7
MAR	TOTAL (MBTU) PEAK (KBTU) DY/HR	151.980 248.844 31/22	458.050 1245.850 3/ 7
APR	TOTAL (MBTU) PEAK (KBTU) DY/HR	137.225 248.844 16/ 9	178.840 843.301 5/ 5
MAY	TOTAL (MBTU) PEAK (KBTU) DY/HR	140.782 266.044 31/18	51.877 694.022 1/ 6
JUN	TOTAL (MBTU) PEAK (KBTU) DY/HR	142.973 266.949 28/16	0.000 0.000 30/ 1
JUL	TOTAL (MBTU) PEAK (KBTU) DY/HR	150.130 274.784 23/16	0.000 0.000 31/ 1
AUG	TOTAL (MBTU) PEAK (KBTU) DY/HR	151.945 271.694 23/16	0.000 0.000 31/ 1
SEP	TOTAL (MBTU) PEAK (KBTU) DY/HR	136.654 267.449 7/16	0.000 0.000 30/ 1
OCT	TOTAL (MBTU) PEAK (KBTU) DY/HR	140.748 248.844 31/ 9	170.108 978.312 20/ 7
NOV	TOTAL (MBTU) PEAK (KBTU) DY/HR	144.469 248.844 30/22	380.596 1221.640 3/ 6
DEC	TOTAL (MBTU) PEAK (KBTU) DY/HR	153.823 249.186 13/ 8	637.134 1452.347 13/ 8
	ONE YEAR USE/PEAK	1744.449 274.784	3122.488 1668.132



EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/17/1995 11:19: 9 PDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. 8069-REMAI THE REMAINDER OF THE BLDG. (LESS POOL)  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
SPACE HEAT	115.97	3122.49
SPACE COOL	78.58	0.00
HVAC AUX	969.36	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	580.46	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	0.00	0.00
TOTAL	1744.37	3122.49

TOTAL SITE ENERGY 4866.94 MBTU 222.6 KBTU/SQFT-YR GROSS-AREA 222.6 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 8361.07 MBTU 382.4 KBTU/SQFT-YR GROSS-AREA 382.4 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 0.1  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

PEOPLE-SCHEDULE = L\_PEOPLE AREA/PERSON = 336.0  
 PEOPLE-HG-LAT = 965.0 PEOPLE-HG-SENS = 635.0  
 LIGHTING-TYPE = SUS-FLUOR LIGHTING-W/SQFT = 1.3  
 LIGHT-TO-SPACE = 1.0 LIGHTING-SCHEDULE = L\_PEOPLE  
 SOURCE-SENSIBLE = 0.0 FURN-WEIGHT = 0.5  
 INF-METHOD = AIR-CHANGE AIR-CHANGES/HR = 0.06  
 INF-SCHEDULE = L\_ON ..

E-W HEIGHT = 19.0 WIDTH = 56.0 CONS = EXWALL-1  
 AZIMUTH = 90 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 9.0 WIDTH = 35.0 G-T = 2\_PN\_STD  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 7.0 WIDTH = 13.0 G-T = 2\_PN\_STD  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 20.0 WIDTH = 19.0 CONS = EXWALL-1  
 AZIMUTH = 180 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 19.0 WIDTH = 41.0 CONS = EXWALL-1  
 AZIMUTH = 270 INSIDE-VIS-REFL = 0.2 ..

U-W HEIGHT = 41.0 WIDTH = 41.0 CONS = FLOOR ..

ROOF HEIGHT = 82.0 WIDTH = 82.0 CONS = ROOF-1  
 TILT = 0 SKY-FORM-FACTOR = 1.0 ..

U-W HEIGHT = 8.0 WIDTH = 9.0 CONS = FLOOR  
 AZIMUTH = 180 ..

U-W HEIGHT = 8.0 WIDTH = 9.0 CONS = FLOOR  
 AZIMUTH = 180 ..

END ..

COMPUTE LOADS ..

INPUT SYSTEMS ..

\$-----\$  
 \$ E Z - D O E S Y S T E M S I N P U T \$  
 \$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
 LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
 LINE-3 \* DENVER, CO 80227 \*  
 LINE-4 \*RUN #3 ECONOMIZER BLDG. 8069-REMAI \*  
 LINE-5 \*THE REMAINDER OF THE BLDG. (LESS POOL) \* ..  
 ABORT ERRORS ..

DIAGNOSTIC WARNINGS ..  
SYSTEMS-REPORT VERIFICATION=(SV-A)  
SUMMARY=(SS-A,SS-C,SS-K,SS-O)  
HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

SD\_ON =DAY-SCHEDULE (1,24) (1.) ..  
SD\_OFF =DAY-SCHEDULE (1,24) (0.) ..  
SD\_WT\_HT =DAY-SCHEDULE (1,5) (55.)  
(6,22) (74.)  
(23,24) (55.) ..  
SD\_SM\_CL =DAY-SCHEDULE (1,5) (85.)  
(6,22) (72.)  
(23,24) (85.) ..  
SD\_WINT\_OA =DAY-SCHEDULE (1,24) (0.37) ..  
SD\_WT\_CL =DAY-SCHEDULE (1,5) (57.)  
(6,22) (76.)  
(23,24) (57.) ..  
SD\_SM\_HT =DAY-SCHEDULE (1,5) (83.)  
(6,22) (70.)  
(23,24) (83.) ..  
SD\_FAN\_CYC =DAY-SCHEDULE (1,5) (0.)  
(6,22) (1.)  
(23,24) (0.) ..  
  
SW\_ON =WEEK-SCHEDULE (ALL) SD\_ON ..  
SW\_OFF =WEEK-SCHEDULE (ALL) SD\_OFF ..  
SW\_WT\_HT =WEEK-SCHEDULE (ALL) SD\_WT\_HT ..  
SW\_SM\_CL =WEEK-SCHEDULE (ALL) SD\_SM\_CL ..  
SW\_WINT\_OA =WEEK-SCHEDULE (ALL) SD\_WINT\_OA ..  
SW\_WT\_CL =WEEK-SCHEDULE (ALL) SD\_WT\_CL ..  
SW\_SM\_HT =WEEK-SCHEDULE (ALL) SD\_SM\_HT ..  
SW\_FAN\_CYC =WEEK-SCHEDULE (ALL) SD\_FAN\_CYC ..

\$ FULL ON SYSTEM

S\_ON =SCHEDULE THRU DEC 31 SW\_ON ..

\$ FULL OFF SYSTEM

S\_OFF =SCHEDULE THRU DEC 31 SW\_OFF ..

\$ HEATING SEASON

S\_HE-SCHED =SCHEDULE THRU MAY 15 SW\_ON  
THRU OCT 1 SW\_OFF  
THRU DEC 31 SW\_ON ..

\$ COOLING SEASON

S\_CL\_SCHED =SCHEDULE THRU MAY 15 SW\_OFF

THRU OCT 1 SW\_ON  
 THRU DEC 31 SW\_OFF ..

## \$ HEATING SET TEMP

S\_HT\_SET\_F =SCHEDULE THRU MAY 15 SW\_WT\_HT  
 THRU OCT 1 SW\_SM\_HT  
 THRU DEC 31 SW\_WT\_HT ..

## \$ COOLING SET TEMP

S\_CL\_SET\_F =SCHEDULE THRU MAY 15 SW\_WT\_CL  
 THRU OCT 1 SW\_SM\_CL  
 THRU DEC 31 SW\_WT\_CL ..

## \$ OUTSIDE AIR SCHEDULE

S\_OA\_SCHED =SCHEDULE THRU MAY 15 SW\_WINT\_OA  
 THRU OCT 1 SW\_ON  
 THRU DEC 31 SW\_WINT\_OA ..

S\_HRLY-RPT =SCHEDULE THRU JAN 13 SW\_OFF  
 THRU JAN 15 SW\_ON  
 THRU JUL 21 SW\_OFF  
 THRU JUL 23 SW\_ON  
 THRU DEC 31 SW\_OFF ..

S\_FAN\_CYCL =SCHEDULE THRU DEC 31 SW\_FAN\_CYC ..

## \$ ZONE DESCRIPTION

B-BALL/1ST =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL  
 SIZING-OPTION = FROM-LOADS ..

H-BALL/2ND =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL  
 SIZING-OPTION = FROM-LOADS ..

## \$ SYSTEM DESCRIPTION

H&VSYSTEMS =SYSTEM SYSTEM-TYPE = HVSYS  
 MAX-SUPPLY-T = 120.0 HEATING-SCHEDULE = S\_HE-SCHED  
 OA-CONTROL = FIXED SUPPLY-CFM = 35000.  
 RATED-CFM = 35000. MIN-OUTSIDE-AIR = 0.37  
 MIN-AIR-SCH = S\_OA\_SCHED FAN-SCHEDULE = S\_FAN\_CYCL  
 SUPPLY-DELTA-T = 2.4 SUPPLY-KW = 0.00078  
 MOTOR-PLACEMENT = OUTSIDE-AIRFLOW  
 NIGHT-CYCLE-CTRL = STAY-OFF. NIGHT-VENT-DT = 0.0  
 HEATING-CAPACITY = -1291523.  
 ZONE-NAMES = (B-BALL/1ST) ..

```

AHU'S_1&2 =SYSTEM      SYSTEM-TYPE = PSZ
                      MAX-SUPPLY-T = 120.0  MIN-SUPPLY-T = 55.0
                      HEATING-SCHEDULE = S_HE-SCHED
                      COOLING-SCHEDULE = S_CL_SCHED  ECONO-LIMIT-T = 70.0
                      SUPPLY-CFM = 7315.  RATED-CFM = 7315.
                      MIN-OUTSIDE-AIR = 0.2  FAN-SCHEDULE = S_FAN_CYCL
                      SUPPLY-DELTA-T = 1.8  SUPPLY-KW = 0.00059
                      MOTOR-PLACEMENT = OUTSIDE-AIRFLOW
                      FAN-PLACEMENT = BLOW-THROUGH
                      NIGHT-CYCLE-CTRL = STAY-OFF  NIGHT-VENT-DT = 0.0
                      COOLING-CAPACITY = 171850.  COOL-SH-CAP = 144543.
                      COOL-FT-MIN = 0.  HEATING-CAPACITY = -100648.
                      MIN-HP-T = 0.  MAX-HP-SUPP-T = 0.  DEFROST-T = 0.
                      CRANKCASE-MAX-T = 0.  OUTSIDE-FAN-T = 45.
                      HEAT-SOURCE = HOT-WATER  SIZING-OPTION = COINCIDENT
                      ZONE-NAMES = (H-BALL/2ND)  ..

```



\$ HOURLY REPORT DESCRIPTION

```

H&V-BLK  =REPORT-BLOCK VARIABLE-TYPE = H&VSYSTEMS
          VARIABLE-LIST = (3,5,17,39) ..
SZ-AHU-BLK =REPORT-BLOCK VARIABLE-TYPE = AHU'S_1&2
          VARIABLE-LIST = (3,5,6,17,39) ..
H&VZN-BLK =REPORT-BLOCK VARIABLE-TYPE = B-BALL/1ST
          VARIABLE-LIST = (17,18,7,6) ..
SZZONE-BLK =REPORT-BLOCK VARIABLE-TYPE = H-BALL/2ND
          VARIABLE-LIST = (17,18,7,6) ..
AHU-RPTS  = HOURLY-REPORT  REPORT-SCHEDULE = S_HRLY-RPT
          REPORT-BLOCK = (H&V-BLK,SZ-AHU-BLK)
..
ZONE-RPTS = HOURLY-REPORT  REPORT-SCHEDULE = S_HRLY-RPT
          REPORT-BLOCK = (H&VZN-BLK,SZZONE-BLK)
..
END ..
COMPUTE SYSTEMS ..

```

INPUT PLANT ..

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$-----$
$ E Z - D O E  P L A N T S  I N P U T $
$-----$

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\$ GENERAL PROJECT DATA

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TITLE  LINE-1 *   EMC      ENGINEERS      INC.      *
        LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
        LINE-3 *   DENVER,      CO      80227      *
        LINE-4 *RUN #3 ECONOMIZER BLDG. 8069-REMAI      *
        LINE-5 *THE REMAINDER OF THE BLDG. (LESS POOL) * ..

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ABORT      ERRORS ..
DIAGNOSTIC WARNINGS ..
PLANT-REPORT VERIFICATION=(PV-A)

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EMC ENGINEERS INC. DOE-2.1D 6/2/1995 11:41:1 SDL RUN 1  
 DENVER, CO 80227 RUN #3 ECONOMIZER BLDG. 8069-REMAI THE REMAINDER OF THE BLDG. (LESS POOL)  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR H&VSYSTEMS TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-323.171	15	-7.F	-8.F	24778.	-1240.048	49.841
FEB	0.00000				-241.228	3	-5.F	-6.F	22349.	-1164.511	49.841
MAR	0.00000				-189.086	3	15.F	12.F	24913.	-890.203	49.841
APR	0.00000				-58.657	5	31.F	28.F	24044.	-568.303	49.841
MAY	0.00000				-14.101	1	6	37.F	24778.	-434.264	49.841
JUN	0.00000				0.000				24066.	0.000	49.841
JUL	0.00000				0.000				24666.	0.000	49.841
AUG	0.00000				0.000				25004.	0.000	49.841
SEP	0.00000				0.000				23954.	0.000	49.841
OCT	0.00000				-55.869	20	23.F	22.F	24666.	-680.747	49.841
NOV	0.00000				-152.014	3	13.F	12.F	24021.	-870.373	49.841
DEC	0.00000				-287.836	13	6	1.F	24688.	-1091.635	49.841
TOTAL	0.000				-1321.962				291938.	-1240.048	49.841
MAX											

EMC ENGINEERS INC. DOE-2.1D 6/2/1995 11:41:1 SDL RUN 1  
 DENVER, CO 80227 RUN #3 ECONOMIZER BLDG. 8069-REMAI THE REMAINDER OF THE BLDG. (LESS POOL)  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR H&VSYSTEMS TOPEKA, KS

MONTH	H O U R S				H O U R S				C O I N C I D E N T			
	HOURS HEATING LOAD	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.	HOURS FANS ON	HOURS HEATING AVAIL.	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.	HOURS FANS ON	HOURS HEATING LOAD AT PEAK	HOURS HEATING LOAD AT PEAK	HOURS HEATING LOAD AT PEAK	HOURS HEATING LOAD AT PEAK
JAN	0	744	0	527	0	744	0	527	0.000	0.000	0.000	0.000
FEB	0	672	0	476	0	672	0	476	0.000	0.000	0.000	0.000
MAR	0	744	0	527	0	744	0	527	0.000	0.000	0.000	0.000
APR	0	720	0	510	0	720	0	510	0.000	0.000	0.000	0.000
MAY	0	360	0	527	0	360	0	527	0.000	0.000	0.000	0.000
JUN	0	0	0	527	0	0	0	527	0.000	0.000	0.000	0.000
JUL	0	0	0	527	0	0	0	527	0.000	0.000	0.000	0.000
AUG	0	0	0	527	0	0	0	527	0.000	0.000	0.000	0.000
SEP	0	720	0	527	0	720	0	527	0.000	0.000	0.000	0.000
OCT	0	720	0	527	0	720	0	527	0.000	0.000	0.000	0.000
NOV	0	744	0	527	0	744	0	527	0.000	0.000	0.000	0.000
DEC	0	5424	0	6205	0	5424	0	6205	0.000	0.000	0.000	0.000
ANNUAL	0	5424	0	6205	0	5424	0	6205	0.000	0.000	0.000	0.000

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 6/ 2/1995 11:41: 1 SDL RUN 1 DENVER, CO 80227 RUN #3 ECONOMIZER BLDG. 8069-REMAI THE REMAINDER OF THE BLDG. (LESS POOL) REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR AHU'S_1&2 TOPEKA, KS														
C O O L I N G					H E A T I N G					E L E C				
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	TRICAL ENERGY (KWH)	ELEC- TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)	
JAN	0.00000				0.000	-25.027	15	21	3.F	1.F	6305.	13.149		
FEB	0.00000				0.000	-15.417	3	7	-5.F	-6.F	5679.	13.049		
MAR	0.00000				0.000	-8.879	3	9	17.F	13.F	6353.	13.049		
APR	0.00000				0.000	-1.316	9	7	32.F	30.F	6122.	13.049		
MAY	19.97339	16	13	76.F	67.F	-0.205	1	7	38.F	36.F	8165.	29.585		
JUN	49.98787	28	12	87.F	76.F	0.000					10916.	30.041		
JUL	63.78401	13	13	90.F	79.F	0.000					12391.	31.824		
AUG	61.76687	23	13	93.F	77.F	0.000					12558.	31.330		
SEP	32.39009	7	15	92.F	76.F	0.000					9175.	30.323		
OCT	0.85751	1	18	83.F	68.F	-1.399	20	7	23.F	23.F	6340.	23.399		
NOV	0.00000				0.000	-7.481	10	7	20.F	18.F	6114.	13.049		
DEC	0.00000				0.000	-21.216	14	9	10.F	8.F	6266.	13.149		
TOTAL	228.760				183.444	-80.940					96380.			
MAX										-105.120			31.824	

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 6/ 2/1995 11:41: 1 SDL RUN 1 DENVER, CO 80227 RUN #3 ECONOMIZER BLDG. 8069-REMAI THE REMAINDER OF THE BLDG. (LESS POOL) REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR AHU'S_1&2 TOPEKA, KS														
C O O L I N G					H E A T I N G					E L E C				
MONTH	HOURS COOLING LOAD	HOURS HEATING LOAD	HOURS COINCIDENT COOL-HEAT LOAD	HOURS FLOATING	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.	HOURS FANS ON CYCLE	HOURS NIGHT VENTING	HOURS FLOATING WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)			
JAN	0	505	0	239	744	0	527	0	22	0.000	0.000			
FEB	0	430	0	242	672	0	476	0	46	0.000	0.000			
MAR	0	302	0	442	744	0	527	0	225	0.000	0.000			
APR	0	63	0	657	720	0	510	0	447	0.000	0.000			
MAY	204	15	0	525	360	384	527	0	308	0.000	28.559			
JUN	456	0	0	264	0	720	510	0	54	0.000	29.751			
JUL	512	0	0	232	0	744	527	0	15	0.000	31.046			
AUG	509	0	0	235	0	744	527	0	18	0.000	31.045			
SEP	352	0	0	368	0	696	510	0	158	0.000	30.301			
OCT	11	85	0	648	720	20	527	0	431	0.000	23.180			
NOV	0	289	0	431	720	0	510	0	221	0.000	0.000			
DEC	0	493	0	251	744	0	527	0	34	0.000	0.000			
ANNUAL	2044	2182	0	4534	5424	3308	6205	0	1979					

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 6/2/1995 11:41:1 PDL RUN 1  
 DENVER, CO 80227 RUN #3 ECONOMIZER BLDG. 8069-REMAI THE REMAINDER OF THE BLDG. (LESS POOL)  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY TOTAL (MBTU) PEAK (KBTU) DY/HR	NATURAL-GAS TOTAL (MBTU) PEAK (KBTU) DY/HR
JAN	123.906 249.434 28/9	490.887 1680.285 15/7	
FEB	111.472 249.093 28/22	376.478 1599.241 3/7	
MAR	121.584 249.093 31/22	302.430 1266.990 3/7	
APR	109.831 249.093 16/9	100.606 870.371 5/7	
MAY	114.551 271.192 31/18	25.441 711.469 1/7	
JUN	119.446 272.751 28/15	0.000 0.000 30/1	
JUL	126.526 278.838 23/16	0.000 0.000 31/1	
AUG	128.251 277.149 23/16	0.000 0.000 31/1	
SEP	113.116 273.713 7/16	0.000 0.000 30/1	
OCT	112.569 250.072 1/17	97.058 1045.115 20/7	
NOV	115.570 249.093 30/22	246.878 1214.664 3/6	
DEC	123.184 249.434 13/8	445.270 1502.673 13/8	
	ONE YEAR USE/PEAK	1420.008 278.838	2085.049 1680.285



EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 6/ 2/1995 11:41: 1 PDL RUN 1  
 DENVER, CO 80227 RUN #3 ECONOMIZER BLDG. 8069-REMAI THE REMAINDER OF THE BLDG. (LESS POOL)  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
SPACE HEAT	77.79	2085.05
SPACE COOL	75.56	0.00
HVAC AUX	686.15	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	580.46	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	0.00	0.00
TOTAL	1419.96	2085.05

TOTAL SITE ENERGY 3505.06 MBTU 160.3 KBTU/SOFT-YR GROSS-AREA 160.3 KBTU/SOFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 6349.34 MBTU 290.4 KBTU/SOFT-YR GROSS-AREA 290.4 KBTU/SOFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 4.7  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

PEOPLE-SCHEDULE = L\_PEOPLE AREA/PERSON = 336.0  
 PEOPLE-HG-LAT = 965.0 PEOPLE-HG-SENS = 635.0  
 LIGHTING-TYPE = SUS-FLUOR LIGHTING-W/SQFT = 1.3  
 LIGHT-TO-SPACE = 1.0 LIGHTING-SCHEDULE = L\_PEOPLE  
 SOURCE-SENSIBLE = 0.0 FURN-WEIGHT = 0.5  
 INF-METHOD = AIR-CHANGE AIR-CHANGES/HR = 0.06  
 INF-SCHEDULE = L\_ON ..

E-W HEIGHT = 19.0 WIDTH = 56.0 CONS = EXWALL-1  
 AZIMUTH = 90 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 9.0 WIDTH = 35.0 G-T = 2\_PN\_STD  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 7.0 WIDTH = 13.0 G-T = 2\_PN\_STD  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 20.0 WIDTH = 19.0 CONS = EXWALL-1  
 AZIMUTH = 180 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 19.0 WIDTH = 41.0 CONS = EXWALL-1  
 AZIMUTH = 270 INSIDE-VIS-REFL = 0.2 ..

U-W HEIGHT = 41.0 WIDTH = 41.0 CONS = FLOOR ..

ROOF HEIGHT = 82.0 WIDTH = 82.0 CONS = ROOF-1  
 TILT = 0 SKY-FORM-FACTOR = 1.0 ..

U-W HEIGHT = 8.0 WIDTH = 9.0 CONS = FLOOR  
 AZIMUTH = 180 ..

U-W HEIGHT = 8.0 WIDTH = 9.0 CONS = FLOOR  
 AZIMUTH = 180 ..

END ..

COMPUTE LOADS ..

INPUT SYSTEMS ..

\$-----\$  
 \$ E Z - D O E S Y S T E M S I N P U T \$  
 \$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
 LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
 LINE-3 \* DENVER, CO 80227 \*  
 LINE-4 \*RUN #4 NIGHT INFILTRATION BLDG. 8069-R \*  
 LINE-5 \*THE REMAINDER OF THE BLDG. (LESS POOL) \* ..  
 ABORT ERRORS ..

```

DIAGNOSTIC          WARNINGS ..
SYSTEMS-REPORT     VERIFICATION=(SV-A)
                   SUMMARY=(SS-A,SS-C,SS-K,SS-O)
                   HOURLY-DATA-SAVE = YES ..

```

\$ SCHEDULES

```

SD_ON      =DAY-SCHEDULE (1,24) (1.) ..
SD_OFF     =DAY-SCHEDULE (1,24) (0.) ..
SD_WT_HT   =DAY-SCHEDULE (1,24) (74.) ..
SD_SM_CL   =DAY-SCHEDULE (1,24) (72.) ..
SD_WINT_OA =DAY-SCHEDULE (1,5) (0.)
            (6,22) (0.37)
            (23,24) (0.) ..
SD_WT_CL   =DAY-SCHEDULE (1,24) (76.) ..
SD_SM_HT   =DAY-SCHEDULE (1,24) (70.) ..
SD_SM_OA   =DAY-SCHEDULE (1,5) (0.)
            (6,22) (1.)
            (23,24) (0.) ..
SD_SZ'S_OA =DAY-SCHEDULE (1,5) (0.)
            (6,22) (0.2)
            (23,24) (0.) ..

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SW_ON      =WEEK-SCHEDULE (ALL) SD_ON ..
SW_OFF     =WEEK-SCHEDULE (ALL) SD_OFF ..
SW_WT_HT   =WEEK-SCHEDULE (ALL) SD_WT_HT ..
SW_SM_CL   =WEEK-SCHEDULE (ALL) SD_SM_CL ..
SW_WINT_OA =WEEK-SCHEDULE (ALL) SD_WINT_OA ..
SW_WT_CL   =WEEK-SCHEDULE (ALL) SD_WT_CL ..
SW_SM_HT   =WEEK-SCHEDULE (ALL) SD_SM_HT ..
SW_SM_OA   =WEEK-SCHEDULE (ALL) SD_SM_OA ..
SW_SZ'S_OA =WEEK-SCHEDULE (ALL) SD_SZ'S_OA ..

```

\$ FULL ON SYSTEM

S\_ON =SCHEDULE THRU DEC 31 SW\_ON ..

\$ FULL OFF SYSTEM

S\_OFF =SCHEDULE THRU DEC 31 SW\_OFF ..

\$ HEATING SEASON

```

S_HE-SCHED =SCHEDULE THRU MAY 15 SW_ON
            THRU OCT 1 SW_OFF
            THRU DEC 31 SW_ON ..

```

\$ COOLING SEASON

```

S_CL_SCHED =SCHEDULE THRU MAY 15 SW_OFF
            THRU OCT 1 SW_ON

```

THRU DEC 31 SW\_OFF ..

\$ HEATING SET TEMP

S\_HT\_SET\_F =SCHEDULE THRU MAY 15 SW\_WT\_HT
THRU OCT 1 SW\_SM\_HT
THRU DEC 31 SW\_WT\_HT ..

\$ COOLING SET TEMP

S\_CL\_SET\_F =SCHEDULE THRU MAY 15 SW\_WT\_CL
THRU OCT 1 SW\_SM\_CL
THRU DEC 31 SW\_WT\_CL ..

\$ OUTSIDE AIR SCHEDULE

S\_OA\_SCHED =SCHEDULE THRU MAY 15 SW\_WINT\_OA
THRU OCT 1 SW\_SM\_OA
THRU DEC 31 SW\_WINT\_OA ..

S\_HRLY-RPT =SCHEDULE THRU JAN 13 SW\_OFF
THRU JAN 15 SW\_ON
THRU JUL 21 SW\_OFF
THRU JUL 23 SW\_ON
THRU DEC 31 SW\_OFF ..

S\_SZ'S\_OA\* =SCHEDULE THRU DEC 31 SW\_SZ'S\_OA ..

\$ ZONE DESCRIPTION

B-BALL/1ST =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F
ZONE-TYPE = CONDITIONED
THERMOSTAT-TYPE = PROPORTIONAL
SIZING-OPTION = FROM-LOADS ..

H-BALL/2ND =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F
ZONE-TYPE = CONDITIONED
THERMOSTAT-TYPE = PROPORTIONAL
SIZING-OPTION = FROM-LOADS ..

\$ SYSTEM DESCRIPTION

H&VSYSTEMS =SYSTEM SYSTEM-TYPE = HVSYS
MAX-SUPPLY-T = 120.0 HEATING-SCHEDULE = S\_HE-SCHED
OA-CONTROL = FIXED SUPPLY-CFM = 35000.
RATED-CFM = 35000. MIN-OUTSIDE-AIR = 0.37
MIN-AIR-SCH = S\_OA\_SCHED SUPPLY-DELTA-T = 2.4
SUPPLY-KW = 0.00078
MOTOR-PLACEMENT = OUTSIDE-AIRFLOW
NIGHT-CYCLE-CTRL = STAY-OFF NIGHT-VENT-DT = 0.0
HEATING-CAPACITY = -1291523.
ZONE-NAMES = (B-BALL/1ST) ..



AHU'S\_1&2 =SYSTEM SYSTEM-TYPE = PSZ

MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_HE-SCHED  
 COOLING-SCHEDULE = S\_CL\_SCHED OA-CONTROL = FIXED  
 SUPPLY-CFM = 7315. RATED-CFM = 7315.  
 MIN-OUTSIDE-AIR = 0.2 MIN-AIR-SCH = S SZ'S\_OA% ←  
 SUPPLY-DELTA-T = 1.8 SUPPLY-KW = 0.00059  
 MOTOR-PLACEMENT = OUTSIDE-AIRFLOW  
 FAN-PLACEMENT = BLOW-THROUGH  
 NIGHT-CYCLE-CTRL = STAY-OFF NIGHT-VENT-DT = 0.0  
 COOLING-CAPACITY = 171850. COOL-SH-CAP = 144543.  
 COOL-FT-MIN = 0. HEATING-CAPACITY = -100648.  
 MIN-HP-T = 0. MAX-HP-SUPP-T = 0. DEFROST-T = 0.  
 CRANKCASE-MAX-T = 0. OUTSIDE-FAN-T = 45.  
 HEAT-SOURCE = HOT-WATER SIZING-OPTION = COINCIDENT  
 ZONE-NAMES = (H-BALL/2ND) ..

\$ HOURLY REPORT DESCRIPTION

H&V-BLK =REPORT-BLOCK VARIABLE-TYPE = H&VSYSTEMS  
 VARIABLE-LIST = (3,5,17,39) ..  
 SZ-AHU-BLK =REPORT-BLOCK VARIABLE-TYPE = AHU'S\_1&2  
 VARIABLE-LIST = (3,5,6,17,39) ..  
 H&VZN-BLK =REPORT-BLOCK VARIABLE-TYPE = B-BALL/1ST  
 VARIABLE-LIST = (17,18,7,6) ..  
 SZZONE-BLK =REPORT-BLOCK VARIABLE-TYPE = H-BALL/2ND  
 VARIABLE-LIST = (17,18,7,6) ..  
 AHU-RPTS = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (H&V-BLK,SZ-AHU-BLK)  
 ..  
 ZONE-RPTS = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (H&VZN-BLK,SZZONE-BLK)  
 ..  
 END ..  
 COMPUTE SYSTEMS ..

INPUT PLANT ..

\$-----\$  
 \$ E Z - D O E P L A N T S I N P U T \$  
 \$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
 LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
 LINE-3 \* DENVER, CO 80227 \*  
 LINE-4 \*RUN #4 NIGHT INFILTRATION BLDG. 8069-R \*  
 LINE-5 \*THE REMAINDER OF THE BLDG. (LESS POOL) \* ..

ABORT ERRORS ..  
 DIAGNOSTIC WARNINGS ..  
 PLANT-REPORT VERIFICATION=(PV-A)  
 SUMMARY=(PS-B,BEPS)

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/17/1995 13:13:53 SDL RUN 1  
 DENVER, CO 80227 RUN #4 NIGHT INFILTRATION BLDG. 8069-R THE REMAINDER OF THE BLDG. (LESS POOL)  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR H&VSYSTEMS TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-312.632	15	-8.F	-9.F	-1212.085	30702.	49.841
FEB	0.00000				-231.814	3	-5.F	-6.F	-1146.739	27700.	49.841
MAR	0.00000				-179.106	3	14.F	12.F	-845.295	30838.	49.841
APR	0.00000				-52.533	5	30.F	27.F	-538.162	29777.	49.841
MAY	0.00000				-12.203	1	38.F	36.F	-410.682	30702.	49.841
JUN	0.00000				0.000				0.000	29799.	49.841
JUL	0.00000				0.000				0.000	30590.	49.841
AUG	0.00000				0.000				0.000	30928.	49.841
SEP	0.00000				0.000				0.000	29687.	49.841
OCT	0.00000				-50.203	20	23.F	23.F	-664.061	30590.	49.841
NOV	0.00000				-143.263	3	13.F	12.F	-791.235	29754.	49.841
DEC	0.00000				-277.366	13	0.F	-1.F	-1039.518	30612.	49.841
TOTAL	0.000				-1259.121				-1212.085	361697.	49.841
MAX											

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/17/1995 13:13:53 SDL RUN 1  
 DENVER, CO 80227 RUN #4 NIGHT INFILTRATION BLDG. 8069-R THE REMAINDER OF THE BLDG. (LESS POOL)  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR H&VSYSTEMS TOPEKA, KS

MONTH	HOURS				HOURS				HOURS				HOURS			
	COOLING LOAD	HEATING LOAD	COINCIDENT COOL-HEAT LOAD	FLOATING	HEATING AVAIL.	COOLING AVAIL.	FANS ON	FANS ON CYCLE	NIGHT VENTING	FLOATING WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)		
JAN	0	631	0	113	744	0	744	0	0	113	0.000	27.300	0.000	27.300		
FEB	0	550	0	122	672	0	672	0	0	122	0.000	27.300	0.000	27.300		
MAR	0	575	0	169	744	0	744	0	0	169	0.000	27.300	0.000	27.300		
APR	0	399	0	321	720	0	720	0	0	321	0.000	27.300	0.000	27.300		
MAY	0	152	0	592	360	0	744	0	0	592	0.000	27.300	0.000	27.300		
JUN	0	0	0	720	0	0	720	0	0	720	0.000	27.300	0.000	27.300		
JUL	0	0	0	744	0	0	744	0	0	744	0.000	27.300	0.000	27.300		
AUG	0	0	0	744	0	0	744	0	0	744	0.000	27.300	0.000	27.300		
SEP	0	0	0	720	0	0	720	0	0	720	0.000	27.300	0.000	27.300		
OCT	0	367	0	377	720	0	744	0	0	377	0.000	27.300	0.000	27.300		
NOV	0	495	0	225	720	0	720	0	0	225	0.000	27.300	0.000	27.300		
DEC	0	602	0	142	744	0	744	0	0	142	0.000	27.300	0.000	27.300		
ANNUAL	0	3771	0	4989	5424	0	8760	0	0	4989						

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/17/1995 13:13:53 SDL RUN 1  
 DENVER, CO 80227 RUN #4 NIGHT INFILTRATION BLDG. 8069-R THE REMAINDER OF THE BLDG. (LESS POOL)  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR AHU'S 1&2 TOPEKA, KS

MONTH	COOLING			HEATING			DRY-BULB			WET-BULB			MAXIMUM			ELECTRIC		
	HOURS LOAD	ENERGY (MBTU)	OF MAX DY HR	TIME OF MAX DY HR	HEATING ENERGY (MBTU)	OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	MAXIMUM HEATING LOAD (KBTU/HR)	DRY- BULB TEMP	WET- BULB TEMP	TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)				
JAN	0	0.00000			-35.529	15	6	-8.F	-9.F	-121.121		7242.	13.149					
FEB	0	0.00000			-23.585	3	6	-1.F	-2.F	-115.538		6525.	13.049					
MAR	0	0.00000			-13.192	3	6	15.F	12.F	-107.928		7290.	13.049					
APR	0	0.00000			-1.151	5	7	30.F	27.F	-46.546		7029.	13.049					
MAY	28	0.05231	16	13	-0.310	1	6	37.F	37.F	-15.782		9771.	30.476					
JUN	62	1.2816	28	16	0.000					0.000		12901.	30.628					
JUL	74	2.7632	13	13	0.000					0.000		14302.	32.286					
AUG	72	5.2496	23	13	0.000					0.000		14505.	31.734					
SEP	43	4.5966	7	15	0.000					0.000		11037.	30.894					
OCT	1	0.08288	1	17	-1.425	20	7	23.F	23.F	-63.189		7296.	24.031					
NOV	0	0.00000			-11.167	3	6	13.F	12.F	-102.650		7020.	13.049					
DEC	0	0.00000			-31.238	15	6	9.F	7.F	-111.369		7202.	13.149					
TOTAL	281.524				-117.597					-121.121		112113.						
MAX														32.286				

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/17/1995 13:13:53 SDL RUN 1  
 DENVER, CO 80227 RUN #4 NIGHT INFILTRATION BLDG. 8069-R THE REMAINDER OF THE BLDG. (LESS POOL)  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR AHU'S 1&2 TOPEKA, KS

MONTH	HOURS COOLING		HOURS HEATING		HOURS COOLING		HOURS HEATING		HOURS COOLING		HOURS HEATING		HOURS COOLING		HOURS HEATING		HOURS COOLING		HOURS HEATING	
	LOAD	AVAIL.	LOAD	AVAIL.	LOAD	AVAIL.	LOAD	AVAIL.	LOAD	AVAIL.	LOAD	AVAIL.	LOAD	AVAIL.	LOAD	AVAIL.	LOAD	AVAIL.	LOAD	AVAIL.
JAN	0	744	0	744	0	744	0	744	0	744	0	744	0	744	0	744	0	744	0	744
FEB	0	672	0	672	0	672	0	672	0	672	0	672	0	672	0	672	0	672	0	672
MAR	0	744	0	744	0	744	0	744	0	744	0	744	0	744	0	744	0	744	0	744
APR	0	720	0	720	0	720	0	720	0	720	0	720	0	720	0	720	0	720	0	720
MAY	374	360	0	360	375	360	0	360	711	720	0	720	9	213	0	213	0	213	0	213
JUN	711	0	0	0	711	0	0	0	744	0	0	0	9	0	0	0	0	0	0	0
JUL	744	0	0	0	744	0	0	0	744	0	0	0	0	0	0	0	0	0	0	0
AUG	741	0	0	0	742	0	0	0	744	0	0	0	0	0	0	0	0	0	0	0
SEP	665	0	0	0	667	0	0	0	720	0	0	0	0	0	0	0	0	0	0	0
OCT	19	720	0	720	19	720	0	720	19	744	0	744	340	175	0	175	0	175	0	175
NOV	0	744	0	744	0	744	0	744	0	744	0	744	0	744	0	744	0	744	0	744
DEC	0	744	0	744	0	744	0	744	0	744	0	744	0	744	0	744	0	744	0	744
ANNUAL	3254	5424	0	5424	3258	8760	0	8760	0	8760	0	8760	1376	1376	0	1376	0	1376	0	1376

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/17/1995 13:13:53 PDL RUN 1  
 DENVER, CO 80227 RUN #4 NIGHT INFILTRATION BLDG. 8069-R THE REMAINDER OF THE BLDG. (LESS POOL)  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY 148.920 249.383 28/9	NATURAL-GAS 496.204 1677.795 15/6
JAN	TOTAL (MBTU) PEAK (KBTU) DY/HR	133.849 249.042 28/22	378.767 1592.294 3/7
FEB	TOTAL (MBTU) PEAK (KBTU) DY/HR	145.764 249.042 31/22	297.271 1263.417 3/7
MAR	TOTAL (MBTU) PEAK (KBTU) DY/HR	132.898 249.042 15/8	93.307 852.298 5/7
APR	TOTAL (MBTU) PEAK (KBTU) DY/HR	140.462 274.233 31/18	23.512 653.961 1/7
MAY	TOTAL (MBTU) PEAK (KBTU) DY/HR	145.797 274.755 28/16	0.000 0.000 30/1
JUN	TOTAL (MBTU) PEAK (KBTU) DY/HR	153.278 280.417 23/15	0.000 0.000 31/1
JUL	TOTAL (MBTU) PEAK (KBTU) DY/HR	155.128 278.531 23/16	0.000 0.000 31/1
AUG	TOTAL (MBTU) PEAK (KBTU) DY/HR	139.048 275.662 7/16	0.000 0.000 30/1
SEP	TOTAL (MBTU) PEAK (KBTU) DY/HR	136.383 252.230 1/17	90.309 1015.888 20/7
OCT	TOTAL (MBTU) PEAK (KBTU) DY/HR	138.903 249.042 30/22	242.117 1203.320 3/6
NOV	TOTAL (MBTU) PEAK (KBTU) DY/HR	148.027 249.383 13/8	449.226 1473.683 13/8
DEC	TOTAL (MBTU) PEAK (KBTU) DY/HR	1718.458 280.417	2070.712 1677.795



EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOB-2.1D 5/17/1995 13:13:53 PDL RUN 1  
 DENVER, CO 80227 RUN #4 NIGHT INFILTRATION BLDG. 8069-R THE REMAINDER OF THE BLDG. (LESS POOL)  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
SPACE HEAT	78.31	2070.71
SPACE COOL	91.63	0.00
HVAC AUX	967.97	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	580.46	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	0.00	0.00
TOTAL	1718.36	2070.71

TOTAL SITE ENERGY 3789.17 MBTU 173.3 KBTU/SQFT-YR GROSS-AREA 173.3 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 7231.25 MBTU 330.8 KBTU/SQFT-YR GROSS-AREA 330.8 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTILING RANGE = 1.1  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

PEOPLE-SCHEDULE = L\_PEOPLE AREA/PERSON = 336.0  
 PEOPLE-HG-LAT = 965.0 PEOPLE-HG-SENS = 635.0  
 LIGHTING-TYPE = SUS-FLUOR LIGHTING-W/SQFT = 1.3  
 LIGHT-TO-SPACE = 1.0 LIGHTING-SCHEDULE = L\_PEOPLE  
 SOURCE-SENSIBLE = 0.0 FURN-WEIGHT = 0.5  
 INF-METHOD = AIR-CHANGE AIR-CHANGES/HR = 0.06  
 INF-SCHEDULE = L\_ON ..

E-W HEIGHT = 19.0 WIDTH = 56.0 CONS = EXWALL-1  
 AZIMUTH = 90 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 9.0 WIDTH = 35.0 G-T = 2\_PN\_STD  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 7.0 WIDTH = 13.0 G-T = 2\_PN\_STD  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 20.0 WIDTH = 19.0 CONS = EXWALL-1  
 AZIMUTH = 180 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 19.0 WIDTH = 41.0 CONS = EXWALL-1  
 AZIMUTH = 270 INSIDE-VIS-REFL = 0.2 ..

U-W HEIGHT = 41.0 WIDTH = 41.0 CONS = FLOOR ..

ROOF HEIGHT = 82.0 WIDTH = 82.0 CONS = ROOF-1  
 TILT = 0 SKY-FORM-FACTOR = 1.0 ..

U-W HEIGHT = 8.0 WIDTH = 9.0 CONS = FLOOR  
 AZIMUTH = 180 ..

U-W HEIGHT = 8.0 WIDTH = 9.0 CONS = FLOOR  
 AZIMUTH = 180 ..

END ..

COMPUTE LOADS ..

INPUT SYSTEMS ..

\$-----\$  
 \$ E Z - D O E S Y S T E M S I N P U T \$  
 \$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
 LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
 LINE-3 \* DENVER, CO 80227 \*  
 LINE-4 \*RUN #5 DAY INFILTRATION BLDG. 8069-R \*  
 LINE-5 \*THE REMAINDER OF THE BLDG. (LESS POOL) \* ..  
 ABORT ERRORS ..

```

DIAGNOSTIC          WARNINGS ..
SYSTEMS-REPORT     VERIFICATION=(SV-A)
                   SUMMARY=(SS-A,SS-C,SS-K,SS-O)
                   HOURLY-DATA-SAVE = YES ..

```

\$ SCHEDULES

```

SD_ON      =DAY-SCHEDULE (1,24) (1.) ..
SD_OFF     =DAY-SCHEDULE (1,24) (0.) ..
SD_WT_HT   =DAY-SCHEDULE (1,24) (74.) ..
SD_SM_CL   =DAY-SCHEDULE (1,24) (72.) ..
SD_WINT_OA =DAY-SCHEDULE (1,5) (0.37)
            (6,22) (0.)
            (23,24) (0.37) ..
SD_WT_CL   =DAY-SCHEDULE (1,24) (76.) ..
SD_SM_HT   =DAY-SCHEDULE (1,24) (70.) ..
SD_SM_OA   =DAY-SCHEDULE (1,5) (1.)
            (6,22) (0.)
            (23,24) (1.) ..
SD_SZ'S_OA =DAY-SCHEDULE (1,5) (0.2)
            (6,22) (0.)
            (23,24) (0.2) ..

SW_ON      =WEEK-SCHEDULE (ALL) SD_ON ..
SW_OFF     =WEEK-SCHEDULE (ALL) SD_OFF ..
SW_WT_HT   =WEEK-SCHEDULE (ALL) SD_WT_HT ..
SW_SM_CL   =WEEK-SCHEDULE (ALL) SD_SM_CL ..
SW_WINT_OA =WEEK-SCHEDULE (ALL) SD_WINT_OA ..
SW_WT_CL   =WEEK-SCHEDULE (ALL) SD_WT_CL ..
SW_SM_HT   =WEEK-SCHEDULE (ALL) SD_SM_HT ..
SW_SM_OA   =WEEK-SCHEDULE (ALL) SD_SM_OA ..
SW_SZ'S_OA =WEEK-SCHEDULE (ALL) SD_SZ'S_OA ..

```



\$ FULL ON SYSTEM

S\_ON =SCHEDULE THRU DEC 31 SW\_ON ..

\$ FULL OFF SYSTEM

S\_OFF =SCHEDULE THRU DEC 31 SW\_OFF ..

\$ HEATING SEASON

```

S_HE-SCHED =SCHEDULE THRU MAY 15 SW_ON
            THRU OCT 1 SW_OFF
            THRU DEC 31 SW_ON ..

```

\$ COOLING SEASON

```

S_CL_SCHED =SCHEDULE THRU MAY 15 SW_OFF
            THRU OCT 1 SW_ON

```

THRU DEC 31 SW\_OFF ..

\$ HEATING SET TEMP

S\_HT\_SET\_F =SCHEDULE THRU MAY 15 SW\_WT\_HT  
THRU OCT 1 SW\_SM\_HT  
THRU DEC 31 SW\_WT\_HT ..

\$ COOLING SET TEMP

S\_CL\_SET\_F =SCHEDULE THRU MAY 15 SW\_WT\_CL  
THRU OCT 1 SW\_SM\_CL  
THRU DEC 31 SW\_WT\_CL ..

\$ OUTSIDE AIR SCHEDULE

S\_OA\_SCHED =SCHEDULE THRU MAY 15 SW\_WINT\_OA  
THRU OCT 1 SW\_SM\_OA  
THRU DEC 31 SW\_WINT\_OA ..

S\_HRLY-RPT =SCHEDULE THRU JAN 13 SW\_OFF  
THRU JAN 15 SW\_ON  
THRU JUL 21 SW\_OFF  
THRU JUL 23 SW\_ON  
THRU DEC 31 SW\_OFF ..

S\_SZ'S\_OA\* =SCHEDULE THRU DEC 31 SW\_SZ'S\_OA ..

\$ ZONE DESCRIPTION

B-BALL/1ST =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL  
SIZING-OPTION = FROM-LOADS ..

H-BALL/2ND =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL  
SIZING-OPTION = FROM-LOADS ..

\$ SYSTEM DESCRIPTION

H&VSYSTEMS =SYSTEM SYSTEM-TYPE = HVSYS  
MAX-SUPPLY-T = 120.0 HEATING-SCHEDULE = S\_HE-SCHED  
OA-CONTROL = FIXED SUPPLY-CFM = 35000.  
RATED-CFM = 35000. MIN-OUTSIDE-AIR = 0.37  
MIN-AIR-SCH = S\_OA\_SCHED SUPPLY-DELTA-T = 2.4  
SUPPLY-KW = 0.00078  
MOTOR-PLACEMENT = OUTSIDE-AIRFLOW  
NIGHT-CYCLE-CTRL = STAY-OFF NIGHT-VENT-DT = 0.0  
HEATING-CAPACITY = -1291523.  
ZONE-NAMES = (B-BALL/1ST) ..

AHU'S\_1&2 =SYSTEM SYSTEM-TYPE = PSZ

MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_HE-SCHED  
 COOLING-SCHEDULE = S\_CL\_SCHED OA-CONTROL = FIXED  
 SUPPLY-CFM = 7315. RATED-CFM = 7315.  
 MIN-OUTSIDE-AIR = 0.2 MIN-AIR-SCH = S\_SZ'S\_OA% ←  
 SUPPLY-DELTA-T = 1.8 SUPPLY-KW = 0.00059  
 MOTOR-PLACEMENT = OUTSIDE-AIRFLOW  
 FAN-PLACEMENT = BLOW-THROUGH  
 NIGHT-CYCLE-CTRL = STAY-OFF NIGHT-VENT-DT = 0.0  
 COOLING-CAPACITY = 171850. COOL-SH-CAP = 144543.  
 COOL-FT-MIN = 0. HEATING-CAPACITY = -100648.  
 MIN-HP-T = 0. MAX-HP-SUPP-T = 0. DEFRST-T = 0.  
 CRANKCASE-MAX-T = 0. OUTSIDE-FAN-T = 45.  
 HEAT-SOURCE = HOT-WATER SIZING-OPTION = COINCIDENT  
 ZONE-NAMES = (H-BALL/2ND) ..

\$ HOURLY REPORT DESCRIPTION

H&V-BLK =REPORT-BLOCK VARIABLE-TYPE = H&VSYSTEMS  
 VARIABLE-LIST = (3,5,17,39) ..  
 SZ-AHU-BLK =REPORT-BLOCK VARIABLE-TYPE = AHU'S\_1&2  
 VARIABLE-LIST = (3,5,6,17,39) ..  
 H&VZN-BLK =REPORT-BLOCK VARIABLE-TYPE = B-BALL/1ST  
 VARIABLE-LIST = (17,18,7,6) ..  
 SZZONE-BLK =REPORT-BLOCK VARIABLE-TYPE = H-BALL/2ND  
 VARIABLE-LIST = (17,18,7,6) ..  
 AHU-RPTS = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (H&V-BLK,SZ-AHU-BLK)  
 ..  
 ZONE-RPTS = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (H&VZN-BLK,SZZONE-BLK)  
 ..  
 END ..  
 COMPUTE SYSTEMS ..  
 INPUT PLANT ..

\$-----\$  
 \$ E Z - D O E P L A N T S I N P U T \$  
 \$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
 LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
 LINE-3 \* DENVER, CO 80227 \*  
 LINE-4 \*RUN #5 DAY INFILTRATION BLDG. 8069-R \*  
 LINE-5 \*THE REMAINDER OF THE BLDG. (LESS POOL) \* ..

ABORT ERRORS ..  
 DIAGNOSTIC WARNINGS ..  
 PLANT-REPORT VERIFICATION=(PV-A)  
 SUMMARY=(PS-B,BEPS)

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/17/1995 13:24:51 SDL RUN 1  
 DENVER, CO 80227 RUN #5 DAY INFILTRATION BLDG. 8069-R THE REMAINDER OF THE BLDG. (LESS POOL)  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR H&VSYSTEMS TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				M A X I M U M		E L E C	
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	MAXIMUM HEATING LOAD (KBTU/HR)	TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-135.359	15	-8.F	-9.F	0.000	-1183.851	30702.	49.841
FEB	0.00000				-103.026	3	-1.F	-2.F	0.000	-1037.317	27700.	49.841
MAR	0.00000				-85.492	4	14.F	12.F	0.000	-795.337	30838.	49.841
APR	0.00000				-32.170	5	31.F	29.F	0.000	-481.643	29777.	49.841
MAY	0.00000				-8.517	1	38.F	37.F	0.000	-306.761	30702.	49.841
JUN	0.00000				0.000				0.000	0.000	29799.	49.841
JUL	0.00000				0.000				0.000	0.000	30590.	49.841
AUG	0.00000				0.000				0.000	0.000	30928.	49.841
SEP	0.00000				0.000				0.000	0.000	29687.	49.841
OCT	0.00000				-25.310	20	25.F	25.F	0.000	-550.208	30590.	49.841
NOV	0.00000				-69.119	3	13.F	12.F	0.000	-767.176	29754.	49.841
DEC	0.00000				-117.992	14	2.F	1.F	0.000	-983.318	30612.	49.841
TOTAL MAX	0.000				-576.984				0.000	-1183.851	361697.	49.841

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/17/1995 13:24:51 SDL RUN 1  
 DENVER, CO 80227 RUN #5 DAY INFILTRATION BLDG. 8069-R THE REMAINDER OF THE BLDG. (LESS POOL)  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR H&VSYSTEMS TOPEKA, KS

MONTH	H O U R S				H O U R S				H O U R S				C O I N C I D E N T			
	HOURS COOLING LOAD	HOURS HEATING LOAD	HOURS COOL-HEAT LOAD	HOURS FLOATING	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.	HOURS FANS ON	HOURS FANS ON CYCLE	HOURS NIGHT VENTING	HOURS FLOATING WHEN FANS ON	HEATING COOLING PEAK (KBTU/HR)	HEATING COOLING PEAK (KBTU/HR)	HEATING COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)		
JAN	0	239	0	505	744	0	744	0	0	0	505	460.432	27.300			
FEB	0	217	0	455	672	0	672	0	0	0	455	472.526	27.300			
MAR	0	236	0	508	744	0	744	0	0	0	508	463.483	27.300			
APR	0	229	0	491	720	0	720	0	0	0	491	84.461	27.300			
MAY	0	115	0	629	360	0	744	0	0	0	629	0.000	27.300			
JUN	0	0	0	720	0	0	720	0	0	0	720	0.000	27.300			
JUL	0	0	0	744	0	0	744	0	0	0	744	0.000	27.300			
AUG	0	0	0	744	0	0	744	0	0	0	744	0.000	27.300			
SEP	0	0	0	720	0	0	720	0	0	0	720	0.000	27.300			
OCT	0	229	0	515	720	0	744	0	0	0	515	284.038	27.300			
NOV	0	230	0	490	720	0	720	0	0	0	490	546.565	27.300			
DEC	0	242	0	502	744	0	744	0	0	0	502	550.577	27.300			
ANNUAL	0	1737	0	7023	5424	0	8760	0	0	0	7023					

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/17/1995 13:24:51 SDL RUN 1  
 DENVER, CO 80227 RUN #5 DAY INFILTRATION BLDG. 8069-R THE REMAINDER OF THE BLDG. (LESS POOL)  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR AHU'S 1&2 TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC-TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-16.187	14 23	-4.F	-5.F	-114.697	7242.	13.149
FEB	0.00000				-9.590	3 1	2.F	1.F	-103.316	6525.	13.049
MAR	0.00000				-4.653	4 5	14.F	12.F	-91.823	7290.	13.049
APR	0.00000				-1.147	1 3	36.F	32.F	-25.959	7029.	13.049
MAY	26.73633	16	6	57.F	-0.553	6 23	51.F	47.F	-18.790	9619.	29.573
JUN	53.74252	29	16	89.F	0.000				0.000	12106.	25.929
JUL	60.69129	13	13	90.F	0.000				0.000	13068.	27.359
AUG	60.19955	23	15	95.F	0.000				0.000	13349.	27.210
SEP	40.77584	7	15	92.F	0.000				0.000	10737.	26.184
OCT	0.80793	1	18	83.F	-1.186	2 5	55.F	53.F	-40.612	7271.	22.998
NOV	0.00000				-3.472	3 5	13.F	12.F	-73.940	7020.	13.049
DEC	0.00000				-13.121	14 23	3.F	2.F	-108.979	7202.	13.149
TOTAL	242.953				-49.909				-114.697	108452.	29.573
MAX											

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/17/1995 13:24:51 SDL RUN 1  
 DENVER, CO 80227 RUN #5 DAY INFILTRATION BLDG. 8069-R THE REMAINDER OF THE BLDG. (LESS POOL)  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR AHU'S 1&2 TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C			
	HOURS COOLING LOAD	HOURS HEATING LOAD	HOURS COOL-HEAT LOAD	HOURS COINCIDENT LOAD	HOURS COOLING AVAIL.	HOURS HEATING AVAIL.	HOURS FANS ON CYCLE	HOURS NIGHT VENTING	HOURS FLOATING WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELEC-TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0	0	0	0	744	0	0	0	0	-15.635	4.316	4.316
FEB	0	0	0	0	672	0	0	0	0	-11.140	4.316	4.316
MAR	0	0	0	0	744	0	0	0	0	-11.300	4.316	4.316
APR	0	0	0	0	720	0	0	0	0	-4.196	4.316	4.316
MAY	359	118	0	0	744	0	0	0	0	0.000	27.902	27.902
JUN	709	0	0	0	709	0	0	0	11	0.000	25.910	25.910
JUL	744	0	0	0	744	0	0	0	0	0.000	26.299	26.299
AUG	743	0	0	0	743	0	0	0	1	0.000	26.923	26.923
SEP	600	0	0	0	630	0	0	0	120	0.000	26.058	26.058
OCT	13	0	0	0	16	0	0	0	486	0.000	22.808	22.808
NOV	0	0	0	0	0	0	0	0	479	-28.609	4.316	4.316
DEC	0	0	0	0	744	0	0	0	400	-66.422	4.316	4.316
ANNUAL	3168	2090	0	0	3212	8760	0	0	3502			

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC. DOE-2.1D 5/17/1995 13:24:51 PDL RUN 1  
 DENVER, CO 80227 RUN #5 DAY INFILTRATION BLDG. 8069-R THE REMAINDER OF THE BLDG. (LESS POOL)  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY TOTAL (MBTU) PEAK (KBTU) DY/HR	NATURAL-GAS TOTAL (MBTU) PEAK (KBTU) DY/HR
JAN	137.829 224.556 15/ 9	214.154 1618.936 15/ 5	
FEB	123.736 220.812 2/ 7	164.058 1463.770 3/ 5	
MAR	136.810 220.389 7/22	136.740 1188.464 4/ 5	
APR	129.578 220.269 7/22	56.399 729.944 5/ 5	
MAY	139.108 271.153 16/15	16.503 521.474 1/ 5	
JUN	143.083 258.709 28/15	0.000 0.000 30/ 1	
JUL	149.066 263.592 23/16	0.000 0.000 31/ 1	
AUG	151.181 263.083 11/16	0.000 0.000 31/ 1	
SEP	138.025 259.582 6/16	0.000 0.000 30/ 1	
OCT	132.825 248.703 1/17	46.291 810.760 20/ 5	
NOV	131.289 220.147 11/18	111.831 1137.251 3/ 5	
DEC	136.989 222.817 12/ 6	189.542 1407.030 14/24	
	ONE YEAR USE/PEAK	1649.519 271.153	935.518 1618.936



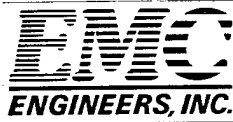
EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/17/1995 13:24:51 PDL RUN 1  
 DENVER, CO 80227 RUN #5 DAY INFILTRATION BLDG. 8069-R THE REMAINDER OF THE BLDG. (LESS POOL)  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
SPACE HEAT	34.63	935.52
SPACE COOL	79.13	0.00
HVAC AUX	955.19	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	580.45	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	0.00	0.00
TOTAL	1649.40	935.52

TOTAL SITE ENERGY 2585.04 MBTU 118.2 KBTU/SQFT-YR GROSS-AREA 118.2 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 5889.03 MBTU 269.4 KBTU/SQFT-YR GROSS-AREA 269.4 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 1.1  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

**COMPUTER ENERGY SIMULATIONS**

**BLDG. 6914  
RETAIL BUILDINGS**



DENVER - ATLANTA

PROJECT: FEASIBILITY STUDY FOR  
INSTALLATION OF UMCS  
LOCATION: FORT RILEY, KANSAS

EMC NO: 1406-001  
CALC. BY: AJN  
CHECKED BY: CEL  
DATE: 05-Jul-95

BUILDING NO.: 6914  
BLDG. TYPE: MAIN POST EXCHANGE

**ENERGY CONSTANT CALCULATIONS**

	BASERUN	RUN1	RUN2	RUN3	RUN4	RUN5
HEATING (MBtu)	3577.3	2568.5	3050.3	1345.8	2518.0	449.2
COOLING (KWH)	775,716	727,231	738,614	682,359	761,570	670,155

SUPPLY AIR FAN	29,224 CFM
FLOOR AREA	26,443 FT <sup>2</sup>
CFMI	16658 CFM
UA	2542 BTU/HR.°F
BLDG CONSTR.	2 (1 FOR LIGHT) (2 FOR HEAVY)

EZDOE COMPUTER RUN DEFINITION:	
BASERUN	EXISTING OPERATION
RUN1	NIGHT SETBACK
RUN2	DDC CONTROL
RUN3	ECONOMIZER
RUN4	NIGHTTIME INFILTRATION (OA)
RUN5	DAYTIME INFILTRATION (OA)

HOURS OF OCCUPANCY			ANNUAL HEATING & COOLING HOURS		
M-F	800	2200	70 HR	HR. ON HEATING	3178 HR/YR
SAT.	800	2200	14 HR	HR. ON COOLING	1932 HR/YR
SUN.	800	2200	14 HR	HR. OFF HEATING	2270 HR/YR
	TOTAL OCCUPY HR.		98 HR/WK	HR. OFF COOLING	1380 HR/YR
	TOTAL UNOCC. HR.		70 HR/WK		
	ANNUAL OCCUPY HR.		5110 HR/YR		
	ANNUAL UNOCC. HR.		3650 HR/YR		

PRESENT HR. OF OPERATION FOR SYS. WITH HEATING AND COOLING 8760 HR/YR  
 PRESENT HR. OF OPERATION FOR SYS. WITH HEATING ONLY 5448 HR/YR  
 PRESENT HR. OF OPERATION FOR SYS. WITH COOLING ONLY 3312 HR/YR  
 HRS SAVED (HTG ONLY) 5448 - 3178 = 2270 HR/YR  
 HRS SAVED (CLG ONLY) 3312 - 1932 = 1380 HR/YR

HOAUHC	3577.28 MBtu	-	2518.01 MBtu	=	1.74E+01 Btu/CFM-HR	
	16657.68 CFM	x	3650 HR/YR			
HOAUH	3577.28 MBtu	-	2518.01 MBtu	=	2.80E+01 Btu/CFM-HR	
	16657.68 CFM	x	2270 HR/YR			
COAUHC	775,716.4 kWH	-	761,570.5 kWH	=	2.33E-04 kWH/CFM-HR	
	16657.68 CFM	x	3650 HR/YR			
COAUC	775,716.4 kWH	-	761,570.5 kWH	=	6.15E-04 kWH/CFM-HR	
	16657.68 CFM	x	1380 HR/YR			
HOAOHC	3577.28 MBtu	-	449.17 MBtu	=	3.67E+01 Btu/CFM-HR	
	16657.68 CFM	x	5110 HR/YR			
HOAOH	3577.28 MBtu	-	449.17 MBtu	=	5.91E+01 Btu/CFM-HR	
	16657.68 CFM	x	3178 HR/YR			
COAOHC	775,716.4 kWH	-	670,155.3 kWH	=	1.24E-03 kWH/CFM-HR	
	16657.68 CFM	x	5110 HR/YR			
COAOC	775,716.4 kWH	-	670,155.3 kWH	=	3.28E-03 kWH/CFM-HR	
	16657.68 CFM	x	1932 HR/YR			
DC DUTY	1 / 6 (10 MINUTES PER HOUR)			=	0.17	
DC DEMAND	1 / 6 (10 MINUTES PER HOUR)			=	0.17	
ECC	727,231.2 kWH	-	682,358.6 kWH	=	7.95E-04 kWH/CFM-HR	
	29224 CFM	x	1932 HR/YR			
ECHC	727,231.2 kWH	-	682,358.6 kWH	=	3.00E-04 kWH/CFM-HR	
	29224 CFM	x	5110 HR/YR			
NSUCHC	775,716.4 kWH	-	727,231.2 kWH	=	4.55E-04 kWH/CFM-HR	
	29224 CFM	x	3650 HR/YR			
NSUCC	775,716.4 kWH	-	727,231.2 kWH	=	1.20E-03 kWH/CFM-HR	
	29224 CFM	x	1380 HR/YR			
DDCCHC	775,716.4 kWH	-	738,614.1 kWH	=	2.48E-04 kWH/CFM-HR	
	29224 CFM	x	5110 HR/YR			
DDCCC	775,716.4 kWH	-	738,614.1 kWH	=	6.57E-04 kWH/CFM-HR	
	29224 CFM	x	1932 HR/YR			
NSC	3577.28 MBtu	-	2568.47 MBtu	=	3.97E+05 Btu/UA	
	2541.5924 UA					
DDCH	3577.28 MBtu	-	3050.34 MBtu	=	2.07E+05 Btu/UA	
	2541.5924 UA					
OPT	(2 HR/DAY X 240 DAY/YR)		-	175 HR/YR	=	305 HR/YR
CHWR	(1.10 kW X 0.012 Eff. X 664 HRS X 2 Degrees of Reset)			=	17.5 kWH/TON	
OAR	567 HR/YR	x	0.01	=	5.67 HR/YR	



INPUT LOADS ..

```

$-----$
$ E Z - D O E   L O A D S   I N P U T $
$-----$

```

\$ GENERAL PROJECT DATA

```

TITLE  LINE-1 *      EMC      ENGINEERS      INC.      *
        LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
        LINE-3 *      DENVER,      CO      80227      *

        LINE-4 *BASELINE SIMULATION FOR BLDG. #6914      *
        LINE-5 *MAIN FLOOR OF MAIN POST EXCHANGE      * ..

```

```

ABORT          ERRORS ..
DIAGNOSTIC     WARNINGS ..
LOADS-REPORT   VERIFICATION=(LV-D)
               SUMMARY=(LS-C,LS-D)
               HOURLY-DATA-SAVE = YES ..
BUILDING-LOCATION  LATITUDE = 39.0
                LONGITUDE = 96.5
                ALTITUDE = 1065.
                TIME-ZONE = 6
                GROSS-AREA = 26442.5
                SHIELDING-COEF = 0.29
                X-REF = 0.0
                Y-REF = 0.0 ..
RUN-PERIOD     JAN 1 1994 THRU DEC 31 1994 ..

```

\$ SCHEDULES

```

LD_PE-SUN =DAY-SCHEDULE (1,7) (0.)
              (8,9) (0.15)
              (10,19) (1.)
              (20,22) (0.15)
              (23,24) (0.) ..

LD_LT-WEEK =DAY-SCHEDULE (1,6) (0.05)
              (7,24) (1.) ..

LD_ON      =DAY-SCHEDULE (1,24) (1.) ..

LD_OFF     =DAY-SCHEDULE (1,24) (0.) ..

LD_PE-WEEK =DAY-SCHEDULE (1,6) (0.)
              (7,8) (0.15)
              (9,21) (1.)
              (22,24) (0.15) ..

LD_LT-SUN  =DAY-SCHEDULE (1,7) (0.05)
              (8,22) (1.)
              (23,24) (0.05) ..

```

```

LW_ON      =WEEK-SCHEDULE (ALL) LD_ON  ..

LW_OFF     =WEEK-SCHEDULE (ALL) LD_OFF ..

LW_PEOPLE  =WEEK-SCHEDULE (WD)  LD_PE-WEEK
              (SAT) LD_PE-WEEK
              (SUN) LD_PE-SUN
              (HOL) LD_PE-SUN ..

LW_LITES   =WEEK-SCHEDULE (WD)  LD_LT-WEEK
              (SAT) LD_LT-WEEK
              (SUN) LD_LT-SUN
              (HOL) LD_LT-SUN ..

```

## \$ ON 100% OF THE TIME

```
L_ON      =SCHEDULE THRU DEC 31 LW_ON  ..
```

## \$ OFF 100% OF THE TIME

```
L_OFF     =SCHEDULE THRU DEC 31 LW_OFF ..
```

## \$ PEOPLE LOAD

```
L_PEOPLE  =SCHEDULE THRU DEC 31 LW_PEOPLE ..
```

## \$ LIGHTING LOAD FOR PX

```
L_LITES   =SCHEDULE THRU DEC 31 LW_LITES ..
```

## \$ CONSTRUCTION TYPES

## \$ EXTERIOR WALL BRICK, INSL, CMU

```
WALL-1    =LAYERS      MATERIAL=(BK01,IN43,CB31)  I-F-R= 0.6100
              THICKNESS=(0.333,0.083,0.667)  ..
```

```
EXWALL-1  =CONSTRUCTION  LAYERS = WALL-1
              ABSORPTANCE = 0.880
              ROUGHNESS = 2  ..
```

```
FLOOR     =CONSTRUCTION  U-VALUE = 0.020
              ABSORPTANCE = 0.610
              ROUGHNESS = 5  ..
```

## \$ BUILT-UP ROOF WITH INSL=R-16.3

```
INSLATRF  =LAYERS      MATERIAL=(HF-E2,IN02,IN34,PW05,AL33,AC01)
              THICKNESS=(0.042,0.296,0.104,0.063,0.000,0.031)  ..
```

```
ROOF-1    =CONSTRUCTION  LAYERS = INSLATRF
              ABSORPTANCE = 0.800
              ROUGHNESS = 1  ..
```

## \$ EXTERIOR WALL W/ ASBESTOS FACIA

```
WALL-2    =LAYERS      MATERIAL=(CM01,AL31,IN37)  I-F-R= 0.6100
              THICKNESS=(0.083,0.000,0.333)  ..
```

EXWALL-2 =CONSTRUCTION    LAYERS = WALL-2  
                               ABSORPTANCE = 0.610  
                               ROUGHNESS = 2 ..

\$ STANDARD METAL DOOR  
 DOOR-STD =LAYERS        MATERIAL=(HF-A3,IN44,HF-A3)    I-F-R= 0.6100  
                               THICKNESS=(0.005,0.104,0.005) ..  
 DOOR-MET =CONSTRUCTION    LAYERS = DOOR-STD  
                               ABSORPTANCE = 0.860  
                               ROUGHNESS = 5 ..

2\_PN\_STD =GLASS-TYPE      GLASS-TYPE-CODE = 4  
                               PANES = 2 ..

\$ SPACE DESCRIPTION

MAIN-SALES =SPACE    AREA = 26442.5    VOLUME = 522239.5  
 TEMPERATURE = (73.)    ZONE-TYPE = CONDITIONED  
 PEOPLE-SCHEDULE = L\_PEOPLE    NUMBER-OF-PEOPLE = 65.0  
 PEOPLE-HG-LAT = 625.0    PEOPLE-HG-SENS = 375.0  
 LIGHTING-TYPE = REC-FLUOR-RSV    LIGHTING-W/SQFT = 2.46  
 LIGHT-TO-SPACE = 1.0    LIGHTING-SCHEDULE = L\_LITES  
 SOURCE-SENSIBLE = 0.0    FURN-WEIGHT = 2.5  
 INF-METHOD = NONE ..

E-W        HEIGHT = 14.0    WIDTH = 98.0    CONS = EXWALL-1  
 AZIMUTH = 302    SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 2.0    WIDTH = 6.5    G-T = 2\_PN\_STD  
 MULTIPLIER = 5.0    SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5    OVERHANG-A = 10.  
 OVERHANG-B = 6.    OVERHANG-W = 32.    OVERHANG-D = 10. ..

WINDOW HEIGHT = 7.0    WIDTH = 3.0    G-T = 2\_PN\_STD  
 MULTIPLIER = 4.0    SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5    OVERHANG-A = 10.  
 OVERHANG-B = 6.    OVERHANG-W = 32.    OVERHANG-D = 10. ..

WINDOW HEIGHT = 6.0    WIDTH = 2.3    G-T = 2\_PN\_STD  
 MULTIPLIER = 6.0    SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5    OVERHANG-A = 10.  
 OVERHANG-B = 6.    OVERHANG-W = 32.    OVERHANG-D = 10. ..

E-W        HEIGHT = 6.0    WIDTH = 98.0    CONS = EXWALL-2  
 AZIMUTH = 302    SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

E-W        HEIGHT = 19.8    WIDTH = 42.0    CONS = EXWALL-1  
 AZIMUTH = 32    SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 8.0    WIDTH = 6.0    G-T = 2\_PN\_STD

SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5  
OVERHANG-A = 10. OVERHANG-B = 6. OVERHANG-W = 32.  
OVERHANG-D = 10. ..

E-W HEIGHT = 19.8 WIDTH = 36.0 CONS = EXWALL-1  
AZIMUTH = 122 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 19.8 WIDTH = 138.0 CONS = EXWALL-1  
AZIMUTH = 212 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

DOOR HEIGHT = 7.0 WIDTH = 3.0 CONS = DOOR-MET  
MULTIPLIER = 2.0 SETBACK = 0.2  
SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5  
OVERHANG-A = 10. OVERHANG-B = 6. OVERHANG-W = 32.  
OVERHANG-D = 10. ..

U-W HEIGHT = 155.5 WIDTH = 170.0 CONS = FLOOR ..

ROOF HEIGHT = 155.5 WIDTH = 170.0 CONS = ROOF-1  
TILT = 0 SKY-FORM-FACTOR = 1.0 ..

END ..  
COMPUTE LOADS ..

INPUT SYSTEMS ..

\$-----\$  
\$ E Z - D O E S Y S T E M S I N P U T \$  
\$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
LINE-3 \* DENVER, CO 80227 \*  
  
LINE-4 \*BASELINE SIMULATION FOR BLDG. #6914 \*  
LINE-5 \*MAIN FLOOR OF MAIN POST EXCHANGE \* ..

ABORT ERRORS ..  
DIAGNOSTIC WARNINGS ..  
SYSTEMS-REPORT VERIFICATION=(SV-A)  
SUMMARY=(SS-A,SS-C,SS-K,SS-O)  
HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

SD\_ON =DAY-SCHEDULE (1,24) (1.) ..  
SD\_OFF =DAY-SCHEDULE (1,24) (0.) ..  
SD\_WT\_HT =DAY-SCHEDULE (1,24) (74.) ..  
SD\_SM\_CL =DAY-SCHEDULE (1,24) (72.) ..  
SD\_WT\_CL =DAY-SCHEDULE (1,24) (76.) ..  
SD\_SM\_HT =DAY-SCHEDULE (1,24) (70.) ..



SD\_OA% =DAY-SCHEDULE (1,24) (0.57) ..  
SW\_ON =WEEK-SCHEDULE (ALL) SD\_ON ..  
SW\_OFF =WEEK-SCHEDULE (ALL) SD\_OFF ..  
SW\_WT\_HT =WEEK-SCHEDULE (ALL) SD\_WT\_HT ..  
SW\_SM\_CL =WEEK-SCHEDULE (ALL) SD\_SM\_CL ..  
SW\_WT\_CL =WEEK-SCHEDULE (ALL) SD\_WT\_CL ..  
SW\_SM\_HT =WEEK-SCHEDULE (ALL) SD\_SM\_HT ..  
SW\_OA% =WEEK-SCHEDULE (ALL) SD\_OA% ..

\$ FULL ON SYSTEM

S\_ON =SCHEDULE THRU DEC 31 SW\_ON ..

\$ FULL OFF SYSTEM

S\_OFF =SCHEDULE THRU DEC 31 SW\_OFF ..

\$ HEATING SEASON

S\_HE-SCHED =SCHEDULE THRU MAY 15 SW\_ON  
THRU OCT 1 SW\_OFF  
THRU DEC 31 SW\_ON ..

\$ COOLING SEASON

S\_CL\_SCHED =SCHEDULE THRU MAY 15 SW\_OFF  
THRU OCT 1 SW\_ON  
THRU DEC 31 SW\_OFF ..

\$ HEATING SET TEMP

S\_HT\_SET\_F =SCHEDULE THRU MAY 15 SW\_WT\_HT  
THRU OCT 1 SW\_SM\_HT  
THRU DEC 31 SW\_WT\_HT ..

\$ COOLING SET TEMP

S\_CL\_SET\_F =SCHEDULE THRU MAY 15 SW\_WT\_CL  
THRU OCT 1 SW\_SM\_CL  
THRU DEC 31 SW\_WT\_CL ..

S\_OA% =SCHEDULE THRU DEC 31 SW\_OA% ..

S\_HRLY-RPT =SCHEDULE THRU JAN 14 SW\_OFF  
THRU JAN 15 SW\_ON  
THRU JUL 22 SW\_OFF  
THRU JUL 23 SW\_ON  
THRU DEC 31 SW\_OFF ..

\$ ZONE DESCRIPTION

MAIN-SALES =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0

HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F
ZONE-TYPE = CONDITIONED
THERMOSTAT-TYPE = PROPORTIONAL
SIZING-OPTION = FROM-LOADS ..

\$ SYSTEM DESCRIPTION

LARG-SZ =SYSTEM SYSTEM-TYPE = PSZ
MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0
HEATING-SCHEDULE = S\_HE-SCHED
COOLING-SCHEDULE = S\_CL\_SCHED OA-CONTROL = FIXED
SUPPLY-CFM = 28100. RATED-CFM = 28100.
MIN-OUTSIDE-AIR = 0.57 MIN-AIR-SCH = S\_OA%
MAX-OA-FRACTION = 0.57 SUPPLY-DELTA-T = 1.8
SUPPLY-KW = 0.00059
MOTOR-PLACEMENT = OUTSIDE-AIRFLOW
NIGHT-CYCLE-CTRL = STAY-OFF NIGHT-VENT-DT = 0.0
MIN-CFM-RATIO = 1.0 COOLING-CAPACITY = 1328568.
COOL-SH-CAP = 1107140. COOL-FT-MIN = 0.
HEATING-CAPACITY = -1800000. MIN-HP-T = 0.
MAX-HP-SUPP-T = 0. CRANKCASE-MAX-T = 0.
OUTSIDE-FAN-T = 45. HEAT-SOURCE = HOT-WATER
SIZING-OPTION = COINCIDENT
ZONE-NAMES = (MAIN-SALES) ..

\$ HOURLY REPORT DESCRIPTION

AHU-BLK =REPORT-BLOCK VARIABLE-TYPE = LARG-SZ
VARIABLE-LIST = (3,5,6,17,39,1) ..
ZONE-BLK =REPORT-BLOCK VARIABLE-TYPE = MAIN-SALES
VARIABLE-LIST = (17,18,7,6) ..
AHU-HRLY = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT
REPORT-BLOCK = (AHU-BLK)
..
ZONE-HRLY = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT
REPORT-BLOCK = (ZONE-BLK)
..
END ..
COMPUTE SYSTEMS ..

INPUT PLANT ..

\$-----\$
\$ E Z - D O E P L A N T S I N P U T \$
\$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*
LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*
LINE-3 \* DENVER, CO 80227 \*
LINE-4 \*BASELINE SIMULATION FOR BLDG. #6914 \*

LINE-5 \*MAIN FLOOR OF MAIN POST EXCHANGE \* ..

ABORT ERRORS ..  
 DIAGNOSTIC WARNINGS ..  
 PLANT-REPORT VERIFICATION=(PV-A)  
 SUMMARY=(PS-B,BEPS)  
 HOURLY-DATA-SAVE = YES ..

## \$ SCHEDULES

PD\_ON =DAY-SCHEDULE (1,24) (1.) ..

PD\_OFF =DAY-SCHEDULE (1,24) (0.) ..

PW\_ON =WEEK-SCHEDULE (ALL) PD\_ON ..

PW\_OFF =WEEK-SCHEDULE (ALL) PD\_OFF ..

## \$ HEATING SEASON

P\_HEAT =SCHEDULE THRU MAY 15 PW\_ON  
 THRU OCT 1 PW\_OFF  
 THRU DEC 31 PW\_ON ..

## \$ COOLING SEASON

P\_COOL =SCHEDULE THRU MAY 15 PW\_OFF  
 THRU OCT 1 PW\_ON  
 THRU DEC 31 PW\_OFF ..

## \$ EQUIPMENT DESCRIPTION

BOIL-HW =PLANT-EQUIPMENT TYPE = HW-BOILER  
 SIZE = -999. ..

CHILL-RECP =PLANT-EQUIPMENT TYPE = HERM-REC-CHLR  
 SIZE = -999. INSTALLED-NUMBER = 4  
 MAX-NUMBER-AVAIL = 4 ..

PLANT-PARAMETERS BOILER-FUEL = NATURAL-GAS HERM-REC-COND-TYPE = AIR  
 COMP-TO-TWR-WTR = 2.3 CHILL-WTR-T = 45.  
 CCIRC-HEAD = 50.0 HCIRC-HEAD = 58.0  
 HCIRC-DESIGN-T-DROP = 20.0 ..

ENERGY-RESOURCE RESOURCE = ELECTRICITY ..  
 ENERGY-RESOURCE RESOURCE = NATURAL-GAS ..

HEAT-SEASO =LOAD-ASSIGNMENT TYPE = HEATING  
 OPERATION-MODE = RUN-NEEDED  
  
 LOAD-RANGE = 0.000  
 PLANT-EQUIPMENT = BOIL-HW  
 NUMBER = 1 ..

Path: C:\ELITE\EZDOE

File: MOD6914 .INP 14,117 .a.. 5-17-95 14:31:18

Page 8

COOL-SEASO =LOAD-ASSIGNMENT TYPE = COOLING  
OPERATION-MODE = RUN-NEEDED  
  
LOAD-RANGE = 0.000  
PLANT-EQUIPMENT = CHILL-RECP  
NUMBER = 4 ..

END ..  
COMPUTE PLANT ..  
STOP ..

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/17/1995 14:31:25 LDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #6914 MAIN FLOOR OF MAIN POST EXCHANGE  
 REPORT- LV-D DETAILS OF EXTERIOR SURFACES IN THE PROJECT TOPEKA, KS

NUMBER OF EXTERIOR SURFACES 6 RECTANGULAR 6 OTHER 0  
 (U-VALUE INCLUDES INSIDE AIR FILM PLUS OUTSIDE AIR FILM AT 7.5 MPH WINDSPEED )

SURFACE	SPACE	U-VALUE (BTU/HR-SQFT-F)	AREA (SQFT)	U-VALUE (BTU/HR-SQFT-F)	AREA (SQFT)	W A L L + G L A S S - U-VALUE (BTU/HR-SQFT-F)	AREA (SQFT)	AZIMUTH
MAIN-SALES		0.490	48.00	0.104	783.60	0.127	831.60	NORTH
MAIN-SALES		0.000	0.00	0.104	712.80	0.104	712.80	EAST
MAIN-SALES		0.000	0.00	0.104	2732.40	0.104	2732.40	SOUTH
MAIN-SALES		0.000	0.00	0.054	588.00	0.054	588.00	WEST
MAIN-SALES		0.490	231.80	0.104	1140.20	0.169	1372.00	WEST
MAIN-SALES		0.000	0.00	0.048	26435.00	0.048	26435.00	ROOF
MAIN-SALES		0.000	0.00	0.020	26435.00	0.020	26435.00	UNDERGRND

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/17/1995 14:31:25 LDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #6914 MAIN FLOOR OF MAIN POST EXCHANGE  
 REPORT- LV-D DETAILS OF EXTERIOR SURFACES IN THE PROJECT TOPEKA, KS

NORTH	EAST	SOUTH	WEST	ROOF	ALL WALLS	WALLS+ROOFS	UNDERGRND	BUILDING	AVERAGE U-VALUE/GLASS (BTU/HR-SQFT-F)	AVERAGE U-VALUE/WALLS (BTU/HR-SQFT-F)	AVERAGE U-VALUE WALLS+GLASS (BTU/HR-SQFT-F)	GLASS AREA (SQFT)	OPAQUE AREA (SQFT)	GLASS+OPAQUE AREA (SQFT)
									0.490	0.104	0.127	48.00	783.60	831.60
									0.000	0.104	0.104	0.00	712.80	712.80
									0.000	0.104	0.104	0.00	2732.40	2732.40
									0.490	0.087	0.135	231.80	1728.20	1960.00
									0.000	0.048	0.048	0.00	26435.00	26435.00
									0.490	0.099	0.117	279.80	5957.00	6236.80
									0.490	0.058	0.061	279.80	32392.00	32671.80
									0.000	0.020	0.020	0.00	26435.00	26435.00
									0.490	0.041	0.043	279.80	58827.00	59106.80

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/17/1995 14:31:25 LDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #6914 MAIN FLOOR OF MAIN POST EXCHANGE  
 REPORT- LS-C BUILDING PEAK LOAD COMPONENTS TOPEKA, KS

\*\*\* BUILDING \*\*\*

FLOOR AREA 26443 SQFT 2457 SQMT  
 VOLUME 522240 CUFT 14790 CUMT

COOLING LOAD  
 TIME AUG 4 6PM  
 DRY-BULB TEMP 92F 33C  
 WET-BULB TEMP 70F 21C

HEATING LOAD  
 TIME JAN 15 6AM  
 DRY-BULB TEMP -8F -22C  
 WET-BULB TEMP -9F -23C

	SENSIBLE (KBTU/H)	( KW )	LATENT (KBTU/H)	( KW )	SENSIBLE (KBTU/H)	( KW )
WALLS	2.223	0.651	0.000	0.000	-44.128	-12.924
ROOFS	78.271	22.924	0.000	0.000	-108.037	-31.641
GLASS CONDUCTION	1.678	0.491	0.000	0.000	-10.634	-3.114
GLASS SOLAR	5.935	1.738	0.000	0.000	0.426	0.125
DOOR	0.134	0.039	0.000	0.000	-0.411	-0.120
INTERNAL SURFACES	0.000	0.000	0.000	0.000	0.000	0.000
UNDERGROUND SURFACES	-2.501	-0.733	0.000	0.000	-15.180	-4.446
OCCUPANTS TO SPACE	22.693	6.646	40.625	11.898	2.434	0.713
LIGHT TO SPACE	218.531	64.002	0.000	0.000	24.112	7.062
EQUIPMENT TO SPACE	0.000	0.000	0.000	0.000	0.000	0.000
PROCESS TO SPACE	0.000	0.000	0.000	0.000	0.000	0.000
INFILTRATION	0.000	0.000	0.000	0.000	0.000	0.000
TOTAL	326.964	95.759	40.625	11.898	-151.416	-44.346
TOTAL LOAD	367.589	KBTU/H	107.658	KW	-151.416	KBTU/H
TOTAL LOAD / AREA	13.90BTU/H.SQFT	43.824	W /SQMT	5.726BTU/H.SQFT	18.052	W /SQMT

\*\*\*\*\*  
 \* NOTE 1) THE ABOVE LOADS EXCLUDE OUTSIDE VENTILATION AIR \*  
 \* LOADS \*  
 \* 2) TIMES GIVEN IN STANDARD TIME FOR THE LOCATION \*  
 \* IN CONSIDERATION \*  
 \*\*\*\*\*

EMC ENGINEERS INC. DOE-2.1D 5/17/1995 14:31:25 SDL RUN 1  
 DENVER, CO 80227 EZDOE - ELITE SOFTWARE DEVELOPMENT INC MAIN FLOOR OF MAIN POST EXCHANGE  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR LARG-SZ TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC- TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-574.911	15	6	-8.F	-9.F	48299.	81.700
FEB	0.00000				-433.854	3	6	-1.F	-2.F	43532.	81.700
MAR	0.00000				-348.525	4	6	14.F	12.F	48480.	81.600
APR	0.00000				-117.813	5	6	31.F	28.F	46892.	81.600
MAY	107.99516	31	18	90.F	-29.812	1	6	37.F	37.F	58468.	198.001
JUN	336.14935	27	16	89.F	0.000				0.000	79274.	201.884
JUL	469.78516	23	17	97.F	0.000				0.000	93225.	229.525
AUG	461.75812	20	14	93.F	0.000				0.000	94624.	217.550
SEP	206.15425	5	18	90.F	0.000				0.000	66734.	204.881
OCT	2.80517	1	18	83.F	-105.446	20	6	24.F	23.F	48397.	127.598
NOV	0.00000				-284.563	3	6	13.F	12.F	46522.	81.600
DEC	0.00000				-508.530	13	6	2.F	1.F	48295.	81.700
TOTAL	1584.647				-2403.450					722768.	
MAX											229.525

EMC ENGINEERS INC. DOE-2.1D 5/17/1995 14:31:25 SDL RUN 1  
 DENVER, CO 80227 EZDOE - ELITE SOFTWARE DEVELOPMENT INC MAIN FLOOR OF MAIN POST EXCHANGE  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR LARG-SZ TOPEKA, KS

MONTH	HOURS OF HOURS				HOURS				COINCIDENT LOADS				
	COOLING LOAD	HEATING LOAD	COOL-HEAT LOAD	FLOATING	HEATING AVAIL.	COOLING AVAIL.	FANS ON CYCLE	NIGHT VENTING	FLOATING WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)
JAN	0	744	0	0	0	744	0	0	0	-579.138	81.600	-579.138	81.600
FEB	0	672	0	0	0	672	0	0	0	-597.308	81.600	-597.308	81.600
MAR	0	722	0	22	0	744	0	0	22	-577.443	81.600	-577.443	81.600
APR	0	543	0	177	0	720	0	0	177	-338.336	198.001	-338.336	198.001
MAY	294	226	0	224	298	360	0	0	224	0.000	201.884	0.000	201.884
JUN	637	0	0	83	641	720	0	0	83	0.000	228.583	0.000	228.583
JUL	729	0	0	15	729	0	0	0	15	0.000	214.036	0.000	214.036
AUG	712	0	0	32	714	0	0	0	32	0.000	201.690	0.000	201.690
SEP	485	0	0	235	489	0	0	0	235	0.000	127.426	0.000	127.426
OCT	11	539	0	194	11	720	0	0	194	0.000	81.600	0.000	81.600
NOV	0	657	0	63	0	720	0	0	63	-708.968	81.600	-708.968	81.600
DEC	0	744	0	0	0	744	0	0	0	-675.307	81.600	-675.307	81.600
ANNUAL	2868	4847	0	1045	2882	5424	0	0	1045				

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/17/1995 14:31:25 PDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #6914 MAIN FLOOR OF MAIN POST EXCHANGE  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY TOTAL (MBTU) PEAK (KBTU) DY/HR	NATURAL-GAS TOTAL (MBTU) PEAK (KBTU) DY/HR
JAN	198.177 324.894 28/9	198.177 324.894 28/9	817.247 2099.407 15/6
FEB	178.249 324.894 3/8	178.249 324.894 3/8	638.710 1903.385 3/6
MAR	193.403 324.553 31/24	193.403 324.553 31/24	528.133 1559.740 4/6
APR	174.092 324.553 16/8	174.092 324.553 16/8	191.555 1140.267 5/6
MAY	204.294 676.058 31/18	204.294 676.058 31/18	51.048 933.656 1/6
JUN	270.677 689.318 27/16	270.677 689.318 27/16	0.000 0.000 30/1
JUL	318.310 783.697 23/16	318.310 783.697 23/16	0.000 0.000 31/1
AUG	323.086 742.807 22/16	323.086 742.807 22/16	0.000 0.000 31/1
SEP	227.861 699.551 7/16	227.861 699.551 7/16	0.000 0.000 30/1
OCT	178.994 435.673 1/17	178.994 435.673 1/17	175.872 1290.436 20/6
NOV	182.973 324.553 30/24	182.973 324.553 30/24	436.058 1556.397 3/6
DEC	197.537 324.894 13/8	197.537 324.894 13/8	738.649 1834.691 13/6
	ONE YEAR USE/PEAK	2647.650 783.697	3577.272 2099.407



EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/17/1995 14:31:25 PDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #6914 MAIN FLOOR OF MAIN POST EXCHANGE  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
SPACE HEAT	136.34	3577.28
SPACE COOL	526.91	0.00
HVAC AUX	539.40	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	1444.87	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	0.00	0.00
TOTAL	2647.52	3577.28

TOTAL SITE ENERGY 6224.92 MBTU 235.4 KBTU/SQFT-YR GROSS-AREA 235.4 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 11528.17 MBTU 436.0 KBTU/SQFT-YR GROSS-AREA 436.0 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTILING RANGE = 0.0  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.



SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5  
OVERHANG-A = 10. OVERHANG-B = 6. OVERHANG-W = 32.  
OVERHANG-D = 10. ..

E-W HEIGHT = 19.8 WIDTH = 36.0 CONS = EXWALL-1  
AZIMUTH = 122 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 19.8 WIDTH = 138.0 CONS = EXWALL-1  
AZIMUTH = 212 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

DOOR HEIGHT = 7.0 WIDTH = 3.0 CONS = DOOR-MET  
MULTIPLIER = 2.0 SETBACK = 0.2  
SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5  
OVERHANG-A = 10. OVERHANG-B = 6. OVERHANG-W = 32.  
OVERHANG-D = 10. ..

U-W HEIGHT = 155.5 WIDTH = 170.0 CONS = FLOOR ..

ROOF HEIGHT = 155.5 WIDTH = 170.0 CONS = ROOF-1  
TILT = 0 SKY-FORM-FACTOR = 1.0 ..

END ..

COMPUTE LOADS ..

INPUT SYSTEMS ..

-----\$  
\$ E Z - D O E S Y S T E M S I N P U T \$  
-----\$

\$ GENERAL PROJECT DATA

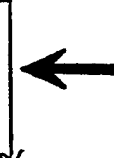
TITLE LINE-1 \* EMC ENGINEERS INC. \*  
LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
LINE-3 \* DENVER, CO 80227 \*

LINE-4 \*RUN #1 NIGHT SETBACK FOR BLDG. #6914 \*  
LINE-5 \*MAIN FLOOR OF MAIN POST EXCHANGE \* ..

ABORT ERRORS ..  
DIAGNOSTIC WARNINGS ..  
SYSTEMS-REPORT VERIFICATION=(SV-A)  
SUMMARY=(SS-A,SS-C,SS-K,SS-O)  
HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

SD\_ON =DAY-SCHEDULE (1,24) (1.) ..  
SD\_OFF =DAY-SCHEDULE (1,24) (0.) ..  
SD\_WT\_HT =DAY-SCHEDULE (1,5) (55.)  
(6,24) (74.) ..  
SD\_SM\_CL =DAY-SCHEDULE (1,5) (85.)  
(6,24) (72.) ..



```

SD_WT_CL =DAY-SCHEDULE (1,5) (57.)
          (6,24) (76.) ..
SD_SM_HT =DAY-SCHEDULE (1,5) (83.)
          (6,24) (70.) ..
SD_OA%   =DAY-SCHEDULE (1,24) (0.57) ..
SD_FAN_CYC =DAY-SCHEDULE (1,5) (0.)
          (6,24) (1.) ..

SW_ON    =WEEK-SCHEDULE (ALL) SD_ON ..
SW_OFF   =WEEK-SCHEDULE (ALL) SD_OFF ..
SW_WT_HT =WEEK-SCHEDULE (ALL) SD_WT_HT ..
SW_SM_CL =WEEK-SCHEDULE (ALL) SD_SM_CL ..
SW_WT_CL =WEEK-SCHEDULE (ALL) SD_WT_CL ..
SW_SM_HT =WEEK-SCHEDULE (ALL) SD_SM_HT ..
SW_OA%   =WEEK-SCHEDULE (ALL) SD_OA% ..
SW_FAN_CYC =WEEK-SCHEDULE (ALL) SD_FAN_CYC ..

```

\$ FULL ON SYSTEM

S\_ON =SCHEDULE THRU DEC 31 SW\_ON ..

\$ FULL OFF SYSTEM

S\_OFF =SCHEDULE THRU DEC 31 SW\_OFF ..

\$ HEATING SEASON

```

S_HE-SCHED =SCHEDULE THRU MAY 15 SW_ON
            THRU OCT 1 SW_OFF
            THRU DEC 31 SW_ON ..

```

\$ COOLING SEASON

```

S_CL_SCHED =SCHEDULE THRU MAY 15 SW_OFF
            THRU OCT 1 SW_ON
            THRU DEC 31 SW_OFF ..

```

\$ HEATING SET TEMP

```

S_HT_SET_F =SCHEDULE THRU MAY 15 SW_WT_HT
            THRU OCT 1 SW_SM_HT
            THRU DEC 31 SW_WT_HT ..

```

\$ COOLING SET TEMP

```

S_CL_SET_F =SCHEDULE THRU MAY 15 SW_WT_CL
            THRU OCT 1 SW_SM_CL
            THRU DEC 31 SW_WT_CL ..

```

S\_OA% =SCHEDULE THRU DEC 31 SW\_OA% ..

```

S_HRLY-RPT =SCHEDULE THRU JAN 14 SW_OFF
            THRU JAN 15 SW_ON
            THRU JUL 22 SW_OFF

```

THRU JUL 23 SW\_ON  
THRU DEC 31 SW\_OFF ..

S\_FAN\_CYC =SCHEDULE THRU DEC 31 SW\_FAN\_CYC ..

\$ ZONE DESCRIPTION

MAIN-SALES =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL  
SIZING-OPTION = FROM-LOADS ..

\$ SYSTEM DESCRIPTION

LARG-SZ =SYSTEM SYSTEM-TYPE = PSZ  
MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
HEATING-SCHEDULE = S\_HE-SCHED  
COOLING-SCHEDULE = S\_CL\_SCHED OA-CONTROL = FIXED  
SUPPLY-CFM = 28100. RATED-CFM = 28100.  
MIN-OUTSIDE-AIR = 0.57 MIN-AIR-SCH = S\_OA%  
MAX-OA-FRACTION = 0.57 FAN-SCHEDULE = S\_FAN\_CYC  
SUPPLY-DELTA-T = 1.8 SUPPLY-KW = 0.00059  
MOTOR-PLACEMENT = OUTSIDE-AIRFLOW  
NIGHT-CYCLE-CTRL = STAY-OFF NIGHT-VENT-DT = 0.0  
MIN-CFM-RATIO = 1.0 COOLING-CAPACITY = 1328568.  
COOL-SH-CAP = 1107140. COOL-FT-MIN = 0.  
HEATING-CAPACITY = -1800000. MIN-HP-T = 0.  
MAX-HP-SUPP-T = 0. CRANKCASE-MAX-T = 0.  
OUTSIDE-FAN-T = 45. HEAT-SOURCE = HOT-WATER  
SIZING-OPTION = COINCIDENT  
ZONE-NAMES = (MAIN-SALES) ..



\$ HOURLY REPORT DESCRIPTION

AHU-BLK =REPORT-BLOCK VARIABLE-TYPE = LARG-SZ  
VARIABLE-LIST = (3,5,6,17,39,1) ..  
ZONE-BLK =REPORT-BLOCK VARIABLE-TYPE = MAIN-SALES  
VARIABLE-LIST = (17,18,7,6) ..  
AHU-HRLY = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
REPORT-BLOCK = (AHU-BLK)  
..  
ZONE-HRLY = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
REPORT-BLOCK = (ZONE-BLK)  
..  
END ..  
COMPUTE SYSTEMS ..  
INPUT PLANT ..

\$-----\$

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/17/1995 14:45:52 SDL RUN 1  
DENVER, CO 80227 RUN #1 NIGHT SETBACK FOR BLDG. #6914 MAIN FLOOR OF MAIN POST EXCHANGE  
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR LARG-SZ TOPEKA, KS

MONTH	COOLING			HEATING			WET-BULB			DRY-BULB			HEATING			MAXIMUM			ELECTRIC		
	ENERGY (MBTU)	TIME OF MAX DY HR	TEMP	ENERGY (MBTU)	TIME OF MAX DY HR	TEMP	TEMP	TEMP	TEMP	TEMP	TEMP	TEMP	TEMP	TEMP	LOAD (KBTU/HR)	LOAD (KBTU/HR)	LOAD (KBTU/HR)	TRICAL ENERGY (KWH)	LOAD (KW)		
JAN	0.00000			-432.168	15	6	-8.F	-9.F							-1718.277	0.000	45730.	81.700			
FEB	0.00000			-318.678	3	6	-1.F	-2.F							-1523.296	0.000	41211.	81.700			
MAR	0.00000			-242.211	4	6	14.F	12.F							-1200.550	0.000	45910.	81.600			
APR	0.00000			-64.192	5	6	31.F	28.F							-813.505	0.000	44406.	81.600			
MAY	113.39243	31	18	-12.768	1	6	37.F	37.F							-583.626	0.000	56324.	198.900			
JUN	327.96432	27	16	0.000											0.000	75879.	203.269				
JUL	443.70926	23	16	0.000											0.000	89457.	230.839				
AUG	436.21201	20	14	0.000											0.000	84210.	218.957				
SEP	206.92751	5	18	-57.141	20	6	24.F	23.F							-941.457	45947.	206.599				
OCT	4.06273	1	18	-193.521	3	6	13.F	12.F							-1193.552	44035.	135.608				
NOV	0.00000			-379.402	13	6	2.F	1.F							-1459.493	45725.	81.600				
DEC	0.00000			-1700.083												686890.	81.700				
TOTAL	1532.268														-1718.277			230.839			
MAX																					

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/17/1995 14:45:52 SDL RUN 1  
DENVER, CO 80227 RUN #1 NIGHT SETBACK FOR BLDG. #6914 MAIN FLOOR OF MAIN POST EXCHANGE  
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR LARG-SZ TOPEKA, KS

MONTH	HOURS COOLING			HOURS HEATING			HOURS COINCIDENT			HOURS FLOATING			HOURS COINCIDENT			ELECTRIC		
	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	
JAN	0	0	0	744	0	0	589	0	0	0	0	0	0	0	0	0	0	81.600
FEB	0	0	0	672	0	0	532	0	0	0	0	0	0	0	0	0	0	81.600
MAR	0	0	0	744	0	0	589	0	0	0	0	0	0	0	0	0	0	81.600
APR	0	0	0	720	0	0	570	0	0	0	0	0	0	0	0	0	0	3.251
MAY	277	150	0	360	361	589	570	0	0	0	0	0	0	0	0	0	0	198.900
JUN	549	0	0	0	705	589	570	0	0	0	0	0	0	0	0	0	0	203.269
JUL	585	0	0	0	743	589	589	0	0	0	0	0	0	0	0	0	0	230.839
AUG	582	0	0	0	739	589	570	0	0	0	0	0	0	0	0	0	0	215.904
SEP	449	0	0	0	600	570	570	0	0	0	0	0	0	0	0	0	0	202.764
OCT	13	385	0	720	18	589	589	0	0	0	0	0	0	0	0	0	0	134.472
NOV	0	506	0	720	0	570	570	0	0	0	0	0	0	0	0	0	0	81.600
DEC	0	589	0	744	0	589	589	0	0	0	0	0	0	0	0	0	0	81.600
ANNUAL	2455	3710	0	5424	3166	6935	6935	0	0	0	0	0	0	0	0	0	0	770

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/17/1995 14:45:52 PDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SETBACK FOR BLDG. #6914 MAIN FLOOR OF MAIN POST EXCHANGE  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY 183.049 326.197 28/ 9	NATURAL-GAS 623.390 2158.930 15/ 6
JAN	TOTAL (MBTU) PEAK (KBTU) DY/HR	183.049 326.197 28/ 9	623.390 2158.930 15/ 6
FEB	TOTAL (MBTU) PEAK (KBTU) DY/HR	164.572 326.197 3/ 8	478.678 1952.494 3/ 6
MAR	TOTAL (MBTU) PEAK (KBTU) DY/HR	178.207 325.855 31/24	375.152 1601.188 4/ 6
APR	TOTAL (MBTU) PEAK (KBTU) DY/HR	160.649 325.855 16/ 8	107.777 1164.116 5/ 6
MAY	TOTAL (MBTU) PEAK (KBTU) DY/HR	194.889 679.131 31/18	22.781 896.378 1/ 6
JUN	TOTAL (MBTU) PEAK (KBTU) DY/HR	259.083 694.047 27/16	0.000 30/ 1 0.000
JUL	TOTAL (MBTU) PEAK (KBTU) DY/HR	300.558 788.183 23/16	0.000 0.000 31/ 1
AUG	TOTAL (MBTU) PEAK (KBTU) DY/HR	305.445 747.611 22/16	0.000 0.000 31/ 1
SEP	TOTAL (MBTU) PEAK (KBTU) DY/HR	219.241 705.417 7/16	0.000 0.000 30/ 1
OCT	TOTAL (MBTU) PEAK (KBTU) DY/HR	165.486 463.022 1/17	97.511 1310.511 20/ 6
NOV	TOTAL (MBTU) PEAK (KBTU) DY/HR	168.567 325.855 30/24	303.453 1593.438 3/ 6
DEC	TOTAL (MBTU) PEAK (KBTU) DY/HR	182.382 326.197 13/ 8	559.734 1883.994 13/ 6
	ONE YEAR USE/PEAK	2482.129 788.183	2568.475 2158.930

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/17/1995 14:45:52 PDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SETBACK FOR BLDG. #6914 MAIN FLOOR OF MAIN POST EXCHANGE  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE	ELECTRICITY	NATURAL-GAS
IN SITE MBTU -		
CATEGORY OF USE		
SPACE HEAT	102.62	2568.47
SPACE COOL	507.70	0.00
HVAC AUX	426.84	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	1444.88	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	0.00	0.00
TOTAL	2482.04	2568.47

TOTAL SITE ENERGY 5050.60 MBTU 191.0 KBTU/SQFT-YR GROSS-AREA 191.0 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 10022.32 MBTU 379.0 KBTU/SQFT-YR GROSS-AREA 379.0 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 0.0  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.



SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5  
OVERHANG-A = 10. OVERHANG-B = 6. OVERHANG-W = 32.  
OVERHANG-D = 10. ..

E-W HEIGHT = 19.8 WIDTH = 36.0 CONS = EXWALL-1  
AZIMUTH = 122 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 19.8 WIDTH = 138.0 CONS = EXWALL-1  
AZIMUTH = 212 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

DOOR HEIGHT = 7.0 WIDTH = 3.0 CONS = DOOR-MET  
MULTIPLIER = 2.0 SETBACK = 0.2  
SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5  
OVERHANG-A = 10. OVERHANG-B = 6. OVERHANG-W = 32.  
OVERHANG-D = 10. ..

U-W HEIGHT = 155.5 WIDTH = 170.0 CONS = FLOOR ..

ROOF HEIGHT = 155.5 WIDTH = 170.0 CONS = ROOF-1  
TILT = 0 SKY-FORM-FACTOR = 1.0 ..

END ..

COMPUTE LOADS ..

INPUT SYSTEMS ..

\$-----\$  
\$ E Z - D O E S Y S T E M S I N P U T \$  
\$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
LINE-3 \* DENVER, CO 80227 \*

LINE-4 \*RUN #2 DDC CONTROL FOR BLDG. #6914 \*  
LINE-5 \*MAIN FLOOR OF MAIN POST EXCHANGE \* ..

ABORT ERRORS ..  
DIAGNOSTIC WARNINGS ..  
SYSTEMS-REPORT VERIFICATION=(SV-A)  
SUMMARY=(SS-A,SS-C,SS-K,SS-O)  
HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

SD\_ON =DAY-SCHEDULE (1,24) (1.) ..  
SD\_OFF =DAY-SCHEDULE (1,24) (0.) ..  
SD\_WT\_HT =DAY-SCHEDULE (1,24) (70.) ..  
SD\_SM\_CL =DAY-SCHEDULE (1,24) (76.) ..  
SD\_WT\_CL =DAY-SCHEDULE (1,24) (72.) ..  
SD\_SM\_HT =DAY-SCHEDULE (1,24) (74.) ..



```

SD_OA%      =DAY-SCHEDULE (1,24) (0.57) ..
SD_FAN_CYC =DAY-SCHEDULE (1,24) (1.) ..

SW_ON       =WEEK-SCHEDULE (ALL) SD_ON ..

SW_OFF      =WEEK-SCHEDULE (ALL) SD_OFF ..

SW_WT_HT   =WEEK-SCHEDULE (ALL) SD_WT_HT ..

SW_SM_CL   =WEEK-SCHEDULE (ALL) SD_SM_CL ..

SW_WT_CL   =WEEK-SCHEDULE (ALL) SD_WT_CL ..

SW_SM_HT   =WEEK-SCHEDULE (ALL) SD_SM_HT ..

SW_OA%     =WEEK-SCHEDULE (ALL) SD_OA% ..

SW_FAN_CYC =WEEK-SCHEDULE (ALL) SD_FAN_CYC ..

```

## \$ FULL ON SYSTEM

```
S_ON       =SCHEDULE THRU DEC 31 SW_ON ..
```

## \$ FULL OFF SYSTEM

```
S_OFF      =SCHEDULE THRU DEC 31 SW_OFF ..
```

## \$ HEATING SEASON

```
S_HE-SCHED =SCHEDULE THRU MAY 15 SW_ON
              THRU OCT  1 SW_OFF
              THRU DEC 31 SW_ON ..
```

## \$ COOLING SEASON

```
S_CL_SCHED =SCHEDULE THRU MAY 15 SW_OFF
              THRU OCT  1 SW_ON
              THRU DEC 31 SW_OFF ..
```

## \$ HEATING SET TEMP

```
S_HT_SET_F =SCHEDULE THRU MAY 15 SW_WT_HT
              THRU OCT  1 SW_SM_HT
              THRU DEC 31 SW_WT_HT ..
```

## \$ COOLING SET TEMP

```
S_CL_SET_F =SCHEDULE THRU MAY 15 SW_WT_CL
              THRU OCT  1 SW_SM_CL
              THRU DEC 31 SW_WT_CL ..
```

```
S_OA%     =SCHEDULE THRU DEC 31 SW_OA% ..
```

```
S_HRLY-RPT =SCHEDULE THRU JAN 14 SW_OFF
              THRU JAN 15 SW_ON
              THRU JUL 22 SW_OFF
              THRU JUL 23 SW_ON
              THRU DEC 31 SW_OFF ..
```

```
S_FAN_CYC =SCHEDULE THRU DEC 31 SW_FAN_CYC ..
```

\$ ZONE DESCRIPTION

MAIN-SALES =ZONE    DESIGN-HEAT-T = 74.0    DESIGN-COOL-T = 72.0  
                   HEAT-TEMP-SCH = S\_HT\_SET\_F    COOL-TEMP-SCH = S\_CL\_SET\_F  
                   ZONE-TYPE = CONDITIONED  
                   THERMOSTAT-TYPE = PROPORTIONAL  
                   SIZING-OPTION = FROM-LOADS    ..

\$ SYSTEM DESCRIPTION

LARG-SZ    =SYSTEM    SYSTEM-TYPE = PSZ  
                   MAX-SUPPLY-T = 120.0    MIN-SUPPLY-T = 55.0  
                   HEATING-SCHEDULE = S\_HE-SCHED  
                   COOLING-SCHEDULE = S\_CL\_SCHED    OA-CONTROL = FIXED  
                   SUPPLY-CFM = 28100.    RATED-CFM = 28100.  
                   MIN-OUTSIDE-AIR = 0.57    MIN-AIR-SCH = S\_OA%  
                   MAX-OA-FRACTION = 0.57    FAN-SCHEDULE = S\_FAN\_CYC  
                   SUPPLY-DELTA-T = 1.8    SUPPLY-KW = 0.00059  
                   MOTOR-PLACEMENT = OUTSIDE-AIRFLOW  
                   NIGHT-CYCLE-CTRL = STAY-OFF    NIGHT-VENT-DT = 0.0  
                   MIN-CFM-RATIO = 1.0    COOLING-CAPACITY = 1328568.  
                   COOL-SH-CAP = 1107140.    COOL-FT-MIN = 0.  
                   HEATING-CAPACITY = -1800000.    MIN-HP-T = 0.  
                   MAX-HP-SUPP-T = 0.    CRANKCASE-MAX-T = 0.  
                   OUTSIDE-FAN-T = 45.    HEAT-SOURCE = HOT-WATER  
                   SIZING-OPTION = COINCIDENT  
                   ZONE-NAMES = (MAIN-SALES)    ..

\$ HOURLY REPORT DESCRIPTION

AHU-BLK    =REPORT-BLOCK    VARIABLE-TYPE = LARG-SZ  
   VARIABLE-LIST = (3,5,6,17,39,1)    ..  
 ZONE-BLK    =REPORT-BLOCK    VARIABLE-TYPE = MAIN-SALES  
   VARIABLE-LIST = (17,18,7,6)    ..  
 AHU-HRLY    = HOURLY-REPORT    REPORT-SCHEDULE = S\_HRLY-RPT  
   REPORT-BLOCK = (AHU-BLK)  
 ..  
 ZONE-HRLY    = HOURLY-REPORT    REPORT-SCHEDULE = S\_HRLY-RPT  
   REPORT-BLOCK = (ZONE-BLK)  
 ..  
 END    ..  
 COMPUTE SYSTEMS    ..  
  
 INPUT PLANT    ..

\$-----\$  
 \$ E Z - D O E   P L A N T S   I N P U T \$  
 \$-----\$

\$ GENERAL PROJECT DATA

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/17/1995 14:56:43 SDL RUN 1  
DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. #6914 MAIN FLOOR OF MAIN POST EXCHANGE  
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR LARG-SZ TOPEKA, KS

MONTH	COOLING			HEATING			WET-BULB			DRY-BULB			MAXIMUM			ELEC-		
	ENERGY (MBTU)	OF MAX DY HR	TEMP	ENERGY (MBTU)	OF MAX DY HR	TEMP	TEMP	TEMP	TEMP	LOAD (KBTU/HR)	LOAD (KBTU/HR)	LOAD (KBTU/HR)	TRICAL ENERGY (KWH)	LOAD (KW)	MAXIMUM	LOAD (KW)	MAXIMUM	
JAN	0.00000			-516.178	15	6	-8.F	-9.F	-1590.946	48299.	81.700							
FEB	0.00000			-380.972	3	6	-1.F	-2.F	-1406.446	43532.	81.700							
MAR	0.00000			-291.787	4	6	14.F	12.F	-1090.250	48480.	81.600							
APR	0.00000			-82.176	5	6	31.F	28.F	-718.287	46892.	81.600							
MAY	75.60682	31	18	-16.567	1	6	37.F	37.F	-498.938	55574.	186.583							
JUN	262.43298	27	17	0.000					0.000	72445.	190.256							
JUL	381.40594	23	17	0.000					0.000	85096.	218.261							
AUG	382.51929	22	16	0.000					0.000	87094.	207.903							
SEP	150.90594	7	16	0.000					0.000	61620.	194.032							
OCT	0.80208	1	18	-67.478	20	6	24.F	23.F	-850.363	48198.	107.246							
NOV	0.00000			-234.187	3	6	13.F	12.F	-1088.312	46522.	81.600							
DEC	0.00000			-449.568	13	6	2.F	1.F	-1342.147	48295.	81.700							
TOTAL	1253.672			-2038.914					-1590.946	692072.	218.261							
MAX																		

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/17/1995 14:56:43 SDL RUN 1  
DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. #6914 MAIN FLOOR OF MAIN POST EXCHANGE  
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR LARG-SZ TOPEKA, KS

MONTH	COOLING LOAD			HEATING LOAD			COINCIDENT COOL-HEAT LOAD			HOURS COINCIDENT			HOURS COOLING			HOURS HEATING			HOURS FLOATING			
	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	
JAN	0	744	0	744	0	744	0	744	0	744	0	744	0	744	0	744	0	744	0	744	0	744
FEB	0	667	0	672	0	672	0	672	0	672	0	672	0	672	0	672	0	672	0	672	0	672
MAR	0	703	0	744	0	744	0	744	0	744	0	744	0	744	0	744	0	744	0	744	0	744
APR	0	495	0	720	0	720	0	720	0	720	0	720	0	720	0	720	0	720	0	720	0	720
MAY	230	205	0	360	0	360	0	360	0	360	0	360	0	360	0	360	0	360	0	360	0	360
JUN	566	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
JUL	675	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AUG	674	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SEP	396	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OCT	5	495	0	720	5	720	0	720	5	720	0	720	0	720	0	720	0	720	0	720	0	720
NOV	631	0	0	744	0	744	0	744	0	744	0	744	0	744	0	744	0	744	0	744	0	744
DEC	0	742	0	744	0	744	0	744	0	744	0	744	0	744	0	744	0	744	0	744	0	744
ANNUAL	2546	4682	0	5424	2568	8760	0	5424	2568	8760	0	5424	2568	8760	0	5424	2568	8760	0	5424	2568	8760

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/17/1995 14:56:43 PDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. #6914 MAIN FLOOR OF MAIN POST EXCHANGE  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY TOTAL (MBTU) PEAK (KBTU) DY/HR	NATURAL-GAS TOTAL (MBTU) PEAK (KBTU) DY/HR
JAN	195.922 322.696 28/ 9	195.922 322.696 28/ 9	738.405 1998.945 15/ 6
FEB	176.055 322.696 3/ 8	176.055 322.696 3/ 8	566.719 1803.560 3/ 6
MAR	189.934 322.355 31/24	189.934 322.355 31/24	445.429 1458.888 4/ 6
APR	170.843 322.355 16/ 7	170.843 322.355 16/ 7	135.342 1037.549 5/ 6
MAY	193.074 637.073 31/18	193.074 637.073 31/18	29.626 781.036 1/ 6
JUN	247.360 649.614 27/17	247.360 649.614 27/17	0.000 0.000 30/ 1
JUL	290.553 745.237 23/16	290.553 745.237 23/16	0.000 0.000 31/ 1
AUG	297.375 709.868 22/16	297.375 709.868 22/16	0.000 0.000 31/ 1
SEP	210.399 662.509 7/16	210.399 662.509 7/16	0.000 0.000 30/ 1
OCT	174.705 366.183 1/18	174.705 366.183 1/18	114.876 1189.122 20/ 6
NOV	179.679 322.355 30/24	179.679 322.355 30/24	361.790 1456.738 3/ 6
DEC	195.040 322.696 13/ 8	195.040 322.696 13/ 8	658.156 1734.475 13/ 6
	ONE YEAR USE/PEAK	2520.938 745.237	3050.342 1998.945

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/17/1995 14:56:43 PDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. #6914 MAIN FLOOR OF MAIN POST EXCHANGE  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE	ELECTRICITY	NATURAL-GAS
IN SITE MBTU -		
CATEGORY OF USE		
SPACE HEAT	117.94	3050.34
SPACE COOL	422.11	0.00
HVAC AUX	535.92	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	1444.91	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	0.00	0.00
TOTAL	2520.89	3050.34

TOTAL SITE ENERGY 5571.28 MBTU 210.7 KBTU/SQFT-YR GROSS-AREA 210.7 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 10620.73 MBTU 401.7 KBTU/SQFT-YR GROSS-AREA 401.7 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 0.0  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5  
OVERHANG-A = 10. OVERHANG-B = 6. OVERHANG-W = 32.  
OVERHANG-D = 10. ..

E-W HEIGHT = 19.8 WIDTH = 36.0 CONS = EXWALL-1  
AZIMUTH = 122 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 19.8 WIDTH = 138.0 CONS = EXWALL-1  
AZIMUTH = 212 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

DOOR HEIGHT = 7.0 WIDTH = 3.0 CONS = DOOR-MET  
MULTIPLIER = 2.0 SETBACK = 0.2  
SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5  
OVERHANG-A = 10. OVERHANG-B = 6. OVERHANG-W = 32.  
OVERHANG-D = 10. ..

U-W HEIGHT = 155.5 WIDTH = 170.0 CONS = FLOOR ..

ROOF HEIGHT = 155.5 WIDTH = 170.0 CONS = ROOF-1  
TILT = 0 SKY-FORM-FACTOR = 1.0 ..

END ..

COMPUTE LOADS ..

INPUT SYSTEMS ..

\$-----\$  
\$ E Z - D O E S Y S T E M S I N P U T \$  
\$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
LINE-3 \* DENVER, CO 80227 \*  
  
LINE-4 \*RUN #3 ECONOMIZER FOR BLDG. #6914 \*  
LINE-5 \*MAIN FLOOR OF MAIN POST EXCHANGE \* ..

ABORT ERRORS ..  
DIAGNOSTIC WARNINGS ..  
SYSTEMS-REPORT VERIFICATION=(SV-A)  
SUMMARY=(SS-A,SS-C,SS-K,SS-O)  
HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

SD\_ON =DAY-SCHEDULE (1,24) (1.) ..  
SD\_OFF =DAY-SCHEDULE (1,24) (0.) ..  
SD\_WT\_HT =DAY-SCHEDULE (1,5) (55.)  
(6,24) (74.) ..  
SD\_SM\_CL =DAY-SCHEDULE (1,5) (85.)  
(6,24) (72.) ..

```

SD_WT_CL  =DAY-SCHEDULE (1,5) (57.)
           (6,24) (76.) ..
SD_SM_HT  =DAY-SCHEDULE (1,5) (83.)
           (6,24) (70.) ..
SD_OA%    =DAY-SCHEDULE (1,24) (0.57) ..
SD_FAN_CYC =DAY-SCHEDULE (1,5) (0.)
           (6,24) (1.) ..

SW_ON     =WEEK-SCHEDULE (ALL) SD_ON ..

SW_OFF    =WEEK-SCHEDULE (ALL) SD_OFF ..

SW_WT_HT  =WEEK-SCHEDULE (ALL) SD_WT_HT ..

SW_SM_CL  =WEEK-SCHEDULE (ALL) SD_SM_CL ..

SW_WT_CL  =WEEK-SCHEDULE (ALL) SD_WT_CL ..

SW_SM_HT  =WEEK-SCHEDULE (ALL) SD_SM_HT ..

SW_OA%    =WEEK-SCHEDULE (ALL) SD_OA% ..

SW_FAN_CYC =WEEK-SCHEDULE (ALL) SD_FAN_CYC ..

```

## \$ FULL ON SYSTEM

```
S_ON      =SCHEDULE THRU DEC 31 SW_ON ..
```

## \$ FULL OFF SYSTEM

```
S_OFF     =SCHEDULE THRU DEC 31 SW_OFF ..
```

## \$ HEATING SEASON

```
S_HE-SCHED =SCHEDULE THRU MAY 15 SW_ON
            THRU OCT  1 SW_OFF
            THRU DEC 31 SW_ON ..
```

## \$ COOLING SEASON

```
S_CL_SCHED =SCHEDULE THRU MAY 15 SW_OFF
            THRU OCT  1 SW_ON
            THRU DEC 31 SW_OFF ..
```

## \$ HEATING SET TEMP

```
S_HT_SET_F =SCHEDULE THRU MAY 15 SW_WT_HT
            THRU OCT  1 SW_SM_HT
            THRU DEC 31 SW_WT_HT ..
```

## \$ COOLING SET TEMP

```
S_CL_SET_F =SCHEDULE THRU MAY 15 SW_WT_CL
            THRU OCT  1 SW_SM_CL
            THRU DEC 31 SW_WT_CL ..
```

```
S_OA%     =SCHEDULE THRU DEC 31 SW_OA% ..
```

```
S_HRLY-RPT =SCHEDULE THRU JAN 14 SW_OFF
            THRU JAN 15 SW_ON
            THRU JUL 22 SW_OFF
```



THRU JUL 23 SW\_ON  
THRU DEC 31 SW\_OFF ..

S\_FAN\_CYC =SCHEDULE THRU DEC 31 SW\_FAN\_CYC ..

\$ ZONE DESCRIPTION

MAIN-SALES =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL  
SIZING-OPTION = FROM-LOADS ..

\$ SYSTEM DESCRIPTION

LARG-SZ =SYSTEM SYSTEM-TYPE = PSZ  
MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
HEATING-SCHEDULE = S\_HE-SCHED  
COOLING-SCHEDULE = S\_CL\_SCHED ECONO-LIMIT-T = 71.0 ←  
SUPPLY-CFM = 28100. RATED-CFM = 28100.  
MIN-OUTSIDE-AIR = 0.57 FAN-SCHEDULE = S\_FAN\_CYC  
SUPPLY-DELTA-T = 1.8 SUPPLY-KW = 0.00059  
MOTOR-PLACEMENT = OUTSIDE-AIRFLOW  
NIGHT-CYCLE-CTRL = STAY-OFF NIGHT-VENT-DT = 0.0  
MIN-CFM-RATIO = 1.0 COOLING-CAPACITY = 1328568.  
COOL-SH-CAP = 1107140. COOL-FT-MIN = 0.  
HEATING-CAPACITY = -1800000. MIN-HP-T = 0.  
MAX-HP-SUPP-T = 0. CRANKCASE-MAX-T = 0.  
OUTSIDE-FAN-T = 45. HEAT-SOURCE = HOT-WATER  
SIZING-OPTION = COINCIDENT  
ZONE-NAMES = (MAIN-SALES) ..

\$ HOURLY REPORT DESCRIPTION

AHU-BLK =REPORT-BLOCK VARIABLE-TYPE = LARG-SZ  
VARIABLE-LIST = (3,5,6,17,39,1) ..  
ZONE-BLK =REPORT-BLOCK VARIABLE-TYPE = MAIN-SALES  
VARIABLE-LIST = (17,18,7,6) ..  
AHU-HRLY = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
REPORT-BLOCK = (AHU-BLK)  
..  
ZONE-HRLY = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
REPORT-BLOCK = (ZONE-BLK)  
..  
END ..  
COMPUTE SYSTEMS ..  
INPUT PLANT ..

\$-----\$  
\$ E Z - D O E P L A N T S I N P U T \$

EMC ENGINEERS INC. EZZOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/17/1995 15:11:29 SDL RUN 1  
 DENVER, CO 80227 RUN #3 ECONOMIZER FOR BLDG. #6914 MAIN FLOOR OF MAIN POST EXCHANGE  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR LARG-SZ TOPEKA, KS

MONTH	COOLING				HEATING				ELECTRIC				
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELECTRIC ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-239.442	15	-8.F	-9.F	-1134.249	45730.		45730.	81.700
FEB	0.00000				-169.550	3	-1.F	-2.F	-1003.084	41211.		41211.	81.700
MAR	0.00000				-117.901	4	14.F	12.F	-790.575	45910.		45910.	81.600
APR	0.00000				-26.270	5	31.F	28.F	-526.755	44406.		44406.	81.600
MAY	92.24457	31	18	90.F	-4.455	1	38.F	36.F	-371.268	54464.		54464.	172.684
JUN	265.85046	27	16	89.F	0.000				0.000	70177.		70177.	175.220
JUL	358.83597	23	16	98.F	0.000				0.000	80358.		80358.	200.200
AUG	350.76666	20	14	93.F	0.000				0.000	81321.		81321.	188.964
SEP	170.33578	7	16	93.F	0.000				0.000	60878.		60878.	178.368
OCT	4.24344	1	17	85.F	-22.109	20	24.F	23.F	-603.647	45965.		45965.	134.379
NOV	0.00000				-93.388	3	13.F	12.F	-780.966	44035.		44035.	81.600
DEC	0.00000				-204.026	13	2.F	1.F	-958.799	45725.		45725.	81.700
TOTAL	1242.276				-877.143				-1134.249	660210.		660210.	200.200
MAX													

EMC ENGINEERS INC. EZZOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/17/1995 15:11:29 SDL RUN 1  
 DENVER, CO 80227 RUN #3 ECONOMIZER FOR BLDG. #6914 MAIN FLOOR OF MAIN POST EXCHANGE  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR LARG-SZ TOPEKA, KS

MONTH	COOLING LOAD		COINCIDENT LOAD		HEATING LOAD		ELECTRIC LOAD	
	HOURS	LOAD	HOURS	LOAD	HOURS	LOAD	HOURS	LOAD
JAN	0	0	0	0	0	0	0	0
FEB	0	0	0	0	0	0	0	0
MAR	0	0	0	0	0	0	0	0
APR	0	0	0	0	0	0	0	0
MAY	234	46	0	0	0	0	0	0
JUN	518	0	0	0	0	0	0	0
JUL	576	0	0	0	0	0	0	0
AUG	573	0	0	0	0	0	0	0
SEP	399	0	0	0	0	0	0	0
OCT	14	162	0	0	0	0	0	0
NOV	0	404	0	0	0	0	0	0
DEC	0	583	0	0	0	0	0	0
ANNUAL	2314	2974	0	0	6935	3259	0	1647

EMC ENGINEERS INC. EZZOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/17/1995 15:11:29 SDL RUN 1  
 DENVER, CO 80227 RUN #3 ECONOMIZER FOR BLDG. #6914 MAIN FLOOR OF MAIN POST EXCHANGE  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR LARG-SZ TOPEKA, KS

MONTH	COOLING LOAD		COINCIDENT LOAD		HEATING LOAD		ELECTRIC LOAD	
	HOURS	LOAD	HOURS	LOAD	HOURS	LOAD	HOURS	LOAD
JAN	0	0	0	0	0	0	0	0
FEB	0	0	0	0	0	0	0	0
MAR	0	0	0	0	0	0	0	0
APR	0	0	0	0	0	0	0	0
MAY	234	46	0	0	0	0	0	0
JUN	518	0	0	0	0	0	0	0
JUL	576	0	0	0	0	0	0	0
AUG	573	0	0	0	0	0	0	0
SEP	399	0	0	0	0	0	0	0
OCT	14	162	0	0	0	0	0	0
NOV	0	404	0	0	0	0	0	0
DEC	0	583	0	0	0	0	0	0
ANNUAL	2314	2974	0	0	6935	3259	0	1647

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/17/1995 15:11:29 PDL RUN 1  
 DENVER, CO 80227 RUN #3 ECONOMIZER FOR BLDG. #6914 MAIN FLOOR OF MAIN POST EXCHANGE  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY 172.831 310.141 28/9	NATURAL-GAS 352.806 1425.128 15/6
JAN	TOTAL (MBTU) PEAK (KBTU) DY/HR	172.831 310.141 28/9	352.806 1425.128 15/6
FEB	TOTAL (MBTU) PEAK (KBTU) DY/HR	155.241 310.141 3/8	261.898 1286.228 3/6
MAR	TOTAL (MBTU) PEAK (KBTU) DY/HR	168.123 309.800 31/24	185.687 1054.834 4/6
APR	TOTAL (MBTU) PEAK (KBTU) DY/HR	154.904 309.800 16/7	43.533 756.635 5/6
MAY	TOTAL (MBTU) PEAK (KBTU) DY/HR	186.638 589.618 31/18	7.599 575.212 1/7
JUN	TOTAL (MBTU) PEAK (KBTU) DY/HR	239.615 598.275 27/16	0.000 0.000 30/1
JUL	TOTAL (MBTU) PEAK (KBTU) DY/HR	274.376 683.570 23/16	0.000 0.000 31/1
AUG	TOTAL (MBTU) PEAK (KBTU) DY/HR	277.666 645.202 22/16	0.000 0.000 31/1
SEP	TOTAL (MBTU) PEAK (KBTU) DY/HR	207.863 609.025 7/16	0.000 0.000 30/1
OCT	TOTAL (MBTU) PEAK (KBTU) DY/HR	159.863 458.827 1/17	37.174 844.798 20/6
NOV	TOTAL (MBTU) PEAK (KBTU) DY/HR	159.844 309.800 30/24	149.219 1044.186 3/6
DEC	TOTAL (MBTU) PEAK (KBTU) DY/HR	172.007 310.141 13/8	307.894 1238.656 13/6
	ONE YEAR USE/PEAK	2328.971 683.570	1345.809 1425.128

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/17/1995 15:11:29 PDL RUN 1  
 DENVER, CO 80227 RUN #3 ECONOMIZER FOR BLDG. #6914 MAIN FLOOR OF MAIN POST EXCHANGE  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
SPACE HEAT	56.69	1345.81
SPACE COOL	416.61	0.00
HVAC AUX	410.70	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	1444.89	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	0.00	0.00
TOTAL	2328.89	1345.81

TOTAL SITE ENERGY 3674.78 MBTU 139.0 KBTU/SQFT-YR GROSS-AREA 139.0 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 8339.72 MBTU 315.4 KBTU/SQFT-YR GROSS-AREA 315.4 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 1.4  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5  
OVERHANG-A = 10. OVERHANG-B = 6. OVERHANG-W = 32.  
OVERHANG-D = 10. ..

E-W HEIGHT = 19.8 WIDTH = 36.0 CONS = EXWALL-1  
AZIMUTH = 122 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 19.8 WIDTH = 138.0 CONS = EXWALL-1  
AZIMUTH = 212 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

DOOR HEIGHT = 7.0 WIDTH = 3.0 CONS = DOOR-MET  
MULTIPLIER = 2.0 SETBACK = 0.2  
SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5  
OVERHANG-A = 10. OVERHANG-B = 6. OVERHANG-W = 32.  
OVERHANG-D = 10. ..

U-W HEIGHT = 155.5 WIDTH = 170.0 CONS = FLOOR ..

ROOF HEIGHT = 155.5 WIDTH = 170.0 CONS = ROOF-1  
TILT = 0 SKY-FORM-FACTOR = 1.0 ..

END ..

COMPUTE LOADS ..

INPUT SYSTEMS ..

-----\$  
\$ E Z - D O E S Y S T E M S I N P U T \$  
-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
LINE-3 \* DENVER, CO 80227 \*  
  
LINE-4 \*RUN #4 NIGHT INFILTRATION BLDG. #6914 \*  
LINE-5 \*MAIN FLOOR OF MAIN POST EXCHANGE \* ..

ABORT ERRORS ..  
DIAGNOSTIC WARNINGS ..  
SYSTEMS-REPORT VERIFICATION=(SV-A)  
SUMMARY=(SS-A,SS-C,SS-K,SS-O)  
HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

SD\_ON =DAY-SCHEDULE (1,24) (1.) ..  
SD\_OFF =DAY-SCHEDULE (1,24) (0.) ..  
SD\_WT\_HT =DAY-SCHEDULE (1,24) (74.) ..  
SD\_SM\_CL =DAY-SCHEDULE (1,24) (72.) ..  
SD\_WT\_CL =DAY-SCHEDULE (1,24) (76.) ..  
SD\_SM\_HT =DAY-SCHEDULE (1,24) (70.) ..

SD\_OA% =DAY-SCHEDULE (1,5) (0.)  
(6,24) (0.57) .. ←

SW\_ON =WEEK-SCHEDULE (ALL) SD\_ON ..

SW\_OFF =WEEK-SCHEDULE (ALL) SD\_OFF ..

SW\_WT\_HT =WEEK-SCHEDULE (ALL) SD\_WT\_HT ..

SW\_SM\_CL =WEEK-SCHEDULE (ALL) SD\_SM\_CL ..

SW\_WT\_CL =WEEK-SCHEDULE (ALL) SD\_WT\_CL ..

SW\_SM\_HT =WEEK-SCHEDULE (ALL) SD\_SM\_HT ..

SW\_OA% =WEEK-SCHEDULE (ALL) SD\_OA% ..

\$ FULL ON SYSTEM

S\_ON =SCHEDULE THRU DEC 31 SW\_ON ..

\$ FULL OFF SYSTEM

S\_OFF =SCHEDULE THRU DEC 31 SW\_OFF ..

\$ HEATING SEASON

S\_HE-SCHED =SCHEDULE THRU MAY 15 SW\_ON  
THRU OCT 1 SW\_OFF  
THRU DEC 31 SW\_ON ..

\$ COOLING SEASON

S\_CL\_SCHED =SCHEDULE THRU MAY 15 SW\_OFF  
THRU OCT 1 SW\_ON  
THRU DEC 31 SW\_OFF ..

\$ HEATING SET TEMP

S\_HT\_SET\_F =SCHEDULE THRU MAY 15 SW\_WT\_HT  
THRU OCT 1 SW\_SM\_HT  
THRU DEC 31 SW\_WT\_HT ..

\$ COOLING SET TEMP

S\_CL\_SET\_F =SCHEDULE THRU MAY 15 SW\_WT\_CL  
THRU OCT 1 SW\_SM\_CL  
THRU DEC 31 SW\_WT\_CL ..

S\_OA% =SCHEDULE THRU DEC 31 SW\_OA% ..

S\_HRLY-RPT =SCHEDULE THRU JAN 14 SW\_OFF  
THRU JAN 15 SW\_ON  
THRU JUL 22 SW\_OFF  
THRU JUL 23 SW\_ON  
THRU DEC 31 SW\_OFF ..

\$ ZONE DESCRIPTION

```

MAIN-SALES =ZONE    DESIGN-HEAT-T = 74.0  DESIGN-COOL-T = 72.0
HEAT-TEMP-SCH = S_HT_SET_F  COOL-TEMP-SCH = S_CL_SET_F
ZONE-TYPE = CONDITIONED
THERMOSTAT-TYPE = PROPORTIONAL
SIZING-OPTION = FROM-LOADS ..

```

\$ SYSTEM DESCRIPTION

```

LARG-SZ  =SYSTEM    SYSTEM-TYPE = PSZ
MAX-SUPPLY-T = 120.0  MIN-SUPPLY-T = 55.0
HEATING-SCHEDULE = S_HE-SCHED
COOLING-SCHEDULE = S_CL_SCHED  OA-CONTROL = FIXED
SUPPLY-CFM = 28100.  RATED-CFM = 28100.
MIN-OUTSIDE-AIR = 0.57  MIN-AIR-SCH = S_OA% ←
MAX-OA-FRACTION = 0.57  SUPPLY-DELTA-T = 1.8
SUPPLY-KW = 0.00059
MOTOR-PLACEMENT = OUTSIDE-AIRFLOW
NIGHT-CYCLE-CTRL = STAY-OFF  NIGHT-VENT-DT = 0.0
MIN-CFM-RATIO = 1.0  COOLING-CAPACITY = 1328568.
COOL-SH-CAP = 1107140.  COOL-FT-MIN = 0.
HEATING-CAPACITY = -1800000.  MIN-HP-T = 0.
MAX-HP-SUPP-T = 0.  CRANKCASE-MAX-T = 0.
OUTSIDE-FAN-T = 45.  HEAT-SOURCE = HOT-WATER
SIZING-OPTION = COINCIDENT
ZONE-NAMES = (MAIN-SALES) ..

```

\$ HOURLY REPORT DESCRIPTION

```

AHU-BLK  =REPORT-BLOCK VARIABLE-TYPE = LARG-SZ
VARIABLE-LIST = (3,5,6,17,39,1) ..
ZONE-BLK  =REPORT-BLOCK VARIABLE-TYPE = MAIN-SALES
VARIABLE-LIST = (17,18,7,6) ..
AHU-HRLY  = HOURLY-REPORT REPORT-SCHEDULE = S_HRLY-RPT
REPORT-BLOCK = (AHU-BLK)
..
ZONE-HRLY  = HOURLY-REPORT REPORT-SCHEDULE = S_HRLY-RPT
REPORT-BLOCK = (ZONE-BLK)
..
END ..

```

COMPUTE SYSTEMS ..

INPUT PLANT ..

```

$-----$
$ E Z - D O E   P L A N T S   I N P U T $
$-----$

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\$ GENERAL PROJECT DATA

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TITLE  LINE-1 *   EMC   ENGINEERS   INC.   *
LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
LINE-3 *   DENVER,   CO   80227   *

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EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/17/1995 15:43:13 SDL RUN 1												
DENVER, CO 80227 RUN #4 NIGHT INFILTRATION BLDG. #6914 MAIN FLOOR OF MAIN POST EXCHANGE												
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR LARG-SZ TOPEKA, KS												
----- C O O L I N G ----- H E A T I N G ----- E L E C -----												
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC-TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				0.000	-425.891	15	6	-8.F	-9.F	48299.	81.700
FEB	0.00000				0.000	-312.716	3	6	-1.F	-2.F	43532.	81.700
MAR	0.00000				0.000	-235.482	4	6	14.F	12.F	48480.	81.600
APR	0.00000				0.000	-60.082	5	6	31.F	28.F	46892.	81.600
MAY	118.13782	31 18	90.F	76.F	1122.082	-11.403	1	6	37.F	37.F	59297.	197.898
JUN	334.48047	27 16	89.F	77.F	1179.922	0.000				0.000	79013.	201.855
JUL	448.55234	23 17	97.F	79.F	1404.293	0.000				0.000	91214.	229.416
AUG	442.27390	20 14	93.F	78.F	1266.371	0.000				0.000	92754.	217.358
SEP	213.39183	5 18	90.F	77.F	1166.976	0.000				0.000	67299.	204.748
OCT	4.34122	1 17	85.F	68.F	544.435	-53.337	20	6	24.F	23.F	48542.	137.128
NOV	0.00000				0.000	-187.634	3	6	13.F	12.F	46522.	81.600
DEC	0.00000				0.000	-372.827	13	6	2.F	1.F	48295.	81.700
TOTAL	1561.176				1404.293	-1659.372				-1662.039	720163.	229.416
MAX												

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/17/1995 15:43:13 SDL RUN 1												
DENVER, CO 80227 RUN #4 NIGHT INFILTRATION BLDG. #6914 MAIN FLOOR OF MAIN POST EXCHANGE												
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR LARG-SZ TOPEKA, KS												
----- N U M B E R O F H O U R S -----												
MONTH	HOURS COOLING LOAD	HOURS HEATING LOAD	HOURS COINCIDENT COOL-HEAT LOAD	HOURS FLOATING	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.	HOURS FANS ON	HOURS FANS ON CYCLE	HOURS NIGHT VENTING	HOURS FLOATING WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	COINCIDENT ELECTRIC LOAD AT COOLING PEAK (KW)
JAN	0	744	0	0	744	0	744	0	0	0	-577.469	81.600
FEB	0	668	0	4	672	0	672	0	0	4	-595.144	81.600
MAR	0	680	0	64	744	0	744	0	0	64	-575.863	81.600
APR	0	434	0	286	720	0	720	0	0	286	0.000	19.830
MAY	352	164	0	228	360	352	744	0	0	228	0.000	201.855
JUN	694	0	0	26	0	696	720	0	0	26	0.000	228.499
JUL	737	0	0	7	0	738	744	0	0	7	0.000	213.897
AUG	733	0	0	11	0	735	744	0	0	11	0.000	201.752
SEP	575	0	0	145	0	579	720	0	0	145	0.000	137.128
OCT	14	400	0	330	720	14	744	0	0	330	0.000	81.600
NOV	0	594	0	126	720	0	720	0	0	126	-707.536	81.600
DEC	0	736	0	8	744	0	744	0	0	8	-673.519	81.600
ANNUAL	3105	4420	0	1235	5424	3114	8760	0	0	1235		



EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/17/1995 15:43:13 PDL RUN 1  
 DENVER, CO 80227 RUN #4 NIGHT INFILTRATION BLDG. #6914 MAIN FLOOR OF MAIN POST EXCHANGE  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY 193.087 324.651 28/ 9	NATURAL-GAS 617.723 2088.270 15/ 6
JAN	TOTAL (MBTU) PEAK (KBTU) DY/HR	173.424 324.651 3/ 8	472.210 1890.775 3/ 6
FEB	TOTAL (MBTU) PEAK (KBTU) DY/HR	187.475 324.309 31/24	366.388 1546.672 4/ 6
MAR	TOTAL (MBTU) PEAK (KBTU) DY/HR	169.089 324.309 16/ 8	101.626 1126.956 5/ 6
APR	TOTAL (MBTU) PEAK (KBTU) DY/HR	205.016 675.710 31/18	20.712 853.315 1/ 6
MAY	TOTAL (MBTU) PEAK (KBTU) DY/HR	269.783 689.220 27/16	0.000 0.000 30/ 1
JUN	TOTAL (MBTU) PEAK (KBTU) DY/HR	311.445 783.325 23/16	0.000 0.000 31/ 1
JUL	TOTAL (MBTU) PEAK (KBTU) DY/HR	316.702 742.152 22/16	0.000 0.000 31/ 1
AUG	TOTAL (MBTU) PEAK (KBTU) DY/HR	229.788 699.097 7/16	0.000 0.000 30/ 1
SEP	TOTAL (MBTU) PEAK (KBTU) DY/HR	174.055 468.213 1/17	91.443 1275.874 20/ 6
OCT	TOTAL (MBTU) PEAK (KBTU) DY/HR	177.313 324.309 30/24	295.269 1542.278 3/ 6
NOV	TOTAL (MBTU) PEAK (KBTU) DY/HR	192.164 324.651 13/ 8	552.639 1821.758 13/ 6
DEC	TOTAL (MBTU) PEAK (KBTU) DY/HR		
	ONE YEAR USE/PEAK	2599.342 783.325	2518.011 2088.270

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/17/1995 15:43:13 PDL RUN 1  
 DENVER, CO 80227 RUN #4 NIGHT INFILTRATION BLDG. #6914 MAIN FLOOR OF MAIN POST EXCHANGE  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE	ELECTRICITY	NATURAL-GAS
IN SITE MBTU -		
CATEGORY OF USE		
SPACE HEAT	100.97	2518.01
SPACE COOL	518.02	0.00
HVAC AUX	535.36	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	1444.88	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	0.00	0.00
TOTAL	2599.24	2518.01

TOTAL SITE ENERGY 5117.35 MBTU 193.5 KBTU/SQFT-YR GROSS-AREA 193.5 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 10323.84 MBTU 390.4 KBTU/SQFT-YR GROSS-AREA 390.4 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 0.0  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5  
OVERHANG-A = 10. OVERHANG-B = 6. OVERHANG-W = 32.  
OVERHANG-D = 10. ..

E-W HEIGHT = 19.8 WIDTH = 36.0 CONS = EXWALL-1  
AZIMUTH = 122 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 19.8 WIDTH = 138.0 CONS = EXWALL-1  
AZIMUTH = 212 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

DOOR HEIGHT = 7.0 WIDTH = 3.0 CONS = DOOR-MET  
MULTIPLIER = 2.0 SETBACK = 0.2  
SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5  
OVERHANG-A = 10. OVERHANG-B = 6. OVERHANG-W = 32.  
OVERHANG-D = 10. ..

U-W HEIGHT = 155.5 WIDTH = 170.0 CONS = FLOOR ..

ROOF HEIGHT = 155.5 WIDTH = 170.0 CONS = ROOF-1  
TILT = 0 SKY-FORM-FACTOR = 1.0 ..

END ..

COMPUTE LOADS ..

INPUT SYSTEMS ..

\$-----\$  
\$ E Z - D O E S Y S T E M S I N P U T \$  
\$-----\$

\$ GENERAL PROJECT DATA


TITLE LINE-1 \* EMC ENGINEERS INC. \*  
LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
LINE-3 \* DENVER, CO 80227 \*  
  
LINE-4 \*RUN #5 DAY INFILTRATION BLDG. #6914 \*  
LINE-5 \*MAIN FLOOR OF MAIN POST EXCHANGE \* ..

ABORT ERRORS ..  
DIAGNOSTIC WARNINGS ..  
SYSTEMS-REPORT VERIFICATION=(SV-A)  
SUMMARY=(SS-A,SS-C,SS-K,SS-O)  
HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

SD\_ON =DAY-SCHEDULE (1,24) (1.) ..  
SD\_OFF =DAY-SCHEDULE (1,24) (0.) ..  
SD\_WT\_HT =DAY-SCHEDULE (1,24) (74.) ..  
SD\_SM\_CL =DAY-SCHEDULE (1,24) (72.) ..  
SD\_WT\_CL =DAY-SCHEDULE (1,24) (76.) ..  
SD\_SM\_HT =DAY-SCHEDULE (1,24) (70.) ..

```
SD_OA%    =DAY-SCHEDULE (1,5) (0.57)
           (6,24) (0.) ..
```



SW\_ON =WEEK-SCHEDULE (ALL) SD\_ON ..

SW\_OFF =WEEK-SCHEDULE (ALL) SD\_OFF ..

SW\_WT\_HT =WEEK-SCHEDULE (ALL) SD\_WT\_HT ..

SW\_SM\_CL =WEEK-SCHEDULE (ALL) SD\_SM\_CL ..

SW\_WT\_CL =WEEK-SCHEDULE (ALL) SD\_WT\_CL ..

SW\_SM\_HT =WEEK-SCHEDULE (ALL) SD\_SM\_HT ..

SW\_OA% =WEEK-SCHEDULE (ALL) SD\_OA% ..

\$ FULL ON SYSTEM

S\_ON =SCHEDULE THRU DEC 31 SW\_ON ..

\$ FULL OFF SYSTEM

S\_OFF =SCHEDULE THRU DEC 31 SW\_OFF ..

\$ HEATING SEASON

```
S_HE-SCHED =SCHEDULE THRU MAY 15 SW_ON
              THRU OCT 1 SW_OFF
              THRU DEC 31 SW_ON ..
```

\$ COOLING SEASON

```
S_CL_SCHED =SCHEDULE THRU MAY 15 SW_OFF
              THRU OCT 1 SW_ON
              THRU DEC 31 SW_OFF ..
```

\$ HEATING SET TEMP

```
S_HT_SET_F =SCHEDULE THRU MAY 15 SW_WT_HT
              THRU OCT 1 SW_SM_HT
              THRU DEC 31 SW_WT_HT ..
```

\$ COOLING SET TEMP

```
S_CL_SET_F =SCHEDULE THRU MAY 15 SW_WT_CL
              THRU OCT 1 SW_SM_CL
              THRU DEC 31 SW_WT_CL ..
```

S\_OA% =SCHEDULE THRU DEC 31 SW\_OA% ..

```
S_HRLY-RPT =SCHEDULE THRU JAN 14 SW_OFF
              THRU JAN 15 SW_ON
              THRU JUL 22 SW_OFF
              THRU JUL 23 SW_ON
              THRU DEC 31 SW_OFF ..
```

\$ ZONE DESCRIPTION

```

MAIN-SALES =ZONE    DESIGN-HEAT-T = 74.0  DESIGN-COOL-T = 72.0
                    HEAT-TEMP-SCH = S_HT_SET_F  COOL-TEMP-SCH = S_CL_SET_F
                    ZONE-TYPE = CONDITIONED
                    THERMOSTAT-TYPE = PROPORTIONAL
                    SIZING-OPTION = FROM-LOADS ..

```

\$ SYSTEM DESCRIPTION

```

LARG-SZ    =SYSTEM  SYSTEM-TYPE = PSZ
                    MAX-SUPPLY-T = 120.0  MIN-SUPPLY-T = 55.0
                    HEATING-SCHEDULE = S_HE-SCHED
                    COOLING-SCHEDULE = S_CL_SCHED  OA-CONTROL = FIXED
                    SUPPLY-CFM = 28100.  RATED-CFM = 28100.
                    MIN-OUTSIDE-AIR = 0.57  MIN-AIR-SCH = S_OA%
                    MAX-OA-FRACTION = 0.57  SUPPLY-DELTA-T = 1.8
                    SUPPLY-KW = 0.00059
                    MOTOR-PLACEMENT = OUTSIDE-AIRFLOW
                    NIGHT-CYCLE-CTRL = STAY-OFF  NIGHT-VENT-DT = 0.0
                    MIN-CFM-RATIO = 1.0  COOLING-CAPACITY = 1328568.
                    COOL-SH-CAP = 1107140.  COOL-FT-MIN = 0.
                    HEATING-CAPACITY = -1800000.  MIN-HP-T = 0.
                    MAX-HP-SUPP-T = 0.  CRANKCASE-MAX-T = 0.
                    OUTSIDE-FAN-T = 45.  HEAT-SOURCE = HOT-WATER
                    SIZING-OPTION = COINCIDENT
                    ZONE-NAMES = (MAIN-SALES) ..

```

\$ HOURLY REPORT DESCRIPTION

```

AHU-BLK    =REPORT-BLOCK VARIABLE-TYPE = LARG-SZ
                    VARIABLE-LIST = (3,5,6,17,39,1) ..
ZONE-BLK    =REPORT-BLOCK VARIABLE-TYPE = MAIN-SALES
                    VARIABLE-LIST = (17,18,7,6) ..
AHU-HRLY    = HOURLY-REPORT  REPORT-SCHEDULE = S_HRLY-RPT
                    REPORT-BLOCK = (AHU-BLK)
..
ZONE-HRLY    = HOURLY-REPORT  REPORT-SCHEDULE = S_HRLY-RPT
                    REPORT-BLOCK = (ZONE-BLK)
..
END ..
COMPUTE SYSTEMS ..

```

INPUT PLANT ..

```

$-----$
$ E Z - D O E   P L A N T S   I N P U T $
$-----$

```

\$ GENERAL PROJECT DATA

```

TITLE  LINE-1 *      EMC      ENGINEERS      INC.      *
        LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
        LINE-3 *      DENVER,      CO      80227      *

```

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/17/1995 15:53:40 SDL RUN 1  
DENVER, CO 80227 RUN #5 DAY INFILTRATION BLDG. #6914 MAIN FLOOR OF MAIN POST EXCHANGE  
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR LARG-SZ TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC-TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-87.542	15	-8.F	-9.F	-1370.868	48299.	81.700
FEB	0.00000				-60.402	3	-1.F	-2.F	-1168.006	43532.	81.700
MAR	0.00000				-38.419	4	14.F	12.F	-822.719	48480.	81.600
APR	0.00000				-6.920	5	31.F	29.F	-291.202	46892.	81.600
MAY	98.38956	16	62.F	59.F	-2.255	4	48.F	46.F	-118.532	57595.	153.561
JUN	194.03796	20	77.F	73.F	0.000				0.000	66665.	125.568
JUL	227.30663	13	80.F	74.F	0.000				0.000	71693.	130.552
AUG	229.09183	21	82.F	74.F	0.000				0.000	72884.	132.823
SEP	163.05345	6	79.F	72.F	0.000				0.000	62683.	126.440
OCT	4.00641	1	67.F	62.F	-6.084	2	55.F	53.F	-392.574	48512.	115.118
NOV	0.00000				-25.569	3	13.F	12.F	-747.002	46522.	81.600
DEC	0.00000				-68.034	13	5.F	4.F	-1080.630	48295.	81.700
TOTAL	915.886				-295.226				-1370.868	662078.	153.561
MAX											

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/17/1995 15:53:40 SDL RUN 1  
DENVER, CO 80227 RUN #5 DAY INFILTRATION BLDG. #6914 MAIN FLOOR OF MAIN POST EXCHANGE  
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR LARG-SZ TOPEKA, KS

MONTH	HOURS				HOURS				HOURS				COINCIDENT LOADS	
	COOLING LOAD	HEATING LOAD	COOL-HEAT LOAD	FLOATING	HEATING AVAIL.	COOLING AVAIL.	FANS ON CYCLE	FANS ON NIGHT	FLOATING WHEN	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)	MAXIMUM HEATING LOAD (KBTU/HR)	MAXIMUM ELEC LOAD (KW)	
JAN	0	0	0	579	744	0	0	0	0	0.000	81.600	1370.868	81.700	
FEB	0	0	0	522	672	0	0	0	0	0.000	81.600	1168.006	81.700	
MAR	0	0	0	581	744	0	0	0	0	0.000	81.600	822.719	81.600	
APR	0	0	0	562	720	0	0	0	0	-119.667	19.830	291.202	81.600	
MAY	319	81	0	344	744	0	0	0	0	0.000	87.425	118.532	153.561	
JUN	664	0	0	56	720	0	0	0	0	0.000	63.469	0.000	125.568	
JUL	731	0	0	13	744	0	0	0	0	0.000	75.129	0.000	130.552	
AUG	720	0	0	24	744	0	0	0	0	0.000	79.853	0.000	132.823	
SEP	601	0	0	119	720	0	0	0	0	0.000	66.063	0.000	126.440	
OCT	17	164	0	563	744	0	0	0	0	0.000	109.824	0.000	115.118	
NOV	0	162	0	558	720	0	0	0	0	0.000	81.600	0.000	81.600	
DEC	0	165	0	579	744	0	0	0	0	0.000	81.600	0.000	81.700	
ANNUAL	3052	1208	0	4500	8760	0	0	0	0	0.000	662078.	1370.868	153.561	

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/17/1995 15:53:40 PDL RUN 1  
 DENVER, CO 80227 RUN #5 DAY INFILTRATION BLDG. #6914 MAIN FLOOR OF MAIN POST EXCHANGE  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY 170.317 278.960 28/9	NATURAL-GAS 125.243 1722.428 15/5
JAN	TOTAL (MBTU) PEAK (KBTU) DY/HR	153.434 278.960 3/8	91.369 1506.957 3/5
FEB	TOTAL (MBTU) PEAK (KBTU) DY/HR	169.350 278.619 31/24	60.163 1126.582 4/5
MAR	TOTAL (MBTU) PEAK (KBTU) DY/HR	161.983 278.619 30/24	13.135 487.425 5/5
APR	TOTAL (MBTU) PEAK (KBTU) DY/HR	197.500 524.321 16/11	4.622 205.259 4/1
MAY	TOTAL (MBTU) PEAK (KBTU) DY/HR	227.622 428.741 28/17	0.000 0.000 30/1
JUN	TOTAL (MBTU) PEAK (KBTU) DY/HR	244.790 445.760 23/16	0.000 0.000 31/1
JUL	TOTAL (MBTU) PEAK (KBTU) DY/HR	248.858 453.513 11/16	0.000 0.000 31/1
AUG	TOTAL (MBTU) PEAK (KBTU) DY/HR	214.029 431.721 7/16	0.000 0.000 30/1
SEP	TOTAL (MBTU) PEAK (KBTU) DY/HR	167.477 393.061 1/18	11.791 628.713 2/5
OCT	TOTAL (MBTU) PEAK (KBTU) DY/HR	162.018 278.619 30/24	41.733 1040.875 3/5
NOV	TOTAL (MBTU) PEAK (KBTU) DY/HR	169.957 278.960 13/8	101.112 1412.324 13/5
DEC	TOTAL (MBTU) PEAK (KBTU) DY/HR		
	ONE YEAR USE/PEAK	2287.335 524.321	449.168 1722.428

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/17/1995 15:53:40 PDL RUN 1  
 DENVER, CO 80227 RUN #5 DAY INFILTRATION BLDG. #6914 MAIN FLOOR OF MAIN POST EXCHANGE  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

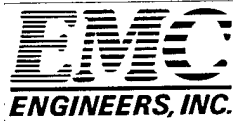
ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
SPACE HEAT	17.90	449.17
SPACE COOL	319.69	0.00
HVAC AUX	504.77	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	1444.89	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	0.00	0.00
TOTAL	2287.24	449.17

TOTAL SITE ENERGY 2736.50 MBTU 103.5 KBTU/SQFT-YR GROSS-AREA 103.5 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 7318.04 MBTU 276.8 KBTU/SQFT-YR GROSS-AREA 276.8 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 0.2  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.



**COMPUTER ENERGY SIMULATIONS**

**BLDG. 724  
SIMULATOR BUILDINGS**



DENVER - ATLANTA

PROJECT: FEASIBILITY STUDY FOR  
INSTALLATION OF UMCS  
LOCATION: FORT RILEY, KANSAS

EMC NO: 1406-001  
CALC. BY: AJN  
CHECKED BY: CEL  
DATE: 05-Jul-95

BUILDING NO.: 724  
BLDG. TYPE: FLIGHT SIMULATOR

**ENERGY CONSTANT CALCULATIONS**

	BASERUN	RUN1	RUN2	RUN3	RUN4	RUN5
HEATING (MBtu)	157.4	86.4	125.2	172.2	37.2	106.1
COOLING (kWH)	671,529	646,666	667,510	637,378	669,229	671,017

SUPPLY AIR FAN	12,688 CFM
FLOOR AREA	10,506 FT <sup>2</sup>
CFMI	1269 CFM
UA	790 BTU/HR-°F
BLDG CONSTR.	1 (1 FOR LIGHT ) 2 (2 FOR HEAVY)

EZDOE COMPUTER RUN DEFINITION:	
BASERUN	EXISTING OPERATION
RUN1	NIGHT SETBACK
RUN2	DDC CONTROL
RUN3	ECONOMIZER
RUN4	NIGHTTIME INFILTRATION (OA)
RUN5	DAYTIME INFILTRATION (OA)

HOURS OF OCCUPANCY			ANNUAL HEATING & COOLING HOURS	
M-F	600	1600	50 HR	HR. ON HEATING 1621 HR/YR
SAT.	0	0	0 HR	HR. ON COOLING 986 HR/YR
SUN.	0	0	0 HR	HR. OFF HEATING 3827 HR/YR
	TOTAL OCCUPY HR.		50 HR/WK	HR. OFF COOLING 2326 HR/YR
	TOTAL UNOCC. HR.		118 HR/WK	
	ANNUAL OCCUPY HR.		2607 HR/YR	
	ANNUAL UNOCC. HR.		6153 HR/YR	

PRESENT HR. OF OPERATION FOR SYS. WITH HEATING AND COOLING 8760 HR/YR  
 PRESENT HR. OF OPERATION FOR SYS. WITH HEATING ONLY 5448 HR/YR  
 PRESENT HR. OF OPERATION FOR SYS. WITH COOLING ONLY 3312 HR/YR  
 HRS SAVED (HTG ONLY) 5448 - 1621 = 3827 HR/YR  
 HRS SAVED (CLG ONLY) 3312 - 986 = 2326 HR/YR

HOAUHC	157.43 MBtu	-	37.24 MBtu	=	1.54E+01 Btu/CFM-HR
	1268.8 CFM	x	6153 HR/YR		
HOAUH	157.43 MBtu	-	37.24 MBtu	=	2.48E+01 Btu/CFM-HR
	1268.8 CFM	x	3827 HR/YR		
COAUHC	671,529.4 kWH	-	669,229.4 kWH	=	2.95E-04 kWH/CFM-HR
	1268.8 CFM	x	6153 HR/YR		
COAUH	671,529.4 kWH	-	669,229.4 kWH	=	7.79E-04 kWH/CFM-HR
	1268.8 CFM	x	2326 HR/YR		
HOAOHC	157.43 MBtu	-	106.06 MBtu	=	1.55E+01 Btu/CFM-HR
	1268.8 CFM	x	2607 HR/YR		
HOAOH	157.43 MBtu	-	106.06 MBtu	=	2.50E+01 Btu/CFM-HR
	1268.8 CFM	x	1621 HR/YR		
COAOHC	671,529.4 kWH	-	671,016.7 kWH	=	1.55E-04 kWH/CFM-HR
	1268.8 CFM	x	2607 HR/YR		
COAOH	671,529.4 kWH	-	671,016.7 kWH	=	4.10E-04 kWH/CFM-HR
	1268.8 CFM	x	986 HR/YR		
DC DUTY	1 / 6 (10 MINUTES PER HOUR)			=	0.17
DC DEMAND	1 / 6 (10 MINUTES PER HOUR)			=	0.17
ECC	646,665.7 kWH	-	637,377.7 kWH	=	7.43E-04 kWH/CFM-HR
	12688 CFM	x	986 HR/YR		
ECHC	646,665.7 kWH	-	637,377.7 kWH	=	2.81E-04 kWH/CFM-HR
	12688 CFM	x	2607 HR/YR		
NSUCHC	671,529.4 kWH	-	646,665.7 kWH	=	3.18E-04 kWH/CFM-HR
	12688 CFM	x	6153 HR/YR		
NSUCC	671,529.4 kWH	-	646,665.7 kWH	=	8.42E-04 kWH/CFM-HR
	12688 CFM	x	2326 HR/YR		
DDCCHC	671,529.4 kWH	-	667,509.5 kWH	=	1.22E-04 kWH/CFM-HR
	12688 CFM	x	2607 HR/YR		
DDCCC	671,529.4 kWH	-	667,509.5 kWH	=	3.21E-04 kWH/CFM-HR
	12688 CFM	x	986 HR/YR		
NSC	157.43 MBtu	-	86.37 MBtu	=	8.99E+04 Btu/UA
	790.1094 UA				
DDCH	157.43 MBtu	-	125.22 MBtu	=	4.08E+04 Btu/UA
	790.1094 UA				
OPT	(2 HR/DAY X 240 DAY/YR)			=	132 HR/YR
				=	348 HR/YR
CHWR	(1.10 kW X 0.012 Eff. X 664 HRS X 2 Degrees of Reset)			=	17.5 kWH/TON
OAR	567 HR/YR	x	0.01	=	5.67 HR/YR



INPUT LOADS ..

```

$-----$
$ E Z - D O E   L O A D S   I N P U T $
$-----$

```

## \$ GENERAL PROJECT DATA

```

TITLE  LINE-1 *      EMC      ENGINEERS      INC.      *
        LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
        LINE-3 *      DENVER,      CO      80227      *

        LINE-4 *BASELINE SIMULATION BLDG. #724      *
        LINE-5 *FLIGHT SIMULATOR      * ..

```

```

ABORT          ERRORS ..
DIAGNOSTIC     WARNINGS ..
LOADS-REPORT   VERIFICATION=(LV-D)
               SUMMARY=(LS-C,LS-D)
               HOURLY-DATA-SAVE = YES ..
BUILDING-LOCATION  LATITUDE = 39.0
                LONGITUDE = 96.5
                ALTITUDE = 1065.
                TIME-ZONE = 6
                GROSS-AREA = 13100
                SHIELDING-COEF = 0.29
                X-REF = 0.0
                Y-REF = 0.0 ..
RUN-PERIOD     JAN 1 1994 THRU DEC 31 1994 ..

```

## \$ SCHEDULES

```

LD_ON          =DAY-SCHEDULE (1,24) (1.) ..
LD_OFF         =DAY-SCHEDULE (1,24) (0.) ..
LD_PEO/LIT    =DAY-SCHEDULE (1,4) (0.)
                (5) (0.5)
                (6,15) (1.)
                (16) (0.75)
                (17,24) (0.) ..

LW_ON         =WEEK-SCHEDULE (ALL) LD_ON ..
LW_PEO/LIT    =WEEK-SCHEDULE (MON) LD_OFF
                (TUE) LD_OFF
                (WED) LD_PEO/LIT
                (THU) LD_PEO/LIT
                (FRI) LD_PEO/LIT
                (SAT) LD_PEO/LIT
                (SUN) LD_PEO/LIT
                (HOL) LD_OFF ..

```

LW\_OFF =WEEK-SCHEDULE (ALL) LD\_OFF ..

\$ PEOPLE AND LIGHTING SCH

L\_PEO/LIT =SCHEDULE THRU DEC 31 LW\_PEO/LIT ..

\$ FULL ON 100%

L\_ON =SCHEDULE THRU DEC 31 LW\_ON ..

\$ FULL OFF 0%

L\_OFF =SCHEDULE THRU DEC 31 LW\_OFF ..

\$ CONSTRUCTION TYPES

\$ BRICK, AIR, INSL, CMU

WALL-1 =LAYERS MATERIAL=(BK05,AL11,IN37,CB31) I-F-R= 0.6100  
THICKNESS=(0.333,0.000,0.333,0.667) ..

EXWALL-1 =CONSTRUCTION LAYERS = WALL-1  
ABSORPTANCE = 0.880  
ROUGHNESS = 2 ..

FLOOR =CONSTRUCTION U-VALUE = 0.020  
ABSORPTANCE = 0.610  
ROUGHNESS = 5 ..

\$ METAL ROOF, W/ INSL

MTL-ROOF =LAYERS MATERIAL=(HF-A3,IN05,HF-A3,AL33)  
THICKNESS=(0.005,0.807,0.005,0.000) ..

ROOF-1 =CONSTRUCTION LAYERS = MTL-ROOF  
ABSORPTANCE = 0.800  
ROUGHNESS = 5 ..

\$ STANDARD METAL DOOR

DOOR-STD =LAYERS MATERIAL=(HF-A3,IN22,HF-A3) I-F-R= 0.6100  
THICKNESS=(0.005,0.083,0.005) ..

DOOR-MET =CONSTRUCTION LAYERS = DOOR-STD  
ABSORPTANCE = 0.860  
ROUGHNESS = 5 ..

\$ WALL THAT LOOKS LIKE A ROOF

WALL/ROF =LAYERS MATERIAL=(HF-A3,IN37,CB36)  
THICKNESS=(0.005,0.333,1.000) ..

ROOF/WAL =CONSTRUCTION LAYERS = WALL/ROF  
ABSORPTANCE = 0.800  
ROUGHNESS = 5 ..

2\_PN\_STD =GLASS-TYPE GLASS-TYPE-CODE = 2  
PANES = 2 ..

## \$ SPACE DESCRIPTION

ZONE\_2 =SPACE AREA = 4498.0 VOLUME = 53975.0  
 TEMPERATURE = (73.) ZONE-TYPE = CONDITIONED  
 PEOPLE-SCHEDULE = L\_PEOP/LIT AREA/PERSON = 496.0  
 PEOPLE-HG-LAT = 625.0 PEOPLE-HG-SENS = 375.0  
 LIGHTING-TYPE = SUS-FLUOR LIGHTING-W/SQFT = 1.73  
 LIGHT-TO-SPACE = 1.0 LIGHTING-SCHEDULE = L\_PEOP/LIT  
 EQUIP-SCHEDULE = L\_PEOP/LIT EQUIPMENT-W/SQFT = 0.12  
 EQUIPMENT-KW = 19.25 SOURCE-SENSIBLE = 0.0  
 FURN-WEIGHT = 1. INF-METHOD = AIR-CHANGE  
 AIR-CHANGES/HR = 0.11 INF-SCHEDULE = L\_ON ..

E-W HEIGHT = 12.0 WIDTH = 106.4 CONS = EXWALL-1  
 AZIMUTH = 135 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 12.0 WIDTH = 44.8 CONS = EXWALL-1  
 AZIMUTH = 225 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 21.0 WIDTH = 12.8 CONS = EXWALL-1  
 AZIMUTH = 225 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 2.5 WIDTH = 28.8 CONS = ROOF/WAL  
 AZIMUTH = 135 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 12.0 WIDTH = 35.2 CONS = EXWALL-1  
 AZIMUTH = 45 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

U-W HEIGHT = 67.0 WIDTH = 67.0 CONS = FLOOR ..

ROOF HEIGHT = 67.0 WIDTH = 67.0 CONS = ROOF-1  
 TILT = 0 SKY-FORM-FACTOR = 1.0 ..

ZONE\_1 =SPACE AREA = 2780.0 VOLUME = 37233.0  
 TEMPERATURE = (73.) ZONE-TYPE = CONDITIONED  
 PEOPLE-SCHEDULE = L\_PEOP/LIT AREA/PERSON = 496.0  
 PEOPLE-HG-LAT = 625.0 PEOPLE-HG-SENS = 375.0  
 LIGHTING-TYPE = SUS-FLUOR LIGHTING-W/SQFT = 1.73  
 LIGHT-TO-SPACE = 1.0 LIGHTING-SCHEDULE = L\_PEOP/LIT  
 EQUIP-SCHEDULE = L\_PEOP/LIT EQUIPMENT-W/SQFT = 0.12  
 SOURCE-SENSIBLE = 0.0 FURN-WEIGHT = 1.  
 INF-METHOD = AIR-CHANGE AIR-CHANGES/HR = 0.11  
 INF-SCHEDULE = L\_ON ..

E-W HEIGHT = 12.0 WIDTH = 57.6 CONS = EXWALL-1  
 AZIMUTH = 315 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 12.0 WIDTH = 44.8 CONS = EXWALL-1

AZIMUTH = 225 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 21.0 WIDTH = 12.8 CONS = EXWALL-1  
AZIMUTH = 225 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 2.5 WIDTH = 28.8 CONS = ROOF/WAL  
AZIMUTH = 315 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

ROOF HEIGHT = 53.0 WIDTH = 52.5 CONS = ROOF-1  
TILT = 0 SKY-FORM-FACTOR = 1.0 ..

U-W HEIGHT = 53.0 WIDTH = 52.5 CONS = FLOOR ..

COMP\_AREA =SPACE AREA = 1362.0 VOLUME = 16344.0  
TEMPERATURE = (73.) ZONE-TYPE = CONDITIONED  
PEOPLE-SCHEDULE = L\_PEOP/LIT AREA/PERSON = 496.0  
PEOPLE-HG-LAT = 625.0 PEOPLE-HG-SENS = 375.0  
LIGHTING-TYPE = SUS-FLUOR LIGHTING-W/SQFT = 1.47  
LIGHT-TO-SPACE = 1.0 LIGHTING-SCHEDULE = L\_PEOP/LIT  
EQUIP-SCHEDULE = L\_ON EQUIPMENT-KW = 33.2  
SOURCE-SENSIBLE = 0.0 FURN-WEIGHT = 1.  
INF-METHOD = NONE ..

E-W HEIGHT = 12.0 WIDTH = 44.8 CONS = EXWALL-1  
AZIMUTH = 45 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

U-W HEIGHT = 40.0 WIDTH = 34.0 CONS = FLOOR ..

ROOF HEIGHT = 40.0 WIDTH = 34.0 CONS = ROOF-1  
TILT = 0 SKY-FORM-FACTOR = 1.0 ..

SIMUL\_AREA =SPACE AREA = 1866.0 VOLUME = 43851.0  
TEMPERATURE = (73.) ZONE-TYPE = CONDITIONED  
PEOPLE-SCHEDULE = L\_PEOP/LIT AREA/PERSON = 496.0  
PEOPLE-HG-LAT = 625.0 PEOPLE-HG-SENS = 375.0  
LIGHTING-TYPE = SUS-FLUOR LIGHTING-W/SQFT = 0.83  
LIGHT-TO-SPACE = 1.0 LIGHTING-SCHEDULE = L\_PEOP/LIT  
SOURCE-SENSIBLE = 0.0 FURN-WEIGHT = 1.  
INF-METHOD = NONE ..

U-W HEIGHT = 41.0 WIDTH = 45.5 CONS = FLOOR ..

ROOF HEIGHT = 11.2 WIDTH = 36.8 CONS = ROOF-1  
TILT = 0 SKY-FORM-FACTOR = 1.0 ..

E-W HEIGHT = 11.2 WIDTH = 24.0 CONS = ROOF/WAL  
AZIMUTH = 45 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 11.2 WIDTH = 24.0 CONS = ROOF/WAL

AZIMUTH = 225 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 2.5 WIDTH = 43.2 CONS = ROOF/WAL  
AZIMUTH = 135 SKY-FORM-FACTOR = 1.0 ..

E-W HEIGHT = 2.5 WIDTH = 43.2 CONS = ROOF/WAL  
AZIMUTH = 315 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

ROOF HEIGHT = 14.4 WIDTH = 36.8 CONS = ROOF-1  
AZIMUTH = 135 TILT = 40 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

ROOF HEIGHT = 18.0 WIDTH = 46.0 CONS = ROOF-1  
AZIMUTH = 315 TILT = 40 SKY-FORM-FACTOR = 1.0 ..

END ..

COMPUTE LOADS ..

INPUT SYSTEMS ..

\$-----\$  
\$ E Z - D O E S Y S T E M S I N P U T \$  
\$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
LINE-3 \* DENVER, CO 80227 \*

LINE-4 \*BASELINE SIMULATION BLDG. #724 \*

LINE-5 \*FLIGHT SIMULATOR \* ..

ABORT ERRORS ..  
DIAGNOSTIC WARNINGS ..  
SYSTEMS-REPORT VERIFICATION=(SV-A)  
SUMMARY=(SS-A,SS-C,SS-K,SS-O)  
HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

SD\_ON =DAY-SCHEDULE (1,24) (1.) ..  
SD\_OFF =DAY-SCHEDULE (1,24) (0.) ..  
SD\_WT\_HT\_W =DAY-SCHEDULE (1,24) (74.) ..  
SD\_SM\_CL\_W =DAY-SCHEDULE (1,24) (72.) ..  
SD\_WT\_CL\_W =DAY-SCHEDULE (1,24) (76.) ..  
SD\_SM\_HT\_W =DAY-SCHEDULE (1,24) (70.) ..  
SD\_WT\_HT\_D =DAY-SCHEDULE (1,24) (55.) ..  
SD\_SM\_CL\_D =DAY-SCHEDULE (1,24) (85.) ..  
SD\_WT\_CL\_D =DAY-SCHEDULE (1,24) (57.) ..  
SD\_SM\_HT\_D =DAY-SCHEDULE (1,24) (83.) ..  
SD\_FAN\_WK =DAY-SCHEDULE (1,4) (0.)  
(5,16) (1.)



```

(17,24) (0.) ..
SD_FAN_END =DAY-SCHEDULE (1,24) (0.) ..
SD_WTHT_CR =DAY-SCHEDULE (1,24) (74.) ..
SD_SMCL_CR =DAY-SCHEDULE (1,24) (72.) ..
SD_WTCL_CR =DAY-SCHEDULE (1,24) (76.) ..
SD_SMHT_CR =DAY-SCHEDULE (1,24) (70.) ..
SD_OA%      =DAY-SCHEDULE (1,24) (0.1) ..

SW_ON       =WEEK-SCHEDULE (ALL) SD_ON ..

SW_OFF      =WEEK-SCHEDULE (ALL) SD_OFF ..

SW_WT_HT    =WEEK-SCHEDULE (ALL) SD_WT_HT_W ..

SW_SM_CL    =WEEK-SCHEDULE (ALL) SD_SM_CL_W ..

SW_WT_CL    =WEEK-SCHEDULE (ALL) SD_WT_CL_W ..

SW_SM_HT    =WEEK-SCHEDULE (ALL) SD_SM_HT_W ..

SW_FAN_CYC =WEEK-SCHEDULE (MON) SD_FAN_END
              (TUE) SD_FAN_END
              (WED) SD_FAN_WK
              (THU) SD_FAN_WK
              (FRI) SD_FAN_WK
              (SAT) SD_FAN_WK
              (SUN) SD_FAN_WK
              (HOL) SD_FAN_END ..

SW_WTHT_CR =WEEK-SCHEDULE (ALL) SD_WTHT_CR ..

SW_SMCL_CR =WEEK-SCHEDULE (ALL) SD_SMCL_CR ..

SW_WTCL_CR =WEEK-SCHEDULE (ALL) SD_WTCL_CR ..

SW_SMHT_CR =WEEK-SCHEDULE (ALL) SD_SMHT_CR ..

SW_OA%     =WEEK-SCHEDULE (ALL) SD_OA% ..

$ FULL ON SYSTEM
S_ON       =SCHEDULE THRU DEC 31 SW_ON ..

$ FULL OFF SYSTEM
S_OFF      =SCHEDULE THRU DEC 31 SW_OFF ..

$ HEATING SEASON
S_HE-SCHED =SCHEDULE THRU MAY 15 SW_ON
              THRU OCT 1 SW_OFF
              THRU DEC 31 SW_ON ..

$ COOLING SEASON
S_CL_SCHED =SCHEDULE THRU MAY 15 SW_OFF
              THRU OCT 1 SW_ON
              THRU DEC 31 SW_OFF ..

```

## \$ HEATING SET TEMP

S\_HT\_SET =SCHEDULE THRU MAY 15 SW\_WT\_HT  
 THRU OCT 1 SW\_SM\_HT  
 THRU DEC 31 SW\_WT\_HT ..

## \$ COOLING SET TEMP

S\_CL\_SET =SCHEDULE THRU MAY 15 SW\_WT\_CL  
 THRU OCT 1 SW\_SM\_CL  
 THRU DEC 31 SW\_WT\_CL ..

S\_HRLY-RPT =SCHEDULE THRU JAN 3 SW\_OFF  
 THRU JAN 5 SW\_ON  
 THRU AUG 13 SW\_OFF  
 THRU AUG 15 SW\_ON  
 THRU DEC 31 SW\_OFF ..

S\_FAN\_CYC =SCHEDULE THRU DEC 31 SW\_FAN\_CYC ..

## \$ HEATING SET TEMP

S\_HT\_SETCR =SCHEDULE THRU MAY 15 SW\_WTHT\_CR  
 THRU OCT 1 SW\_SMHT\_CR  
 THRU DEC 31 SW\_WTHT\_CR ..

## \$ COOLING SET TEMP

S\_CL\_SETCR =SCHEDULE THRU MAY 15 SW\_WTCL\_CR  
 THRU OCT 1 SW\_SMCL\_CR  
 THRU DEC 31 SW\_WTCL\_CR ..

S\_OA% =SCHEDULE THRU DEC 31 SW\_OA% ..

## \$ ZONE DESCRIPTION

ZONE\_2 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET COOL-TEMP-SCH = S\_CL\_SET  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL  
 SIZING-OPTION = FROM-LOADS ..

ZONE\_1 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET COOL-TEMP-SCH = S\_CL\_SET  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL  
 SIZING-OPTION = FROM-LOADS ..

COMP\_AREA =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SETCR COOL-TEMP-SCH = S\_CL\_SETCR  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL  
 SIZING-OPTION = FROM-LOADS ..

SIMUL\_AREA =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET COOL-TEMP-SCH = S\_CL\_SET  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL

SIZING-OPTION = FROM-LOADS ..

\$ SYSTEM DESCRIPTION

MZ-PERIM =SYSTEM SYSTEM-TYPE = MZS  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_HE-SCHED  
 COOLING-SCHEDULE = S\_CL\_SCHED PREHEAT-T = 0.0  
 OA-CONTROL = FIXED SUPPLY-CFM = 6200.  
 RATED-CFM = 6200. MIN-OUTSIDE-AIR = 0.1  
 MIN-AIR-SCH = S\_OA% MAX-OA-FRACTION = 0.1  
 FAN-SCHEDULE = S\_ON SUPPLY-DELTA-T = 2.7  
 SUPPLY-KW = 0.00088 NIGHT-CYCLE-CTRL = CYCLE-ON-ANY  
 NIGHT-VENT-DT = 0.0 MIN-CFM-RATIO = 1.0  
 COOLING-CAPACITY = 190200. COOL-SH-CAP = 152160.  
 HEATING-CAPACITY = -146100.  
 SIZING-OPTION = COINCIDENT RETURN-AIR-PATH = DUCT  
 ZONE-NAMES = (ZONE\_1, ZONE\_2) ..

SING-ZN =SYSTEM SYSTEM-TYPE = PSZ  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_ON COOLING-SCHEDULE = S\_ON  
 HEAT-SET-T = 120.0 OA-CONTROL = FIXED  
 SUPPLY-CFM = 6000. RATED-CFM = 6000.  
 MIN-OUTSIDE-AIR = 0.1 MIN-AIR-SCH = S\_OA%  
 MAX-OA-FRACTION = 0.1 FAN-SCHEDULE = S\_ON  
 SUPPLY-DELTA-T = 1.8 SUPPLY-KW = 0.00059  
 NIGHT-CYCLE-CTRL = CYCLE-ON-ANY NIGHT-VENT-DT = 0.0  
 COOLING-CAPACITY = 165100. COOL-SH-CAP = 132080.  
 COOL-FT-MIN = 0. HEATING-CAPACITY = -120100.  
 MIN-HP-T = 0. MAX-HP-SUPP-T = 0. DEFROST-T = 0.  
 CRANKCASE-MAX-T = 0. OUTSIDE-FAN-T = 45.  
 HEAT-SOURCE = HOT-WATER SIZING-OPTION = COINCIDENT  
 RETURN-AIR-PATH = DUCT  
 ZONE-NAMES = (SIMUL\_AREA) ..

CRU'S =SYSTEM SYSTEM-TYPE = PSZ  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_ON COOLING-SCHEDULE = S\_ON  
 SUPPLY-CFM = 17200. RATED-CFM = 17200.  
 FAN-SCHEDULE = S\_OFF SUPPLY-DELTA-T = 1.8  
 SUPPLY-KW = 0.00059 NIGHT-CYCLE-CTRL = CYCLE-ON-ANY  
 NIGHT-VENT-DT = 0.0 COOLING-CAPACITY = 322000.  
 COOL-SH-CAP = 322000. COOL-FT-MIN = 0.  
 HEATING-CAPACITY = -95600. MIN-HP-T = 0.  
 MAX-HP-SUPP-T = 0. DEFROST-T = 0.  
 CRANKCASE-MAX-T = 0. OUTSIDE-FAN-T = 45.  
 HEAT-SOURCE = ELECTRIC SIZING-OPTION = COINCIDENT  
 ZONE-NAMES = (COMP\_AREA) ..

\$ HOURLY REPORT DESCRIPTION

SPACE-MZ =REPORT-BLOCK VARIABLE-TYPE = ZONE\_2  
 VARIABLE-LIST = (17,18,7,6) ..

```

SPACE-SZ  =REPORT-BLOCK VARIABLE-TYPE = SIMUL_AREA
           VARIABLE-LIST = (17,18,7,6) ..
SPACE-CRU  =REPORT-BLOCK VARIABLE-TYPE = COMP_AREA
           VARIABLE-LIST = (17,18,7,6) ..
AHU-MZ     =REPORT-BLOCK VARIABLE-TYPE = MZ-PERIM
           VARIABLE-LIST = (3,5,6,18,19,17) ..
AHU-SZ     =REPORT-BLOCK VARIABLE-TYPE = SING-ZN
           VARIABLE-LIST = (3,5,6,17) ..
AHU-CRU    =REPORT-BLOCK VARIABLE-TYPE = CRU'S
           VARIABLE-LIST = (3,5,6,17) ..
ZONE-HRLY  = HOURLY-REPORT REPORT-SCHEDULE = S_HRLY-RPT
           REPORT-BLOCK = (SPACE-MZ,SPACE-SZ,SPACE-CRU)

..
AHU-HRLY   = HOURLY-REPORT REPORT-SCHEDULE = S_HRLY-RPT
           REPORT-BLOCK = (AHU-MZ,AHU-SZ,AHU-CRU)

..
END ..
COMPUTE SYSTEMS ..

INPUT PLANT ..

```

```

$-----$
$ E Z - D O E   P L A N T S   I N P U T $
$-----$

```

\$ GENERAL PROJECT DATA

```

TITLE LINE-1 *      EMC      ENGINEERS      INC.      *
      LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
      LINE-3 *      DENVER,      CO      80227      *

      LINE-4 *BASELINE SIMULATION BLDG. #724      *
      LINE-5 *FLIGHT SIMULATOR      * ..

```

```

ABORT          ERRORS ..
DIAGNOSTIC     WARNINGS ..
PLANT-REPORT   VERIFICATION=(PV-A)
               SUMMARY=(PS-B,BEPS)
               HOURLY-DATA-SAVE = YES ..

```

\$ SCHEDULES

```

PD_ON          =DAY-SCHEDULE (1,24) (1.) ..
PD_OFF         =DAY-SCHEDULE (1,24) (0.) ..

PW_OFF         =WEEK-SCHEDULE (ALL) PD_OFF ..
PW_ON          =WEEK-SCHEDULE (ALL) PD_ON ..

```

\$ HEATING SEASON

```

P_HEAT        =SCHEDULE THRU MAY 15 PW_ON
               THRU OCT 1 PW_OFF

```

THRU DEC 31 PW\_ON ..

## \$ COOLING\_SEASON

P\_COOL =SCHEDULE THRU MAY 15 PW\_OFF  
THRU OCT 1 PW\_ON  
THRU DEC 31 PW\_OFF ..

## \$ EQUIPMENT DESCRIPTION

BOILER-HW =PLANT-EQUIPMENT TYPE = HW-BOILER  
SIZE = -999. ..

CHILLER-RC =PLANT-EQUIPMENT TYPE = HERM-REC-CHLR  
SIZE = -999. INSTALLED-NUMBER = 4  
MAX-NUMBER-AVAIL = 4 ..

PLANT-PARAMETERS BOILER-FUEL = NATURAL-GAS TWR-PUMP-HEAD = 35.  
HERM-REC-COND-TYPE = AIR CHILL-WTR-T = 45.  
CCIRC-HEAD = 30.0 HCIRC-HEAD = 63.0  
HCIRC-DESIGN-T-DROP = 20.0 ..

ENERGY-RESOURCE RESOURCE = ELECTRICITY ..  
ENERGY-RESOURCE RESOURCE = NATURAL-GAS ..

HEAT-SCH =LOAD-ASSIGNMENT TYPE = HEATING  
OPERATION-MODE = RUN-NEEDED  
  
LOAD-RANGE = 0.000  
PLANT-EQUIPMENT = BOILER-HW  
NUMBER = 1 ..

COOL-SCH =LOAD-ASSIGNMENT TYPE = COOLING  
OPERATION-MODE = RUN-NEEDED  
  
LOAD-RANGE = 0.000  
PLANT-EQUIPMENT = CHILLER-RC  
NUMBER = 4 ..

END ..  
COMPUTE PLANT ..  
STOP ..

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 9:38:58 LDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION BLDG. #724 FLIGHT SIMULATOR TOPEKA, KS  
 REPORT- LV-D DETAILS OF EXTERIOR SURFACES IN THE PROJECT

NUMBER OF EXTERIOR SURFACES 20 RECTANGULAR 20 OTHER 0  
 (U-VALUE INCLUDES INSIDE AIR FILM PLUS OUTSIDE AIR FILM AT 7.5 MPH WINDSPEED)

SURFACE	SPACE	U-VALUE (BTU/HR-SQFT-F)	AREA (SQFT)	U-VALUE (BTU/HR-SQFT-F)	AREA (SQFT)	U-VALUE (BTU/HR-SQFT-F)	AREA (SQFT)	U-VALUE (BTU/HR-SQFT-F)	AREA (SQFT)	AZIMUTH
ZONE 2		0.000	0.00	0.049	422.40	0.049	422.40	0.049	422.40	NORTH-EAST
COMP_AREA		0.000	0.00	0.049	537.60	0.049	537.60	0.049	537.60	NORTH-EAST
SIMUL_AREA		0.000	0.00	0.051	268.80	0.051	268.80	0.051	268.80	NORTH-EAST
ZONE 2		0.000	0.00	0.049	72.00	0.049	72.00	0.049	72.00	SOUTH-EAST
ZONE 2		0.000	0.00	0.049	1276.80	0.049	1276.80	0.049	1276.80	SOUTH-EAST
SIMUL_AREA		0.000	0.00	0.051	108.00	0.051	108.00	0.051	108.00	SOUTH-EAST
ZONE 1		0.000	0.00	0.049	268.80	0.049	268.80	0.049	268.80	SOUTH-WEST
ZONE 2		0.000	0.00	0.049	537.60	0.049	537.60	0.049	537.60	SOUTH-WEST
ZONE 2		0.000	0.00	0.049	268.80	0.049	268.80	0.049	268.80	SOUTH-WEST
SIMUL_AREA		0.000	0.00	0.051	537.60	0.049	537.60	0.049	537.60	SOUTH-WEST
ZONE 1		0.000	0.00	0.049	691.20	0.049	691.20	0.049	691.20	NORTH-WEST
ZONE 1		0.000	0.00	0.051	72.00	0.051	72.00	0.051	72.00	NORTH-WEST
ZONE 1		0.000	0.00	0.051	108.00	0.051	108.00	0.051	108.00	NORTH-WEST
ZONE 1		0.000	0.00	0.029	2782.50	0.029	2782.50	0.029	2782.50	ROOF
ZONE 2		0.000	0.00	0.029	4489.00	0.029	4489.00	0.029	4489.00	ROOF
COMP_AREA		0.000	0.00	0.029	1360.00	0.029	1360.00	0.029	1360.00	ROOF
SIMUL_AREA		0.000	0.00	0.029	412.16	0.029	412.16	0.029	412.16	ROOF
SIMUL_AREA		0.000	0.00	0.029	529.92	0.029	529.92	0.029	529.92	ROOF
SIMUL_AREA		0.000	0.00	0.029	828.00	0.029	828.00	0.029	828.00	ROOF
ZONE 2		0.000	0.00	0.020	4489.00	0.020	4489.00	0.020	4489.00	UNDERGRND
ZONE 1		0.000	0.00	0.020	2782.50	0.020	2782.50	0.020	2782.50	UNDERGRND
COMP_AREA		0.000	0.00	0.020	1360.00	0.020	1360.00	0.020	1360.00	UNDERGRND

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 9:38:58 LDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION BLDG. #724 FLIGHT SIMULATOR TOPEKA, KS  
 REPORT- LV-D DETAILS OF EXTERIOR SURFACES IN THE PROJECT

SURFACE	SPACE	U-VALUE (BTU/HR-SQFT-F)	AREA (SQFT)	U-VALUE (BTU/HR-SQFT-F)	AREA (SQFT)	U-VALUE (BTU/HR-SQFT-F)	AREA (SQFT)	U-VALUE (BTU/HR-SQFT-F)	AREA (SQFT)	AZIMUTH
SIMUL_AREA		0.000	0.00	0.020	1865.50	0.020	1865.50	0.020	1865.50	UNDERGRND

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 9:38:58 LDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION BLDG. #724 FLIGHT SIMULATOR  
 REPORT- LV-D DETAILS OF EXTERIOR SURFACES IN THE PROJECT TOPEKA, KS

	AVERAGE U-VALUE/GLASS (BTU/HR-SQFT-F)	AVERAGE U-VALUE/WALLS (BTU/HR-SQFT-F)	AVERAGE U-VALUE WALLS+GLASS (BTU/HR-SQFT-F)	GLASS AREA (SQFT)	OPAQUE AREA (SQFT)	GLASS+OPAQUE AREA (SQFT)
NORTH-EAST	0.000	0.049	0.049	0.00	1228.80	1228.80
SOUTH-EAST	0.000	0.049	0.049	0.00	1456.80	1456.80
SOUTH-WEST	0.000	0.049	0.049	0.00	1881.60	1881.60
NORTH-WEST	0.000	0.049	0.049	0.00	871.20	871.20
ROOF	0.000	0.029	0.029	0.00	10401.58	10401.58
ALL WALLS	0.000	0.049	0.049	0.00	5438.40	5438.40
WALLS+ROOFS	0.000	0.036	0.036	0.00	15839.98	15839.98
UNDERGRND	0.000	0.020	0.020	0.00	10497.00	10497.00
BUILDING	0.000	0.030	0.030	0.00	26336.98	26336.98

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 9:38:58 LDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION BLDG. #724 FLIGHT SIMULATOR TOPEKA, KS  
 REPORT- LS-C BUILDING PEAK LOAD COMPONENTS

\*\*\* BUILDING \*\*\*

FLOOR AREA 10506 SQFT 976 SQMT  
 VOLUME 151403 CUFT 4288 CUMT

TIME AUG 11 3PM  
 DRY-BULB TEMP 99F 37C  
 WET-BULB TEMP 72F 22C

HEATING LOAD  
 JAN 4 3AM  
 8F -13C  
 7F -14C

COOLING LOAD  
 AUG 11 3PM  
 99F 37C  
 72F 22C

	SENSIBLE ( KBTU/H ) ( KW )		LATENT ( KBTU/H ) ( KW )		SENSIBLE ( KBTU/H ) ( KW )	
WALLS	3.097	0.907	0.000	0.000	-12.623	-3.697
ROOFS	21.140	6.191	0.000	0.000	-17.072	-5.000
GLASS CONDUCTION	0.000	0.000	0.000	0.000	0.000	0.000
GLASS SOLAR	0.000	0.000	0.000	0.000	0.000	0.000
DOOR	0.000	0.000	0.000	0.000	0.000	0.000
INTERNAL SURFACES	0.000	0.000	0.000	0.000	0.000	0.000
UNDERGROUND SURFACES	-0.993	-0.291	0.000	0.000	-5.247	-1.537
OCCUPANTS TO SPACE	7.357	2.155	13.238	3.877	0.015	0.005
LIGHT TO SPACE	49.105	14.382	0.000	0.000	0.158	0.046
EQUIPMENT TO SPACE	176.927	51.817	0.000	0.000	0.153	0.045
PROCESS TO SPACE	0.000	0.000	0.000	0.000	0.000	0.000
INFILTRATION	3.578	1.048	1.133	0.332	-26.001	-7.615
TOTAL	260.211	76.209	14.372	4.209	-60.617	-17.753
TOTAL LOAD	274.583	80.419	80.419	80.419	-60.617	-17.753
TOTAL LOAD / AREA	26.14	7.62	82.393	82.393	5.770	18.189

\*\*\*\*\*  
 \* NOTE 1) THE ABOVE LOADS EXCLUDE OUTSIDE VENTILATION AIR \*  
 \* LOADS \*  
 \* 2) TIMES GIVEN IN STANDARD TIME FOR THE LOCATION \*  
 \* IN CONSIDERATION \*  
 \*\*\*\*\*



EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 9:38:58 SDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION BLDG. #724 FLIGHT SIMULATOR TOPEKA, KS  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR MZ-PERIM

MONTH	COOLING ENERGY (MBTU)		TIME OF MAX DY HR		DRY- BULB TEMP		WET- BULB TEMP		HEATING ENERGY (MBTU)		TIME OF MAX DY HR		DRY- BULB TEMP		WET- BULB TEMP		HEATING LOAD (KBTU/HR)		ELEC- TRICAL ENERGY (KWH)		ELEC- MAXIMUM LOAD (KW)	
	HOURS	LOAD	HOURS	LOAD	HOURS	TEMP	HOURS	TEMP	HOURS	TEMP	HOURS	TEMP	HOURS	TEMP	HOURS	TEMP	HOURS	LOAD	HOURS	LOAD	HOURS	LOAD
JAN	0	0.00000	16	267.5386	2	62.F	59.F	0.F	0.F	0.F	5	4	0.F	0.F	0.F	0.F	0.F	-73.482	12153.	38.157	12153.	38.157
FEB	0	0.00000	19	56.74051	15	87.F	76.F	9.F	9.F	-6.510	2	4	10.F	9.F	9.F	9.F	0.000	-68.129	11024.	38.157	11024.	38.157
MAR	0	0.00000	16	68.07877	15	89.F	80.F	22.F	22.F	-3.734	2	4	25.F	22.F	22.F	22.F	0.000	-47.732	12153.	38.157	12153.	38.157
APR	0	0.00000	20	63.90371	14	93.F	78.F	30.F	30.F	-0.748	6	4	35.F	30.F	30.F	30.F	0.000	-13.487	12022.	38.157	12022.	38.157
MAY	384	26.57586	7	47.47175	15	92.F	76.F	53.F	53.F	-0.355	4	17	55.F	53.F	53.F	53.F	0.000	-10.519	11785.	38.157	11785.	38.157
JUN	720	56.74051	19	56.74051	15	87.F	76.F	0.000	0.000	0.000	2	4	10.F	9.F	9.F	9.F	0.000	0.000	12022.	38.157	12022.	38.157
JUL	744	68.07877	16	68.07877	15	89.F	80.F	0.000	0.000	0.000	2	4	10.F	9.F	9.F	9.F	0.000	0.000	12521.	38.157	12521.	38.157
AUG	713	63.90371	20	63.90371	14	93.F	78.F	0.000	0.000	0.000	2	4	10.F	9.F	9.F	9.F	0.000	0.000	11785.	38.157	11785.	38.157
SEP	24	47.47175	1	47.47175	15	92.F	76.F	0.000	0.000	0.000	2	2	64.F	59.F	59.F	59.F	0.000	-47.779	12022.	38.157	12022.	38.157
OCT	0	1.56012	1	1.56012	15	82.F	67.F	0.000	0.000	-0.830	30	4	32.F	28.F	28.F	28.F	0.000	-30.236	12153.	38.157	12153.	38.157
NOV	0	0.00000	0	0.00000	0	0.000	0.000	0.000	0.000	-1.012	13	6	2.F	1.F	1.F	1.F	0.000	-67.203	10918.	38.157	10918.	38.157
DEC	0	0.00000	0	0.00000	0	0.000	0.000	0.000	0.000	-7.863	13	6	2.F	1.F	1.F	1.F	0.000	-67.203	12521.	38.157	12521.	38.157
TOTAL	3329	264.331	5415	264.331	16	0	0	0	0	-31.539	8760	0	0	0	0	0	0	-73.482	143067.	38.157	143067.	38.157

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 9:38:58 SDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION BLDG. #724 FLIGHT SIMULATOR TOPEKA, KS  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR MZ-PERIM

MONTH	HOURS COOLING LOAD		HOURS COINCIDENT COOL-HEAT LOAD		HOURS HEATING LOAD		HOURS HEATING AVAIL.		HOURS COOLING AVAIL.		HOURS FANS ON CYCLE ON		HOURS NIGHT VENTING		HOURS FLOATING WHEN FANS ON		HEATING LOAD AT COOLING PEAK (KBTU/HR)		ELECTRIC LOAD AT COOLING PEAK (KW)		
	HOURS	LOAD	HOURS	LOAD	HOURS	LOAD	HOURS	LOAD	HOURS	LOAD	HOURS	LOAD	HOURS	LOAD	HOURS	LOAD	HOURS	LOAD	HOURS	LOAD	
JAN	0	0	0	0	0	0	744	0	0	0	744	0	0	0	0	0	0	-33.270	5.456	5.456	
FEB	0	0	0	0	0	0	672	0	0	0	672	0	0	0	0	0	0	-14.947	5.456	5.456	
MAR	0	0	0	0	0	0	744	0	0	0	744	0	0	0	0	0	0	-1.379	5.456	5.456	
APR	0	0	0	0	0	0	720	0	0	0	720	0	0	0	0	0	0	-1.964	5.456	5.456	
MAY	384	26.57586	351	26.57586	9	360	384	384	384	744	9	9	0	0	0	0	0	0.000	5.456	5.456	
JUN	720	56.74051	0	0	0	0	720	720	720	720	0	0	0	0	0	0	0	0.000	38.157	38.157	
JUL	744	68.07877	0	0	0	0	744	744	744	744	0	0	0	0	0	0	0	0.000	38.157	38.157	
AUG	713	63.90371	0	0	0	0	713	713	713	713	0	0	0	0	0	0	0	0.000	38.157	38.157	
SEP	24	47.47175	0	0	0	0	24	24	24	720	0	0	0	0	0	0	0	0.000	38.157	38.157	
OCT	0	1.56012	0	0	0	0	0	0	0	720	0	0	0	0	0	0	0	0.000	38.157	38.157	
NOV	0	0.00000	0	0	0	0	0	0	0	744	0	0	0	0	0	0	0	-4.873	5.456	5.456	
DEC	0	0.00000	0	0	0	0	0	0	0	744	0	0	0	0	0	0	0	-3.901	5.456	5.456	
ANNUAL	3329	264.331	5415	264.331	16	0	5424	3336	3336	8760	0	0	0	0	0	0	0	-73.482	143067.	38.157	143067.

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 9:38:58 SDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION BLDG. #724 FLIGHT SIMULATOR TOPEKA, KS  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR SING-ZN

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC-TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-17.659	15	4	-8.F	-9.F	3022.	5.188
FEB	0.02510	26	15	60.F	45.F	3	4	0.F	-1.F	2730.	5.492
MAR	0.32480	27	15	70.F	51.F	4	4	14.F	12.F	3046.	6.216
APR	3.02967	27	15	77.F	68.F	5	7	30.F	27.F	3216.	7.819
MAY	9.19698	31	18	90.F	76.F	1	4	39.F	37.F	3921.	9.130
JUN	18.38746	30	14	88.F	76.F	2	4	50.F	49.F	4840.	10.595
JUL	23.92714	23	15	97.F	79.F					5552.	11.970
AUG	23.18727	20	14	93.F	78.F					5531.	11.354
SEP	12.64664	7	15	92.F	76.F	12	7	42.F	42.F	4227.	10.945
OCT	3.95623	1	15	82.F	67.F	20	4	25.F	25.F	3401.	8.675
NOV	0.87103	23	14	74.F	62.F	3	4	13.F	12.F	2959.	7.084
DEC	0.01942	28	15	58.F	47.F	13	8	0.F	-1.F	3036.	5.352
TOTAL	95.572				-69.113					45479.	11.970
MAX											
TOTAL											
MAX											
TOTAL											
MAX											
TOTAL											
MAX											

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 9:38:58 SDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION BLDG. #724 FLIGHT SIMULATOR TOPEKA, KS  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR SING-ZN

MONTH	HOURS				HOURS				HOURS				HOURS				HOURS			
	COOLING LOAD	HEATING LOAD	COINCIDENT LOAD	COOL-HEAT LOAD	FLOATING	HEATING AVAIL.	COOLING AVAIL.	FANS ON	FANS ON CYCLE	FANS ON	NIGHT VENTING	FLOATING WHEN	HEATING PEAK	COOLING PEAK	ELECTRIC LOAD AT	HEATING PEAK	COOLING PEAK	ELECTRIC LOAD AT		
JAN	0	744	0	0	0	744	744	744	0	0	0	0	-20.997	3.540	0.000	0.000	0.000	5.492		
FEB	11	661	0	0	0	672	672	672	0	0	0	0	0.000	5.492	0.000	0.000	0.000	5.492		
MAR	78	666	0	0	0	744	744	744	0	0	0	0	0.000	6.216	0.000	0.000	0.000	6.216		
APR	384	335	0	0	1	720	720	720	0	0	0	1	0.000	7.819	0.000	0.000	0.000	7.819		
MAY	646	98	0	0	0	744	744	744	0	0	0	0	0.000	8.583	0.000	0.000	0.000	8.583		
JUN	715	5	0	0	0	720	720	720	0	0	0	0	0.000	10.595	0.000	0.000	0.000	10.595		
JUL	744	0	0	0	0	744	744	744	0	0	0	0	0.000	11.970	0.000	0.000	0.000	11.970		
AUG	744	0	0	0	0	744	744	744	0	0	0	0	0.000	11.300	0.000	0.000	0.000	11.300		
SEP	623	97	0	0	0	720	720	720	0	0	0	0	0.000	10.945	0.000	0.000	0.000	10.945		
OCT	394	350	0	0	0	744	744	744	0	0	0	0	0.000	8.675	0.000	0.000	0.000	8.675		
NOV	158	562	0	0	0	720	720	720	0	0	0	0	0.000	7.084	0.000	0.000	0.000	7.084		
DEC	14	730	0	0	0	744	744	744	0	0	0	0	0.000	5.352	0.000	0.000	0.000	5.352		
ANNUAL	4511	4248	0	0	1	8760	8760	8760	0	0	0	1								

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 9:38:58 SDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION BLDG. #724 FLIGHT SIMULATOR TOPEKA, KS  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR CRU'S

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC-TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	100.38735	15	11	-1.F	0.000	246.669	246.669	0.000	0.000	35818.	59.700
FEB	90.95567	3	10	10.F	0.000	241.575	241.575	0.000	0.000	32679.	61.377
MAR	101.75665	3	7	14.F	0.000	235.055	235.055	0.000	0.000	36961.	64.123
APR	99.73093	28	15	74.F	0.000	240.717	240.717	0.000	0.000	37284.	66.565
MAY	104.52082	16	3	61.F	0.000	240.751	240.751	0.000	0.000	39554.	68.457
JUN	102.29000	16	11	66.F	0.000	223.435	223.435	0.000	0.000	39226.	66.515
JUL	106.57320	30	6	63.F	0.000	218.749	218.749	0.000	0.000	41040.	67.627
AUG	106.44633	4	15	92.F	0.000	232.520	232.520	0.000	0.000	41181.	71.045
SEP	101.72897	15	6	46.F	0.000	225.422	225.422	0.000	0.000	38578.	68.542
OCT	103.31563	14	13	71.F	0.000	239.604	239.604	0.000	0.000	38648.	67.038
NOV	98.70152	3	7	19.F	0.000	236.852	236.852	0.000	0.000	36072.	64.627
DEC	101.00494	14	7	10.F	0.000	240.516	240.516	0.000	0.000	36148.	61.436
TOTAL	1217.413				0.000	246.669	246.669	0.000	0.000	453192.	71.045
MAX											

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 9:38:58 SDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION BLDG. #724 FLIGHT SIMULATOR TOPEKA, KS  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR CRU'S

MONTH	HOURS COINCIDENT COOL-HEAT LOAD				HOURS OF HEATING AVAIL.				HOURS OF COOLING AVAIL.				HOURS FANS ON CYCLE ON				HOURS FLOATING WHEN FANS ON				--COINCIDENT LOADS--			
	HOURS COOLING LOAD	HOURS HEATING LOAD	HOURS COOLING LOAD	HOURS HEATING LOAD	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.	HOURS FANS ON	HOURS FANS ON	HOURS FANS ON	HOURS FANS ON	HOURS FANS ON	HOURS FANS ON	HOURS FANS ON	HOURS FANS ON	HOURS FANS ON	HOURS FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)				
JAN	530	0	0	0	744	744	744	744	530	530	530	530	530	530	530	530	530	0.000	54.234					
FEB	483	0	0	0	672	672	672	672	483	483	483	483	483	483	483	483	483	0.000	54.921					
MAR	546	0	0	0	744	744	744	744	546	546	546	546	546	546	546	546	546	0.000	55.087					
APR	538	0	0	0	720	720	720	720	538	538	538	538	538	538	538	538	538	0.000	66.665					
MAY	564	0	0	0	744	744	744	744	564	564	564	564	564	564	564	564	564	0.000	62.090					
JUN	564	0	0	0	720	720	720	720	564	564	564	564	564	564	564	564	564	0.000	63.713					
JUL	595	0	0	0	744	744	744	744	595	595	595	595	595	595	595	595	595	0.000	62.725					
AUG	590	0	0	0	744	744	744	744	590	590	590	590	590	590	590	590	590	0.000	70.934					
SEP	555	0	0	0	720	720	720	720	555	555	555	555	555	555	555	555	555	0.000	59.750					
OCT	554	0	0	0	744	744	744	744	554	554	554	554	554	554	554	554	554	0.000	66.094					
NOV	529	0	0	0	720	720	720	720	529	529	529	529	529	529	529	529	529	0.000	55.769					
DEC	537	0	0	0	744	744	744	744	537	537	537	537	537	537	537	537	537	0.000	54.877					
ANNUAL	6585	0	0	0	8760	8760	8760	8760	6585	6585	6585	6585	6585	6585	6585	6585	6585	0	0					

EMC ENGINEERS INC. E2DOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 9:38:58 PDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION BLDG. #724 FLIGHT SIMULATOR  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY	NATURAL-GAS
JAN	176.209 352.446 9/14	41.590 148.941 5/4	30.052 134.871 2/4
FEB	160.306 358.995 26/13	21.894 104.288 15/7	6.327 52.834 6/3
MAR	179.652 366.507 27/15	180.173 384.267 28/15	1.707 26.324 1/4
APR	197.891 437.114 21/15	210.611 450.773 29/15	0.017 5.591 2/4
MAY	224.768 463.212 23/13	224.768 463.212 23/13	0.000 0.000 31/1
JUN	222.157 467.104 12/15	203.571 458.539 7/15	0.000 0.000 31/1
JUL	186.401 426.032 1/14	186.401 426.032 1/14	0.549 15.680 12/7
AUG	171.832 375.562 23/13	171.832 375.562 23/13	5.634 78.847 2/2
SEP	178.473 359.070 28/15	178.473 359.070 28/15	14.856 78.912 12/4
OCT	TOTAL (MBTU) PEAK (KBTU) DY/HR	TOTAL (MBTU) PEAK (KBTU) DY/HR	TOTAL (MBTU) PEAK (KBTU) DY/HR
NOV	TOTAL (MBTU) PEAK (KBTU) DY/HR	TOTAL (MBTU) PEAK (KBTU) DY/HR	TOTAL (MBTU) PEAK (KBTU) DY/HR
DEC	TOTAL (MBTU) PEAK (KBTU) DY/HR	TOTAL (MBTU) PEAK (KBTU) DY/HR	TOTAL (MBTU) PEAK (KBTU) DY/HR
	ONE YEAR USE/PEAK	2292.044 467.104	157.426 148.941

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 9:38:58 PDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION BLDG. #724 FLIGHT SIMULATOR TOPEKA, KS  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
SPACE HEAT	6.89	157.43
SPACE COOL	425.66	0.00
HVAC AUX	506.20	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	160.53	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	1192.66	0.00
TOTAL	2291.93	157.43

TOTAL SITE ENERGY 2449.47 MBTU 187.0 KBTU/SQFT-YR GROSS-AREA 233.1 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 7040.44 MBTU 537.4 KBTU/SQFT-YR GROSS-AREA 670.1 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTILING RANGE = 46.7  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

AZIMUTH = 225 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 2.5 WIDTH = 43.2 CONS = ROOF/WAL  
AZIMUTH = 135 SKY-FORM-FACTOR = 1.0 ..

E-W HEIGHT = 2.5 WIDTH = 43.2 CONS = ROOF/WAL  
AZIMUTH = 315 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

ROOF HEIGHT = 14.4 WIDTH = 36.8 CONS = ROOF-1  
AZIMUTH = 135 TILT = 40 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

ROOF HEIGHT = 18.0 WIDTH = 46.0 CONS = ROOF-1  
AZIMUTH = 315 TILT = 40 SKY-FORM-FACTOR = 1.0 ..

END ..

COMPUTE LOADS ..

INPUT SYSTEMS ..

-----\$  
\$ E Z - D O E S Y S T E M S I N P U T \$  
-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
LINE-3 \* DENVER, CO 80227 \*  
  
LINE-4 \*RUN #1 NIGHT SETBACK BLDG. #724 \*  
LINE-5 \*FLIGHT SIMULATOR \* ..

ABORT ERRORS ..  
DIAGNOSTIC WARNINGS ..  
SYSTEMS-REPORT VERIFICATION=(SV-A)  
SUMMARY=(SS-A,SS-C,SS-K,SS-O)  
HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

SD\_ON =DAY-SCHEDULE (1,24) (1.) ..  
SD\_OFF =DAY-SCHEDULE (1,24) (0.) ..  
SD\_WT\_HT\_W =DAY-SCHEDULE (1,4) (55.)  
(5,16) (74.)  
(17,24) (55.) ..  
SD\_SM\_CL\_W =DAY-SCHEDULE (1,4) (85.)  
(5,16) (72.)  
(17,24) (85.) ..  
SD\_WT\_CL\_W =DAY-SCHEDULE (1,4) (57.)  
(5,16) (76.)  
(17,24) (57.) ..  
SD\_SM\_HT\_W =DAY-SCHEDULE (1,4) (83.)



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(5,16) (70.)
(17,24) (83.) ..
SD_WT_HT_D =DAY-SCHEDULE (1,24) (55.) ..
SD_SM_CL_D =DAY-SCHEDULE (1,24) (85.) ..
SD_WT_CL_D =DAY-SCHEDULE (1,24) (57.) ..
SD_SM_HT_D =DAY-SCHEDULE (1,24) (83.) ..
SD_FAN_WK =DAY-SCHEDULE (1,4) (0.)
(5,16) (1.)
(17,24) (0.) ..
SD_FAN_END =DAY-SCHEDULE (1,24) (0.) ..
SD_WTHT_CR =DAY-SCHEDULE (1,24) (74.) ..
SD_SMCL_CR =DAY-SCHEDULE (1,24) (72.) ..
SD_WTCL_CR =DAY-SCHEDULE (1,24) (76.) ..
SD_SMHT_CR =DAY-SCHEDULE (1,24) (70.) ..

SW_ON =WEEK-SCHEDULE (ALL) SD_ON ..

SW_OFF =WEEK-SCHEDULE (ALL) SD_OFF ..

SW_WT_HT =WEEK-SCHEDULE (MON) SD_WT_HT_D
(TUE) SD_WT_HT_D
(WED) SD_WT_HT_W
(THU) SD_WT_HT_W
(FRI) SD_WT_HT_W
(SAT) SD_WT_HT_W
(SUN) SD_WT_HT_W
(HOL) SD_WT_HT_D ..

SW_SM_CL =WEEK-SCHEDULE (MON) SD_SM_CL_D
(TUE) SD_SM_CL_D
(WED) SD_SM_CL_W
(THU) SD_SM_CL_W
(FRI) SD_SM_CL_W
(SAT) SD_SM_CL_W
(SUN) SD_SM_CL_W
(HOL) SD_SM_CL_D ..

SW_WT_CL =WEEK-SCHEDULE (MON) SD_WT_CL_D
(TUE) SD_WT_CL_D
(WED) SD_WT_CL_W
(THU) SD_WT_CL_W
(FRI) SD_WT_CL_W
(SAT) SD_WT_CL_W
(SUN) SD_WT_CL_W
(HOL) SD_WT_CL_D ..

SW_SM_HT =WEEK-SCHEDULE (MON) SD_SM_HT_D
(TUE) SD_SM_HT_D
(WED) SD_SM_HT_W
(THU) SD_SM_HT_W
(FRI) SD_SM_HT_W
(SAT) SD_SM_HT_W
(SUN) SD_SM_HT_W
(HOL) SD_SM_HT_D ..

SW_FAN_CYC =WEEK-SCHEDULE (MON) SD_FAN_END

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(TUE) SD\_FAN\_END  
 (WED) SD\_FAN\_WK  
 (THU) SD\_FAN\_WK  
 (FRI) SD\_FAN\_WK  
 (SAT) SD\_FAN\_WK  
 (SUN) SD\_FAN\_WK  
 (HOL) SD\_FAN\_END ..

SW\_WTHT\_CR =WEEK-SCHEDULE (ALL) SD\_WTHT\_CR ..

SW\_SMCL\_CR =WEEK-SCHEDULE (ALL) SD\_SMCL\_CR ..

SW\_WTCL\_CR =WEEK-SCHEDULE (ALL) SD\_WTCL\_CR ..

SW\_SMHT\_CR =WEEK-SCHEDULE (ALL) SD\_SMHT\_CR ..

\$ FULL ON SYSTEM

S\_ON =SCHEDULE THRU DEC 31 SW\_ON ..

\$ FULL OFF SYSTEM

S\_OFF =SCHEDULE THRU DEC 31 SW\_OFF ..

\$ HEATING SEASON

S\_HE-SCHED =SCHEDULE THRU MAY 15 SW\_ON  
 THRU OCT 1 SW\_OFF  
 THRU DEC 31 SW\_ON ..

\$ COOLING SEASON

S\_CL\_SCHED =SCHEDULE THRU MAY 15 SW\_OFF  
 THRU OCT 1 SW\_ON  
 THRU DEC 31 SW\_OFF ..

\$ HEATING SET TEMP

S\_HT\_SET =SCHEDULE THRU MAY 15 SW\_WT\_HT  
 THRU OCT 1 SW\_SM\_HT  
 THRU DEC 31 SW\_WT\_HT ..

\$ COOLING SET TEMP

S\_CL\_SET =SCHEDULE THRU MAY 15 SW\_WT\_CL  
 THRU OCT 1 SW\_SM\_CL  
 THRU DEC 31 SW\_WT\_CL ..

S\_HRLY-RPT =SCHEDULE THRU JAN 3 SW\_OFF  
 THRU JAN 5 SW\_ON  
 THRU AUG 13 SW\_OFF  
 THRU AUG 15 SW\_ON  
 THRU DEC 31 SW\_OFF ..

S\_FAN\_CYC =SCHEDULE THRU DEC 31 SW\_FAN\_CYC ..

\$ HEATING SET TEMP

S\_HT\_SETCR =SCHEDULE THRU MAY 15 SW\_WTHT\_CR  
 THRU OCT 1 SW\_SMHT\_CR  
 THRU DEC 31 SW\_WTHT\_CR ..



## \$ COOLING SET TEMP

S\_CL\_SETCR =SCHEDULE THRU MAY 15 SW\_WTCL\_CR  
 THRU OCT 1 SW\_SMCL\_CR  
 THRU DEC 31 SW\_WTCL\_CR ..

## \$ ZONE DESCRIPTION

ZONE\_2 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET COOL-TEMP-SCH = S\_CL\_SET  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL  
 SIZING-OPTION = FROM-LOADS ..

ZONE\_1 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET COOL-TEMP-SCH = S\_CL\_SET  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL  
 SIZING-OPTION = FROM-LOADS ..

COMP\_AREA =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SETCR COOL-TEMP-SCH = S\_CL\_SETCR  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL  
 SIZING-OPTION = FROM-LOADS ..

SIMUL\_AREA =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET COOL-TEMP-SCH = S\_CL\_SET  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL  
 SIZING-OPTION = FROM-LOADS ..

## \$ SYSTEM DESCRIPTION

MZ-PERIM =SYSTEM SYSTEM-TYPE = MZS  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_HE-SCHED  
 COOLING-SCHEDULE = S\_CL\_SCHED PREHEAT-T = 0.0  
 HEAT-CONTROL = COLDEST COOL-CONTROL = WARMEST  
 OA-CONTROL = FIXED SUPPLY-CFM = 6200.  
 RATED-CFM = 6200. MIN-OUTSIDE-AIR = 0.1  
 MAX-OA-FRACTION = 0.1 FAN-SCHEDULE = S\_FAN\_CYC  
 SUPPLY-DELTA-T = 2.7 SUPPLY-KW = 0.00088  
 NIGHT-CYCLE-CTRL = CYCLE-ON-ANY NIGHT-VENT-DT = 0.0  
 MIN-CFM-RATIO = 1.0 COOLING-CAPACITY = 190200.  
 COOL-SH-CAP = 152160. HEATING-CAPACITY = -146100.  
 SIZING-OPTION = COINCIDENT RETURN-AIR-PATH = DUCT  
 ZONE-NAMES = (ZONE\_1, ZONE\_2) ..

SING-ZN =SYSTEM SYSTEM-TYPE = PSZ  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_ON COOLING-SCHEDULE = S\_ON  
 HEAT-SET-T = 120.0 OA-CONTROL = FIXED  
 SUPPLY-CFM = 6000. RATED-CFM = 6000.

```

MIN-OUTSIDE-AIR = 0.1  MAX-OA-FRACTION = 0.1
FAN-SCHEDULE = S_FAN_CYC  SUPPLY-DELTA-T = 1.8
SUPPLY-KW = 0.00059  NIGHT-CYCLE-CTRL = CYCLE-ON-ANY
NIGHT-VENT-DT = 0.0  COOLING-CAPACITY = 165100.
COOL-SH-CAP = 132080.  COOL-FT-MIN = 0.
HEATING-CAPACITY = -120100.  MIN-HP-T = 0.
MAX-HP-SUPP-T = 0.  DEFROST-T = 0.
CRANKCASE-MAX-T = 0.  OUTSIDE-FAN-T = 45.
HEAT-SOURCE = HOT-WATER  SIZING-OPTION = COINCIDENT
RETURN-AIR-PATH = DUCT
ZONE-NAMES = (SIMUL_AREA) ..

```

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CRU'S      =SYSTEM  SYSTEM-TYPE = PSZ
MAX-SUPPLY-T = 120.0  MIN-SUPPLY-T = 55.0
HEATING-SCHEDULE = S_ON  COOLING-SCHEDULE = S_ON
SUPPLY-CFM = 17200.  RATED-CFM = 17200.
FAN-SCHEDULE = S_OFF  SUPPLY-DELTA-T = 1.8
SUPPLY-KW = 0.00059  NIGHT-CYCLE-CTRL = CYCLE-ON-ANY
NIGHT-VENT-DT = 0.0  COOLING-CAPACITY = 322000.
COOL-SH-CAP = 322000.  COOL-FT-MIN = 0.
HEATING-CAPACITY = -95600.  MIN-HP-T = 0.
MAX-HP-SUPP-T = 0.  DEFROST-T = 0.
CRANKCASE-MAX-T = 0.  OUTSIDE-FAN-T = 45.
HEAT-SOURCE = ELECTRIC  SIZING-OPTION = COINCIDENT
ZONE-NAMES = (COMP_AREA) ..

```

#### \$ HOURLY REPORT DESCRIPTION

```

SPACE-MZ  =REPORT-BLOCK VARIABLE-TYPE = ZONE_2
          VARIABLE-LIST = (17,18,7,6) ..
SPACE-SZ  =REPORT-BLOCK VARIABLE-TYPE = SIMUL_AREA
          VARIABLE-LIST = (17,18,7,6) ..
SPACE-CRU =REPORT-BLOCK VARIABLE-TYPE = COMP_AREA
          VARIABLE-LIST = (17,18,7,6) ..
AHU-MZ    =REPORT-BLOCK VARIABLE-TYPE = MZ-PERIM
          VARIABLE-LIST = (3,5,6,18,19,17) ..
AHU-SZ    =REPORT-BLOCK VARIABLE-TYPE = SING-ZN
          VARIABLE-LIST = (3,5,6,17) ..
AHU-CRU   =REPORT-BLOCK VARIABLE-TYPE = CRU'S
          VARIABLE-LIST = (3,5,6,17) ..
ZONE-HRLY = HOURLY-REPORT REPORT-SCHEDULE = S_HRLY-RPT
          REPORT-BLOCK = (SPACE-MZ,SPACE-SZ,SPACE-CRU)
..
AHU-HRLY  = HOURLY-REPORT REPORT-SCHEDULE = S_HRLY-RPT
          REPORT-BLOCK = (AHU-MZ,AHU-SZ,AHU-CRU)
..
END ..
COMPUTE SYSTEMS ..

INPUT PLANT ..

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$-----$
$ E Z - D O E   P L A N T S   I N P U T $
$-----$

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EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 9:45:18 SDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SETBACK BLDG. #724 FLIGHT SIMULATOR TOPEKA, KS  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR MZ-PERIM

MONTH	C O O L I N G				H E A T I N G				E L E C			
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC- TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)	
JAN	0.00000				-6.760	5	7	4.F	3.F	-131.405	12054.	38.157
FEB	0.00000				-4.192	2	6	6.F	5.F	-123.479	10997.	38.157
MAR	0.00000				-2.327	16	5	21.F	19.F	-99.609	12153.	38.157
APR	0.00000				-0.710	6	5	36.F	31.F	-16.568	12022.	38.157
MAY	19.49583	16	2	62.F	59.F	4	17	55.F	53.F	-10.357	11610.	38.157
JUN	41.99467	30	14	88.F	76.F					0.000	11754.	38.157
JUL	49.14065	13	13	90.F	79.F					0.000	12062.	38.157
AUG	44.24644	24	15	95.F	77.F					0.000	11016.	38.157
SEP	37.10414	7	15	92.F	76.F					0.000	11918.	38.157
OCT	1.26359	1	15	82.F	67.F	28	17	61.F	56.F	-10.412	12153.	38.157
NOV	0.00000				-0.918	30	5	29.F	26.F	-44.486	10918.	38.157
DEC	0.00000				-4.868	14	7	10.F	8.F	-137.817	12401.	38.157
TOTAL	193.245				-20.812					-137.817	141049.	38.157
MAX												

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 9:45:18 SDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SETBACK BLDG. #724 FLIGHT SIMULATOR TOPEKA, KS  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR MZ-PERIM

MONTH	HOURS COINCIDENT COOL-HEAT LOAD				HOURS COINCIDENT HEATING LOAD AT COOLING PEAK				HOURS COINCIDENT ELECTRIC LOAD AT COOLING PEAK				
	COOLING LOAD	HEATING LOAD	FLOATING	HEATING AVAIL.	COOLING AVAIL.	FANS ON	FANS ON CYCLE	FANS ON VENTING	FLOATING WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)
JAN	0	633	111	744	0	726	462	0	93	-1.320	5.456	-1.320	5.456
FEB	0	564	108	672	0	667	427	0	103	-0.948	5.456	-0.948	5.456
MAR	0	544	200	744	0	744	480	0	200	-1.300	5.456	-1.300	5.456
APR	0	445	275	720	0	720	456	0	275	-2.005	5.456	-2.005	5.456
MAY	156	221	367	360	384	712	460	0	335	0.000	5.456	0.000	5.456
JUN	385	0	335	0	720	671	407	0	286	0.000	38.157	0.000	38.157
JUL	500	0	244	0	744	660	384	0	160	0.000	38.157	0.000	38.157
AUG	442	0	302	0	744	603	351	0	161	0.000	38.157	0.000	38.157
SEP	322	0	398	0	720	701	437	0	379	0.000	38.157	0.000	38.157
OCT	13	438	293	720	24	744	480	0	293	0.000	38.157	0.000	38.157
NOV	0	499	221	720	0	720	492	0	221	0.000	5.456	0.000	5.456
DEC	0	614	130	744	0	722	446	0	108	-0.934	5.456	-0.934	5.456
ANNUAL	1818	3958	2984	5424	3336	8390	5282	0	2614				

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 9:45:18 SDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SETBACK BLDG. #724 FLIGHT SIMULATOR TOPEKA, KS  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR SING-ZN

MONTH	C O O L I N G			H E A T I N G			E L E C				
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	MAXIMUM ELEC LOAD (KW)
JAN	6.53292	9 17	46.F	37.F	-3.660	5 5	1.F	0.F	2328.	-55.944	7.631
FEB	5.98487	13 17	54.F	46.F	-3.161	2 5	8.F	6.F	2096.	-55.500	8.142
MAR	6.92058	27 17	69.F	50.F	-3.139	16 5	21.F	19.F	2372.	-54.677	9.241
APR	8.49306	30 17	67.F	56.F	-2.390	16 5	36.F	31.F	2726.	-48.902	9.766
MAY	8.76491	15 17	79.F	69.F	-2.237	16 2	62.F	59.F	2855.	-43.120	10.672
JUN	9.36635	29 5	71.F	70.F	-1.828	10 17	62.F	60.F	2871.	-23.738	9.740
JUL	10.18854	13 5	78.F	74.F	-1.705	31 17	79.F	66.F	3077.	-20.818	10.145
AUG	9.33982	24 5	79.F	72.F	-1.537	25 17	68.F	66.F	2841.	-21.820	10.171
SEP	8.91153	7 5	75.F	71.F	-1.993	30 17	50.F	46.F	2808.	-25.700	9.899
OCT	9.74011	2 2	64.F	59.F	-2.141	19 5	46.F	45.F	2937.	-42.768	10.305
NOV	7.04817	17 17	60.F	51.F	-2.746	2 5	16.F	15.F	2301.	-50.359	9.100
DEC	6.81716	3 17	52.F	44.F	-3.452	14 5	11.F	10.F	2400.	-55.291	8.104
TOTAL	98.108				-29.989				31612.	-55.944	10.672
MAX											

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 9:45:18 SDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SETBACK BLDG. #724 FLIGHT SIMULATOR TOPEKA, KS  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR SING-ZN

MONTH	N U M B E R O F H O U R S				C O I N C I D E N T L O A D S				C O I N C I D E N T L O A D S			
	HOURS COOLING LOAD	HOURS HEATING LOAD	HOURS COOL-HEAT LOAD	HOURS COINCIDENT LOAD	HOURS HEATING AVAIL.	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.	HOURS COINCIDENT LOAD	HOURS HEATING LOAD AT PEAK	HOURS HEATING LOAD AT PEAK	HOURS COOLING LOAD AT PEAK	HOURS COINCIDENT LOAD AT PEAK
JAN	213	234	0	0	744	744	744	447	183	0.000	0.000	7.631
FEB	197	198	0	0	672	672	672	395	155	0.000	0.000	8.142
MAR	230	203	0	0	744	744	744	433	169	0.000	0.000	9.241
APR	296	173	0	0	720	720	720	469	205	0.000	0.000	9.236
MAY	315	165	0	0	744	744	744	480	228	0.000	0.000	10.345
JUN	298	144	0	0	720	720	720	442	178	0.000	0.000	9.061
JUL	303	151	0	0	744	744	744	454	178	0.000	0.000	9.472
AUG	279	140	0	0	744	744	744	419	167	0.000	0.000	9.570
SEP	304	149	0	0	720	720	720	453	189	0.000	0.000	9.302
OCT	339	157	0	0	744	744	744	496	232	0.000	0.000	10.224
NOV	246	174	0	0	720	720	720	420	192	0.000	0.000	8.638
DEC	226	227	0	0	744	744	744	453	177	0.000	0.000	8.018
ANNUAL	3246	2115	0	0	8760	8760	8760	5361	2253	0	0	

EMC ENGINEERS INC. EZZOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 9:45:18 SDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SETBACK BLDG. #724 FLIGHT SIMULATOR TOPEKA, KS  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR CRU'S

MONTH	C O O L I N G				H E A T I N G				E L E C			
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	100.38735	15	11	-2.F	246.669	0.000	11	-1.F	-2.F	0.000	35818.	59.700
FEB	90.95567	3	10	10.F	241.575	0.000	10	10.F	8.F	0.000	32679.	61.377
MAR	101.75665	3	7	14.F	235.055	0.000	7	14.F	12.F	0.000	36961.	64.123
APR	99.73093	28	15	74.F	240.717	0.000	15	74.F	67.F	0.000	37284.	66.665
MAY	104.52082	16	11	61.F	240.751	0.000	11	66.F	59.F	0.000	39554.	68.457
JUN	102.29000	16	11	66.F	223.435	0.000	11	63.F	63.F	0.000	39226.	66.515
JUL	106.57320	30	6	63.F	218.749	0.000	6	60.F	60.F	0.000	41040.	67.627
AUG	106.44633	4	15	92.F	232.520	0.000	15	92.F	69.F	0.000	41181.	71.045
SEP	101.72897	15	6	46.F	225.422	0.000	6	46.F	45.F	0.000	38578.	68.542
OCT	103.31563	14	13	71.F	239.604	0.000	13	71.F	64.F	0.000	38648.	67.038
NOV	98.70152	3	7	19.F	236.852	0.000	7	19.F	17.F	0.000	36072.	64.627
DEC	101.00494	14	7	10.F	240.516	0.000	7	10.F	8.F	0.000	36148.	61.436
TOTAL MAX	1217.413				246.669	0.000				0.000	453192.	71.045

EMC ENGINEERS INC. EZZOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 9:45:18 SDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SETBACK BLDG. #724 FLIGHT SIMULATOR TOPEKA, KS  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR CRU'S

MONTH	HOURS				HOURS				HOURS				COINCIDENT LOADS	
	COOLING LOAD	HEATING LOAD	COOL-HEAT LOAD	FLOATING	HEATING AVAIL.	COOLING AVAIL.	FANS ON	FANS ON	FANS ON	FANS ON	HEATING LOAD AT PEAK (KBTU/HR)	ELECTRIC LOAD AT PEAK (KW)	COOLING PEAK	LOAD AT PEAK
JAN	530	0	0	214	744	744	530	530	530	0	0.000	54.234	0.000	54.234
FEB	483	0	0	189	672	672	483	483	483	0	0.000	54.921	0.000	54.921
MAR	546	0	0	198	744	744	546	546	546	0	0.000	55.087	0.000	55.087
APR	538	0	0	182	720	720	538	538	538	0	0.000	66.665	0.000	66.665
MAY	564	0	0	180	744	744	564	564	564	0	0.000	62.090	0.000	62.090
JUN	564	0	0	156	720	720	564	564	564	0	0.000	63.713	0.000	63.713
JUL	590	0	0	149	744	744	590	590	590	0	0.000	62.725	0.000	62.725
AUG	590	0	0	154	744	744	590	590	590	0	0.000	70.934	0.000	70.934
SEP	555	0	0	165	720	720	555	555	555	0	0.000	59.750	0.000	59.750
OCT	554	0	0	190	744	744	554	554	554	0	0.000	66.094	0.000	66.094
NOV	529	0	0	191	720	720	529	529	529	0	0.000	55.769	0.000	55.769
DEC	537	0	0	207	744	744	537	537	537	0	0.000	54.877	0.000	54.877
ANNUAL	6585	0	0	2175	8760	8760	6585	6585	6585	0	0.000		0.000	

EMC ENGINEERS INC. 80227 EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 9:45:18 PDL RUN 1  
 DENVER, CO MONTHLY PEAK AND TOTAL ENERGY USE RUN #1 NIGHT SETBACK BLDG. #724 FLIGHT SIMULATOR TOPEKA, KS  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY 172.799 353.880 12/12	NATURAL-GAS 16.331 224.978 5/ 6
JAN	TOTAL (MBTU) PEAK (KBTU) DY/HR	172.799 353.880 12/12	16.331 224.978 5/ 6
FEB	TOTAL (MBTU) PEAK (KBTU) DY/HR	157.451 357.718 26/13	11.867 218.364 2/ 6
MAR	TOTAL (MBTU) PEAK (KBTU) DY/HR	176.938 364.269 27/15	9.413 198.903 16/ 5
APR	TOTAL (MBTU) PEAK (KBTU) DY/HR	178.624 378.168 28/15	5.915 98.987 6/ 5
MAY	TOTAL (MBTU) PEAK (KBTU) DY/HR	190.782 443.986 21/15	4.767 71.865 16/ 2
JUN	TOTAL (MBTU) PEAK (KBTU) DY/HR	196.984 451.562 29/15	3.188 40.192 10/17
JUL	TOTAL (MBTU) PEAK (KBTU) DY/HR	207.943 469.365 23/13	2.998 35.420 31/17
AUG	TOTAL (MBTU) PEAK (KBTU) DY/HR	202.809 469.409 21/15	2.708 37.057 25/17
SEP	TOTAL (MBTU) PEAK (KBTU) DY/HR	193.437 465.583 7/15	3.465 43.398 30/17
OCT	TOTAL (MBTU) PEAK (KBTU) DY/HR	184.807 432.838 1/14	5.457 71.290 19/ 5
NOV	TOTAL (MBTU) PEAK (KBTU) DY/HR	169.334 369.628 23/13	6.821 132.031 30/ 5
DEC	TOTAL (MBTU) PEAK (KBTU) DY/HR	175.264 358.732 28/15	13.444 226.998 14/ 7
	ONE YEAR USE/PEAK	2207.171 469.409	86.375 226.998

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 9:45:18 PDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SETBACK BLDG. #724 FLIGHT SIMULATOR  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
SPACE HEAT	4.09	86.37
SPACE COOL	392.08	0.00
HVAC AUX	457.71	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	160.53	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	1192.66	0.00
TOTAL	2207.07	86.37

TOTAL SITE ENERGY 2293.55 MBTU 175.1 KBTU/SQFT-YR GROSS-AREA 218.3 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 6714.52 MBTU 512.6 KBTU/SQFT-YR GROSS-AREA 639.1 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 55.6  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

AZIMUTH = 225 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 2.5 WIDTH = 43.2 CONS = ROOF/WAL  
AZIMUTH = 135 SKY-FORM-FACTOR = 1.0 ..

E-W HEIGHT = 2.5 WIDTH = 43.2 CONS = ROOF/WAL  
AZIMUTH = 315 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

ROOF HEIGHT = 14.4 WIDTH = 36.8 CONS = ROOF-1  
AZIMUTH = 135 TILT = 40 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

ROOF HEIGHT = 18.0 WIDTH = 46.0 CONS = ROOF-1  
AZIMUTH = 315 TILT = 40 SKY-FORM-FACTOR = 1.0 ..

END ..  
COMPUTE LOADS ..

INPUT SYSTEMS ..

-----\$  
\$ E Z - D O E S Y S T E M S I N P U T \$  
-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
LINE-3 \* DENVER, CO 80227 \*

LINE-4 \*RUN #2 DDC CONTROL FOR BLDG. 724 \*  
LINE-5 \*FLIGHT SIMULATOR \* ..

ABORT ERRORS ..  
DIAGNOSTIC WARNINGS ..  
SYSTEMS-REPORT VERIFICATION=(SV-A)  
SUMMARY=(SS-A,SS-C,SS-K,SS-O)  
HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

SD\_ON =DAY-SCHEDULE (1,24) (1.) ..  
SD\_OFF =DAY-SCHEDULE (1,24) (0.) ..  
SD\_WT\_HT\_W =DAY-SCHEDULE (1,24) (70.) ..  
SD\_SM\_CL\_W =DAY-SCHEDULE (1,24) (76.) ..  
SD\_WT\_CL\_W =DAY-SCHEDULE (1,24) (72.) ..  
SD\_SM\_HT\_W =DAY-SCHEDULE (1,24) (74.) ..  
SD\_WT\_HT\_D =DAY-SCHEDULE (1,24) (55.) ..  
SD\_SM\_CL\_D =DAY-SCHEDULE (1,24) (85.) ..  
SD\_WT\_CL\_D =DAY-SCHEDULE (1,24) (57.) ..  
SD\_SM\_HT\_D =DAY-SCHEDULE (1,24) (83.) ..  
SD\_FAN\_WK =DAY-SCHEDULE (1,4) (0.)  
(5,16) (1.)





```

(17,24) (0.) ..
SD_FAN_END =DAY-SCHEDULE (1,24) (0.) ..
SD_WTHT_CR =DAY-SCHEDULE (1,24) (74.) ..
SD_SMCL_CR =DAY-SCHEDULE (1,24) (72.) ..
SD_WTCL_CR =DAY-SCHEDULE (1,24) (76.) ..
SD_SMHT_CR =DAY-SCHEDULE (1,24) (70.) ..
SD_OA%      =DAY-SCHEDULE (1,24) (0.1) ..

```



```

SW_ON      =WEEK-SCHEDULE (ALL) SD_ON ..

SW_OFF     =WEEK-SCHEDULE (ALL) SD_OFF ..

SW_WT_HT   =WEEK-SCHEDULE (ALL) SD_WT_HT_W ..

SW_SM_CL   =WEEK-SCHEDULE (ALL) SD_SM_CL_W ..

SW_WT_CL   =WEEK-SCHEDULE (ALL) SD_WT_CL_W ..

SW_SM_HT   =WEEK-SCHEDULE (ALL) SD_SM_HT_W ..

SW_FAN_CYC =WEEK-SCHEDULE (MON) SD_FAN_END
              (TUE) SD_FAN_END
              (WED) SD_FAN_WK
              (THU) SD_FAN_WK
              (FRI) SD_FAN_WK
              (SAT) SD_FAN_WK
              (SUN) SD_FAN_WK
              (HOL) SD_FAN_END ..

SW_WTHT_CR =WEEK-SCHEDULE (ALL) SD_WTHT_CR ..

SW_SMCL_CR =WEEK-SCHEDULE (ALL) SD_SMCL_CR ..

SW_WTCL_CR =WEEK-SCHEDULE (ALL) SD_WTCL_CR ..

SW_SMHT_CR =WEEK-SCHEDULE (ALL) SD_SMHT_CR ..

SW_OA%     =WEEK-SCHEDULE (ALL) SD_OA% ..

```

\$ FULL ON SYSTEM

S\_ON =SCHEDULE THRU DEC 31 SW\_ON ..

\$ FULL OFF SYSTEM

S\_OFF =SCHEDULE THRU DEC 31 SW\_OFF ..

\$ HEATING SEASON

```

S_HE-SCHED =SCHEDULE THRU MAY 15 SW_ON
              THRU OCT 1 SW_OFF
              THRU DEC 31 SW_ON ..

```

\$ COOLING SEASON

```

S_CL_SCHED =SCHEDULE THRU MAY 15 SW_OFF
              THRU OCT 1 SW_ON
              THRU DEC 31 SW_OFF ..

```

## \$ HEATING SET TEMP

S\_HT\_SET =SCHEDULE THRU MAY 15 SW\_WT\_HT  
 THRU OCT 1 SW\_SM\_HT  
 THRU DEC 31 SW\_WT\_HT ..

## \$ COOLING SET TEMP

S\_CL\_SET =SCHEDULE THRU MAY 15 SW\_WT\_CL  
 THRU OCT 1 SW\_SM\_CL  
 THRU DEC 31 SW\_WT\_CL ..

S\_HRLY-RPT =SCHEDULE THRU JAN 3 SW\_OFF  
 THRU JAN 5 SW\_ON  
 THRU AUG 13 SW\_OFF  
 THRU AUG 15 SW\_ON  
 THRU DEC 31 SW\_OFF ..

S\_FAN\_CYC =SCHEDULE THRU DEC 31 SW\_FAN\_CYC ..

## \$ HEATING SET TEMP

S\_HT\_SETCR =SCHEDULE THRU MAY 15 SW\_WTHT\_CR  
 THRU OCT 1 SW\_SMHT\_CR  
 THRU DEC 31 SW\_WTHT\_CR ..

## \$ COOLING SET TEMP

S\_CL\_SETCR =SCHEDULE THRU MAY 15 SW\_WTCL\_CR  
 THRU OCT 1 SW\_SMCL\_CR  
 THRU DEC 31 SW\_WTCL\_CR ..

S\_OA% =SCHEDULE THRU DEC 31 SW\_OA% ..

## \$ ZONE DESCRIPTION

ZONE\_2 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET COOL-TEMP-SCH = S\_CL\_SET  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL  
 SIZING-OPTION = FROM-LOADS ..

ZONE\_1 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET COOL-TEMP-SCH = S\_CL\_SET  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL  
 SIZING-OPTION = FROM-LOADS ..

COMP\_AREA =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SETCR COOL-TEMP-SCH = S\_CL\_SETCR  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL  
 SIZING-OPTION = FROM-LOADS ..

SIMUL\_AREA =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET COOL-TEMP-SCH = S\_CL\_SET  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL

SIZING-OPTION = FROM-LOADS ..

## \$ SYSTEM DESCRIPTION

MZ-PERIM =SYSTEM SYSTEM-TYPE = MZS  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_HE-SCHED  
 COOLING-SCHEDULE = S\_CL\_SCHED PREHEAT-T = 0.0  
 HEAT-CONTROL = COLDEST COOL-CONTROL = WARMEST  
 OA-CONTROL = FIXED SUPPLY-CFM = 6200.  
 RATED-CFM = 6200. MIN-OUTSIDE-AIR = 0.1  
 MIN-AIR-SCH = S\_OA% MAX-OA-FRACTION = 0.1  
 FAN-SCHEDULE = S\_ON SUPPLY-DELTA-T = 2.7  
 SUPPLY-KW = 0.00088 NIGHT-CYCLE-CTRL = CYCLE-ON-ANY  
 NIGHT-VENT-DT = 0.0 MIN-CFM-RATIO = 1.0  
 COOLING-CAPACITY = 190200. COOL-SH-CAP = 152160.  
 HEATING-CAPACITY = -146100.  
 SIZING-OPTION = COINCIDENT RETURN-AIR-PATH = DUCT  
 ZONE-NAMES = (ZONE\_1, ZONE\_2) ..

SING-ZN =SYSTEM SYSTEM-TYPE = PSZ  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_ON COOLING-SCHEDULE = S\_ON  
 HEAT-SET-T = 120.0 OA-CONTROL = FIXED  
 SUPPLY-CFM = 6000. RATED-CFM = 6000.  
 MIN-OUTSIDE-AIR = 0.1 MIN-AIR-SCH = S\_OA%  
 MAX-OA-FRACTION = 0.1 FAN-SCHEDULE = S\_ON  
 SUPPLY-DELTA-T = 1.8 SUPPLY-KW = 0.00059  
 NIGHT-CYCLE-CTRL = CYCLE-ON-ANY NIGHT-VENT-DT = 0.0  
 COOLING-CAPACITY = 165100. COOL-SH-CAP = 132080.  
 COOL-FT-MIN = 0. HEATING-CAPACITY = -120100.  
 MIN-HP-T = 0. MAX-HP-SUPP-T = 0. DEFROST-T = 0.  
 CRANKCASE-MAX-T = 0. OUTSIDE-FAN-T = 45.  
 HEAT-SOURCE = HOT-WATER SIZING-OPTION = COINCIDENT  
 RETURN-AIR-PATH = DUCT  
 ZONE-NAMES = (SIMUL\_AREA) ..

CRU'S =SYSTEM SYSTEM-TYPE = PSZ  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_ON COOLING-SCHEDULE = S\_ON  
 SUPPLY-CFM = 17200. RATED-CFM = 17200.  
 FAN-SCHEDULE = S\_OFF SUPPLY-DELTA-T = 1.8  
 SUPPLY-KW = 0.00059 NIGHT-CYCLE-CTRL = CYCLE-ON-ANY  
 NIGHT-VENT-DT = 0.0 COOLING-CAPACITY = 322000.  
 COOL-SH-CAP = 322000. COOL-FT-MIN = 0.  
 HEATING-CAPACITY = -95600. MIN-HP-T = 0.  
 MAX-HP-SUPP-T = 0. DEFROST-T = 0.  
 CRANKCASE-MAX-T = 0. OUTSIDE-FAN-T = 45.  
 HEAT-SOURCE = ELECTRIC SIZING-OPTION = COINCIDENT  
 ZONE-NAMES = (COMP\_AREA) ..

## \$ HOURLY REPORT DESCRIPTION

SPACE-MZ =REPORT-BLOCK VARIABLE-TYPE = ZONE\_2

```

                VARIABLE-LIST = (17,18,7,6) ..
SPACE-SZ  =REPORT-BLOCK VARIABLE-TYPE = SIMUL_AREA
                VARIABLE-LIST = (17,18,7,6) ..
SPACE-CRU  =REPORT-BLOCK VARIABLE-TYPE = COMP_AREA
                VARIABLE-LIST = (17,18,7,6) ..
AHU-MZ    =REPORT-BLOCK VARIABLE-TYPE = MZ-PERIM
                VARIABLE-LIST = (3,5,6,18,19,17) ..
AHU-SZ    =REPORT-BLOCK VARIABLE-TYPE = SING-ZN
                VARIABLE-LIST = (3,5,6,17) ..
AHU-CRU   =REPORT-BLOCK VARIABLE-TYPE = CRU'S
                VARIABLE-LIST = (3,5,6,17) ..
ZONE-HRLY = HOURLY-REPORT REPORT-SCHEDULE = S_HRLY-RPT
                REPORT-BLOCK = (SPACE-MZ,SPACE-SZ,SPACE-CRU)
..
AHU-HRLY  = HOURLY-REPORT REPORT-SCHEDULE = S_HRLY-RPT
                REPORT-BLOCK = (AHU-MZ,AHU-SZ,AHU-CRU)
..
END ..
COMPUTE SYSTEMS ..

INPUT PLANT ..

```

```

$-----$
$ E Z - D O E   P L A N T S   I N P U T $
$-----$

```

\$ GENERAL PROJECT DATA

```

TITLE  LINE-1 *      EMC      ENGINEERS      INC.      *
        LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
        LINE-3 *      DENVER,      CO      80227      *
        LINE-4 *RUN #2 DDC CONTROL FOR BLDG. 724      *
        LINE-5 *FLIGHT SIMULATOR                      * ..

```

```

ABORT          ERRORS ..
DIAGNOSTIC     WARNINGS ..
PLANT-REPORT   VERIFICATION=(PV-A)
                SUMMARY=(PS-B,BEPS)
                HOURLY-DATA-SAVE = YES ..

```

\$ SCHEDULES

```

PD_ON  =DAY-SCHEDULE (1,24) (1.) ..
PD_OFF =DAY-SCHEDULE (1,24) (0.) ..

PW_OFF =WEEK-SCHEDULE (ALL) PD_OFF ..
PW_ON  =WEEK-SCHEDULE (ALL) PD_ON  ..

```

\$ HEATING SEASON

```

P_HEAT =SCHEDULE THRU MAY 15 PW_ON

```

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 10:17:35 SDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. 724 FLIGHT SIMULATOR TOPEKA, KS  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR MZ-PERIM

MONTH	C O O L I N G				H E A T I N G				E L E C			
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC- TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-7.197	5 4	0.F	0.F	12153.	-68.035	12153.	38.157
FEB	0.00000				-4.329	2 4	10.F	9.F	11024.	-62.521	11024.	38.157
MAR	0.00000				-1.741	2 4	25.F	22.F	12153.	-38.033	12153.	38.157
APR	0.00000				-0.685	3 17	49.F	45.F	12022.	-10.455	12022.	38.157
MAY	23.09587	16 2	62.F	59.F	-0.350	4 17	55.F	53.F	11785.	-10.500	11785.	38.157
JUN	50.49344	19 15	87.F	76.F	0.000				12022.	0.000	12022.	38.157
JUL	60.92594	23 15	97.F	79.F	0.000				11785.	0.000	11785.	38.157
AUG	57.17864	21 15	94.F	77.F	0.000				12022.	0.000	12022.	38.157
SEP	41.65851	7 15	92.F	76.F	-0.684	28 17	61.F	56.F	12153.	-10.478	12153.	38.157
OCT	1.41983	1 15	82.F	67.F	-0.712	20 17	51.F	46.F	10918.	-10.524	10918.	38.157
NOV	0.00000				-5.292	13 6	2.F	1.F	12521.	-61.138	12521.	38.157
DEC	0.00000				-20.989				143067.			
TOTAL	234.772									-68.035		
MAX												38.157

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 10:17:35 SDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. 724 FLIGHT SIMULATOR TOPEKA, KS  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR MZ-PERIM

MONTH	HOURS				HOURS				HOURS				HOURS			
	COOLING LOAD	HEATING LOAD	COINCIDENT COOL-HEAT LOAD	FLOATING	HEATING AVAIL.	COOLING AVAIL.	FANS ON	FANS ON CYCLE	FANS ON	NIGHT VENTING	FLOATING WHEN	HEATING LOAD AT COOLING PEAK (KBTU/HR)	COINCIDENT HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)		
JAN	0	587	0	157	744	0	744	0	0	0	157	-22.330	-22.330	5.456		
FEB	0	477	0	195	672	0	672	0	0	0	195	-0.982	-0.982	5.456		
MAR	0	493	0	251	744	0	744	0	0	0	251	-1.282	-1.282	5.456		
APR	0	443	0	277	720	0	720	0	0	0	277	-1.949	-1.949	5.456		
MAY	376	223	0	145	360	384	744	0	0	0	145	0.000	0.000	5.456		
JUN	720	0	0	0	0	720	720	0	0	0	0	0.000	0.000	38.157		
JUL	744	0	0	0	744	744	744	0	0	0	0	0.000	0.000	38.157		
AUG	744	0	0	0	744	744	744	0	0	0	0	0.000	0.000	38.157		
SEP	691	0	0	29	720	24	744	0	0	0	29	0.000	0.000	38.157		
OCT	21	438	0	285	720	0	744	0	0	0	285	0.000	0.000	38.157		
NOV	0	471	0	249	720	0	744	0	0	0	249	-0.903	-0.903	5.456		
DEC	0	525	0	219	744	0	744	0	0	0	219	-0.838	-0.838	5.456		
ANNUAL	3296	3657	0	1807	5424	3336	8760	0	0	0	1807					

EMC ENGINEERS INC. DOE-2.1D 5/15/1995 10:17:35 SDL RUN 1  
 DENVER, CO 80227 EZDOE - ELITE SOFTWARE DEVELOPMENT INC FLIGHT SIMULATOR  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR SING-ZN TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC-TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.01049	9 15	53.F	40.F	-15.505	15 4	-8.F	-9.F	-48.805	3022.	5.280
FEB	0.06809	26 15	60.F	45.F	-11.042	3 4	0.F	-1.F	-41.831	2733.	5.735
MAR	0.64169	27 15	70.F	51.F	-7.947	4 4	14.F	12.F	-31.508	3072.	6.496
APR	4.53813	27 15	77.F	68.F	-1.831	5 7	30.F	27.F	-19.539	3352.	8.372
MAY	8.53535	31 18	90.F	76.F	-0.347	1 4	39.F	37.F	-10.890	3852.	8.651
JUN	14.75157	30 14	88.F	76.F	-0.035	2 4	50.F	49.F	-5.949	4469.	10.148
JUL	19.72405	23 15	97.F	79.F	0.000	4 4	56.F	55.F	0.000	5120.	11.347
AUG	19.26447	20 14	93.F	78.F	-0.001	4 4	42.F	42.F	-0.603	5116.	10.814
SEP	9.90516	7 15	92.F	76.F	-0.661	12 7	42.F	42.F	-12.068	3955.	10.459
OCT	5.72662	5 15	83.F	68.F	-1.300	20 4	25.F	25.F	-21.672	3560.	9.016
NOV	1.49035	23 14	74.F	62.F	-6.130	3 4	13.F	12.F	-31.073	3013.	7.474
DEC	0.08632	28 15	58.F	47.F	-13.052	13 8	0.F	-1.F	-42.374	3041.	5.590
TOTAL	84.742				-57.851				-48.805	44305.	11.347
MAX											

EMC ENGINEERS INC. DOE-2.1D 5/15/1995 10:17:35 SDL RUN 1  
 DENVER, CO 80227 EZDOE - ELITE SOFTWARE DEVELOPMENT INC FLIGHT SIMULATOR  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR SING-ZN TOPEKA, KS

MONTH	H O U R S				H O U R S				H O U R S				C O I N C I D E N T			
	HOURS COOLING LOAD	HOURS HEATING LOAD	HOURS FLOATING	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.	HOURS FANS ON	HOURS FANS ON CYCLE	HOURS NIGHT VENTING	HOURS FLOATING WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)	
JAN	8	736	0	744	744	744	0	0	0	0.000	5.280	0.000	5.280	0.000	5.280	
FEB	21	651	0	672	672	672	0	0	0	0.000	5.735	0.000	5.735	0.000	5.735	
MAR	128	616	0	744	744	744	0	0	0	0.000	6.496	0.000	6.496	0.000	6.496	
APR	471	248	1	720	720	720	0	0	1	0.000	8.372	0.000	8.372	0.000	8.372	
MAY	640	104	0	744	744	744	0	0	0	0.000	7.907	0.000	7.907	0.000	7.907	
JUN	704	16	0	720	744	744	0	0	0	0.000	10.148	0.000	10.148	0.000	10.148	
JUL	744	0	0	744	744	744	0	0	0	0.000	11.347	0.000	11.347	0.000	11.347	
AUG	743	1	0	744	744	744	0	0	0	0.000	10.756	0.000	10.756	0.000	10.756	
SEP	570	150	0	720	720	744	0	0	0	0.000	10.459	0.000	10.459	0.000	10.459	
OCT	492	252	0	744	744	744	0	0	0	0.000	9.016	0.000	9.016	0.000	9.016	
NOV	203	517	0	720	720	744	0	0	0	0.000	7.474	0.000	7.474	0.000	7.474	
DEC	33	711	0	744	744	744	0	0	0	0.000	5.590	0.000	5.590	0.000	5.590	
ANNUAL	4757	4002	1	8760	8760	8760	0	0	1	0.000	44305.	0.000	44305.	0.000	44305.	

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 10:17:35 SDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. 724 FLIGHT SIMULATOR TOPEKA, KS  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR CRU'S

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC-TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	100.38735	15 11	-1.F	-2.F	0.000				0.000	35818.	59.700
FEB	90.95567	3 10	10.F	8.F	0.000				0.000	32679.	61.377
MAR	101.75665	3 7	14.F	12.F	0.000				0.000	36961.	64.123
APR	99.73093	28 15	74.F	67.F	0.000				0.000	37284.	66.665
MAY	104.52082	16 3	61.F	59.F	0.000				0.000	39554.	68.457
JUN	102.29000	16 11	66.F	63.F	0.000				0.000	39226.	66.515
JUL	106.57320	30 6	63.F	60.F	0.000				0.000	41040.	67.627
AUG	106.44633	4 15	92.F	69.F	0.000				0.000	41181.	71.045
SEP	101.72897	15 6	46.F	45.F	0.000				0.000	38578.	68.542
OCT	103.31563	14 13	71.F	64.F	0.000				0.000	38648.	67.038
NOV	98.70152	3 7	19.F	17.F	0.000				0.000	36072.	64.627
DEC	101.00494	14 7	10.F	8.F	0.000				0.000	36148.	61.436
TOTAL	1217.413				0.000				0.000	453192.	71.045
MAX					246.669				0.000		

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 10:17:35 SDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. 724 FLIGHT SIMULATOR TOPEKA, KS  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR CRU'S

MONTH	H O U R S				H O U R S				H O U R S		H O U R S	
	HOURS COOLING LOAD	HOURS HEATING LOAD	HOURS COINCIDENT COOL-HEAT LOAD	HOURS FLOATING	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.	HOURS FANS ON	HOURS FANS ON CYCLE	HOURS NIGHT VENTING	HOURS FLOATING WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)
JAN	530	214	0	214	744	744	530	530	530	0	0.000	54.234
FEB	483	189	0	189	672	672	483	483	483	0	0.000	54.921
MAR	546	198	0	198	744	744	546	546	546	0	0.000	55.087
APR	538	182	0	182	720	720	538	538	538	0	0.000	66.665
MAY	564	180	0	180	744	744	564	564	564	0	0.000	62.090
JUN	564	156	0	156	720	720	564	564	564	0	0.000	63.713
JUL	595	149	0	149	744	744	595	595	595	0	0.000	62.725
AUG	590	154	0	154	744	744	590	590	590	0	0.000	70.934
SEP	555	165	0	165	720	720	555	555	555	0	0.000	59.750
OCT	554	190	0	190	744	744	554	554	554	0	0.000	66.094
NOV	529	191	0	191	720	720	529	529	529	0	0.000	55.769
DEC	537	207	0	207	744	744	537	537	537	0	0.000	54.877
ANNUAL	6585	2175	0	2175	8760	8760	6585	6585	6585	0	0.000	

EMC ENGINEERS INC. 80227 EZZOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 10:17:35 PDL RUN 1  
 DENVER, CO MONTHLY PEAK AND TOTAL ENERGY USE RUN #2 DDC CONTROL FOR BLDG. 724 FLIGHT SIMULATOR TOPEKA, KS  
 REPORT- PS-B

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY TOTAL (MBTU) PEAK (KBTU) DY/HR	NATURAL-GAS TOTAL (MBTU) PEAK (KBTU) DY/HR
JAN	175.958 351.853 22/14	175.958 351.853 22/14	34.125 138.571 5/4
FEB	160.082 359.069 26/13	160.082 359.069 26/13	24.200 124.264 2/4
MAR	179.431 366.720 27/15	179.431 366.720 27/15	16.065 84.034 2/4
APR	180.373 385.337 28/15	180.373 385.337 28/15	4.551 35.059 5/7
MAY	196.690 438.023 27/15	196.690 438.023 27/15	1.381 21.306 1/4
JUN	207.763 450.155 29/15	207.763 450.155 29/15	0.071 10.576 2/4
JUL	221.429 462.366 23/13	221.429 462.366 23/13	0.000 0.000 31/1
AUG	218.921 467.200 12/15	218.921 467.200 12/15	0.002 1.841 4/4
SEP	201.057 457.919 7/15	201.057 457.919 7/15	1.208 20.576 12/7
OCT	186.616 424.126 1/14	186.616 424.126 1/14	3.686 39.197 20/3
NOV	171.765 376.142 23/13	171.765 376.142 23/13	11.702 51.674 3/3
DEC	178.238 359.139 28/15	178.238 359.139 28/15	28.233 129.733 13/6
	ONE YEAR USE/PEAK	2278.322 467.200	125.222 138.571



EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 10:17:35 PDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. 724 FLIGHT SIMULATOR TOPEKA, KS  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
SPACE HEAT	5.72	125.22
SPACE COOL	413.83	0.00
HVAC AUX	505.47	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	160.53	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	1192.66	0.00
TOTAL	2278.21	125.22

TOTAL SITE ENERGY 2403.54 MBTU 183.5 KBTU/SQFT-YR GROSS-AREA 228.8 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 6967.03 MBTU 531.8 KBTU/SQFT-YR GROSS-AREA 663.1 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 46.7  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

AZIMUTH = 225 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 2.5 WIDTH = 43.2 CONS = ROOF/WAL  
AZIMUTH = 135 SKY-FORM-FACTOR = 1.0 ..

E-W HEIGHT = 2.5 WIDTH = 43.2 CONS = ROOF/WAL  
AZIMUTH = 315 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

ROOF HEIGHT = 14.4 WIDTH = 36.8 CONS = ROOF-1  
AZIMUTH = 135 TILT = 40 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

ROOF HEIGHT = 18.0 WIDTH = 46.0 CONS = ROOF-1  
AZIMUTH = 315 TILT = 40 SKY-FORM-FACTOR = 1.0 ..

END ..

COMPUTE LOADS ..

INPUT SYSTEMS ..

\$-----\$  
\$ E Z - D O E S Y S T E M S I N P U T \$  
\$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
LINE-3 \* DENVER, CO 80227 \*  
  
LINE-4 \*RUN #3 ECONOMIZER FOR BLDG. #724 \*  
LINE-5 \*FLIGHT SIMULATOR \* ..  
  
ABORT ERRORS ..  
DIAGNOSTIC WARNINGS ..  
SYSTEMS-REPORT VERIFICATION=(SV-A)  
SUMMARY=(SS-A,SS-C,SS-K,SS-O)  
HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

SD\_ON =DAY-SCHEDULE (1,24) (1.) ..  
SD\_OFF =DAY-SCHEDULE (1,24) (0.) ..  
SD\_WT\_HT\_W =DAY-SCHEDULE (1,4) (55.)  
(5,16) (74.)  
(17,24) (55.) ..  
SD\_SM\_CL\_W =DAY-SCHEDULE (1,4) (85.)  
(5,16) (72.)  
(17,24) (85.) ..  
SD\_WT\_CL\_W =DAY-SCHEDULE (1,4) (57.)  
(5,16) (76.)  
(17,24) (57.) ..  
SD\_SM\_HT\_W =DAY-SCHEDULE (1,4) (83.)

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(5,16) (70.)
(17,24) (83.) ..
SD_WT_HT_D =DAY-SCHEDULE (1,24) (55.) ..
SD_SM_CL_D =DAY-SCHEDULE (1,24) (85.) ..
SD_WT_CL_D =DAY-SCHEDULE (1,24) (57.) ..
SD_SM_HT_D =DAY-SCHEDULE (1,24) (83.) ..
SD_FAN_WK =DAY-SCHEDULE (1,4) (0.)
(5,16) (1.)
(17,24) (0.) ..
SD_FAN_END =DAY-SCHEDULE (1,24) (0.) ..
SD_WTHT_CR =DAY-SCHEDULE (1,24) (74.) ..
SD_SMCL_CR =DAY-SCHEDULE (1,24) (72.) ..
SD_WTCL_CR =DAY-SCHEDULE (1,24) (76.) ..
SD_SMHT_CR =DAY-SCHEDULE (1,24) (70.) ..

SW_ON =WEEK-SCHEDULE (ALL) SD_ON ..

SW_OFF =WEEK-SCHEDULE (ALL) SD_OFF ..

SW_WT_HT =WEEK-SCHEDULE (MON) SD_WT_HT_D
(TUE) SD_WT_HT_D
(WED) SD_WT_HT_W
(THU) SD_WT_HT_W
(FRI) SD_WT_HT_W
(SAT) SD_WT_HT_W
(SUN) SD_WT_HT_W
(HOL) SD_WT_HT_D ..

SW_SM_CL =WEEK-SCHEDULE (MON) SD_SM_CL_D
(TUE) SD_SM_CL_D
(WED) SD_SM_CL_W
(THU) SD_SM_CL_W
(FRI) SD_SM_CL_W
(SAT) SD_SM_CL_W
(SUN) SD_SM_CL_W
(HOL) SD_SM_CL_D ..

SW_WT_CL =WEEK-SCHEDULE (MON) SD_WT_CL_D
(TUE) SD_WT_CL_D
(WED) SD_WT_CL_W
(THU) SD_WT_CL_W
(FRI) SD_WT_CL_W
(SAT) SD_WT_CL_W
(SUN) SD_WT_CL_W
(HOL) SD_WT_CL_D ..

SW_SM_HT =WEEK-SCHEDULE (MON) SD_SM_HT_D
(TUE) SD_SM_HT_D
(WED) SD_SM_HT_W
(THU) SD_SM_HT_W
(FRI) SD_SM_HT_W
(SAT) SD_SM_HT_W
(SUN) SD_SM_HT_W
(HOL) SD_SM_HT_D ..

SW_FAN_CYC =WEEK-SCHEDULE (MON) SD_FAN_END

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(TUE) SD\_FAN\_END  
(WED) SD\_FAN\_WK  
(THU) SD\_FAN\_WK  
(FRI) SD\_FAN\_WK  
(SAT) SD\_FAN\_WK  
(SUN) SD\_FAN\_WK  
(HOL) SD\_FAN\_END ..

SW\_WTHT\_CR =WEEK-SCHEDULE (ALL) SD\_WTHT\_CR ..

SW\_SMCL\_CR =WEEK-SCHEDULE (ALL) SD\_SMCL\_CR ..

SW\_WTCL\_CR =WEEK-SCHEDULE (ALL) SD\_WTCL\_CR ..

SW\_SMHT\_CR =WEEK-SCHEDULE (ALL) SD\_SMHT\_CR ..

\$ FULL ON SYSTEM

S\_ON =SCHEDULE THRU DEC 31 SW\_ON ..

\$ FULL OFF SYSTEM

S\_OFF =SCHEDULE THRU DEC 31 SW\_OFF ..

\$ HEATING SEASON

S\_HE-SCHED =SCHEDULE THRU MAY 15 SW\_ON  
THRU OCT 1 SW\_OFF  
THRU DEC 31 SW\_ON ..

\$ COOLING SEASON

S\_CL\_SCHED =SCHEDULE THRU MAY 15 SW\_OFF  
THRU OCT 1 SW\_ON  
THRU DEC 31 SW\_OFF ..

\$ HEATING SET TEMP

S\_HT\_SET =SCHEDULE THRU MAY 15 SW\_WT\_HT  
THRU OCT 1 SW\_SM\_HT  
THRU DEC 31 SW\_WT\_HT ..

\$ COOLING SET TEMP

S\_CL\_SET =SCHEDULE THRU MAY 15 SW\_WT\_CL  
THRU OCT 1 SW\_SM\_CL  
THRU DEC 31 SW\_WT\_CL ..

S\_HRLY-RPT =SCHEDULE THRU JAN 3 SW\_OFF  
THRU JAN 5 SW\_ON  
THRU AUG 13 SW\_OFF  
THRU AUG 15 SW\_ON  
THRU DEC 31 SW\_OFF ..

S\_FAN\_CYC =SCHEDULE THRU DEC 31 SW\_FAN\_CYC ..

\$ HEATING SET TEMP

S\_HT\_SETCR =SCHEDULE THRU MAY 15 SW\_WTHT\_CR  
THRU OCT 1 SW\_SMHT\_CR  
THRU DEC 31 SW\_WTHT\_CR ..

## \$ COOLING SET TEMP

S\_CL\_SETCR =SCHEDULE THRU MAY 15 SW\_WTCL\_CR  
 THRU OCT 1 SW\_SMCL\_CR  
 THRU DEC 31 SW\_WTCL\_CR ..

## \$ ZONE DESCRIPTION

ZONE\_2 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET COOL-TEMP-SCH = S\_CL\_SET  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL  
 SIZING-OPTION = FROM-LOADS ..

ZONE\_1 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET COOL-TEMP-SCH = S\_CL\_SET  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL  
 SIZING-OPTION = FROM-LOADS ..

COMP\_AREA =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SETCR COOL-TEMP-SCH = S\_CL\_SETCR  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL  
 SIZING-OPTION = FROM-LOADS ..

SIMUL\_AREA =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET COOL-TEMP-SCH = S\_CL\_SET  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL  
 SIZING-OPTION = FROM-LOADS ..

## \$ SYSTEM DESCRIPTION

MZ-PERIM =SYSTEM SYSTEM-TYPE = MZS  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_HE-SCHED  
 COOLING-SCHEDULE = S\_CL\_SCHED PREHEAT-T = 0.0  
ECONO-LIMIT-T = 69.0 HEAT-CONTROL = COLDEST ←  
 COOL-CONTROL = WARMEST SUPPLY-CFM = 6200.  
 RATED-CFM = 6200. MIN-OUTSIDE-AIR = 0.1  
 FAN-SCHEDULE = S\_FAN\_CYC SUPPLY-DELTA-T = 2.7  
 SUPPLY-KW = 0.00088 NIGHT-CYCLE-CTRL = CYCLE-ON-ANY  
 NIGHT-VENT-DT = 0.0 MIN-CFM-RATIO = 1.0  
 COOLING-CAPACITY = 190200. COOL-SH-CAP = 152160.  
 HEATING-CAPACITY = -146100.  
 SIZING-OPTION = COINCIDENT RETURN-AIR-PATH = DUCT  
 ZONE-NAMES = (ZONE\_1, ZONE\_2) ..

SING-ZN =SYSTEM SYSTEM-TYPE = PSZ  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_ON COOLING-SCHEDULE = S\_ON  
 HEAT-SET-T = 120.0 ECONO-LIMIT-T = 69.0 ←  
 SUPPLY-CFM = 6000. RATED-CFM = 6000.

```

MIN-OUTSIDE-AIR = 0.1  FAN-SCHEDULE = S_FAN_CYC
SUPPLY-DELTA-T = 1.8  SUPPLY-KW = 0.00059
NIGHT-CYCLE-CTRL = CYCLE-ON-ANY  NIGHT-VENT-DT = 0.0
COOLING-CAPACITY = 165100.  COOL-SH-CAP = 132080.
COOL-FT-MIN = 0.  HEATING-CAPACITY = -120100.
MIN-HP-T = 0.  MAX-HP-SUPP-T = 0.  DEFROST-T = 0.
CRANKCASE-MAX-T = 0.  OUTSIDE-FAN-T = 45.
HEAT-SOURCE = HOT-WATER  SIZING-OPTION = COINCIDENT
RETURN-AIR-PATH = DUCT
ZONE-NAMES = (SIMUL_AREA) ..

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CRU'S  =SYSTEM  SYSTEM-TYPE = PSZ
MAX-SUPPLY-T = 120.0  MIN-SUPPLY-T = 55.0
HEATING-SCHEDULE = S_ON  COOLING-SCHEDULE = S_ON
SUPPLY-CFM = 17200.  RATED-CFM = 17200.
FAN-SCHEDULE = S_OFF  SUPPLY-DELTA-T = 1.8
SUPPLY-KW = 0.00059  NIGHT-CYCLE-CTRL = CYCLE-ON-ANY
NIGHT-VENT-DT = 0.0  COOLING-CAPACITY = 322000.
COOL-SH-CAP = 322000.  COOL-FT-MIN = 0.
HEATING-CAPACITY = -95600.  MIN-HP-T = 0.
MAX-HP-SUPP-T = 0.  DEFROST-T = 0.
CRANKCASE-MAX-T = 0.  OUTSIDE-FAN-T = 45.
HEAT-SOURCE = ELECTRIC  SIZING-OPTION = COINCIDENT
ZONE-NAMES = (COMP_AREA) ..

```

## \$ HOURLY REPORT DESCRIPTION

```

SPACE-MZ  =REPORT-BLOCK VARIABLE-TYPE = ZONE_2
          VARIABLE-LIST = (17,18,7,6) ..
SPACE-SZ  =REPORT-BLOCK VARIABLE-TYPE = SIMUL_AREA
          VARIABLE-LIST = (17,18,7,6) ..
SPACE-CRU =REPORT-BLOCK VARIABLE-TYPE = COMP_AREA
          VARIABLE-LIST = (17,18,7,6) ..
AHU-MZ    =REPORT-BLOCK VARIABLE-TYPE = MZ-PERIM
          VARIABLE-LIST = (3,5,6,18,19,17) ..
AHU-SZ    =REPORT-BLOCK VARIABLE-TYPE = SING-ZN
          VARIABLE-LIST = (3,5,6,17) ..
AHU-CRU   =REPORT-BLOCK VARIABLE-TYPE = CRU'S
          VARIABLE-LIST = (3,5,6,17) ..
ZONE-HRLY = HOURLY-REPORT REPORT-SCHEDULE = S_HRLY-RPT
          REPORT-BLOCK = (SPACE-MZ,SPACE-SZ,SPACE-CRU)
..
AHU-HRLY  = HOURLY-REPORT REPORT-SCHEDULE = S_HRLY-RPT
          REPORT-BLOCK = (AHU-MZ,AHU-SZ,AHU-CRU)
..
END ..
COMPUTE SYSTEMS ..

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INPUT PLANT ..

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$-----$
$ E Z - D O E  P L A N T S  I N P U T $
$-----$

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EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 10:30:16 SDL RUN 1  
 DENVER, CO 80227 RUN #3 ECONOMIZER FOR BLDG. #724 FLIGHT SIMULATOR  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR MZ-PERIM TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C			
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	MAXIMUM ELEC LOAD (KW)	
JAN	0.00000				-17.183	19	5	29.F	28.F	-145.615	11154.	38.157
FEB	0.00000				-14.014	23	5	31.F	28.F	-145.383	10233.	38.157
MAR	0.00000				-12.567	2	5	24.F	21.F	-145.604	11252.	38.157
APR	0.00000				-5.638	6	5	36.F	31.F	-145.368	11825.	38.157
MAY	12.59915	22	14	79.F	-1.357	4	5	58.F	56.F	-84.711	11632.	38.157
JUN	37.73230	23	6	68.F	0.000					0.000	11760.	38.157
JUL	48.56630	13	13	90.F	0.000					0.000	12062.	38.157
AUG	42.63340	27	7	68.F	0.000					0.000	11026.	38.157
SEP	27.87341	23	11	68.F	0.000					0.000	11929.	38.157
OCT	0.82629	1	15	82.F	-3.995	19	5	46.F	45.F	-103.083	12120.	38.157
NOV	0.00000				-10.639	30	5	29.F	26.F	-145.670	10383.	38.157
DEC	0.00000				-16.470	14	5	11.F	10.F	-145.634	11719.	38.157
TOTAL	170.231				-81.863					-145.670	137089.	38.157
MAX												

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 10:30:16 SDL RUN 1  
 DENVER, CO 80227 RUN #3 ECONOMIZER FOR BLDG. #724 FLIGHT SIMULATOR  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR MZ-PERIM TOPEKA, KS

MONTH	HOURS OF N U M B E R				HOURS				COINCIDENT LOADS				
	COOLING LOAD	HEATING LOAD	FLOATING	HEATING AVAIL.	COOLING AVAIL.	FANS ON	FANS ON CYCLE	HOURS NIGHT VENTING	HOURS FLOATING WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)
JAN	0	0	380	744	0	561	297	0	197	0.000	0.000	0.000	0.000
FEB	0	0	323	672	0	527	287	0	178	0.000	0.000	0.000	0.000
MAR	0	0	399	744	0	579	315	0	234	0.000	0.000	0.000	0.000
APR	0	0	442	720	0	684	420	0	406	0.000	0.000	0.000	5.456
MAY	136	112	496	360	384	716	464	0	468	0.000	0.000	0.000	38.157
JUN	378	0	342	0	720	672	408	0	294	0.000	0.000	0.000	38.157
JUL	497	0	247	0	744	660	384	0	163	0.000	0.000	0.000	38.157
AUG	438	0	306	0	744	605	353	0	167	0.000	0.000	0.000	38.157
SEP	262	0	458	0	720	703	439	0	441	0.000	0.000	0.000	38.157
OCT	7	253	484	720	24	738	474	0	308	0.000	0.000	0.000	38.157
NOV	0	314	406	720	0	622	394	0	308	0.000	0.000	0.000	5.456
DEC	0	404	340	744	0	597	321	0	193	0.000	0.000	0.000	0.000
ANNUAL	1718	2419	4623	5424	3336	7664	4556	0	3527				

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 10:30:16 SDL RUN 1  
 DENVER, CO 80227 RUN #3 ECONOMIZER FOR BLDG. #724 FLIGHT SIMULATOR TOPEKA, KS  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR SING-ZN

MONTH	C O O L I N G			H E A T I N G			E L E C					
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	TRICAL ENERGY (KWH)	ELEC LOAD (KW)	MAXIMUM HEATING LOAD (KBTU/HR)	MAXIMUM HEATING LOAD (KBTU/HR)
JAN	0.00000				-3.688	5	1.F	0.F	1967.	5.188	-55.946	55.946
FEB	0.00377	28	56.F	43.F	-3.161	2	8.F	6.F	1744.	5.188	-54.303	54.303
MAR	0.66329	24	64.F	64.F	-3.129	16	21.F	19.F	1964.	12.628	-52.947	52.947
APR	4.57602	20	65.F	62.F	-2.424	16	36.F	31.F	2465.	9.748	-47.094	47.094
MAY	5.37330	15	79.F	69.F	-2.135	16	62.F	59.F	2622.	10.662	-48.996	48.996
JUN	6.18788	29	71.F	70.F	-1.733	10	79.F	66.F	2623.	9.740	-22.988	22.988
JUL	9.24953	13	78.F	74.F	-1.681	31	62.F	60.F	2737.	10.145	-20.816	20.816
AUG	8.06227	24	79.F	72.F	-1.501	25	68.F	66.F	2575.	10.171	-21.820	21.820
SEP	4.38171	7	75.F	71.F	-1.908	30	50.F	46.F	2609.	9.899	-26.398	26.398
OCT	5.09513	14	62.F	60.F	-2.159	5	57.F	57.F	2639.	10.298	-40.835	40.835
NOV	1.43159	6	64.F	58.F	-2.740	2	16.F	15.F	1938.	9.084	-48.373	48.373
DEC	0.00000				-3.454	14	11.F	10.F	2004.	5.088	-54.673	54.673
TOTAL	45.026				-29.713				28245.			
MAX											-55.946	55.946

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 10:30:16 SDL RUN 1  
 DENVER, CO 80227 RUN #3 ECONOMIZER FOR BLDG. #724 FLIGHT SIMULATOR TOPEKA, KS  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR SING-ZN

MONTH	H O U R S			H O U R S			H O U R S			C O I N C I D E N T		
	HOURS COOLING LOAD	HOURS HEATING LOAD	HOURS COOL-HEAT LOAD	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.	HOURS FANS ON	HOURS FANS ON	HOURS FANS ON	HOURS FLOATING WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)	COINCIDENT HEATING LOAD AT COOLING PEAK (KBTU/HR)
JAN	0	507	0	744	744	446	182	0	209	0.000	0.000	0.000
FEB	1	470	0	672	672	394	154	0	192	0.000	3.840	0.000
MAR	25	514	0	744	744	431	167	0	201	0.000	12.628	0.000
APR	152	392	0	720	720	474	176	0	146	0.000	9.686	0.000
MAY	201	374	0	744	744	492	240	0	122	0.000	10.340	0.000
JUN	219	360	0	720	720	450	186	0	90	0.000	9.061	0.000
JUL	278	315	0	744	744	455	179	0	26	0.000	9.472	0.000
AUG	250	355	0	744	744	421	169	0	32	0.000	9.570	0.000
SEP	162	402	0	720	720	491	227	0	173	0.000	9.301	0.000
OCT	191	391	0	744	744	499	235	0	146	0.000	9.349	0.000
NOV	57	487	0	720	720	419	191	0	186	0.000	9.054	0.000
DEC	0	512	0	744	744	453	177	0	221	0.000	0.000	0.000
ANNUAL	1536	5079	0	8760	8760	5425	2317	0	1744			



EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 10:30:16 SDL RUN 1  
DENVER, CO 80227 RUN #3 ECONOMIZER FOR BLDG. #724 FLIGHT SIMULATOR TOPEKA, KS  
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR CRU'S

MONTH	COOLING				HEATING				ELECTRIC			
	ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	MAXIMUM COOLING LOAD (KBTU/HR)	MAXIMUM ELEC LOAD (KW)
JAN	100.38735	15 11	-1.1 F	-2. F	0.000				35818.	0.000	59.700	
FEB	90.95567	3 10	10. F	8. F	0.000				32679.	0.000	61.377	
MAR	101.75665	3 7	14. F	12. F	0.000				36961.	0.000	64.123	
APR	99.73093	28 15	74. F	67. F	0.000				37284.	0.000	66.665	
MAY	104.52082	16 3	61. F	59. F	0.000				39554.	0.000	68.457	
JUN	102.29000	16 11	66. F	63. F	0.000				39226.	0.000	66.515	
JUL	106.57320	30 6	63. F	60. F	0.000				41040.	0.000	67.627	
AUG	106.44633	4 15	92. F	69. F	0.000				41181.	0.000	71.045	
SEP	101.72897	15 6	46. F	45. F	0.000				38578.	0.000	68.542	
OCT	103.31563	14 13	71. F	64. F	0.000				38648.	0.000	67.038	
NOV	98.70152	3 7	19. F	17. F	0.000				36072.	0.000	64.627	
DEC	101.00494	14 7	10. F	8. F	0.000				36148.	0.000	61.436	
TOTAL	1217.413				0.000				453192.	0.000	71.045	
MAX												

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 10:30:16 SDL RUN 1  
DENVER, CO 80227 RUN #3 ECONOMIZER FOR BLDG. #724 FLIGHT SIMULATOR TOPEKA, KS  
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR CRU'S

MONTH	COOLING				HEATING				ELECTRIC			
	HOURS COOLING LOAD	HOURS HEATING LOAD	HOURS COINCIDENT COOL-HEAT LOAD	HOURS FLOATING LOAD	HOURS COOLING AVAIL.	HOURS HEATING AVAIL.	HOURS FANS ON CYCLE	HOURS NIGHT VENTING	HOURS FLOATING WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)	
JAN	530	0	0	214	744	744	530	0	0	0.000	54.234	
FEB	483	0	0	189	672	672	483	0	0	0.000	54.921	
MAR	546	0	0	198	744	744	546	0	0	0.000	55.087	
APR	538	0	0	182	720	720	538	0	0	0.000	66.665	
MAY	564	0	0	180	744	744	564	0	0	0.000	62.090	
JUN	564	0	0	156	720	720	564	0	0	0.000	63.713	
JUL	595	0	0	149	744	744	595	0	0	0.000	62.725	
AUG	590	0	0	154	744	744	590	0	0	0.000	70.934	
SEP	555	0	0	165	720	720	555	0	0	0.000	59.750	
OCT	554	0	0	190	744	744	554	0	0	0.000	66.094	
NOV	529	0	0	191	720	720	529	0	0	0.000	55.769	
DEC	537	0	0	207	744	744	537	0	0	0.000	54.877	
ANNUAL	6585	0	0	2175	8760	8760	6585	0	0	0.000		

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY 168.727 356.480 12/12	NATURAL-GAS 31.093 251.339 26/ 5
JAN	TOTAL (MBTU) PEAK (KBTU) DY/HR	153.923 360.026 26/13	25.927 246.622 23/ 5
FEB	TOTAL (MBTU) PEAK (KBTU) DY/HR	172.705 366.463 9/14	23.845 249.676 16/ 5
MAR	TOTAL (MBTU) PEAK (KBTU) DY/HR	177.038 378.164 28/15	12.903 243.323 6/ 5
APR	TOTAL (MBTU) PEAK (KBTU) DY/HR	188.145 439.835 21/15	5.918 171.140 4/ 5
MAY	TOTAL (MBTU) PEAK (KBTU) DY/HR	194.782 453.047 29/15	3.051 39.119 10/17
JUN	TOTAL (MBTU) PEAK (KBTU) DY/HR	206.944 463.797 23/13	2.981 35.569 31/17
JUL	TOTAL (MBTU) PEAK (KBTU) DY/HR	201.562 467.694 12/15	2.668 37.209 25/17
AUG	TOTAL (MBTU) PEAK (KBTU) DY/HR	189.943 460.177 7/15	3.360 44.690 30/17
SEP	TOTAL (MBTU) PEAK (KBTU) DY/HR	183.287 427.911 1/14	9.958 189.480 19/ 5
OCT	TOTAL (MBTU) PEAK (KBTU) DY/HR	166.440 369.758 23/13	20.380 244.270 30/ 5
NOV	TOTAL (MBTU) PEAK (KBTU) DY/HR	171.971 361.265 28/15	30.140 251.571 14/ 5
DEC	TOTAL (MBTU) PEAK (KBTU) DY/HR	2175.470 467.694	172.223 251.571

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 10:30:16 PDL RUN 1  
 DENVER, CO 80227 RUN #3 ECONOMIZER FOR BLDG. #724 FLIGHT SIMULATOR TOPEKA, KS  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE

ENERGY TYPE	ELECTRICITY	NATURAL-GAS
IN SITE MBTU -		
CATEGORY OF USE		
SPACE HEAT	7.27	172.22
SPACE COOL	372.63	0.00
HVAC AUX	442.28	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	160.53	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	1192.66	0.00
TOTAL	2175.37	172.22

TOTAL SITE ENERGY 2347.69 MBTU 179.2 KBTU/SQFT-YR GROSS-AREA 223.5 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 6705.16 MBTU 511.8 KBTU/SQFT-YR GROSS-AREA 638.2 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 52.0  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

AZIMUTH = 225 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 2.5 WIDTH = 43.2 CONS = ROOF/WAL  
AZIMUTH = 135 SKY-FORM-FACTOR = 1.0 ..

E-W HEIGHT = 2.5 WIDTH = 43.2 CONS = ROOF/WAL  
AZIMUTH = 315 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

ROOF HEIGHT = 14.4 WIDTH = 36.8 CONS = ROOF-1  
AZIMUTH = 135 TILT = 40 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

ROOF HEIGHT = 18.0 WIDTH = 46.0 CONS = ROOF-1  
AZIMUTH = 315 TILT = 40 SKY-FORM-FACTOR = 1.0 ..

END ..  
COMPUTE LOADS ..  
INPUT SYSTEMS ..

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\$ E Z - D O E S Y S T E M S I N P U T \$  
-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
LINE-3 \* DENVER, CO 80227 \*  
  
LINE-4 \*RUN #4 NIGHT INFILTRATION FOR BLDG. #724\*  
LINE-5 \*FLIGHT SIMULATOR \* ..

ABORT ERRORS ..  
DIAGNOSTIC WARNINGS ..  
SYSTEMS-REPORT VERIFICATION=(SV-A)  
SUMMARY=(SS-A,SS-C,SS-K,SS-O)  
HOURLY-DATA-SAVE = YES ..


\$ SCHEDULES

SD\_ON =DAY-SCHEDULE (1,24) (1.) ..  
SD\_OFF =DAY-SCHEDULE (1,24) (0.) ..  
SD\_WT\_HT\_W =DAY-SCHEDULE (1,24) (74.) ..  
SD\_SM\_CL\_W =DAY-SCHEDULE (1,24) (72.) ..  
SD\_WT\_CL\_W =DAY-SCHEDULE (1,24) (76.) ..  
SD\_SM\_HT\_W =DAY-SCHEDULE (1,24) (70.) ..  
SD\_WT\_HT\_D =DAY-SCHEDULE (1,24) (55.) ..  
SD\_SM\_CL\_D =DAY-SCHEDULE (1,24) (85.) ..  
SD\_WT\_CL\_D =DAY-SCHEDULE (1,24) (57.) ..  
SD\_SM\_HT\_D =DAY-SCHEDULE (1,24) (83.) ..  
SD\_FAN\_WK =DAY-SCHEDULE (1,4) (0.)  
(5,16) (1.)

```

(17,24) (0.) ..
SD_FAN_END =DAY-SCHEDULE (1,24) (0.) ..
SD_WTHT_CR =DAY-SCHEDULE (1,24) (74.) ..
SD_SMCL_CR =DAY-SCHEDULE (1,24) (72.) ..
SD_WTCL_CR =DAY-SCHEDULE (1,24) (76.) ..
SD_SMHT_CR =DAY-SCHEDULE (1,24) (70.) ..
SD_OA%      =DAY-SCHEDULE (1,4) (0.)
                (5,16) (0.1)
                (17,24) (0.) ..

```



```

SW_ON       =WEEK-SCHEDULE (ALL) SD_ON ..
SW_OFF      =WEEK-SCHEDULE (ALL) SD_OFF ..
SW_WT_HT    =WEEK-SCHEDULE (ALL) SD_WT_HT_W ..
SW_SM_CL    =WEEK-SCHEDULE (ALL) SD_SM_CL_W ..
SW_WT_CL    =WEEK-SCHEDULE (ALL) SD_WT_CL_W ..
SW_SM_HT    =WEEK-SCHEDULE (ALL) SD_SM_HT_W ..
SW_FAN_CYC =WEEK-SCHEDULE (MON) SD_FAN_END
                (TUE) SD_FAN_END
                (WED) SD_FAN_WK
                (THU) SD_FAN_WK
                (FRI) SD_FAN_WK
                (SAT) SD_FAN_WK
                (SUN) SD_FAN_WK
                (HOL) SD_FAN_END ..
SW_WTHT_CR =WEEK-SCHEDULE (ALL) SD_WTHT_CR ..
SW_SMCL_CR =WEEK-SCHEDULE (ALL) SD_SMCL_CR ..
SW_WTCL_CR =WEEK-SCHEDULE (ALL) SD_WTCL_CR ..
SW_SMHT_CR =WEEK-SCHEDULE (ALL) SD_SMHT_CR ..
SW_OA%     =WEEK-SCHEDULE (MON) SD_OFF
                (TUE) SD_OFF
                (WED) SD_OA%
                (THU) SD_OA%
                (FRI) SD_OA%
                (SAT) SD_OA%
                (SUN) SD_OA%
                (HOL) SD_OFF ..

```

\$ FULL ON SYSTEM

S\_ON =SCHEDULE THRU DEC 31 SW\_ON ..

\$ FULL OFF SYSTEM

S\_OFF =SCHEDULE THRU DEC 31 SW\_OFF ..

\$ HEATING SEASON

```
S_HE-SCHED =SCHEDULE THRU MAY 15 SW_ON
              THRU OCT  1 SW_OFF
              THRU DEC 31 SW_ON  ..
```

## \$ COOLING SEASON

```
S_CL_SCHED =SCHEDULE THRU MAY 15 SW_OFF
              THRU OCT  1 SW_ON
              THRU DEC 31 SW_OFF  ..
```

## \$ HEATING SET TEMP

```
S_HT_SET   =SCHEDULE THRU MAY 15 SW_WT_HT
              THRU OCT  1 SW_SM_HT
              THRU DEC 31 SW_WT_HT  ..
```

## \$ COOLING SET TEMP

```
S_CL_SET   =SCHEDULE THRU MAY 15 SW_WT_CL
              THRU OCT  1 SW_SM_CL
              THRU DEC 31 SW_WT_CL  ..
```

```
S_HRLY-RPT =SCHEDULE THRU JAN  3 SW_OFF
              THRU JAN  5 SW_ON
              THRU AUG 13 SW_OFF
              THRU AUG 15 SW_ON
              THRU DEC 31 SW_OFF  ..
```

```
S_FAN_CYC  =SCHEDULE THRU DEC 31 SW_FAN_CYC  ..
```

## \$ HEATING SET TEMP

```
S_HT_SETCR =SCHEDULE THRU MAY 15 SW_WTHT_CR
              THRU OCT  1 SW_SMHT_CR
              THRU DEC 31 SW_WTHT_CR  ..
```

## \$ COOLING SET TEMP

```
S_CL_SETCR =SCHEDULE THRU MAY 15 SW_WTCL_CR
              THRU OCT  1 SW_SMCL_CR
              THRU DEC 31 SW_WTCL_CR  ..
```

```
S_OA%      =SCHEDULE THRU DEC 31 SW_OA%  ..
```

## \$ ZONE DESCRIPTION

```
ZONE_2      =ZONE  DESIGN-HEAT-T = 74.0  DESIGN-COOL-T = 72.0
                  HEAT-TEMP-SCH = S_HT_SET  COOL-TEMP-SCH = S_CL_SET
                  ZONE-TYPE = CONDITIONED
                  THERMOSTAT-TYPE = PROPORTIONAL
                  SIZING-OPTION = FROM-LOADS  ..
```

```
ZONE_1      =ZONE  DESIGN-HEAT-T = 74.0  DESIGN-COOL-T = 72.0
                  HEAT-TEMP-SCH = S_HT_SET  COOL-TEMP-SCH = S_CL_SET
                  ZONE-TYPE = CONDITIONED
                  THERMOSTAT-TYPE = PROPORTIONAL
                  SIZING-OPTION = FROM-LOADS  ..
```

```
COMP_AREA   =ZONE  DESIGN-HEAT-T = 74.0  DESIGN-COOL-T = 72.0
```

HEAT-TEMP-SCH = S\_HT\_SETCR COOL-TEMP-SCH = S\_CL\_SETCR  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL  
 SIZING-OPTION = FROM-LOADS ..

SIMUL\_AREA =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET COOL-TEMP-SCH = S\_CL\_SET  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL  
 SIZING-OPTION = FROM-LOADS ..

\$ SYSTEM DESCRIPTION

MZ-PERIM =SYSTEM SYSTEM-TYPE = MZS  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_HE-SCHED  
 COOLING-SCHEDULE = S\_CL\_SCHED PREHEAT-T = 0.0  
 OA-CONTROL = FIXED SUPPLY-CFM = 6200.  
 RATED-CFM = 6200. MIN-AIR-SCH = S\_OA% ←  
 MAX-OA-FRACTION = 0.1 FAN-SCHEDULE = S\_ON  
 SUPPLY-DELTA-T = 2.7 SUPPLY-KW = 0.00088  
 NIGHT-CYCLE-CTRL = CYCLE-ON-ANY NIGHT-VENT-DT = 0.0  
 MIN-CFM-RATIO = 1.0 COOLING-CAPACITY = 190200.  
 COOL-SH-CAP = 152160. HEATING-CAPACITY = -146100.  
 SIZING-OPTION = COINCIDENT RETURN-AIR-PATH = DUCT  
 ZONE-NAMES = (ZONE\_1, ZONE\_2) ..

SING-ZN =SYSTEM SYSTEM-TYPE = PSZ  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_ON COOLING-SCHEDULE = S\_ON  
 HEAT-SET-T = 120.0 OA-CONTROL = FIXED  
 SUPPLY-CFM = 6000. RATED-CFM = 6000.  
MIN-AIR-SCH = S\_OA% MAX-OA-FRACTION = 0.1 ←  
 FAN-SCHEDULE = S\_ON SUPPLY-DELTA-T = 1.8  
 SUPPLY-KW = 0.00059 NIGHT-CYCLE-CTRL = CYCLE-ON-ANY  
 NIGHT-VENT-DT = 0.0 COOLING-CAPACITY = 165100.  
 COOL-SH-CAP = 132080. COOL-FT-MIN = 0.  
 HEATING-CAPACITY = -120100. MIN-HP-T = 0.  
 MAX-HP-SUPP-T = 0. DEFROST-T = 0.  
 CRANKCASE-MAX-T = 0. OUTSIDE-FAN-T = 45.  
 HEAT-SOURCE = HOT-WATER SIZING-OPTION = COINCIDENT  
 RETURN-AIR-PATH = DUCT  
 ZONE-NAMES = (SIMUL\_AREA) ..

CRU'S =SYSTEM SYSTEM-TYPE = PSZ  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_ON COOLING-SCHEDULE = S\_ON  
 SUPPLY-CFM = 17200. RATED-CFM = 17200.  
 FAN-SCHEDULE = S\_OFF SUPPLY-DELTA-T = 1.8  
 SUPPLY-KW = 0.00059 NIGHT-CYCLE-CTRL = CYCLE-ON-ANY  
 NIGHT-VENT-DT = 0.0 COOLING-CAPACITY = 322000.  
 COOL-SH-CAP = 322000. COOL-FT-MIN = 0.  
 HEATING-CAPACITY = -95600. MIN-HP-T = 0.  
 MAX-HP-SUPP-T = 0. DEFROST-T = 0.  
 CRANKCASE-MAX-T = 0. OUTSIDE-FAN-T = 45.

HEAT-SOURCE = ELECTRIC SIZING-OPTION = COINCIDENT  
ZONE-NAMES = (COMP\_AREA) ..

\$ HOURLY REPORT DESCRIPTION

SPACE-MZ =REPORT-BLOCK VARIABLE-TYPE = ZONE\_2  
          VARIABLE-LIST = (17,18,7,6) ..  
SPACE-SZ =REPORT-BLOCK VARIABLE-TYPE = SIMUL\_AREA  
          VARIABLE-LIST = (17,18,7,6) ..  
SPACE-CRU =REPORT-BLOCK VARIABLE-TYPE = COMP\_AREA  
          VARIABLE-LIST = (17,18,7,6) ..  
AHU-MZ =REPORT-BLOCK VARIABLE-TYPE = MZ-PERIM  
          VARIABLE-LIST = (3,5,6,18,19,17) ..  
AHU-SZ =REPORT-BLOCK VARIABLE-TYPE = SING-ZN  
          VARIABLE-LIST = (3,5,6,17) ..  
AHU-CRU =REPORT-BLOCK VARIABLE-TYPE = CRU'S  
          VARIABLE-LIST = (3,5,6,17) ..  
ZONE-HRLY = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
          REPORT-BLOCK = (SPACE-MZ,SPACE-SZ,SPACE-CRU)  
..  
AHU-HRLY = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
          REPORT-BLOCK = (AHU-MZ,AHU-SZ,AHU-CRU)  
..  
END ..  
COMPUTE SYSTEMS ..

INPUT PLANT ..

\$-----\$  
\$ E Z - D O E P L A N T S I N P U T \$  
\$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
LINE-3 \* DENVER, CO 80227 \*  
  
LINE-4 \*RUN #4 NIGHT INFILTRATION FOR BLDG. #724\*  
LINE-5 \*FLIGHT SIMULATOR \* ..

ABORT ERRORS ..  
DIAGNOSTIC WARNINGS ..  
PLANT-REPORT VERIFICATION=(PV-A)  
SUMMARY=(PS-B,BEPS)  
HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

PD\_ON =DAY-SCHEDULE (1,24) (1.) ..  
PD\_OFF =DAY-SCHEDULE (1,24) (0.) ..



EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 10:44:17 SDL RUN 1  
 DENVER, CO 80227 RUN #4 NIGHT INFILTRATION FOR BLDG. #724FLIGHT SIMULATOR  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR MZ-PERIM TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C			
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC- TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				0.000	-0.524	28	-1. F	-2. F	-9.897	12153.	38.157
FEB	0.00000				0.000	-0.466	2	8. F	6. F	-6.069	11024.	38.157
MAR	0.00000				0.000	-0.493	9	61. F	45. F	-5.483	12153.	38.157
APR	0.00000				0.000	-0.423	2	75. F	55. F	-5.785	12022.	38.157
MAY	27.35177	16	2	62. F	393.774	-0.203	11	82. F	62. F	-4.460	11785.	38.157
JUN	51.22044	19	15	87. F	171.050	0.000				0.000	12022.	38.157
JUL	59.86089	16	15	89. F	181.644	0.000				0.000	12521.	38.157
AUG	55.88170	20	14	93. F	175.549	0.000				0.000	11785.	38.157
SEP	45.78396	7	15	92. F	169.524	0.000				0.000	12022.	38.157
OCT	1.57378	1	15	82. F	135.400	-0.500	2	64. F	59. F	-4.104	12153.	38.157
NOV	0.00000				0.000	-0.419	23	67. F	55. F	-4.960	10918.	38.157
DEC	0.00000				0.000	-0.528	15	8. F	7. F	-9.735	12521.	38.157
TOTAL	241.672				393.774	-3.556				-44.104	143067.	38.157

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 10:44:17 SDL RUN 1  
 DENVER, CO 80227 RUN #4 NIGHT INFILTRATION FOR BLDG. #724FLIGHT SIMULATOR  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR MZ-PERIM TOPEKA, KS

MONTH	N U M B E R O F H O U R S				C O I N C I D E N T L O A D S				H E A T I N G A N D C O O L I N G P E A K L O A D S			
	HOURS COOLING LOAD	HOURS HEATING LOAD	HOURS COOL-HEAT LOAD	HOURS FLOATING	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.	HOURS FANS ON CYCLE	HOURS FANS ON VENTING	HOURS NIGHT VENTING	HOURS FLOATING WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)
JAN	0	744	0	0	744	0	0	0	0	0	-0.843	5.456
FEB	0	672	0	0	672	0	0	0	0	0	-0.835	5.456
MAR	0	744	0	0	744	0	0	0	0	0	-0.994	5.456
APR	0	675	0	45	720	0	0	0	45	0	-0.941	5.456
MAY	384	251	0	109	360	384	0	0	109	0	0.000	5.456
JUN	720	0	0	0	0	720	0	0	0	0	0.000	38.157
JUL	744	0	0	0	744	744	0	0	0	0	0.000	38.157
AUG	744	0	0	0	744	744	0	0	0	0	0.000	38.157
SEP	718	0	0	2	720	24	0	0	2	0	0.000	38.157
OCT	24	610	0	110	720	0	0	0	110	0	0.000	38.157
NOV	0	720	0	0	720	0	0	0	0	0	-0.262	5.456
DEC	0	744	0	0	744	0	0	0	0	0	-0.371	5.456
ANNUAL	3334	5160	0	266	5424	3336	8760	0	0	266		

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 10:44:17 SDL RUN 1  
 DENVER, CO 80227 RUN #4 NIGHT INFILTRATION FOR BLDG. #724FLIGHT SIMULATOR TOPEKA, KS  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR SING-ZN

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC LOAD (KW)
JAN	3.26103	12	17	43.F 35.F	-5.649	15	5	-8.F -9.F	3205.	-48.578	5.188
FEB	3.15777	13	17	54.F 46.F	-3.862	3	7	-5.F -6.F	2914.	-43.269	5.506
MAR	4.16496	27	15	70.F 51.F	-2.532	4	5	14.F 12.F	3298.	-31.787	6.232
APR	6.12366	27	15	77.F 68.F	-0.615	15	7	30.F 28.F	3452.	-17.188	7.824
MAY	9.47406	27	14	81.F 70.F	-0.128	1	5	38.F 37.F	3904.	-12.542	9.134
JUN	13.35523	30	14	88.F 76.F	-0.001	2	5	50.F 49.F	4297.	-0.837	10.586
JUL	16.54510	23	15	97.F 79.F	0.000				4776.	0.000	11.954
AUG	15.56999	20	14	93.F 78.F	0.000				4689.	0.000	11.334
SEP	10.93560	7	15	92.F 76.F	-0.047	11	5	41.F 40.F	4002.	-6.758	10.929
OCT	7.13214	1	15	82.F 67.F	-0.633	20	5	25.F 25.F	3637.	-22.207	8.694
NOV	4.88792	3	14	74.F 62.F	-2.005	3	5	13.F 12.F	3235.	-31.273	7.095
DEC	3.44106	23	17	52.F 44.F	-4.286	15	5	8.F 7.F	3232.	-36.242	5.369
TOTAL MAX	98.048				-19.757				44641.	-48.578	11.954

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 10:44:17 SDL RUN 1  
 DENVER, CO 80227 RUN #4 NIGHT INFILTRATION FOR BLDG. #724FLIGHT SIMULATOR TOPEKA, KS  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR SING-ZN

MONTH	N U M B E R O F H O U R S				C O I N C I D E N T L O A D S				C O I N C I D E N T L O A D S			
	HOURS HEATING LOAD	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.	HOURS FANS ON	HOURS COOLING AVAIL.	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.	HOURS FANS ON	HOURS HEATING LOAD AT PEAK	HOURS COOLING LOAD AT PEAK	HOURS HEATING LOAD AT PEAK	HOURS COOLING LOAD AT PEAK
JAN	480	264	0	744	744	744	744	0	0.000	0.000	0.000	4.196
FEB	443	229	0	672	672	672	672	0	0.000	0.000	0.000	4.361
MAR	539	205	0	744	744	744	744	0	0.000	0.000	0.000	6.232
APR	632	88	0	720	720	720	720	0	0.000	0.000	0.000	7.824
MAY	720	24	0	744	744	744	744	0	0.000	0.000	0.000	9.134
JUN	719	1	0	720	720	720	720	0	0.000	0.000	0.000	10.586
JUL	744	0	0	744	744	744	744	0	0.000	0.000	0.000	11.954
AUG	744	0	0	744	744	744	744	0	0.000	0.000	0.000	11.288
SEP	696	24	0	720	720	720	720	0	0.000	0.000	0.000	10.929
OCT	645	99	0	744	744	744	744	0	0.000	0.000	0.000	8.694
NOV	550	170	0	720	720	720	720	0	0.000	0.000	0.000	7.095
DEC	483	261	0	744	744	744	744	0	0.000	0.000	0.000	4.329
ANNUAL	7395	1365	0	8760	8760	8760	8760	0	0.000	0.000	0.000	

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 10:44:17 SDL RUN 1  
 DENVER, CO 80227 RUN #4 NIGHT INFILTRATION FOR BLDG. #724FLIGHT SIMULATOR TOPEKA, KS  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR CRU'S

MONTH	COOLING ENERGY (MBTU)			HEATING ENERGY (MBTU)			WET-BULB TEMP			DRY-BULB TEMP			TIME OF MAX			MAXIMUM COOLING LOAD (KBTU/HR)			MAXIMUM HEATING LOAD (KBTU/HR)			ELECTRIC LOAD (KW)		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	WET-BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	MAXIMUM HEATING LOAD (KBTU/HR)	WET-BULB TEMP	DRY-BULB TEMP	TIME OF MAX DY HR	HEATING ENERGY (MBTU)	MAXIMUM HEATING LOAD (KBTU/HR)	ELECTRIC LOAD (KW)	MAXIMUM HEATING LOAD (KBTU/HR)	WET-BULB TEMP	DRY-BULB TEMP	HEATING ENERGY (MBTU)	MAXIMUM HEATING LOAD (KBTU/HR)	ELECTRIC LOAD (KW)				
JAN	100.38735	15	11	-1.F	15	11	246.669	0.000	0.000	0.000	0.000	0.000	35818.	0.000	0.000	0.000	0.000	0.000	59.700					
FEB	90.95567	3	10	8.F	3	10	241.575	0.000	0.000	0.000	0.000	0.000	32679.	0.000	0.000	0.000	0.000	0.000	61.377					
MAR	101.75665	3	7	12.F	3	7	235.055	0.000	0.000	0.000	0.000	0.000	36961.	0.000	0.000	0.000	0.000	0.000	64.123					
APR	99.73093	28	15	74.F	28	15	240.717	0.000	0.000	0.000	0.000	0.000	37284.	0.000	0.000	0.000	0.000	0.000	66.665					
MAY	104.52082	16	3	61.F	16	3	240.751	0.000	0.000	0.000	0.000	0.000	39554.	0.000	0.000	0.000	0.000	0.000	68.457					
JUN	102.29000	16	11	66.F	16	11	223.435	0.000	0.000	0.000	0.000	0.000	39226.	0.000	0.000	0.000	0.000	0.000	66.515					
JUL	106.57320	30	6	63.F	30	6	218.749	0.000	0.000	0.000	0.000	0.000	41040.	0.000	0.000	0.000	0.000	0.000	67.627					
AUG	106.44633	4	15	92.F	4	15	232.520	0.000	0.000	0.000	0.000	0.000	41181.	0.000	0.000	0.000	0.000	0.000	71.045					
SEP	101.72897	15	6	46.F	15	6	225.422	0.000	0.000	0.000	0.000	0.000	38578.	0.000	0.000	0.000	0.000	0.000	68.542					
OCT	103.31563	14	13	71.F	14	13	239.604	0.000	0.000	0.000	0.000	0.000	38648.	0.000	0.000	0.000	0.000	0.000	67.038					
NOV	98.70152	3	7	19.F	3	7	236.852	0.000	0.000	0.000	0.000	0.000	36072.	0.000	0.000	0.000	0.000	0.000	64.627					
DEC	101.00494	14	7	10.F	14	7	240.516	0.000	0.000	0.000	0.000	0.000	36148.	0.000	0.000	0.000	0.000	0.000	61.436					
TOTAL	1217.413						246.669	0.000	0.000	0.000	0.000	0.000	453192.	0.000	0.000	0.000	0.000	0.000	71.045					
MAX																								

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 10:44:17 SDL RUN 1  
 DENVER, CO 80227 RUN #4 NIGHT INFILTRATION FOR BLDG. #724FLIGHT SIMULATOR TOPEKA, KS  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR CRU'S

MONTH	HOURS COOLING LOAD			HOURS HEATING LOAD			HOURS COINCIDENT COOL-HEAT LOAD			HOURS FLOATING			HOURS FANS ON			HOURS NIGHT VENTING			HOURS FLOATING WHEN FANS ON			HEATING LOAD AT COOLING PEAK (KBTU/HR)			ELECTRIC LOAD AT COOLING PEAK (KW)		
	COOLING LOAD	HEATING LOAD	COINCIDENT COOL-HEAT LOAD	HEATING LOAD	COOLING LOAD	COINCIDENT COOL-HEAT LOAD	FLOATING	HEATING AVAIL.	COOLING AVAIL.	FANS ON	HEATING AVAIL.	COOLING AVAIL.	FANS ON	NIGHT VENTING	FLOATING WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)										
JAN	530	0	0	744	744	214	214	744	744	530	744	530	530	0	0	0.000	54.234										
FEB	483	0	0	672	672	189	189	672	672	483	672	483	483	0	0	0.000	54.921										
MAR	546	0	0	744	744	198	198	744	744	546	744	546	546	0	0	0.000	55.087										
APR	538	0	0	720	720	182	182	720	720	538	720	538	538	0	0	0.000	66.665										
MAY	564	0	0	744	744	180	180	744	744	564	744	564	564	0	0	0.000	62.090										
JUN	564	0	0	720	720	156	156	720	720	564	720	564	564	0	0	0.000	63.713										
JUL	595	0	0	744	744	149	149	744	744	595	744	595	595	0	0	0.000	62.725										
AUG	590	0	0	744	744	154	154	744	744	590	744	590	590	0	0	0.000	70.934										
SEP	555	0	0	720	720	165	165	720	720	555	720	555	555	0	0	0.000	59.750										
OCT	554	0	0	744	744	190	190	744	744	554	744	554	554	0	0	0.000	66.094										
NOV	529	0	0	720	720	191	191	720	720	529	720	529	529	0	0	0.000	55.769										
DEC	537	0	0	744	744	207	207	744	744	537	744	537	537	0	0	0.000	54.877										
ANNUAL	6585	0	0	8760	8760	2175	2175	8760	8760	6585	8760	6585	6585	0	0	0.000											

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 10:44:17 PDL RUN 1  
 DENVER, CO 80227 RUN #4 NIGHT INFILTRATION FOR BLDG. #724FLIGHT SIMULATOR  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY TOTAL (MBTU) PEAK (KBTU) DY/HR	NATURAL-GAS TOTAL (MBTU) PEAK (KBTU) DY/HR
JAN	175.305 352.024 9/14	175.305 352.024 9/14	9.161 68.122 15/ 5
FEB	159.675 358.654 26/13	159.675 358.654 26/13	6.792 59.102 3/ 5
MAR	179.418 366.159 27/15	179.418 366.159 27/15	4.970 46.772 4/ 5
APR	180.456 383.538 28/15	180.456 383.538 28/15	1.968 28.587 15/ 5
MAY	198.847 443.831 21/15	198.847 443.831 21/15	0.646 25.426 1/ 5
JUN	209.228 450.826 29/15	209.228 450.826 29/15	0.002 1.788 2/ 5
JUL	221.847 463.217 23/13	221.847 463.217 23/13	0.000 0.000 31/ 1
AUG	218.895 467.201 12/15	218.895 467.201 12/15	0.000 0.000 31/ 1
SEP	204.078 458.564 7/15	204.078 458.564 7/15	0.087 11.463 11/ 5
OCT	186.781 432.472 1/14	186.781 432.472 1/14	2.061 58.753 2/ 2
NOV	171.908 375.199 23/13	171.908 375.199 23/13	4.064 47.556 3/ 5
DEC	177.757 358.725 28/15	177.757 358.725 28/15	7.488 59.341 15/ 5
	ONE YEAR USE/PEAK	2284.195 467.201	37.240 68.122

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 10:44:17 PDL RUN 1  
 DENVER, CO 80227 RUN #4 NIGHT INFILTRATION FOR BLDG. #724FLIGHT SIMULATOR  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE	ELECTRICITY	NATURAL-GAS
IN SITE MBTU -		
CATEGORY OF USE		
SPACE HEAT	1.59	37.24
SPACE COOL	423.15	0.00
HVAC AUX	506.15	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	160.53	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	1192.66	0.00
TOTAL	2284.08	37.24

TOTAL SITE ENERGY 2321.44 MBTU 177.2 KBTU/SQFT-YR GROSS-AREA 221.0 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 6896.69 MBTU 526.5 KBTU/SQFT-YR GROSS-AREA 656.5 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 46.7  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

AZIMUTH = 225 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 2.5 WIDTH = 43.2 CONS = ROOF/WAL  
AZIMUTH = 135 SKY-FORM-FACTOR = 1.0 ..

E-W HEIGHT = 2.5 WIDTH = 43.2 CONS = ROOF/WAL  
AZIMUTH = 315 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

ROOF HEIGHT = 14.4 WIDTH = 36.8 CONS = ROOF-1  
AZIMUTH = 135 TILT = 40 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

ROOF HEIGHT = 18.0 WIDTH = 46.0 CONS = ROOF-1  
AZIMUTH = 315 TILT = 40 SKY-FORM-FACTOR = 1.0 ..

END ..  
COMPUTE LOADS ..

INPUT SYSTEMS ..

\$-----\$  
\$ E Z - D O E S Y S T E M S I N P U T \$  
\$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
LINE-3 \* DENVER, CO 80227 \*  
  
LINE-4 \*RUN #5 DAY INFILTRATION FOR BLDG. #724 \*  
LINE-5 \*FLIGHT SIMULATOR \* ..

ABORT ERRORS ..  
DIAGNOSTIC WARNINGS ..  
SYSTEMS-REPORT VERIFICATION=(SV-A)  
SUMMARY=(SS-A,SS-C,SS-K,SS-O)  
HOURLY-DATA-SAVE = YES ..


\$ SCHEDULES

SD\_ON =DAY-SCHEDULE (1,24) (1.) ..  
SD\_OFF =DAY-SCHEDULE (1,24) (0.) ..  
SD\_WT\_HT\_W =DAY-SCHEDULE (1,24) (74.) ..  
SD\_SM\_CL\_W =DAY-SCHEDULE (1,24) (72.) ..  
SD\_WT\_CL\_W =DAY-SCHEDULE (1,24) (76.) ..  
SD\_SM\_HT\_W =DAY-SCHEDULE (1,24) (70.) ..  
SD\_WT\_HT\_D =DAY-SCHEDULE (1,24) (55.) ..  
SD\_SM\_CL\_D =DAY-SCHEDULE (1,24) (85.) ..  
SD\_WT\_CL\_D =DAY-SCHEDULE (1,24) (57.) ..  
SD\_SM\_HT\_D =DAY-SCHEDULE (1,24) (83.) ..  
SD\_FAN\_WK =DAY-SCHEDULE (1,4) (0.)  
(5,16) (1.)

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(17,24) (0.) ..
SD_FAN_END =DAY-SCHEDULE (1,24) (0.) ..
SD_WTHT_CR =DAY-SCHEDULE (1,24) (74.) ..
SD_SMCL_CR =DAY-SCHEDULE (1,24) (72.) ..
SD_WTCL_CR =DAY-SCHEDULE (1,24) (76.) ..
SD_SMHT_CR =DAY-SCHEDULE (1,24) (70.) ..
SD_OA%      =DAY-SCHEDULE (1,4) (0.1)
              (5,16) (0.)
              (17,24) (0.1) ..
SD_OA%_END =DAY-SCHEDULE (1,24) (0.1) ..

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SW_ON      =WEEK-SCHEDULE (ALL) SD_ON ..
SW_OFF     =WEEK-SCHEDULE (ALL) SD_OFF ..
SW_WT_HT  =WEEK-SCHEDULE (ALL) SD_WT_HT_W ..
SW_SM_CL  =WEEK-SCHEDULE (ALL) SD_SM_CL_W ..
SW_WT_CL  =WEEK-SCHEDULE (ALL) SD_WT_CL_W ..
SW_SM_HT  =WEEK-SCHEDULE (ALL) SD_SM_HT_W ..
SW_FAN_CYC =WEEK-SCHEDULE (MON) SD_FAN_END
              (TUE) SD_FAN_END
              (WED) SD_FAN_WK
              (THU) SD_FAN_WK
              (FRI) SD_FAN_WK
              (SAT) SD_FAN_WK
              (SUN) SD_FAN_WK
              (HOL) SD_FAN_END ..

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SW_WTHT_CR =WEEK-SCHEDULE (ALL) SD_WTHT_CR ..
SW_SMCL_CR =WEEK-SCHEDULE (ALL) SD_SMCL_CR ..
SW_WTCL_CR =WEEK-SCHEDULE (ALL) SD_WTCL_CR ..
SW_SMHT_CR =WEEK-SCHEDULE (ALL) SD_SMHT_CR ..
SW_OA%     =WEEK-SCHEDULE (MON) SD_OA%_END
              (TUE) SD_OA%_END
              (WED) SD_OA%
              (THU) SD_OA%
              (FRI) SD_OA%
              (SAT) SD_OA%
              (SUN) SD_OA%
              (HOL) SD_OA%_END ..

```

\$ FULL ON SYSTEM

S\_ON =SCHEDULE THRU DEC 31 SW\_ON ..

\$ FULL OFF SYSTEM

S\_OFF =SCHEDULE THRU DEC 31 SW\_OFF ..

## \$ HEATING SEASON

S\_HE-SCHED =SCHEDULE THRU MAY 15 SW\_ON  
 THRU OCT 1 SW\_OFF  
 THRU DEC 31 SW\_ON ..

## \$ COOLING SEASON

S\_CL\_SCHED =SCHEDULE THRU MAY 15 SW\_OFF  
 THRU OCT 1 SW\_ON  
 THRU DEC 31 SW\_OFF ..

## \$ HEATING SET TEMP

S\_HT\_SET =SCHEDULE THRU MAY 15 SW\_WT\_HT  
 THRU OCT 1 SW\_SM\_HT  
 THRU DEC 31 SW\_WT\_HT ..

## \$ COOLING SET TEMP

S\_CL\_SET =SCHEDULE THRU MAY 15 SW\_WT\_CL  
 THRU OCT 1 SW\_SM\_CL  
 THRU DEC 31 SW\_WT\_CL ..

S\_HRLY-RPT =SCHEDULE THRU JAN 3 SW\_OFF  
 THRU JAN 5 SW\_ON  
 THRU AUG 13 SW\_OFF  
 THRU AUG 15 SW\_ON  
 THRU DEC 31 SW\_OFF ..

S\_FAN\_CYC =SCHEDULE THRU DEC 31 SW\_FAN\_CYC ..

## \$ HEATING SET TEMP

S\_HT\_SETCR =SCHEDULE THRU MAY 15 SW\_WHT\_CR  
 THRU OCT 1 SW\_SMHT\_CR  
 THRU DEC 31 SW\_WHT\_CR ..

## \$ COOLING SET TEMP

S\_CL\_SETCR =SCHEDULE THRU MAY 15 SW\_WTCL\_CR  
 THRU OCT 1 SW\_SMCL\_CR  
 THRU DEC 31 SW\_WTCL\_CR ..

S\_OA% =SCHEDULE THRU DEC 31 SW\_OA% ..

## \$ ZONE DESCRIPTION

ZONE\_2 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET COOL-TEMP-SCH = S\_CL\_SET  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL  
 SIZING-OPTION = FROM-LOADS ..


ZONE\_1 =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET COOL-TEMP-SCH = S\_CL\_SET  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL  
 SIZING-OPTION = FROM-LOADS ..




COMP\_AREA =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SETCR COOL-TEMP-SCH = S\_CL\_SETCR  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL  
 SIZING-OPTION = FROM-LOADS ..

SIMUL\_AREA =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET COOL-TEMP-SCH = S\_CL\_SET  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL  
 SIZING-OPTION = FROM-LOADS ..

## \$ SYSTEM DESCRIPTION

MZ-PERIM =SYSTEM SYSTEM-TYPE = MZS  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_HE-SCHED  
 COOLING-SCHEDULE = S\_CL\_SCHED PREHEAT-T = 0.0  
 OA-CONTROL = FIXED SUPPLY-CFM = 6200.  
 RATED-CFM = 6200. MIN-AIR-SCH = S\_OA%   
 MAX-OA-FRACTION = 0.1 FAN-SCHEDULE = S\_ON  
 SUPPLY-DELTA-T = 2.7 SUPPLY-KW = 0.00088  
 NIGHT-CYCLE-CTRL = CYCLE-ON-ANY NIGHT-VENT-DT = 0.0  
 MIN-CFM-RATIO = 1.0 COOLING-CAPACITY = 190200.  
 COOL-SH-CAP = 152160. HEATING-CAPACITY = -146100.  
 SIZING-OPTION = COINCIDENT RETURN-AIR-PATH = DUCT  
 ZONE-NAMES = (ZONE\_1, ZONE\_2) ..

SING-ZN =SYSTEM SYSTEM-TYPE = PSZ  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_ON COOLING-SCHEDULE = S\_ON  
 HEAT-SET-T = 120.0 OA-CONTROL = FIXED  
 SUPPLY-CFM = 6000. RATED-CFM = 6000.  
 MIN-AIR-SCH = S\_OA% MAX-OA-FRACTION = 0.1   
 FAN-SCHEDULE = S\_ON SUPPLY-DELTA-T = 1.8  
 SUPPLY-KW = 0.00059 NIGHT-CYCLE-CTRL = CYCLE-ON-ANY  
 NIGHT-VENT-DT = 0.0 COOLING-CAPACITY = 165100.  
 COOL-SH-CAP = 132080. COOL-FT-MIN = 0.  
 HEATING-CAPACITY = -120100. MIN-HP-T = 0.  
 MAX-HP-SUPP-T = 0. DEFROST-T = 0.  
 CRANKCASE-MAX-T = 0. OUTSIDE-FAN-T = 45.  
 HEAT-SOURCE = HOT-WATER SIZING-OPTION = COINCIDENT  
 RETURN-AIR-PATH = DUCT  
 ZONE-NAMES = (SIMUL\_AREA) ..

CRU'S =SYSTEM SYSTEM-TYPE = PSZ  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_ON COOLING-SCHEDULE = S\_ON  
 SUPPLY-CFM = 17200. RATED-CFM = 17200.  
 FAN-SCHEDULE = S\_OFF SUPPLY-DELTA-T = 1.8  
 SUPPLY-KW = 0.00059 NIGHT-CYCLE-CTRL = CYCLE-ON-ANY  
 NIGHT-VENT-DT = 0.0 COOLING-CAPACITY = 322000.  
 COOL-SH-CAP = 322000. COOL-FT-MIN = 0.  
 HEATING-CAPACITY = -95600. MIN-HP-T = 0.  
 MAX-HP-SUPP-T = 0. DEFROST-T = 0.

CRANKCASE-MAX-T = 0. OUTSIDE-FAN-T = 45.  
 HEAT-SOURCE = ELECTRIC SIZING-OPTION = COINCIDENT  
 ZONE-NAMES = (COMP\_AREA) ..

## \$ HOURLY REPORT DESCRIPTION

SPACE-MZ =REPORT-BLOCK VARIABLE-TYPE = ZONE\_2  
 VARIABLE-LIST = (17,18,7,6) ..  
 SPACE-SZ =REPORT-BLOCK VARIABLE-TYPE = SIMUL\_AREA  
 VARIABLE-LIST = (17,18,7,6) ..  
 SPACE-CRU =REPORT-BLOCK VARIABLE-TYPE = COMP\_AREA  
 VARIABLE-LIST = (17,18,7,6) ..  
 AHU-MZ =REPORT-BLOCK VARIABLE-TYPE = MZ-PERIM  
 VARIABLE-LIST = (3,5,6,18,19,17) ..  
 AHU-SZ =REPORT-BLOCK VARIABLE-TYPE = SING-ZN  
 VARIABLE-LIST = (3,5,6,17) ..  
 AHU-CRU =REPORT-BLOCK VARIABLE-TYPE = CRU'S  
 VARIABLE-LIST = (3,5,6,17) ..  
 ZONE-HRLY = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (SPACE-MZ,SPACE-SZ,SPACE-CRU)  
 ..  
 AHU-HRLY = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (AHU-MZ,AHU-SZ,AHU-CRU)  
 ..  
 END ..  
 COMPUTE SYSTEMS ..

INPUT PLANT ..

\$-----\$  
 \$ E Z - D O E P L A N T S I N P U T \$  
 \$-----\$

## \$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
 LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
 LINE-3 \* DENVER, CO 80227 \*  
 LINE-4 \*RUN #5 DAY INFILTRATION FOR BLDG. #724 \*  
 LINE-5 \*FLIGHT SIMULATOR \* ..

ABORT ERRORS ..  
 DIAGNOSTIC WARNINGS ..  
 PLANT-REPORT VERIFICATION=(PV-A)  
 SUMMARY=(PS-B,BEPS)  
 HOURLY-DATA-SAVE = YES ..

## \$ SCHEDULES

PD\_ON =DAY-SCHEDULE (1,24) (1.) ..  
 PD\_OFF =DAY-SCHEDULE (1,24) (0.) ..

EMC ENGINEERS INC. EZZOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 10:53: 0 SDL RUN 1  
DENVER, CO 80227 RUN #5 DAY INFILTRATION FOR BLDG. #724 FLIGHT SIMULATOR  
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR MZ-PERIM TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-4.705	5	0.F	0.F	12153.	-69.555	38.157
FEB	0.00000				-3.509	2	10.F	9.F	11024.	-66.566	38.157
MAR	0.00000				-1.556	2	25.F	22.F	12153.	-37.375	38.157
APR	0.00000				-0.923	3	49.F	45.F	12022.	-16.158	38.157
MAY	27.76151	16	62.F	59.F	-0.479	4	55.F	53.F	11785.	-16.650	38.157
JUN	54.07588	19	87.F	76.F	0.000				12022.	0.000	38.157
JUL	62.55460	23	97.F	79.F	0.000				12521.	0.000	38.157
AUG	59.68844	24	95.F	77.F	0.000				11785.	0.000	38.157
SEP	47.71723	7	92.F	76.F	0.000				12022.	0.000	38.157
OCT	1.69185	1	82.F	67.F	-1.041	2	64.F	59.F	12153.	-47.653	38.157
NOV	0.00000				-0.962	19	45.F	37.F	10918.	-17.355	38.157
DEC	0.00000				-4.260	14	14.F	12.F	12521.	-65.360	38.157
TOTAL	253.489				-17.434				143067.	-69.555	38.157
MAX											

H18-66

EMC ENGINEERS INC. EZZOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 10:53: 0 SDL RUN 1  
DENVER, CO 80227 RUN #5 DAY INFILTRATION FOR BLDG. #724 FLIGHT SIMULATOR  
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR MZ-PERIM TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C			
	HOURS COOLING LOAD	HOURS HEATING LOAD	HOURS COINCIDENT COOL-HEAT LOAD	HOURS FLOATING LOAD	HOURS COOLING AVAIL.	HOURS HEATING AVAIL.	HOURS FANS ON CYCLE ON	HOURS NIGHT VENTING	HOURS FLOATING WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELEC LOAD AT COOLING PEAK (KW)	
JAN	0	0	0	0	744	0	0	0	0	-1.526	5.456	
FEB	0	0	0	0	672	0	0	0	0	-1.306	5.456	
MAR	0	0	0	0	744	0	0	0	0	-1.632	5.456	
APR	0	0	0	57	720	0	0	0	57	-2.275	5.456	
MAY	384	276	0	84	384	0	0	0	84	0.000	5.456	
JUN	720	0	0	0	720	0	0	0	0	0.000	38.157	
JUL	744	0	0	0	744	0	0	0	0	0.000	5.456	
AUG	744	0	0	0	744	0	0	0	0	0.000	5.456	
SEP	716	0	0	0	720	0	0	0	0	0.000	38.157	
OCT	24	0	0	104	24	0	0	0	104	0.000	38.157	
NOV	0	0	0	1	0	0	0	0	1	-1.143	5.456	
DEC	0	0	0	0	744	0	0	0	0	-1.211	5.456	
ANNUAL	3332	5178	0	250	3336	5424	0	0	250			

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 10:53: 0 SDL RUN 1  
 DENVER, CO 80227 RUN #5 DAY INFILTRATION FOR BLDG. #724 FLIGHT SIMULATOR  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR SING-ZN TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC- TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	2.75553	12 15	52.F	42.F	-11.737	15 4	-8.F	-9.F	-51.299	3175.	6.144
FEB	2.66934	24 15	52.F	45.F	-8.895	3 4	0.F	-1.F	-44.420	2888.	6.311
MAR	3.31709	18 12	58.F	52.F	-7.147	4 4	14.F	12.F	-34.187	3247.	6.561
APR	5.34210	27 17	75.F	67.F	-2.044	5 7	30.F	27.F	-22.475	3394.	7.090
MAY	9.92895	31 18	90.F	76.F	-0.347	1 4	39.F	37.F	-13.826	3954.	8.583
JUN	16.07705	19 17	87.F	76.F	-0.006	2 4	50.F	49.F	-2.828	4593.	8.616
JUL	19.35152	23 17	97.F	79.F	0.000				0.000	5079.	10.111
AUG	19.49169	24 17	95.F	77.F	0.000				0.000	5134.	9.526
SEP	12.23977	7 17	92.F	75.F	-0.219	12 7	42.F	42.F	-9.002	4154.	8.907
OCT	6.18177	1 17	85.F	68.F	-1.533	20 4	25.F	25.F	-24.443	3565.	7.372
NOV	3.45482	23 15	74.F	61.F	-5.593	3 4	13.F	12.F	-33.737	3133.	7.022
DEC	3.13769	3 15	54.F	45.F	-10.643	13 8	0.F	-1.F	-45.196	3225.	6.253
TOTAL	103.947				-48.163				-51.299	45549.	10.111
MAX											

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 10:53: 0 SDL RUN 1  
 DENVER, CO 80227 RUN #5 DAY INFILTRATION FOR BLDG. #724 FLIGHT SIMULATOR  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR SING-ZN TOPEKA, KS

MONTH	H O U R S				H O U R S				C O I N C I D E N T		C O I N C I D E N T	
	HOURS COOLING LOAD	HOURS HEATING LOAD	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.	HOURS FANS ON CYCLE ON	HOURS NIGHT VENTING	HOURS FLOATING WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)	
JAN	264	480	744	744	744	744	0	0	0	0.000	6.134	
FEB	240	432	672	672	672	672	0	0	0	0.000	6.188	
MAR	289	455	744	744	744	744	0	0	0	0.000	6.446	
APR	476	244	720	720	720	720	0	0	0	0.000	5.584	
MAY	670	74	744	744	744	744	0	0	0	0.000	8.583	
JUN	716	4	720	720	720	720	0	0	0	0.000	8.616	
JUL	744	0	744	744	744	744	0	0	0	0.000	10.111	
AUG	744	0	744	744	744	744	0	0	0	0.000	9.524	
SEP	649	71	720	720	720	720	0	0	0	0.000	8.907	
OCT	495	249	744	744	744	744	0	0	0	0.000	6.961	
NOV	330	390	720	720	720	720	0	0	0	0.000	7.022	
DEC	276	468	744	744	744	744	0	0	0	0.000	6.215	
ANNUAL	5893	2867	8760	8760	8760	8760	0	0	0			

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 10:53:0 SDL RUN 1  
 DENVER, CO 80227 RUN #5 DAY INFILTRATION FOR BLDG. #724 FLIGHT SIMULATOR  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR CRU'S TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	100.38735	15 11	-1.F	-2.F	246.669	0.000				35818.	59.700
FEB	90.95567	3 10	10.F	8.F	241.575	0.000				32679.	61.377
MAR	101.75665	3 7	14.F	12.F	235.055	0.000				36961.	64.123
APR	99.73093	28 15	74.F	67.F	240.717	0.000				37284.	66.665
MAY	104.52082	16 3	61.F	59.F	240.751	0.000				39554.	68.457
JUN	102.29000	16 11	66.F	63.F	223.435	0.000				39226.	66.515
JUL	106.57320	30 6	63.F	60.F	218.749	0.000				41040.	67.627
AUG	106.44633	4 15	92.F	69.F	232.520	0.000				41181.	71.045
SEP	101.72897	15 6	46.F	45.F	225.422	0.000				38578.	68.542
OCT	103.31563	14 13	71.F	64.F	239.604	0.000				38648.	67.038
NOV	98.70152	3 7	19.F	17.F	236.852	0.000				36072.	64.627
DEC	101.00494	14 7	10.F	8.F	240.516	0.000				36148.	61.436
TOTAL	1217.413				246.669	0.000				453192.	71.045
MAX											

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 10:53:0 SDL RUN 1  
 DENVER, CO 80227 RUN #5 DAY INFILTRATION FOR BLDG. #724 FLIGHT SIMULATOR  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR CRU'S TOPEKA, KS

MONTH	H O U R S				H O U R S				H O U R S				C O I N C I D E N T L O A D S			
	HOURS COOLING LOAD	HOURS HEATING LOAD	HOURS COOL-HEAT LOAD	HOURS COINCIDENT LOAD	HOURS FLOATING	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.	HOURS FANS ON	HOURS FANS ON CYCLE	HOURS FANS ON NIGHT	HOURS FLOATING WHEN	HOURS HEATING LOAD AT COOLING PEAK	HOURS COOLING LOAD AT COOLING PEAK	HOURS HEATING LOAD AT COOLING PEAK	HOURS COINCIDENT LOAD AT COOLING PEAK	
JAN	530	0	0	0	214	744	744	530	530	0	0	0.000	0.000	0.000	54.234	
FEB	483	0	0	0	189	672	672	483	483	0	0	0.000	0.000	0.000	54.921	
MAR	546	0	0	0	198	744	744	546	546	0	0	0.000	0.000	0.000	55.087	
APR	538	0	0	0	182	720	720	538	538	0	0	0.000	0.000	0.000	66.665	
MAY	564	0	0	0	180	744	744	564	564	0	0	0.000	0.000	0.000	62.090	
JUN	564	0	0	0	156	720	720	564	564	0	0	0.000	0.000	0.000	63.713	
JUL	595	0	0	0	149	744	744	595	595	0	0	0.000	0.000	0.000	62.725	
AUG	590	0	0	0	154	744	744	590	590	0	0	0.000	0.000	0.000	70.934	
SEP	555	0	0	0	165	720	720	555	555	0	0	0.000	0.000	0.000	59.750	
OCT	554	0	0	0	190	744	744	554	554	0	0	0.000	0.000	0.000	66.094	
NOV	529	0	0	0	191	720	720	529	529	0	0	0.000	0.000	0.000	55.769	
DEC	537	0	0	0	207	744	744	537	537	0	0	0.000	0.000	0.000	54.877	
ANNUAL	6585	0	0	0	2175	8760	8760	6585	6585	0	0	0.000	0.000	0.000		

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOB-2.1D 5/15/1995 10:53:0 PDL RUN 1  
 DENVER, CO 80227 RUN #5 DAY INFILTRATION FOR BLDG. #724 FLIGHT SIMULATOR  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY TOTAL (MBTU) PEAK (KBTU) DY/HR	NATURAL-GAS TOTAL (MBTU) PEAK (KBTU) DY/HR
JAN	176.191 355.618 9/14	176.191 355.618 9/14	25.236 144.009 5/4
FEB	160.430 361.917 26/13	160.430 361.917 26/13	19.659 132.458 2/4
MAR	180.025 368.052 9/14	180.025 368.052 9/14	14.602 88.517 16/4
APR	180.678 381.870 28/15	180.678 381.870 28/15	5.439 40.235 5/7
MAY	198.745 433.701 21/15	198.745 433.701 21/15	1.596 29.360 4/17
JUN	209.839 431.874 29/15	209.839 431.874 29/15	0.013 5.509 2/4
JUL	222.305 439.628 22/15	222.305 439.628 22/15	0.000 0.000 31/1
AUG	220.222 448.766 4/15	220.222 448.766 4/15	0.000 0.000 31/1
SEP	204.083 437.576 7/15	204.083 437.576 7/15	0.421 15.599 12/7
OCT	186.880 423.429 1/14	186.880 423.429 1/14	4.725 78.164 2/2
NOV	172.226 375.416 23/13	172.226 375.416 23/13	11.306 56.835 30/17
DEC	178.672 362.124 28/15	178.672 362.124 28/15	23.058 134.076 13/8
	ONE YEAR USE/PEAK	2290.294 448.766	106.056 144.009

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 10:53: 0 PDL RUN 1  
 DENVER, CO 80227 RUN #5 DAY INFILTRATION FOR BLDG. #724 FLIGHT SIMULATOR  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

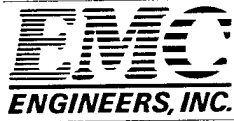
ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
SPACE HEAT	4.94	106.06
SPACE COOL	425.31	0.00
HVAC AUX	506.74	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	160.53	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	1192.66	0.00
TOTAL	2290.18	106.06

TOTAL SITE ENERGY 2396.35 MBTU 182.9 KBTU/SQFT-YR GROSS-AREA 228.1 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 6983.81 MBTU 533.1 KBTU/SQFT-YR GROSS-AREA 664.7 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 46.7  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

**COMPUTER ENERGY SIMULATIONS**

**BLDG. 7485  
BOWLING ALLEY**





DENVER - ATLANTA

PROJECT: FEASIBILITY STUDY FOR  
 INSTALLATION OF UMCS  
 LOCATION: FORT RILEY, KANSAS

EMC NO: 1406-001  
 CALC. BY: AJN  
 CHECKED BY: CEL  
 DATE: 05-Jul-95

BUILDING NO.: 7485  
 BLDG. TYPE: BOWLING ALLEY

**ENERGY CONSTANT CALCULATIONS**

	BASERUN	RUN1	RUN2	RUN3	RUN4	RUN5
HEATING (MBtu)	1369.9	957.6	940.5	1022.0	999.7	585.8
COOLING (kWH)	654,550	571,465	631,975	567,047	650,369	630,161

SUPPLY AIR FAN	27,040 CFM
FLOOR AREA	34,916 FT <sup>2</sup>
CFMI	5408 CFM
UA	7107 BTU/HR-°F
BLDG CONSTR.	2 (1 FOR LIGHT ) (2 FOR HEAVY)

EZDOE COMPUTER RUN DEFINITION:	
BASERUN	EXISTING OPERATION
RUN1	NIGHT SETBACK
RUN2	DDC CONTROL
RUN3	ECONOMIZER
RUN4	NIGHTTIME INFILTRATION (OA)
RUN5	DAYTIME INFILTRATION (OA)

HOURS OF OCCUPANCY				ANNUAL HEATING & COOLING HOURS	
M-F	800	2400	80 HR	HR. ON HEATING	3535 HR/YR
SAT.	600	2400	18 HR	HR. ON COOLING	2149 HR/YR
SUN.	1100	2200	11 HR	HR. OFF HEATING	1913 HR/YR
	TOTAL OCCUPY HR.		109 HR/WK	HR. OFF COOLING	1163 HR/YR
	TOTAL UNOCC. HR.		59 HR/WK		
	ANNUAL OCCUPY HR.		5684 HR/YR		
	ANNUAL UNOCC. HR.		3076 HR/YR		

PRESENT HR. OF OPERATION FOR SYS. WITH HEATING AND COOLING 8760 HR/YR  
 PRESENT HR. OF OPERATION FOR SYS. WITH HEATING ONLY 5448 HR/YR  
 PRESENT HR. OF OPERATION FOR SYS. WITH COOLING ONLY 3312 HR/YR  
 HRS SAVED (HTG ONLY) 5448 - 3535 = 1913 HR/YR  
 HRS SAVED (CLG ONLY) 3312 - 2149 = 1163 HR/YR

HOAUHC	1369.91 MBtu	-	999.7 MBtu	=	2.23E+01 Btu/CFM-HR	
	5408 CFM	x	3076 HR/YR			
HOAUH	1369.91 MBtu	-	999.7 MBtu	=	3.58E+01 Btu/CFM-HR	
	5408 CFM	x	1913 HR/YR			
COAUHC	654,550.2 kWH	-	650,369.2 kWH	=	2.51E-04 kWH/CFM-HR	
	5408 CFM	x	3076 HR/YR			
COAUC	654,550.2 kWH	-	650,369.2 kWH	=	6.65E-04 kWH/CFM-HR	
	5408 CFM	x	1163 HR/YR			
HOAOHC	1369.91 MBtu	-	585.8 MBtu	=	2.55E+01 Btu/CFM-HR	
	5408 CFM	x	5684 HR/YR			
HOAOH	1369.91 MBtu	-	585.8 MBtu	=	4.10E+01 Btu/CFM-HR	
	5408 CFM	x	3535 HR/YR			
COAOHC	654,550.2 kWH	-	630,161.1 kWH	=	7.93E-04 kWH/CFM-HR	
	5408 CFM	x	5684 HR/YR			
COAOC	654,550.2 kWH	-	630,161.1 kWH	=	2.10E-03 kWH/CFM-HR	
	5408 CFM	x	2149 HR/YR			
DC DUTY	1 / 6 (10 MINUTES PER HOUR)			=	0.17	
DC DEMAND	1 / 6 (10 MINUTES PER HOUR)			=	0.17	
ECC	571,465.0 kWH	-	567,046.6 kWH	=	7.60E-05 kWH/CFM-HR	
	27040 CFM	x	2149 HR/YR			
ECHC	571,465.0 kWH	-	567,046.6 kWH	=	2.87E-05 kWH/CFM-HR	
	27040 CFM	x	5684 HR/YR			
NSUCHC	654,550.2 kWH	-	571,465.0 kWH	=	9.99E-04 kWH/CFM-HR	
	27040 CFM	x	3076 HR/YR			
NSUCC	654,550.2 kWH	-	571,465.0 kWH	=	2.64E-03 kWH/CFM-HR	
	27040 CFM	x	1163 HR/YR			
DDCCHC	654,550.2 kWH	-	631,974.8 kWH	=	1.47E-04 kWH/CFM-HR	
	27040 CFM	x	5684 HR/YR			
DDCCC	654,550.2 kWH	-	631,974.8 kWH	=	3.89E-04 kWH/CFM-HR	
	27040 CFM	x	2149 HR/YR			
NSC	1369.91 MBtu	-	957.57 MBtu	=	5.80E+04 Btu/UA	
	7107.36 UA					
DDCH	1369.91 MBtu	-	940.54 MBtu	=	6.04E+04 Btu/UA	
	7107.36 UA					
OPT	( 2 HR/DAY X 240 DAY/YR )		-	175 HR/YR	=	305 HR/YR
CHWR	(1.10 kW X 0.012 Eff. X 664 HRS X 2 Degrees of Reset)				=	17.5 kWH/TON
OAR	567 HR/YR	x	0.01	=	5.67 HR/YR	



INPUT LOADS ..

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$-----$
$ E Z - D O E   L O A D S   I N P U T $
$-----$

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\$ GENERAL PROJECT DATA

```

TITLE  LINE-1 *   EMC      ENGINEERS      INC.      *
LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
LINE-3 *   DENVER,      CO      80227      *

LINE-4 *BASELINE SIMULATION FOR BLDG. 7485      *
LINE-5 *BOWLING ALLEY                          * ..

```

```

ABORT      ERRORS ..
DIAGNOSTIC WARNINGS ..
LOADS-REPORT VERIFICATION=(LV-D)
SUMMARY=(LS-C,LS-D)
HOURLY-DATA-SAVE = YES ..

BUILDING-LOCATION LATITUDE = 39.0
LONGITUDE = 96.5
ALTITUDE = 1065.
TIME-ZONE = 6
GROSS-AREA = 35216
SHIELDING-COEF = 0.29
X-REF = 0.0
Y-REF = 0.0 ..

RUN-PERIOD JAN 1 1994 THRU DEC 31 1994 ..

```

\$ SCHEDULES

```

LD_ON      =DAY-SCHEDULE (1,24) (1.) ..
LD_OFF     =DAY-SCHEDULE (1,24) (0.) ..

LD_LT-M-TR =DAY-SCHEDULE (1,7) (0.)
(8) (0.5)
(9,24) (1.) ..

LD_LT-F&ST =DAY-SCHEDULE (1,2) (1.,0.5)
(3,7) (0.)
(8) (0.5)
(9,24) (1.) ..

LD_LT-SUND =DAY-SCHEDULE (1,10) (0.)
(11) (0.5)
(12,21) (1.)
(22) (0.5)
(23,24) (0.) ..

LD_PE-M-TR =DAY-SCHEDULE (1,7) (0.)
(8) (0.01)

```

(9,16) (0.2)  
 (17) (0.3)  
 (18,21) (0.5)  
 (22,24) (0.3,0.2,0.1) ..

LD\_PE-F&ST =DAY-SCHEDULE (1,2) (0.3,0.1)  
 (3,7) (0.)  
 (8) (0.1)  
 (9,10) (0.2)  
 (11,13) (0.5)  
 (14,16) (0.3)  
 (17) (0.4)  
 (18,19) (0.75)  
 (20,22) (1.)  
 (23,24) (0.75,0.5) ..

LE\_PE-SUND =DAY-SCHEDULE (1,10) (0.)  
 (11) (0.1)  
 (12,17) (0.6)  
 (18,20) (0.75)  
 (21,22) (0.5,0.1)  
 (23,24) (0.) ..

LW\_ON =WEEK-SCHEDULE (ALL) LD\_ON ..

LW\_OFF =WEEK-SCHEDULE (ALL) LD\_OFF ..

LW\_LITES =WEEK-SCHEDULE (MON) LD\_LT-M-TR  
 (TUE) LD\_LT-M-TR  
 (WED) LD\_LT-M-TR  
 (THU) LD\_LT-M-TR  
 (FRI) LD\_LT-F&ST  
 (SAT) LD\_LT-F&ST  
 (SUN) LD\_LT-SUND  
 (HOL) LD\_LT-SUND ..

LW\_PEOPLE =WEEK-SCHEDULE (MON) LD\_PE-M-TR  
 (TUE) LD\_PE-M-TR  
 (WED) LD\_PE-M-TR  
 (THU) LD\_PE-M-TR  
 (FRI) LD\_PE-F&ST  
 (SAT) LD\_PE-F&ST  
 (SUN) LE\_PE-SUND  
 (HOL) LE\_PE-SUND ..

\$ ON 100% OF THE TIME

L\_ON =SCHEDULE THRU DEC 31 LW\_ON ..

\$ OFF 100% OF THE TIME

L\_OFF =SCHEDULE THRU DEC 31 LW\_OFF ..

\$ LIGHTING LOAD

L\_LITES =SCHEDULE THRU DEC 31 LW\_LITES ..

\$ PEOPLE LOAD

L\_PEOPLE =SCHEDULE THRU DEC 31 LW\_PEOPLE ..

\$ CONSTRUCTION TYPES

\$ EXTERIOR WALL ON OLD CONSTRUCTION

WALL-OLD =LAYERS MATERIAL=(BK01,AL21,CB31) I-F-R= 0.6100  
THICKNESS=(0.333,0.000,0.667) ..

EXWALL-O =CONSTRUCTION LAYERS = WALL-OLD  
ABSORPTANCE = 0.880  
ROUGHNESS = 2 ..

FLOOR =CONSTRUCTION U-VALUE = 0.020  
ABSORPTANCE = 0.610  
ROUGHNESS = 5 ..

\$ BUILT-UP ROOF ON OLD CONSTRUCTION

ROOF-OLD =LAYERS MATERIAL=(HF-E2,HF-A3,IN24,HF-A3,AL33,AC02)  
THICKNESS=(0.042,0.005,0.250,0.005,0.000,0.042) ..

OLD-ROOF =CONSTRUCTION LAYERS = ROOF-OLD  
ABSORPTANCE = 0.800  
ROUGHNESS = 1 ..

\$ STANDARD METAL DOOR

DOOR-MET =CONSTRUCTION U-VALUE = 0.020  
ABSORPTANCE = 0.860  
ROUGHNESS = 5 ..

\$ EXTERIOR WALL ON NEW CONSTRUCTION

WALL-NEW =LAYERS MATERIAL=(BK01,IN45,AL21,CB31) I-F-R= 0.6100  
THICKNESS=(0.333,0.167,0.000,0.667) ..

EXWALL-N =CONSTRUCTION LAYERS = WALL-NEW  
ABSORPTANCE = 0.880  
ROUGHNESS = 2 ..

\$ BUILT-UP ROOF ON NEW CONSTRUCTION

ROOF-NEW =LAYERS MATERIAL=(HF-E2,HF-A3,IN05,HF-A3,AL33,AC02)  
THICKNESS=(0.042,0.005,0.807,0.005,0.000,0.042) ..

NEW-ROOF =CONSTRUCTION LAYERS = ROOF-NEW  
ABSORPTANCE = 0.800  
ROUGHNESS = 1 ..

1\_PN\_STD =GLASS-TYPE GLASS-TYPE-CODE = 2  
PANES = 1 ..

\$ SPACE DESCRIPTION

N\_OLD\_SPAC =SPACE AREA = 2256.0 VOLUME = 49632.0  
TEMPERATURE = (73.) ZONE-TYPE = CONDITIONED

PEOPLE-SCHEDULE = L\_PEOPLE PEOPLE-HG-LAT = 870.0  
 PEOPLE-HG-SENS = 580.0 LIGHTING-TYPE = SUS-FLUOR  
 LIGHTING-W/SQFT = 0.5 LIGHT-TO-SPACE = 1.0  
 LIGHTING-SCHEDULE = L\_LITES EQUIP-SCHEDULE = L\_LITES  
 SOURCE-SENSIBLE = 0.0 FURN-WEIGHT = 0.3  
 INF-METHOD = AIR-CHANGE AIR-CHANGES/HR = 0.01  
 INF-SCHEDULE = L\_ON ..

E-W HEIGHT = 22.0 WIDTH = 141.0 CONS = EXWALL-O  
 AZIMUTH = 31 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

DOOR HEIGHT = 7.5 WIDTH = 2.5 CONS = DOOR-MET  
 MULTIPLIER = 2.0 SETBACK = 0.2  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 22.0 WIDTH = 16.0 CONS = EXWALL-O  
 AZIMUTH = 301 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

U-W HEIGHT = 16.0 WIDTH = 141.0 CONS = FLOOR ..

ROOF HEIGHT = 16.0 WIDTH = 141.0 CONS = OLD-ROOF  
 TILT = 0 SKY-FORM-FACTOR = 1.0 ..

CR\_OLD\_SPA =SPACE AREA = 11750.0 VOLUME = 258500.0  
 TEMPERATURE = (73.) ZONE-TYPE = CONDITIONED  
 PEOPLE-SCHEDULE = L\_PEOPLE NUMBER-OF-PEOPLE = 52.5  
 PEOPLE-HG-LAT = 870.0 PEOPLE-HG-SENS = 580.0  
 LIGHTING-TYPE = SUS-FLUOR LIGHTING-W/SQFT = 1.25  
 LIGHT-TO-SPACE = 1.0 LIGHTING-SCHEDULE = L\_LITES  
 EQUIP-SCHEDULE = L\_LITES EQUIPMENT-KW = 2.3  
 SOURCE-SENSIBLE = 0.0 FURN-WEIGHT = 0.3  
 INF-METHOD = AIR-CHANGE AIR-CHANGES/HR = 0.01  
 INF-SCHEDULE = L\_ON ..

U-W HEIGHT = 94.0 WIDTH = 125.0 CONS = FLOOR ..

ROOF HEIGHT = 94.0 WIDTH = 125.0 CONS = OLD-ROOF  
 TILT = 0 SKY-FORM-FACTOR = 1.0 ..

S\_OLD\_SPAC =SPACE AREA = 3762.0 VOLUME = 82764.0  
 TEMPERATURE = (73.) ZONE-TYPE = CONDITIONED  
 PEOPLE-SCHEDULE = L\_PEOPLE NUMBER-OF-PEOPLE = 18.8  
 PEOPLE-HG-LAT = 870.0 PEOPLE-HG-SENS = 580.0  
 LIGHTING-TYPE = SUS-FLUOR LIGHTING-W/SQFT = 1.25  
 LIGHTING-KW = 0.8 LIGHT-TO-SPACE = 1.0  
 LIGHTING-SCHEDULE = L\_LITES  
 EQUIP-SCHEDULE = L\_PEOPLE EQUIPMENT-KW = 3.28  
 SOURCE-SENSIBLE = 0.0 FURN-WEIGHT = 0.3  
 INF-METHOD = AIR-CHANGE AIR-CHANGES/HR = 0.01  
 INF-SCHEDULE = L\_ON ..

E-W HEIGHT = 22.0 WIDTH = 30.0 CONS = EXWALL-O

AZIMUTH = 301 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 22.0 WIDTH = 115.0 CONS = EXWALL-O  
AZIMUTH = 211 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 8.8 WIDTH = 3.3 G-T = 1\_PN\_STD  
MULTIPLIER = 6.0 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

DOOR HEIGHT = 7.5 WIDTH = 2.5 CONS = DOOR-MET  
MULTIPLIER = 2.0 SETBACK = 0.2  
SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

U-W HEIGHT = 30.0 WIDTH = 125.5 CONS = FLOOR ..

ROOF HEIGHT = 30.0 WIDTH = 125.5 CONS = OLD-ROOF  
TILT = 0 SKY-FORM-FACTOR = 1.0 ..

W\_OLD\_SPAC =SPACE AREA = 1504.0 VOLUME = 33088.0  
TEMPERATURE = (73.) ZONE-TYPE = CONDITIONED  
PEOPLE-SCHEDULE = L\_PEOPLE NUMBER-OF-PEOPLE = 3.8  
PEOPLE-HG-LAT = 870.0 PEOPLE-HG-SENS = 580.0  
LIGHTING-TYPE = SUS-FLUOR LIGHTING-W/SQFT = 1.25  
LIGHTING-TO-SPACE = 1.0 LIGHTING-SCHEDULE = L\_LITES  
EQUIP-SCHEDULE = L\_LITES EQUIPMENT-KW = 0.1  
SOURCE-SENSIBLE = 0.0 FURN-WEIGHT = 0.3  
INF-METHOD = AIR-CHANGE AIR-CHANGES/HR = 0.01  
INF-SCHEDULE = L\_ON ..

E-W HEIGHT = 22.0 WIDTH = 94.0 CONS = EXWALL-O  
AZIMUTH = 301 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

U-W HEIGHT = 16.0 WIDTH = 94.0 CONS = FLOOR ..

ROOF HEIGHT = 16.0 WIDTH = 94.0 CONS = OLD-ROOF  
TILT = 0 SKY-FORM-FACTOR = 1.0 ..

N\_NEW\_SPAC =SPACE AREA = 3180.0 VOLUME = 69960.0  
TEMPERATURE = (73.) ZONE-TYPE = CONDITIONED  
PEOPLE-SCHEDULE = L\_PEOPLE PEOPLE-HG-LAT = 870.0  
PEOPLE-HG-SENS = 580.0 LIGHTING-TYPE = SUS-FLUOR  
LIGHTING-W/SQFT = 0.5 LIGHT-TO-SPACE = 1.0  
LIGHTING-SCHEDULE = L\_LITES EQUIP-SCHEDULE = L\_LITES  
SOURCE-SENSIBLE = 0.0 FURN-WEIGHT = 0.3  
INF-METHOD = AIR-CHANGE AIR-CHANGES/HR = 0.01  
INF-SCHEDULE = L\_ON ..

E-W HEIGHT = 22.0 WIDTH = 106.0 CONS = EXWALL-N  
AZIMUTH = 31 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

DOOR HEIGHT = 7.5 WIDTH = 2.5 CONS = DOOR-MET  
MULTIPLIER = 2.0 SETBACK = 0.2  
SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 22.0 WIDTH = 9.0 CONS = EXWALL-N  
AZIMUTH = 301 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 22.0 WIDTH = 30.0 CONS = EXWALL-N  
AZIMUTH = 121 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

U-W HEIGHT = 30.0 WIDTH = 106.0 CONS = FLOOR ..

ROOF HEIGHT = 30.0 WIDTH = 106.0 CONS = NEW-ROOF  
TILT = 0 SKY-FORM-FACTOR = 1.0 ..

CR\_NEW\_SPC =SPACE AREA = 7728.0 VOLUME = 170016.0  
TEMPERATURE = (73.) ZONE-TYPE = CONDITIONED  
PEOPLE-SCHEDULE = L\_PEOPLE NUMBER-OF-PEOPLE = 52.5  
PEOPLE-HG-LAT = 870.0 PEOPLE-HG-SENS = 580.0  
LIGHTING-TYPE = SUS-FLUOR LIGHTING-W/SQFT = 1.25  
LIGHT-TO-SPACE = 1.0 LIGHTING-SCHEDULE = L\_LITES  
EQUIP-SCHEDULE = L\_LITES EQUIPMENT-KW = 1.5  
SOURCE-SENSIBLE = 0.0 FURN-WEIGHT = 0.3  
INF-METHOD = AIR-CHANGE AIR-CHANGES/HR = 0.01  
INF-SCHEDULE = L\_ON ..

U-W HEIGHT = 84.0 WIDTH = 92.0 CONS = FLOOR ..

U-W HEIGHT = 84.0 WIDTH = 92.0 CONS = FLOOR ..

U-W HEIGHT = 84.0 WIDTH = 92.0 CONS = FLOOR ..

ROOF HEIGHT = 84.0 WIDTH = 92.0 CONS = OLD-ROOF  
TILT = 0 SKY-FORM-FACTOR = 1.0 ..

ROOF HEIGHT = 84.0 WIDTH = 92.0 CONS = NEW-ROOF  
TILT = 0 SKY-FORM-FACTOR = 1.0 ..

S\_NEW\_SPAC =SPACE AREA = 2712.0 VOLUME = 59664.0  
TEMPERATURE = (73.) ZONE-TYPE = CONDITIONED  
PEOPLE-SCHEDULE = L\_PEOPLE NUMBER-OF-PEOPLE = 18.8  
PEOPLE-HG-LAT = 870.0 PEOPLE-HG-SENS = 580.0  
LIGHTING-TYPE = SUS-FLUOR LIGHTING-W/SQFT = 1.25  
LIGHT-TO-SPACE = 1.0 LIGHTING-SCHEDULE = L\_LITES  
EQUIP-SCHEDULE = L\_LITES EQUIPMENT-KW = 1.46  
SOURCE-SENSIBLE = 0.0 FURN-WEIGHT = 0.3  
INF-METHOD = AIR-CHANGE AIR-CHANGES/HR = 0.01  
INF-SCHEDULE = L\_ON ..

U-W HEIGHT = 30.0 WIDTH = 84.0 CONS = FLOOR ..

ROOF HEIGHT = 30.0 WIDTH = 84.0 CONS = OLD-ROOF



TILT = 0 SKY-FORM-FACTOR = 1.0 ..

U-W HEIGHT = 30.0 WIDTH = 90.4 CONS = FLOOR ..

ROOF HEIGHT = 30.0 WIDTH = 90.4 CONS = NEW-ROOF  
TILT = 0 SKY-FORM-FACTOR = 1.0 ..

E-W HEIGHT = 22.0 WIDTH = 80.0 CONS = EXWALL-N  
AZIMUTH = 211 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 8.8 WIDTH = 3.3 G-T = 1\_PN\_STD  
MULTIPLIER = 3.0 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 7.0 WIDTH = 11.5 G-T = 1\_PN\_STD  
SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 22.0 WIDTH = 30.0 CONS = EXWALL-N  
AZIMUTH = 121 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

DOOR HEIGHT = 8.8 WIDTH = 3.3 CONS = EXWALL-O  
SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

E\_NEW\_SPAC =SPACE AREA = 2024.0 VOLUME = 44528.0  
TEMPERATURE = (73.) ZONE-TYPE = CONDITIONED  
PEOPLE-SCHEDULE = L\_PEOPLE NUMBER-OF-PEOPLE = 3.8  
PEOPLE-HG-LAT = 870.0 PEOPLE-HG-SENS = 580.0  
LIGHTING-TYPE = SUS-FLUOR LIGHTING-W/SQFT = 1.25  
LIGHT-TO-SPACE = 1.0 LIGHTING-SCHEDULE = L\_LITES  
EQUIP-SCHEDULE = L\_LITES EQUIPMENT-KW = 0.1  
SOURCE-SENSIBLE = 0.0 FURN-WEIGHT = 0.3  
INF-METHOD = AIR-CHANGE AIR-CHANGES/HR = 0.01  
INF-SCHEDULE = L\_ON ..

U-W HEIGHT = 22.0 WIDTH = 92.0 CONS = FLOOR ..

E-W HEIGHT = 22.0 WIDTH = 92.0 CONS = EXWALL-N  
AZIMUTH = 121 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

ROOF HEIGHT = 22.0 WIDTH = 92.0 CONS = NEW-ROOF  
TILT = 0 SKY-FORM-FACTOR = 1.0 ..

ROOF HEIGHT = 22.0 WIDTH = 92.0 CONS = OLD-ROOF  
TILT = 0 SKY-FORM-FACTOR = 1.0 ..

E-W HEIGHT = 22.0 WIDTH = 92.0 CONS = EXWALL-O  
AZIMUTH = 121 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

END ..  
COMPUTE LOADS ..

INPUT SYSTEMS ..

\$-----\$  
\$ E Z - D O E S Y S T E M S I N P U T \$  
\$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
LINE-3 \* DENVER, CO 80227 \*

LINE-4 \*BASELINE SIMULATION FOR BLDG. 7485 \*  
LINE-5 \*BOWLING ALLEY \* ..

ABORT ERRORS ..  
DIAGNOSTIC WARNINGS ..  
SYSTEMS-REPORT VERIFICATION=(SV-A)  
SUMMARY=(SS-A,SS-C,SS-K,SS-O)  
.. HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

SD\_ON =DAY-SCHEDULE (1,24) (1.) ..  
SD\_OFF =DAY-SCHEDULE (1,24) (0.) ..  
SD\_S\_HT\_F =DAY-SCHEDULE (1,24) (71.8) ..  
SD\_S\_CL\_F =DAY-SCHEDULE (1,24) (72.) ..  
SD\_CL\_PIN =DAY-SCHEDULE (1,24) (85.) ..  
SD\_HT\_PIN =DAY-SCHEDULE (1,24) (55.) ..  
SD\_W\_HT\_F =DAY-SCHEDULE (1,24) (74.) ..  
SD\_W\_CL\_F =DAY-SCHEDULE (1,24) (74.2) ..  
SD\_OA% =DAY-SCHEDULE (1,24) (0.2) ..

SW\_ON =WEEK-SCHEDULE (ALL) SD\_ON ..

SW\_OFF =WEEK-SCHEDULE (ALL) SD\_OFF ..

SW\_S\_HT\_F =WEEK-SCHEDULE (ALL) SD\_S\_HT\_F ..

SW\_S\_CL\_F =WEEK-SCHEDULE (ALL) SD\_S\_CL\_F ..

SW\_CL\_PIN =WEEK-SCHEDULE (ALL) SD\_CL\_PIN ..

SW\_HT\_PIN =WEEK-SCHEDULE (ALL) SD\_HT\_PIN ..

SW\_W\_HT\_F =WEEK-SCHEDULE (ALL) SD\_W\_HT\_F ..

SW\_W\_CL\_F =WEEK-SCHEDULE (ALL) SD\_W\_CL\_F ..

SW\_OA% =WEEK-SCHEDULE (ALL) SD\_OA% ..

\$ FULL ON SYSTEM

S\_ON =SCHEDULE THRU DEC 31 SW\_ON ..

## \$ FULL OFF SYSTEM

S\_OFF =SCHEDULE THRU DEC 31 SW\_OFF ..

## \$ HEATING SEASON

S\_HE-SCHED =SCHEDULE THRU MAY 15 SW\_ON  
THRU OCT 1 SW\_OFF  
THRU DEC 31 SW\_ON ..

## \$ COOLING SEASON

S\_CL\_SCHED =SCHEDULE THRU MAY 15 SW\_OFF  
THRU OCT 1 SW\_ON  
THRU DEC 31 SW\_OFF ..

## \$ HEATING SET TEMP

S\_HT\_SET\_F =SCHEDULE THRU MAY 15 SW\_W\_HT\_F  
THRU OCT 1 SW\_S\_HT\_F  
THRU DEC 31 SW\_W\_HT\_F ..

## \$ COOLING SET TEMP

S\_CL\_SET\_F =SCHEDULE THRU MAY 15 SW\_W\_CL\_F  
THRU OCT 15 SW\_S\_CL\_F  
THRU DEC 31 SW\_W\_CL\_F ..

## \$ HEATING SET TEMP =55F

S\_HTIN\_PIN =SCHEDULE THRU DEC 31 SW\_HT\_PIN ..

## \$ COOLING SET TEMP =85F

S\_CLIN\_PIN =SCHEDULE THRU DEC 31 SW\_CL\_PIN ..

S\_HRLY-RPT =SCHEDULE THRU JAN 13 SW\_OFF

THRU JAN 15 SW\_ON

THRU AUG 20 SW\_OFF

THRU AUG 22 SW\_ON

THRU DEC 31 SW\_OFF ..

S\_OA% =SCHEDULE THRU DEC 31 SW\_OA% ..

## \$ ZONE DESCRIPTION

N\_OLD\_SPAC =ZONE DESIGN-HEAT-T = 55.0 DESIGN-COOL-T = 85.0  
HEAT-TEMP-SCH = S\_HTIN\_PIN COOL-TEMP-SCH = S\_CLIN\_PIN  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL ASSIGNED-CFM = 2200.  
SIZING-OPTION = FROM-LOADS  
HEATING-CAPACITY = -82200.0 ..CR\_OLD\_SPA =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..S\_OLD\_SPAC =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F

ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
 SIZING-OPTION = FROM-LOADS ..

W\_OLD\_SPAC =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
 SIZING-OPTION = FROM-LOADS ..

N\_NEW\_SPAC =ZONE DESIGN-HEAT-T = 55.0 DESIGN-COOL-T = 85.0  
 HEAT-TEMP-SCH = S\_HTIN\_PIN COOL-TEMP-SCH = S\_CLIN\_PIN  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL ASSIGNED-CFM = 1630.  
 SIZING-OPTION = FROM-LOADS  
 HEATING-CAPACITY = -54800.0 ..

CR\_NEW\_SPC =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
 SIZING-OPTION = FROM-LOADS ..

S\_NEW\_SPAC =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
 SIZING-OPTION = FROM-LOADS ..

E\_NEW\_SPAC =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
 SIZING-OPTION = FROM-LOADS ..

#### \$ SYSTEM DESCRIPTION

OLD\_SYSTEM =SYSTEM SYSTEM-TYPE = DDS  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_HE-SCHED  
 COOLING-SCHEDULE = S\_CL\_SCHED PREHEAT-T = 0.0  
 OA-CONTROL = FIXED SUPPLY-CFM = 16000.  
 RATED-CFM = 16000. MIN-AIR-SCH = S\_OA%  
 SUPPLY-DELTA-T = 3.4 SUPPLY-KW = 0.00109  
 MOTOR-PLACEMENT = OUTSIDE-AIRFLOW  
 MAX-FAN-RATIO = 1.0 NIGHT-CYCLE-CTRL = STAY-OFF  
 NIGHT-VENT-DT = 0.0 MIN-CFM-RATIO = 1.0  
 COOLING-CAPACITY = 557000. COOL-SH-CAP = 354000.  
 HEATING-CAPACITY = -640000.  
 SIZING-OPTION = COINCIDENT RETURN-AIR-PATH = DIRECT  
 ZONE-NAMES = (CR\_OLD\_SPA, S\_OLD\_SPAC, W\_OLD\_SPAC) ..

NEW\_SYSTEM =SYSTEM SYSTEM-TYPE = VAVS  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_HE-SCHED

```

COOLING-SCHEDULE = S_CL_SCHED  PREHEAT-T = 0.0
COOL-CONTROL = WARMEST  OA-CONTROL = FIXED
SUPPLY-CFM = 10000.  RATED-CFM = 10000.
MIN-AIR-SCH = S_OA%  FAN-CONTROL = CONSTANT-VOLUME
SUPPLY-DELTA-T = 3.4  SUPPLY-KW = 0.00109
MOTOR-PLACEMENT = OUTSIDE-AIRFLOW
MAX-FAN-RATIO = 1.0  NIGHT-CYCLE-CTRL = STAY-OFF
NIGHT-VENT-DT = 0.0  MIN-CFM-RATIO = 1.0
REHEAT-DELTA-T = 65.  COOLING-CAPACITY = 309000.
COOL-SH-CAP = 232000.  COOL-CTRL-RANGE = 2.
HEATING-CAPACITY = -525000.
SIZING-OPTION = COINCIDENT  RETURN-AIR-PATH = DIRECT
ZONE-NAMES = (CR_NEW_SPC, S_NEW_SPAC, E_NEW_SPAC) ..

```

```

UNIT-HEATR =SYSTEM  SYSTEM-TYPE = UHT
MAX-SUPPLY-T = 120.0  HEATING-SCHEDULE = S_HE-SCHED
RATED-CFM = 4050.  FAN-SCHEDULE = S_HE-SCHED
SUPPLY-DELTA-T = 0.2  SUPPLY-KW = 0.00006
NIGHT-CYCLE-CTRL = CYCLE-ON-ANY
HEATING-CAPACITY = -137000.
ZONE-NAMES = (N_OLD_SPAC, N_NEW_SPAC) ..

```

\$ HOURLY REPORT DESCRIPTION

```

BLOCK_#1  =REPORT-BLOCK VARIABLE-TYPE = N_OLD_SPAC
           VARIABLE-LIST = (17,18,7,6) ..
BLOCK_#2  =REPORT-BLOCK VARIABLE-TYPE = S_OLD_SPAC
           VARIABLE-LIST = (17,18,7,6) ..
AHU_DD    =REPORT-BLOCK VARIABLE-TYPE = OLD_SYSTEM
           VARIABLE-LIST = (1,2,3,4,5,6,17) ..
AHU_VAV   =REPORT-BLOCK VARIABLE-TYPE = NEW_SYSTEM
           VARIABLE-LIST = (1,2,3,4,5,6,17) ..
BLOCK_#5  =REPORT-BLOCK VARIABLE-TYPE = N_NEW_SPAC
           VARIABLE-LIST = (17,18,7,6) ..
BLOCK_#6  =REPORT-BLOCK VARIABLE-TYPE = S_NEW_SPAC
           VARIABLE-LIST = (17,18,7,6) ..
OLD_ZONES = HOURLY-REPORT  REPORT-SCHEDULE = S_HRLY-RPT
           REPORT-BLOCK = (BLOCK_#1,BLOCK_#2)
..
NEW_ZONES = HOURLY-REPORT  REPORT-SCHEDULE = S_HRLY-RPT
           REPORT-BLOCK = (BLOCK_#5,BLOCK_#6)
..
DD_RPT    = HOURLY-REPORT  REPORT-SCHEDULE = S_HRLY-RPT
           REPORT-BLOCK = (AHU_DD)
..
VAV_RPT   = HOURLY-REPORT  REPORT-SCHEDULE = S_HRLY-RPT
           REPORT-BLOCK = (AHU_VAV)
..
END ..
COMPUTE SYSTEMS ..

INPUT PLANT ..

```

\$-----\$

\$ E Z - D O E P L A N T S I N P U T \$  
\$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
LINE-3 \* DENVER, CO 80227 \*  
  
LINE-4 \*BASELINE SIMULATION FOR BLDG. 7485 \*  
LINE-5 \*BOWLING ALLEY \* ..

ABORT ERRORS ..  
DIAGNOSTIC WARNINGS ..  
PLANT-REPORT VERIFICATION=(PV-A)  
SUMMARY=(PS-B,BEPS)  
HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

PD\_ON =DAY-SCHEDULE (1,24) (1.) ..  
  
PD\_OFF =DAY-SCHEDULE (1,24) (0.) ..  
  
PW\_ON =WEEK-SCHEDULE (ALL) PD\_ON ..  
  
PW\_OFF =WEEK-SCHEDULE (ALL) PD\_OFF ..

\$ HEATING SEASON

P\_HEAT =SCHEDULE THRU MAY 15 PW\_ON  
THRU OCT 1 PW\_OFF  
THRU DEC 31 PW\_ON ..

\$ COOLING SEASON

P\_COOL =SCHEDULE THRU MAY 15 PW\_OFF  
THRU OCT 1 PW\_ON  
THRU DEC 31 PW\_OFF ..

\$ EQUIPMENT DESCRIPTION

BOILER\_HW =PLANT-EQUIPMENT TYPE = HW-BOILER  
SIZE = -999. ..

CHILLER-CW =PLANT-EQUIPMENT TYPE = HERM-REC-CHLR  
SIZE = -999. INSTALLED-NUMBER = 3  
MAX-NUMBER-AVAIL = 3 ..

PLANT-PARAMETERS BOILER-FUEL = NATURAL-GAS HERM-REC-COND-TYPE = AIR  
CCIRC-HEAD = 0.0 HCIRC-HEAD = 30.0  
HCIRC-DESIGN-T-DROP = 20.0 ..

ENERGY-RESOURCE RESOURCE = ELECTRICITY ..  
ENERGY-RESOURCE RESOURCE = NATURAL-GAS ..

HEATIN-SCH =LOAD-ASSIGNMENT TYPE = HEATING  
OPERATION-MODE = RUN-NEEDED

LOAD-RANGE = 0.000  
PLANT-EQUIPMENT = BOILER\_HW  
NUMBER = 1 ..

COOLIN-SCH =LOAD-ASSIGNMENT TYPE = COOLING  
OPERATION-MODE = RUN-NEEDED

LOAD-RANGE = 0.000  
PLANT-EQUIPMENT = CHILLER-CW  
NUMBER = 3 ..

END ..  
COMPUTE PLANT ..  
STOP ..

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/22/1995 9: 1:13 LDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. 7485 BOWLING ALLEY  
 REPORT- LV-D DETAILS OF EXTERIOR SURFACES IN THE PROJECT TOPEKA, KS

NUMBER OF EXTERIOR SURFACES 23 RECTANGULAR 23 OTHER 0  
 (U-VALUE INCLUDES INSIDE AIR FILM PLUS OUTSIDE AIR FILM AT 7.5 MPH WINDSPEED )

SURFACE	SPACE	U-VALUE (BTU/HR-SQFT-F)	AREA (SQFT)	U-VALUE (BTU/HR-SQFT-F)	AREA (SQFT)	U-VALUE (BTU/HR-SQFT-F)	AREA (SQFT)	W A L L + G L A S S - U-VALUE (BTU/HR-SQFT-F)	AREA (SQFT)	AZIMUTH
N_OLD_SPAC		0.000	0.00	0.236	3102.00	0.236	3102.00	0.236	3102.00	NORTH
N_NEW_SPAC		0.000	0.00	0.060	2332.00	0.060	2332.00	0.060	2332.00	NORTH
S_NEW_SPAC		0.000	0.00	0.060	660.00	0.060	660.00	0.060	660.00	EAST
E_NEW_SPAC		0.000	0.00	0.060	660.00	0.060	660.00	0.060	660.00	EAST
E_NEW_SPAC		0.000	0.00	0.060	2024.00	0.060	2024.00	0.060	2024.00	EAST
S_NEW_SPAC		1.021	167.62	0.236	2024.00	0.236	2024.00	0.151	1760.00	SOUTH
S_OLD_SPAC		1.021	174.24	0.236	2355.76	0.290	2530.00	0.290	2530.00	SOUTH
S_OLD_SPAC		0.000	0.00	0.236	660.00	0.236	2068.00	0.236	2068.00	WEST
S_OLD_SPAC		0.000	0.00	0.236	660.00	0.236	660.00	0.236	660.00	WEST
N_NEW_SPAC		0.000	0.00	0.060	198.00	0.060	198.00	0.060	198.00	WEST
N_OLD_SPAC		0.000	0.00	0.236	352.00	0.236	352.00	0.236	352.00	WEST
N_NEW_SPAC		0.000	0.00	0.028	3180.00	0.028	3180.00	0.028	3180.00	ROOF
CR_NEW_SPC		0.000	0.00	0.074	7728.00	0.074	7728.00	0.074	7728.00	ROOF
CR_NEW_SPC		0.000	0.00	0.028	7728.00	0.028	7728.00	0.028	7728.00	ROOF
S_NEW_SPAC		0.000	0.00	0.074	2520.00	0.074	2520.00	0.074	2520.00	ROOF
S_NEW_SPAC		0.000	0.00	0.028	2712.00	0.028	2712.00	0.028	2712.00	ROOF
W_OLD_SPAC		0.000	0.00	0.074	1504.00	0.074	1504.00	0.074	1504.00	ROOF
CR_OLD_SPA		0.000	0.00	0.074	11750.00	0.074	11750.00	0.074	11750.00	ROOF
S_OLD_SPAC		0.000	0.00	0.074	3765.00	0.074	3765.00	0.074	3765.00	ROOF
E_NEW_SPAC		0.000	0.00	0.028	2024.00	0.028	2024.00	0.028	2024.00	ROOF
E_NEW_SPAC		0.000	0.00	0.074	2024.00	0.074	2024.00	0.074	2024.00	ROOF

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/22/1995 9: 1:13 LDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. 7485 BOWLING ALLEY  
 REPORT- LV-D DETAILS OF EXTERIOR SURFACES IN THE PROJECT TOPEKA, KS

SURFACE	SPACE	U-VALUE (BTU/HR-SQFT-F)	AREA (SQFT)	U-VALUE (BTU/HR-SQFT-F)	AREA (SQFT)	U-VALUE (BTU/HR-SQFT-F)	AREA (SQFT)	W A L L + G L A S S - U-VALUE (BTU/HR-SQFT-F)	AREA (SQFT)	AZIMUTH
N_OLD_SPAC		0.000	0.00	0.074	2256.00	0.074	2256.00	0.074	2256.00	ROOF
N_OLD_SPAC		0.000	0.00	0.020	2256.00	0.020	2256.00	0.020	2256.00	UNDERGRND
CR_OLD_SPA		0.000	0.00	0.020	11750.00	0.020	11750.00	0.020	11750.00	UNDERGRND
S_OLD_SPAC		0.000	0.00	0.020	3765.00	0.020	3765.00	0.020	3765.00	UNDERGRND
W_OLD_SPAC		0.000	0.00	0.020	1504.00	0.020	1504.00	0.020	1504.00	UNDERGRND
N_NEW_SPAC		0.000	0.00	0.020	3180.00	0.020	3180.00	0.020	3180.00	UNDERGRND
CR_NEW_SPC		0.000	0.00	0.020	7728.00	0.020	7728.00	0.020	7728.00	UNDERGRND
CR_NEW_SPC		0.000	0.00	0.020	7728.00	0.020	7728.00	0.020	7728.00	UNDERGRND
S_NEW_SPAC		0.000	0.00	0.020	2520.00	0.020	2520.00	0.020	2520.00	UNDERGRND
S_NEW_SPAC		0.000	0.00	0.020	2712.00	0.020	2712.00	0.020	2712.00	UNDERGRND
E_NEW_SPAC		0.000	0.00	0.020	2024.00	0.020	2024.00	0.020	2024.00	UNDERGRND



EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/22/1995 9: 1:13 LDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. 7485 BOWLING ALLEY TOPEKA, KS  
 REPORT- LV-D DETAILS OF EXTERIOR SURFACES IN THE PROJECT

	AVERAGE U-VALUE/GLASS (BTU/HR-SQFT-F)	AVERAGE U-VALUE/WALLS (BTU/HR-SQFT-F)	AVERAGE U-VALUE WALLS+GLASS (BTU/HR-SQFT-F)	GLASS AREA (SQFT)	OPAQUE AREA (SQFT)	GLASS+OPAQUE AREA (SQFT)
NORTH	0.000	0.160	0.160	0.00	5434.00	5434.00
EAST	0.000	0.126	0.126	0.00	5368.00	5368.00
SOUTH	1.021	0.165	0.233	341.86	3948.14	4290.00
WEST	0.000	0.225	0.225	0.00	3278.00	3278.00
ROOF	0.000	0.059	0.059	0.00	47191.00	47191.00
ALL WALLS	1.021	0.163	0.179	341.86	18028.14	18370.00
ALL WALLS+ROOFS	1.021	0.088	0.092	341.86	65219.14	65561.00
UNDERGRND	0.000	0.020	0.020	0.00	52895.00	52895.00
BUILDING	1.021	0.057	0.060	341.86	118114.14	118456.00

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/22/1995 9: 1:13 LDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. 7485 BOWLING ALLEY TOPEKA, KS  
 REPORT- LS-C BUILDING PEAK LOAD COMPONENTS

\*\*\* BUILDING \*\*\*

FLOOR AREA 34916 SQFT 3244 SQMT  
 VOLUME 768152 CUFT 21754 CUMT

COOLING LOAD  
 JUL 23 8PM  
 91F 33C  
 77F 25C

	SENSIBLE (KBTU/H)	( KW )	LATENT (KBTU/H)	( KW )	HEATING LOAD	JAN 15 7AM	( KW )
WALLS	57.468	16.831	0.000	0.000	-224.260	-7F	-65.680
ROOFS	104.978	30.745	0.000	0.000	-237.339	-22C	-69.511
GLASS CONDUCTION	5.365	1.571	0.000	0.000	-24.792	-8F	-7.261
GLASS SOLAR	19.927	5.836	0.000	0.000	0.878		0.257
DOOR	0.188	0.055	0.000	0.000	-0.747		-0.219
INTERNAL SURFACES	0.000	0.000	0.000	0.000	0.000		0.000
UNDERGROUND SURFACES	-9.497	-2.781	0.000	0.000	-30.373		-8.896
OCCUPANTS TO SPACE	96.973	28.401	177.967	52.122	11.021		3.228
LIGHT TO SPACE	130.067	38.093	0.000	0.000	33.017		9.670
EQUIPMENT TO SPACE	27.077	7.930	0.000	0.000	4.071		1.192
PROCESS TO SPACE	0.000	0.000	0.000	0.000	0.000		0.000
INFILTRATION	2.439	0.714	5.016	1.469	-1.246		-0.365
TOTAL	434.985	127.396	182.983	53.591	-469.771		-137.584
TOTAL LOAD	617.968	KBTU/H	180.987	KW	-137.584		KW
TOTAL LOAD / AREA	17.70BTU/H.SQFT	55.795	W /SQMT	13.454BTU/H.SQFT	42.414		W /SQMT

\*\*\*\*\*  
 \* NOTE 1) THE ABOVE LOADS EXCLUDE OUTSIDE VENTILATION AIR \*  
 \* --- LOADS \*  
 \* 2) TIMES GIVEN IN STANDARD TIME FOR THE LOCATION \*  
 \* IN CONSIDERATION \*  
 \*\*\*\*\*

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/22/1995 9: 1:13 SDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. 7485 BOWLING ALLEY  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR OLD\_SYSTEM TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C			
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC-TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-131.179	15	-7. F	-8. F	25782.	-431.251	25782.	45.178
FEB	0.00000				-92.958	3	-5. F	-6. F	23218.	-397.991	23218.	45.178
MAR	0.00000				-63.926	3	14. F	12. F	25857.	-298.153	25857.	45.178
APR	0.00000				-11.263	5	30. F	27. F	25125.	-190.202	25125.	45.178
MAY	59.01812	16	62. F	59. F	-0.884	5	44. F	40. F	25601.	-34.729	25601.	45.178
JUN	144.31564	24	83. F	74. F	0.000				25020.	0.000	25020.	45.178
JUL	188.20775	17	88. F	80. F	0.000				25707.	0.000	25707.	45.178
AUG	180.61736	20	90. F	75. F	0.000				25857.	0.000	25857.	45.178
SEP	99.56862	5	90. F	77. F	0.000				24945.	0.000	24945.	45.178
OCT	2.60230	1	83. F	68. F	-6.672	20	23. F	23. F	25654.	-198.304	25654.	45.178
NOV	0.00000				-47.621	3	13. F	12. F	24711.	-287.183	24711.	45.178
DEC	0.00000				-111.398	13	2. F	1. F	25835.	-370.444	25835.	45.178
TOTAL	674.330				-465.898				303316.	-431.251	303316.	45.178
MAX												

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/22/1995 9: 1:13 SDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. 7485 BOWLING ALLEY  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR OLD\_SYSTEM TOPEKA, KS

MONTH	HOURS OF				HOURS				COINCIDENT LOADS			
	COOLING LOAD	HEATING LOAD	COOL-HEAT LOAD	FLOATING	HEATING AVAIL.	COOLING AVAIL.	FANS ON	FANS ON	HEATING LOAD AT PEAK (KBTU/HR)	COOLING LOAD AT PEAK (KBTU/HR)	HEATING LOAD AT PEAK (KBTU/HR)	ELECTRIC LOAD AT PEAK (KW)
JAN	0	744	0	0	0	0	744	0	-100.252	0	42.228	42.228
FEB	0	672	0	0	0	0	672	0	-95.981	0	42.228	42.228
MAR	0	744	0	0	0	0	744	0	-98.376	0	42.228	42.228
APR	0	720	0	0	0	0	720	0	-4.695	0	17.440	17.440
MAY	371	360	0	13	384	0	744	0	0.000	13	0.000	45.178
JUN	709	0	0	11	720	0	720	0	0.000	11	0.000	44.359
JUL	744	0	0	0	744	0	744	0	0.000	0	0.000	45.178
AUG	742	0	0	2	744	0	744	0	0.000	2	0.000	44.359
SEP	567	0	0	153	720	0	744	0	0.000	153	0.000	44.359
OCT	16	720	0	8	24	0	744	0	0.000	8	0.000	42.228
NOV	0	720	0	0	0	0	720	0	0.000	0	0.000	42.228
DEC	0	744	0	0	0	0	744	0	-144.346	0	43.539	43.539
ANNUAL	3149	5424	0	187	3336	0	8760	0	-132.184	0	187	187

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/22/1995 9: 1:13 SDL RUN 1										
DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. 7485 BOWLING ALLEY										
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR NEW_SYSTEM TOPEKA, KS										
C O O L I N G										
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)
JAN	0.00000				0.000	-101.232	15	-7.F	-8.F	-326.302
FEB	0.00000				0.000	-74.024	3	-5.F	-6.F	-300.528
MAR	0.00000				0.000	-53.465	3	14.F	12.F	-230.062
APR	0.00000				0.000	-11.126	5	30.F	27.F	-156.843
MAY	43.52706	30	20	82.F	75.F	-0.982	5	44.F	40.F	-36.412
JUN	109.22501	24	20	83.F	74.F	0.000				0.000
JUL	141.67694	17	18	88.F	80.F	0.000				0.000
AUG	138.15678	20	21	87.F	75.F	0.000				0.000
SEP	80.76028	5	18	90.F	77.F	0.000				0.000
OCT	2.27719	1	18	83.F	68.F	-5.533	20	23.F	23.F	-156.662
NOV	0.00000				0.000	-37.089	3	13.F	12.F	-216.867
DEC	0.00000				0.000	-85.732	13	2.F	1.F	-277.992
TOTAL	515.623				327.144	-369.184				-326.302
MAX										

H19-20

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/22/1995 9: 1:13 SDL RUN 1										
DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. 7485 BOWLING ALLEY										
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR NEW_SYSTEM TOPEKA, KS										
H O U R S										
MONTH	HOURS COOLING LOAD	HOURS HEATING LOAD	HOURS COINCIDENT COOL-HEAT LOAD	HOURS FLOATING	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.	HOURS FANS ON	HOURS NIGHT VENTING	HOURS FLOATING WHEN FANS ON	COINCIDENT HEATING LOAD AT COOLING PEAK (KBTU/HR)
JAN	0	0	0	0	744	0	744	0	0	-80.423
FEB	0	0	0	0	672	0	672	0	0	-81.837
MAR	0	0	0	12	744	0	744	0	12	-85.213
APR	0	0	0	230	720	0	720	0	230	-2.983
MAY	361	198	0	185	360	384	744	0	185	0.000
JUN	706	0	0	14	0	720	720	0	14	0.000
JUL	744	0	0	0	0	744	744	0	0	0.000
AUG	742	0	0	2	0	744	744	0	2	0.000
SEP	649	0	0	71	0	720	720	0	71	0.000
OCT	18	464	0	262	24	744	744	0	262	0.000
NOV	0	637	0	83	720	0	720	0	83	-109.433
DEC	0	744	0	0	744	0	744	0	0	-102.705
ANNUAL	3220	4681	0	859	5424	3336	8760	0	859	

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/22/1995 9: 1:13 SDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. 7485 BOWLING ALLEY  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR UNIT-HEATR TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C			
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	ELEC- TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC- TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-19.801	15	-7.F	-8.F	1384.	-68.725	1384.	2.823
FEB	0.00000				-13.271	3	-5.F	-6.F	1235.	-58.491	1235.	2.807
MAR	0.00000				-7.753	4	14.F	12.F	1375.	-38.918	1375.	2.773
APR	0.00000				-0.717	1	54.F	50.F	1327.	-18.313	1327.	2.741
MAY	0.00000				0.000				1333.	0.000	1333.	2.717
JUN	0.00000				0.000				1318.	0.000	1318.	2.717
JUL	0.00000				0.000				1341.	0.000	1341.	2.717
AUG	0.00000				0.000				1363.	0.000	1363.	2.717
SEP	0.00000				0.000				1307.	0.000	1307.	2.717
OCT	0.00000				-0.404	20	23.F	22.F	1337.	-17.871	1337.	2.745
NOV	0.00000				-6.088	3	19.F	17.F	1294.	-34.461	1294.	2.769
DEC	0.00000				-16.079	15	11.F	9.F	1382.	-59.484	1382.	2.804
TOTAL	0.000				-64.113				15995.	-68.725	15995.	2.823
MAX												

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/22/1995 9: 1:13 SDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. 7485 BOWLING ALLEY  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR UNIT-HEATR TOPEKA, KS

MONTH	H O U R S				H O U R S				C O I N C I D E N T				L O A D S			
	HOURS COOLING LOAD	HOURS HEATING LOAD	HOURS FLOATING	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.	HOURS FANS ON	HOURS NIGHT VENTING	HOURS FANS ON	HOURS HEATING LOAD AT PEAK	HOURS COOLING LOAD AT PEAK	HOURS FLOATING WHEN FANS ON	HEATING LOAD AT PEAK (KBTU/HR)	ELECTRIC LOAD AT PEAK (KW)	HEATING LOAD AT PEAK (KBTU/HR)	COOLING LOAD AT PEAK (KBTU/HR)	ELECTRIC LOAD AT PEAK (KW)
JAN	0	740	4	744	0	744	0	0	0	4	-15.695	2.743	-15.695	2.743	4	
FEB	0	663	9	672	0	672	0	0	0	9	-13.177	2.738	-13.177	2.738	9	
MAR	0	546	198	744	0	744	0	0	0	198	-12.723	2.738	-12.723	2.738	198	
APR	0	95	625	720	0	720	0	0	0	625	0.000	2.717	0.000	2.717	625	
MAY	0	0	744	360	0	744	0	0	0	744	0.000	0.000	0.000	0.000	744	
JUN	0	0	720	0	0	720	0	0	0	720	0.000	0.000	0.000	0.000	720	
JUL	0	0	744	0	0	744	0	0	0	744	0.000	0.000	0.000	0.000	744	
AUG	0	0	744	0	0	744	0	0	0	744	0.000	0.000	0.000	0.000	744	
SEP	0	0	720	0	0	720	0	0	0	720	0.000	0.000	0.000	0.000	720	
OCT	0	41	703	720	0	744	0	0	0	703	0.000	2.717	0.000	2.717	703	
NOV	0	430	290	720	0	744	0	0	0	290	-0.339	2.751	-0.339	2.751	290	
DEC	0	737	7	744	0	744	0	0	0	7	-20.660	2.751	-20.660	2.751	7	
ANNUAL	0	3252	5508	5424	0	8760	0	0	0	3336					5508	

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/22/1995 9: 1:13 PDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. 7485 BOWLING ALLEY  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY 166.035 285.215 15/20	NATURAL-GAS 363.651 1040.591 15/ 7
JAN	TOTAL (MBTU) PEAK (KBTU) DY/HR	149.055 285.085 4/20	271.667 967.456 3/ 7
FEB	TOTAL (MBTU) PEAK (KBTU) DY/HR	162.527 284.090 5/22	195.387 755.268 4/ 7
MAR	TOTAL (MBTU) PEAK (KBTU) DY/HR	152.063 276.110 5/ 9	44.129 530.174 5/ 7
APR	TOTAL (MBTU) PEAK (KBTU) DY/HR	184.288 486.408 31/18	6.693 126.377 5/ 7
MAY	TOTAL (MBTU) PEAK (KBTU) DY/HR	228.216 485.616 28/18	0.000 0.000 30/ 1
JUN	TOTAL (MBTU) PEAK (KBTU) DY/HR	254.864 527.286 23/18	0.000 0.000 31/ 1
JUL	TOTAL (MBTU) PEAK (KBTU) DY/HR	256.955 513.824 21/19	0.000 0.000 31/ 1
AUG	TOTAL (MBTU) PEAK (KBTU) DY/HR	204.836 498.186 5/18	0.000 0.000 30/ 1
SEP	TOTAL (MBTU) PEAK (KBTU) DY/HR	155.758 411.121 1/18	27.486 540.833 20/ 7
OCT	TOTAL (MBTU) PEAK (KBTU) DY/HR	153.740 279.499 12/11	145.535 728.493 3/ 6
NOV	TOTAL (MBTU) PEAK (KBTU) DY/HR	165.597 285.127 9/20	315.362 911.539 13/ 7
DEC	TOTAL (MBTU) PEAK (KBTU) DY/HR		
	ONE YEAR USE/PEAK	2233.934 527.286	1369.911 1040.591

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/22/1995 9: 1:13 PDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. 7485 BOWLING ALLEY  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE	ELECTRICITY	NATURAL-GAS
IN SITE MBTU -		
CATEGORY OF USE		
SPACE HEAT	53.06	1369.91
SPACE COOL	380.06	0.00
HVAC AUX	860.55	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	805.77	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	134.53	0.00
TOTAL	2233.98	1369.91

TOTAL SITE ENERGY 3603.84 MBTU 102.3 KBTU/SQFT-YR GROSS-AREA 103.2 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 8078.42 MBTU 229.4 KBTU/SQFT-YR GROSS-AREA 231.4 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 41.8  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.





INPUT SYSTEMS ..

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$-----$
$ E Z - D O E   S Y S T E M S   I N P U T $
$-----$

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\$ GENERAL PROJECT DATA

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TITLE  LINE-1 *      EMC      ENGINEERS      INC.      *
LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
LINE-3 *      DENVER,      CO      80227      *

LINE-4 *RUN #1 NIGHT SETBACK FOR BLDG. 7485 *
LINE-5 *BOWLING ALLEY * ..

ABORT      ERRORS ..
DIAGNOSTIC WARNINGS ..
SYSTEMS-REPORT VERIFICATION=(SV-A)
SUMMARY=(SS-A,SS-C,SS-K,SS-O)
HOURLY-DATA-SAVE = YES ..

```

\$ SCHEDULES

```

SD_ON      =DAY-SCHEDULE (1,24) (1.) ..
SD_OFF     =DAY-SCHEDULE (1,24) (0.) ..
SD_S_HT_SR =DAY-SCHEDULE (1,7) (84.8)
              (8,24) (71.8) ..
SD_S_CL_SR =DAY-SCHEDULE (1,7) (85.)
              (8,24) (72.) ..
SD_CL_PIN  =DAY-SCHEDULE (1,24) (85.) ..
SD_HT_PIN  =DAY-SCHEDULE (1,24) (55.) ..
SD_W_HT_SR =DAY-SCHEDULE (1,7) (55.)
              (8,24) (74.) ..
SD_W_CL_SR =DAY-SCHEDULE (1,7) (55.2)
              (8,24) (74.2) ..
SD_S_HT_FS =DAY-SCHEDULE (1,2) (71.8)
              (3,7) (84.8)
              (8,24) (71.8) ..
SD_S_CL_FS =DAY-SCHEDULE (1,2) (72.)
              (3,7) (85.)
              (8,24) (72.) ..
SD_W_HT_FS =DAY-SCHEDULE (1,2) (74.)
              (3,7) (55.)
              (8,24) (74.) ..
SD_W_CL_FS =DAY-SCHEDULE (1,2) (74.2)
              (3,7) (55.2)
              (8,24) (74.2) ..
SD_FAN_SR  =DAY-SCHEDULE (1,7) (0.)
              (8,24) (1.) ..
SD_FAN_FS  =DAY-SCHEDULE (1,2) (1.)
              (3,7) (0.)
              (8,24) (1.) ..

SW_ON      =WEEK-SCHEDULE (ALL) SD_ON ..

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SW_OFF      =WEEK-SCHEDULE (ALL) SD_OFF  ..

SW_S_HT_F   =WEEK-SCHEDULE (MON) SD_S_HT_SR
              (TUE) SD_S_HT_SR
              (WED) SD_S_HT_SR
              (THU) SD_S_HT_SR
              (FRI) SD_S_HT_FS
              (SAT) SD_S_HT_FS
              (SUN) SD_S_HT_SR
              (HOL) SD_S_HT_SR ..

SW_S_CL_F   =WEEK-SCHEDULE (MON) SD_S_CL_SR
              (TUE) SD_S_CL_SR
              (WED) SD_S_CL_SR
              (THU) SD_S_CL_SR
              (FRI) SD_S_CL_FS
              (SAT) SD_S_CL_FS
              (SUN) SD_S_CL_SR
              (HOL) SD_S_CL_SR ..

SW_CL_PIN   =WEEK-SCHEDULE (ALL) SD_CL_PIN ..

SW_HT_PIN   =WEEK-SCHEDULE (ALL) SD_HT_PIN ..

SW_W_HT_F   =WEEK-SCHEDULE (MON) SD_W_HT_SR
              (TUE) SD_W_HT_SR
              (WED) SD_W_HT_SR
              (THU) SD_W_HT_SR
              (FRI) SD_W_HT_FS
              (SAT) SD_W_HT_FS
              (SUN) SD_W_HT_SR
              (HOL) SD_W_HT_SR ..

SW_W_CL_F   =WEEK-SCHEDULE (MON) SD_W_CL_SR
              (TUE) SD_W_CL_SR
              (WED) SD_W_CL_SR
              (THU) SD_W_CL_SR
              (FRI) SD_W_CL_FS
              (SAT) SD_W_CL_FS
              (SUN) SD_W_CL_SR
              (HOL) SD_W_CL_SR ..

SW_FAN_CYC =WEEK-SCHEDULE (MON) SD_FAN_SR
              (TUE) SD_FAN_SR
              (WED) SD_FAN_SR
              (THU) SD_FAN_SR
              (FRI) SD_FAN_FS
              (SAT) SD_FAN_FS
              (SUN) SD_FAN_SR
              (HOL) SD_FAN_SR ..

```

\$ FULL ON SYSTEM

S\_ON =SCHEDULE THRU DEC 31 SW\_ON ..

\$ FULL OFF SYSTEM

S\_OFF =SCHEDULE THRU DEC 31 SW\_OFF ..

\$ HEATING SEASON

S\_HE-SCHED =SCHEDULE THRU MAY 15 SW\_ON  
 THRU OCT 1 SW\_OFF  
 THRU DEC 31 SW\_ON ..

\$ COOLING SEASON

S\_CL\_SCHED =SCHEDULE THRU MAY 15 SW\_OFF  
 THRU OCT 1 SW\_ON  
 THRU DEC 31 SW\_OFF ..

\$ HEATING SET TEMP

S\_HT\_SET\_F =SCHEDULE THRU MAY 15 SW\_W\_HT\_F  
 THRU OCT 1 SW\_S\_HT\_F  
 THRU DEC 31 SW\_W\_HT\_F ..

\$ COOLING SET TEMP

S\_CL\_SET\_F =SCHEDULE THRU MAY 15 SW\_W\_CL\_F  
 THRU OCT 15 SW\_S\_CL\_F  
 THRU DEC 31 SW\_W\_CL\_F ..

\$ HEATING SET TEMP =55F

S\_HTIN\_PIN =SCHEDULE THRU DEC 31 SW\_HT\_PIN ..

\$ COOLING SET TEMP =85F

S\_CLIN\_PIN =SCHEDULE THRU DEC 31 SW\_CL\_PIN ..

S\_HRLY-RPT =SCHEDULE THRU JAN 14 SW\_OFF

THRU JAN 16 SW\_ON  
 THRU AUG 19 SW\_OFF  
 THRU AUG 21 SW\_ON  
 THRU DEC 31 SW\_OFF ..

S\_FAN\_CYCL =SCHEDULE THRU DEC 31 SW\_FAN\_CYC ..

\$ ZONE DESCRIPTION

N\_OLD\_SPAC =ZONE DESIGN-HEAT-T = 55.0 DESIGN-COOL-T = 85.0  
 HEAT-TEMP-SCH = S\_HTIN\_PIN COOL-TEMP-SCH = S\_CLIN\_PIN  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL ASSIGNED-CFM = 2200.  
 SIZING-OPTION = FROM-LOADS  
 HEATING-CAPACITY = -82200.0 ..

CR\_OLD\_SPA =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
 SIZING-OPTION = FROM-LOADS ..

S\_OLD\_SPAC =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED

THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

W\_OLD\_SPAC =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

N\_NEW\_SPAC =ZONE DESIGN-HEAT-T = 55.0 DESIGN-COOL-T = 85.0  
HEAT-TEMP-SCH = S\_HTIN\_PIN COOL-TEMP-SCH = S\_CLIN\_PIN  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL ASSIGNED-CFM = 1630.  
SIZING-OPTION = FROM-LOADS  
HEATING-CAPACITY = -54800.0 ..

CR\_NEW\_SPC =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

S\_NEW\_SPAC =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

E\_NEW\_SPAC =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

#### \$ SYSTEM DESCRIPTION

OLD\_SYSTEM =SYSTEM SYSTEM-TYPE = DDS  
MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
HEATING-SCHEDULE = S\_HE-SCHED  
COOLING-SCHEDULE = S\_CL\_SCHED PREHEAT-T = 0.0  
OA-CONTROL = FIXED SUPPLY-CFM = 16000.  
RATED-CFM = 16000. MIN-OUTSIDE-AIR = 0.2  
MAX-OA-FRACTION = 0.2 FAN-SCHEDULE = S\_FAN\_CYCL  
SUPPLY-DELTA-T = 3.4 SUPPLY-KW = 0.00109  
MOTOR-PLACEMENT = OUTSIDE-AIRFLOW  
MAX-FAN-RATIO = 1.0 NIGHT-CYCLE-CTRL = STAY-OFF  
NIGHT-VENT-DT = 0.0 MIN-CFM-RATIO = 1.0  
COOLING-CAPACITY = 557000. COOL-SH-CAP = 354000.  
HEATING-CAPACITY = -640000.  
SIZING-OPTION = COINCIDENT RETURN-AIR-PATH = DIRECT  
ZONE-NAMES = (CR\_OLD\_SPA, S\_OLD\_SPAC, W\_OLD\_SPAC) ..

NEW\_SYSTEM =SYSTEM SYSTEM-TYPE = VAVS  
MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
HEATING-SCHEDULE = S\_HE-SCHED

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COOLING-SCHEDULE = S_CL_SCHED  PREHEAT-T = 0.0
COOL-CONTROL = WARMEST  OA-CONTROL = FIXED
SUPPLY-CFM = 10000.  RATED-CFM = 10000.
MIN-OUTSIDE-AIR = 0.2  MAX-OA-FRACTION = 0.2
FAN-SCHEDULE = S_FAN_CYCL
FAN-CONTROL = CONSTANT-VOLUME  SUPPLY-DELTA-T = 3.4
SUPPLY-KW = 0.00109
MOTOR-PLACEMENT = OUTSIDE-AIRFLOW
MAX-FAN-RATIO = 1.0  NIGHT-CYCLE-CTRL = STAY-OFF ←
NIGHT-VENT-DT = 0.0  MIN-CFM-RATIO = 1.0
REHEAT-DELTA-T = 65.  COOLING-CAPACITY = 309000.
COOL-SH-CAP = 232000.  COOL-CTRL-RANGE = 2.
HEATING-CAPACITY = -525000.
SIZING-OPTION = COINCIDENT  RETURN-AIR-PATH = DIRECT
ZONE-NAMES = (CR_NEW_SPC, S_NEW_SPAC, E_NEW_SPAC) ..

```

```

UNIT-HEATR =SYSTEM  SYSTEM-TYPE = UHT
MAX-SUPPLY-T = 120.0  HEATING-SCHEDULE = S_HE-SCHED
RATED-CFM = 4050.  FAN-SCHEDULE = S_HE-SCHED
SUPPLY-DELTA-T = 0.2  SUPPLY-KW = 0.00006
NIGHT-CYCLE-CTRL = CYCLE-ON-ANY
HEATING-CAPACITY = -137000.
ZONE-NAMES = (N_OLD_SPAC, N_NEW_SPAC) ..

```

## \$ HOURLY REPORT DESCRIPTION

```

BLOCK_#1  =REPORT-BLOCK VARIABLE-TYPE = N_OLD_SPAC
          VARIABLE-LIST = (17,18,7,6) ..
BLOCK_#2  =REPORT-BLOCK VARIABLE-TYPE = S_OLD_SPAC
          VARIABLE-LIST = (17,18,7,6) ..
AHU_DD    =REPORT-BLOCK VARIABLE-TYPE = OLD_SYSTEM
          VARIABLE-LIST = (1,2,3,4,5,6,17) ..
AHU_VAV   =REPORT-BLOCK VARIABLE-TYPE = NEW_SYSTEM
          VARIABLE-LIST = (1,2,3,4,5,6,17) ..
BLOCK_#5  =REPORT-BLOCK VARIABLE-TYPE = N_NEW_SPAC
          VARIABLE-LIST = (17,18,7,6) ..
BLOCK_#6  =REPORT-BLOCK VARIABLE-TYPE = S_NEW_SPAC
          VARIABLE-LIST = (17,18,7,6) ..
OLD_ZONES = HOURLY-REPORT REPORT-SCHEDULE = S_HRLY-RPT
          REPORT-BLOCK = (BLOCK_#1,BLOCK_#2)
..
NEW_ZONES = HOURLY-REPORT REPORT-SCHEDULE = S_HRLY-RPT
          REPORT-BLOCK = (BLOCK_#5,BLOCK_#6)
..
DD_RPT    = HOURLY-REPORT REPORT-SCHEDULE = S_HRLY-RPT
          REPORT-BLOCK = (AHU_DD)
..
VAV_RPT   = HOURLY-REPORT REPORT-SCHEDULE = S_HRLY-RPT
          REPORT-BLOCK = (AHU_VAV)
..
END ..
COMPUTE SYSTEMS ..

INPUT PLANT ..

```

EMC ENGINEERS INC. EZZOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/17/1995 16:55:40 SDL RUN 1  
DENVER, CO 80227 RUN #1 NIGHT SETBACK FOR BLDG. 7485 BOWLING ALLEY TOPEKA, KS  
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR OLD\_SYSTEM

----- C O O L I N G ----- H E A T I N G ----- E L E C -----

MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC- TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-78.270	15	-6.F	-7.F	0.000	-78.270	15	-6.F	-7.F	-441.163	22311.	45.178
FEB	0.00000				-51.749	3	-2.F	-3.F	0.000	-51.749	3	-2.F	-3.F	-433.768	20079.	45.178
MAR	0.00000				-30.424	3	15.F	12.F	0.000	-30.424	3	15.F	12.F	-344.685	22351.	45.178
APR	0.00000				-3.176	1	49.F	44.F	0.000	-3.176	1	49.F	44.F	-123.868	21812.	45.178
MAY	57.52285	16	61.F	59.F	-0.195	1	45.F	42.F	444.611	-0.195	1	45.F	42.F	-8.647	22096.	45.178
JUN	129.11554	24	83.F	74.F	0.000				387.746	0.000				0.000	21636.	45.178
JUL	161.65105	17	88.F	80.F	0.000				451.008	0.000				0.000	22271.	45.178
AUG	157.03869	20	90.F	75.F	0.000				415.481	0.000				0.000	22351.	45.178
SEP	95.52588	5	90.F	77.F	0.000				384.845	0.000				0.000	21596.	45.178
OCT	2.77466	1	83.F	68.F	-1.642	20	23.F	22.F	250.461	-1.642	20	23.F	22.F	-87.945	22183.	45.178
NOV	0.00000				-20.557	3	24.F	21.F	0.000	-20.557	3	24.F	21.F	-307.950	21293.	45.178
DEC	0.00000				-64.393	13	0.F	-1.F	0.000	-64.393	13	0.F	-1.F	-420.592	22399.	45.178
TOTAL	603.690				-250.405				451.008	-250.405				-441.163	262392.	45.178

EMC ENGINEERS INC. EZZOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/17/1995 16:55:40 SDL RUN 1  
DENVER, CO 80227 RUN #1 NIGHT SETBACK FOR BLDG. 7485 BOWLING ALLEY TOPEKA, KS  
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR OLD\_SYSTEM

----- N U M B E R O F H O U R S -----

MONTH	HOURS COOLING LOAD	HOURS HEATING LOAD	HOURS COINCIDENT COOL-HEAT LOAD	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.	HOURS FANS ON	HOURS FANS ON CYCLE	HOURS NIGHT VENTING	HOURS FLOATING WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)
JAN	0	545	0	744	0	545	0	0	0	-66.373	42.228
FEB	0	492	0	672	0	492	0	0	0	-63.686	42.228
MAR	0	543	0	744	0	543	0	0	0	-63.897	42.228
APR	0	530	0	720	0	530	0	0	0	-4.252	42.883
MAY	280	263	0	360	384	543	0	0	0	0.000	29.703
JUN	526	0	0	0	720	526	0	0	0	0.000	45.178
JUL	547	0	0	0	744	547	0	0	0	0.000	44.359
AUG	498	0	0	0	744	543	0	0	0	0.000	45.178
SEP	16	526	0	720	24	528	0	0	30	0.000	44.359
OCT	0	524	0	720	0	545	0	0	3	0.000	44.359
NOV	0	547	0	744	0	524	0	0	0	-101.788	42.228
DEC	0	0	0	0	0	547	0	0	0	-95.311	43.539
ANNUAL	2410	3970	0	5424	3336	6413	0	0	33		

EMC ENGINEERS INC. EZZOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/17/1995 16:55:40 SDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SETBACK FOR BLDG. 7485 BOWLING ALLEY TOPEKA, KS  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR UNIT-HEATR

MONTH	C O O L I N G				H E A T I N G				E L E C			
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	ELEC-TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	MAXIMUM HEATING LOAD (KBTU/HR)	MAXIMUM ELEC-TRICAL ENERGY (KWH)
JAN	0.00000				-19.801	15	7	-7.F	-8.F	-68.725	1384.	2.823
FEB	0.00000				-13.271	3	7	-5.F	-6.F	-58.491	1235.	2.807
MAR	0.00000				-7.753	4	7	14.F	12.F	-38.918	1375.	2.773
APR	0.00000				-0.717	1	6	54.F	50.F	-18.313	1327.	2.741
MAY	0.00000				0.000					0.000	1333.	2.717
JUN	0.00000				0.000					0.000	1318.	2.717
JUL	0.00000				0.000					0.000	1341.	2.717
AUG	0.00000				0.000					0.000	1363.	2.717
SEP	0.00000				0.000					0.000	1307.	2.717
OCT	0.00000				-0.404	20	8	23.F	22.F	-17.871	1337.	2.745
NOV	0.00000				-6.088	3	7	19.F	17.F	-34.461	1294.	2.769
DEC	0.00000				-16.079	15	7	11.F	9.F	-59.484	1382.	2.804
TOTAL	0.000				-64.113					-68.725	15995.	2.823
MAX												

EMC ENGINEERS INC. EZZOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/17/1995 16:55:40 SDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SETBACK FOR BLDG. 7485 BOWLING ALLEY TOPEKA, KS  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR UNIT-HEATR

MONTH	C O O L I N G				H E A T I N G				E L E C			
	HOURS COOLING LOAD	HOURS HEATING LOAD	HOURS COINCIDENT COOL-HEAT LOAD	HOURS FLOATING	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.	HOURS FANS ON	HOURS NIGHT VENTING	HOURS FLOTTING WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	HEATING LOAD AT COOLING PEAK (KBTU/HR)	COINCIDENT LOADS-- ELECTRIC LOAD AT COOLING PEAK (KW)
JAN	0	740	0	4	744	0	744	0	4	-15.695	-15.695	2.743
FEB	0	663	0	9	672	0	672	0	9	-13.177	-13.177	2.738
MAR	0	546	0	198	744	0	744	0	198	-12.723	-12.723	2.738
APR	0	95	0	625	720	0	720	0	625	0.000	0.000	2.717
MAY	0	0	0	744	360	0	744	0	744	0.000	0.000	2.717
JUN	0	0	0	744	0	0	720	0	720	0.000	0.000	2.717
JUL	0	0	0	744	0	0	744	0	744	0.000	0.000	2.717
AUG	0	0	0	744	0	0	744	0	744	0.000	0.000	2.717
SEP	0	0	0	720	0	0	720	0	720	0.000	0.000	2.717
OCT	0	41	0	703	720	0	744	0	703	-0.339	-0.339	2.751
NOV	0	430	0	290	720	0	744	0	290	-20.816	-20.816	2.751
DEC	0	737	0	7	744	0	744	0	7	-20.660	-20.660	2.751
ANNUAL	0	3252	0	5508	5424	0	8760	0	5508			

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/17/1995 16:55:40 PDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SETBACK FOR BLDG. 7485 BOWLING ALLEY TOPEKA, KS  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY 145.192 288.456 15/20 129.863 286.758 4/21 141.078 282.793 4/11 132.535 279.351 5/9 162.462 476.635 31/18 199.632 477.145 28/18 220.952 515.354 23/18 223.532 505.508 21/19 181.666 488.107 5/18 135.743 408.119 1/18 132.884 282.740 12/11 144.830 288.368 9/20	NATURAL-GAS 270.125 1204.209 15/8 194.903 1186.046 3/8 128.845 953.981 3/8 23.814 521.994 5/8 4.069 53.756 5/8 0.000 0.000 30/1 0.000 0.000 31/1 0.000 0.000 31/1 0.000 0.000 30/1 14.829 454.105 20/8 90.806 869.880 3/8 230.175 1142.743 13/8
JAN			
FEB			
MAR			
APR			
MAY			
JUN			
JUL			
AUG			
SEP			
OCT			
NOV			
DEC			
	ONE YEAR USE/PEAK	1950.369 515.354	957.566 1204.209



EMC ENGINEERS INC. 80227 DENVER, CO  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE

EZDOE - ELITE SOFTWARE DEVELOPMENT INC  
 RUN #1 NIGHT SETBACK FOR BLDG. 7485  
 BOWLING ALLEY  
 TOPEKA, KS

DOE-2.1D 5/17/1995 16:55:40 PDL RUN 1

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
SPACE HEAT	41.33	957.57
SPACE COOL	334.82	0.00
HVAC AUX	633.94	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	805.78	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	134.53	0.00
TOTAL	1950.41	957.57

TOTAL SITE ENERGY 2907.93 MBTU 82.6 KBTU/SQFT-YR GROSS-AREA / 83.3 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 6814.53 MBTU 193.5 KBTU/SQFT-YR GROSS-AREA 195.2 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 42.1  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.



INPUT SYSTEMS ..

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$-----$
$ E Z - D O E   S Y S T E M S   I N P U T $
$-----$

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\$ GENERAL PROJECT DATA

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TITLE LINE-1 *      EMC      ENGINEERS      INC.      *
LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
LINE-3 *      DENVER,      CO      80227      *

LINE-4 *RUN #2 DDC CONTROL FOR BLDG. 7485      *
LINE-5 *BOWLING ALLEY      * ..

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ABORT          ERRORS ..
DIAGNOSTIC     WARNINGS ..
SYSTEMS-REPORT VERIFICATION=(SV-A)
SUMMARY=(SS-A,SS-C,SS-K,SS-O)
HOURLY-DATA-SAVE = YES ..

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\$ SCHEDULES

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SD_ON      =DAY-SCHEDULE (1,24) (1.) ..
SD_OFF     =DAY-SCHEDULE (1,24) (0.) ..
SD_S_HT_SR =DAY-SCHEDULE (1,24) (75.8) ..
SD_S_CL_SR =DAY-SCHEDULE (1,24) (76.) ..
SD_CL_PIN  =DAY-SCHEDULE (1,24) (85.) ..
SD_HT_PIN  =DAY-SCHEDULE (1,24) (55.) ..
SD_W_HT_SR =DAY-SCHEDULE (1,24) (70.) ..
SD_W_CL_SR =DAY-SCHEDULE (1,24) (70.2) ..
SD_S_HT_FS =DAY-SCHEDULE (1,24) (75.8) ..
SD_S_CL_FS =DAY-SCHEDULE (1,24) (76.) ..
SD_W_HT_FS =DAY-SCHEDULE (1,24) (70.) ..
SD_W_CL_FS =DAY-SCHEDULE (1,24) (70.2) ..
SD_FAN_SR  =DAY-SCHEDULE (1,7) (0.)
              (8,24) (1.) ..
SD_FAN_FS  =DAY-SCHEDULE (1,2) (1.)
              (3,7) (0.)
              (8,24) (1.) ..

SW_ON      =WEEK-SCHEDULE (ALL) SD_ON ..

SW_OFF     =WEEK-SCHEDULE (ALL) SD_OFF ..

SW_S_HT_F  =WEEK-SCHEDULE (MON) SD_S_HT_SR
              (TUE) SD_S_HT_SR
              (WED) SD_S_HT_SR
              (THU) SD_S_HT_SR
              (FRI) SD_S_HT_FS
              (SAT) SD_S_HT_FS
              (SUN) SD_S_HT_SR
              (HOL) SD_S_HT_SR ..

SW_S_CL_F  =WEEK-SCHEDULE (MON) SD_S_CL_SR

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(TUE) SD\_S\_CL\_SR  
(WED) SD\_S\_CL\_SR  
(THU) SD\_S\_CL\_SR  
(FRI) SD\_S\_CL\_FS  
(SAT) SD\_S\_CL\_FS  
(SUN) SD\_S\_CL\_SR  
(HOL) SD\_S\_CL\_SR ..

SW\_CL\_PIN =WEEK-SCHEDULE (ALL) SD\_CL\_PIN ..

SW\_HT\_PIN =WEEK-SCHEDULE (ALL) SD\_HT\_PIN ..

SW\_W\_HT\_F =WEEK-SCHEDULE (MON) SD\_W\_HT\_SR  
(TUE) SD\_W\_HT\_SR  
(WED) SD\_W\_HT\_SR  
(THU) SD\_W\_HT\_SR  
(FRI) SD\_W\_HT\_FS  
(SAT) SD\_W\_HT\_FS  
(SUN) SD\_W\_HT\_SR  
(HOL) SD\_W\_HT\_SR ..

SW\_W\_CL\_F =WEEK-SCHEDULE (MON) SD\_W\_CL\_SR  
(TUE) SD\_W\_CL\_SR  
(WED) SD\_W\_CL\_SR  
(THU) SD\_W\_CL\_SR  
(FRI) SD\_W\_CL\_FS  
(SAT) SD\_W\_CL\_FS  
(SUN) SD\_W\_CL\_SR  
(HOL) SD\_W\_CL\_SR ..

SW\_FAN\_CYC =WEEK-SCHEDULE (ALL) SD\_ON ..

\$ FULL ON SYSTEM

S\_ON =SCHEDULE THRU DEC 31 SW\_ON ..

\$ FULL OFF SYSTEM

S\_OFF =SCHEDULE THRU DEC 31 SW\_OFF ..

\$ HEATING SEASON

S\_HE-SCHED =SCHEDULE THRU MAY 15 SW\_ON  
THRU OCT 1 SW\_OFF  
THRU DEC 31 SW\_ON ..

\$ COOLING SEASON

S\_CL\_SCHED =SCHEDULE THRU MAY 15 SW\_OFF  
THRU OCT 1 SW\_ON  
THRU DEC 31 SW\_OFF ..

\$ HEATING SET TEMP

S\_HT\_SET\_F =SCHEDULE THRU MAY 15 SW\_W\_HT\_F  
THRU OCT 1 SW\_S\_HT\_F  
THRU DEC 31 SW\_W\_HT\_F ..

\$ COOLING SET TEMP

S\_CL\_SET\_F =SCHEDULE THRU MAY 15 SW\_W\_CL\_F

THRU OCT 15 SW\_S\_CL\_F  
 THRU DEC 31 SW\_W\_CL\_F ..

\$ HEATING SET TEMP =55F  
 S\_HTIN\_PIN =SCHEDULE THRU DEC 31 SW\_HT\_PIN ..

\$ COOLING SET TEMP =85F  
 S\_CLIN\_PIN =SCHEDULE THRU DEC 31 SW\_CL\_PIN ..

S\_HRLY-RPT =SCHEDULE THRU JAN 14 SW\_OFF  
 THRU JAN 16 SW\_ON  
 THRU AUG 19 SW\_OFF  
 THRU AUG 21 SW\_ON  
 THRU DEC 31 SW\_OFF ..

S\_FAN\_CYCL =SCHEDULE THRU DEC 31 SW\_FAN\_CYC ..

\$ ZONE DESCRIPTION

N\_OLD\_SPAC =ZONE DESIGN-HEAT-T = 55.0 DESIGN-COOL-T = 85.0  
 HEAT-TEMP-SCH = S\_HTIN\_PIN COOL-TEMP-SCH = S\_CLIN\_PIN  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL ASSIGNED-CFM = 2200.  
 SIZING-OPTION = FROM-LOADS  
 HEATING-CAPACITY = -82200.0 ..

CR\_OLD\_SPA =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
 SIZING-OPTION = FROM-LOADS ..

S\_OLD\_SPAC =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
 SIZING-OPTION = FROM-LOADS ..

W\_OLD\_SPAC =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
 SIZING-OPTION = FROM-LOADS ..

N\_NEW\_SPAC =ZONE DESIGN-HEAT-T = 55.0 DESIGN-COOL-T = 85.0  
 HEAT-TEMP-SCH = S\_HTIN\_PIN COOL-TEMP-SCH = S\_CLIN\_PIN  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL ASSIGNED-CFM = 1630.  
 SIZING-OPTION = FROM-LOADS  
 HEATING-CAPACITY = -54800.0 ..

CR\_NEW\_SPC =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED

THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

S\_NEW\_SPAC =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

E\_NEW\_SPAC =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

#### \$ SYSTEM DESCRIPTION

OLD\_SYSTEM =SYSTEM SYSTEM-TYPE = DDS  
MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
HEATING-SCHEDULE = S\_HE-SCHED  
COOLING-SCHEDULE = S\_CL\_SCHED PREHEAT-T = 0.0  
OA-CONTROL = FIXED SUPPLY-CFM = 16000.  
RATED-CFM = 16000. MIN-OUTSIDE-AIR = 0.2  
MAX-OA-FRACTION = 0.2 FAN-SCHEDULE = S\_FAN\_CYCL  
SUPPLY-DELTA-T = 3.4 SUPPLY-KW = 0.00109  
MOTOR-PLACEMENT = OUTSIDE-AIRFLOW  
MAX-FAN-RATIO = 1.0 NIGHT-CYCLE-CTRL = STAY-OFF  
NIGHT-VENT-DT = 0.0 MIN-CFM-RATIO = 1.0  
COOLING-CAPACITY = 557000. COOL-SH-CAP = 354000.  
HEATING-CAPACITY = -640000.  
SIZING-OPTION = COINCIDENT RETURN-AIR-PATH = DIRECT  
ZONE-NAMES = (CR\_OLD\_SPA, S\_OLD\_SPAC, W\_OLD\_SPAC) ..

NEW\_SYSTEM =SYSTEM SYSTEM-TYPE = VAVS  
MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
HEATING-SCHEDULE = S\_HE-SCHED  
COOLING-SCHEDULE = S\_CL\_SCHED PREHEAT-T = 0.0  
COOL-CONTROL = WARMEST OA-CONTROL = FIXED  
SUPPLY-CFM = 10000. RATED-CFM = 10000.  
MIN-OUTSIDE-AIR = 0.2 MAX-OA-FRACTION = 0.2  
FAN-SCHEDULE = S\_FAN\_CYCL  
FAN-CONTROL = CONSTANT-VOLUME SUPPLY-DELTA-T = 3.4  
SUPPLY-KW = 0.00109  
MOTOR-PLACEMENT = OUTSIDE-AIRFLOW  
MAX-FAN-RATIO = 1.0 NIGHT-CYCLE-CTRL = STAY-OFF  
NIGHT-VENT-DT = 0.0 MIN-CFM-RATIO = 1.0  
REHEAT-DELTA-T = 65. COOLING-CAPACITY = 309000.  
COOL-SH-CAP = 232000. COOL-CTRL-RANGE = 2.  
HEATING-CAPACITY = -525000.  
SIZING-OPTION = COINCIDENT RETURN-AIR-PATH = DIRECT  
ZONE-NAMES = (CR\_NEW\_SPC, S\_NEW\_SPAC, E\_NEW\_SPAC) ..

UNIT-HEATR =SYSTEM SYSTEM-TYPE = UHT  
MAX-SUPPLY-T = 120.0 HEATING-SCHEDULE = S\_HE-SCHED  
RATED-CFM = 4050. FAN-SCHEDULE = S\_HE-SCHED

SUPPLY-DELTA-T = 0.2 SUPPLY-KW = 0.00006  
NIGHT-CYCLE-CTRL = CYCLE-ON-ANY  
HEATING-CAPACITY = -137000.  
ZONE-NAMES = (N\_OLD\_SPAC, N\_NEW\_SPAC) ..

\$ HOURLY REPORT DESCRIPTION

BLOCK\_#1 =REPORT-BLOCK VARIABLE-TYPE = N\_OLD\_SPAC  
VARIABLE-LIST = (17,18,7,6) ..  
BLOCK\_#2 =REPORT-BLOCK VARIABLE-TYPE = S\_OLD\_SPAC  
VARIABLE-LIST = (17,18,7,6) ..  
AHU\_DD =REPORT-BLOCK VARIABLE-TYPE = OLD\_SYSTEM  
VARIABLE-LIST = (1,2,3,4,5,6,17) ..  
AHU\_VAV =REPORT-BLOCK VARIABLE-TYPE = NEW\_SYSTEM  
VARIABLE-LIST = (1,2,3,4,5,6,17) ..  
BLOCK\_#5 =REPORT-BLOCK VARIABLE-TYPE = N\_NEW\_SPAC  
VARIABLE-LIST = (17,18,7,6) ..  
BLOCK\_#6 =REPORT-BLOCK VARIABLE-TYPE = S\_NEW\_SPAC  
VARIABLE-LIST = (17,18,7,6) ..  
OLD\_ZONES = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
REPORT-BLOCK = (BLOCK\_#1,BLOCK\_#2)  
..  
NEW\_ZONES = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
REPORT-BLOCK = (BLOCK\_#5,BLOCK\_#6)  
..  
DD\_RPT = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
REPORT-BLOCK = (AHU\_DD)  
..  
VAV\_RPT = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
REPORT-BLOCK = (AHU\_VAV)  
..  
END ..  
COMPUTE SYSTEMS ..  
  
INPUT PLANT ..

\$-----\$  
\$ E Z - D O E P L A N T S I N P U T \$  
\$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
LINE-3 \* DENVER, CO 80227 \*  
  
LINE-4 \*RUN #2 DDC CONTROL FOR BLDG. 7485 \*  
LINE-5 \*BOWLING ALLEY \* ..

ABORT ERRORS ..  
DIAGNOSTIC WARNINGS ..  
PLANT-REPORT VERIFICATION=(PV-A)  
SUMMARY=(PS-B,BEPS)  
HOURLY-DATA-SAVE = YES ..

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/18/1995 8:13:58 SDL RUN 1  
DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. 7485 BOWLING ALLEY TOPEKA, KS  
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR OLD\_SYSTEM

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC- TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-81.214	15	-7.F	-8.F	-332.252	25782.	45.178
FEB	0.00000				-52.159	3	-5.F	-6.F	-299.281	23218.	45.178
MAR	0.00000				-29.387	3	14.F	12.F	-216.966	25857.	45.178
APR	0.00000				-2.730	5	30.F	27.F	-68.780	25125.	45.178
MAY	49.92852	16	2	59.F	-0.607	1	44.F	41.F	-13.237	25601.	45.178
JUN	118.02316	24	20	83.F	0.000				0.000	25020.	45.178
JUL	153.15526	17	19	88.F	0.000				0.000	25707.	45.178
AUG	148.44141	20	20	90.F	0.000				0.000	25857.	45.178
SEP	82.61338	5	18	90.F	0.000				0.000	24945.	45.178
OCT	2.16902	1	18	83.F	-1.689	20	23.F	22.F	-49.519	25654.	45.178
NOV	0.00000				-19.224	3	13.F	12.F	-204.167	24711.	45.178
DEC	0.00000				-65.118	13	2.F	1.F	-278.203	25835.	45.178
TOTAL	554.332				-252.125				-332.252	303316.	45.178
MAX											

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/18/1995 8:13:58 SDL RUN 1  
DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. 7485 BOWLING ALLEY TOPEKA, KS  
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR OLD\_SYSTEM

MONTH	C O O L I N G				H E A T I N G				E L E C		
	HOURS COOLING LOAD	HOURS HEATING LOAD	HOURS COINCIDENT COOL-HEAT LOAD	HOURS FLOATING	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.	HOURS FANS ON	HOURS NIGHT VENTING	HOURS FLOATING WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)
JAN	0	744	0	0	744	0	0	0	0	-35.582	42.228
FEB	0	672	0	0	672	0	0	0	0	-32.947	42.228
MAR	0	744	0	0	744	0	0	0	0	-33.921	42.228
APR	0	720	0	0	720	0	0	0	0	-4.213	42.883
MAY	370	360	0	14	384	0	0	0	14	0.000	17.440
JUN	710	0	0	10	720	0	0	0	10	0.000	45.178
JUL	744	0	0	1	744	0	0	0	0	0.000	44.359
AUG	743	0	0	1	744	0	0	0	1	0.000	45.178
SEP	588	0	0	132	720	0	0	0	132	0.000	44.359
OCT	15	720	0	9	24	0	0	0	9	0.000	44.359
NOV	0	720	0	0	0	0	0	0	0	-72.568	42.228
DEC	0	744	0	0	744	0	0	0	0	-66.344	43.539
ANNUAL	3170	5424	0	166	3336	8760	0	0	166		



EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/18/1995 8:13:58 SDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. 7485 BOWLING ALLEY TOPEKA, KS  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR NEW SYSTEM

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC LOAD (KW)
JAN	0.00000				-85.047	15	7	-7.F	-8.F	-302.872	17379.
FEB	0.00000				-59.698	3	7	-5.F	-6.F	-277.525	15644.
MAR	0.00000				-39.295	3	7	14.F	12.F	-207.116	17454.
APR	0.00000				-5.702	5	7	30.F	27.F	-129.535	16941.
MAY	34.77984	31	18	90.F	-0.416	1	2	44.F	41.F	-8.718	17249.
JUN	90.68785	24	20	83.F	0.000					0.000	16885.
JUL	121.60986	17	18	88.F	0.000					0.000	17305.
AUG	119.48048	20	20	90.F	0.000					0.000	17454.
SEP	64.65318	5	18	90.F	0.000					0.000	16810.
OCT	1.72889	1	18	83.F	-2.469	20	7	23.F	23.F	-104.847	17277.
NOV	0.00000				-25.618	3	6	13.F	12.F	-194.825	16652.
DEC	0.00000				-69.916	13	7	2.F	1.F	-254.954	17407.
TOTAL	432.940				-288.160					-302.872	204455.
MAX											

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/18/1995 8:13:58 SDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. 7485 BOWLING ALLEY TOPEKA, KS  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR NEW SYSTEM

MONTH	HOURS OF				HOURS OF				HOURS OF				HOURS OF			
	COOLING LOAD	HEATING LOAD	COINCIDENT LOAD	FLOATING	HEATING AVAIL.	COOLING AVAIL.	FANS ON	CYCLE ON	FANS ON	NIGHT VENTING	FLOATING WHEN FANS ON	HEATING PEAK	COOLING PEAK	ELECTRIC LOAD AT PEAK	COINCIDENT LOADS AT PEAK	
JAN	0	744	0	0	744	0	744	0	0	0	0	-55.393	29.532	29.532	29.532	
FEB	0	671	0	1	672	0	672	0	0	1	1	-53.229	29.532	29.532	29.532	
MAR	0	690	0	54	744	0	744	0	0	54	54	-60.482	29.532	29.532	29.532	
APR	0	428	0	292	720	0	720	0	0	292	292	-2.964	29.532	29.532	29.532	
MAY	331	177	0	236	360	384	744	0	0	236	36	0.000	29.532	29.532	29.532	
JUN	684	0	0	36	0	720	720	0	0	3	3	0.000	29.532	29.532	29.532	
JUL	741	0	0	3	0	744	744	0	0	6	6	0.000	29.532	29.532	29.532	
AUG	738	0	0	6	0	744	744	0	0	97	97	0.000	29.532	29.532	29.532	
SEP	623	0	0	97	0	720	744	0	0	304	304	0.000	29.532	29.532	29.532	
OCT	18	422	0	304	24	0	744	0	0	118	118	-86.916	29.532	29.532	29.532	
NOV	0	602	0	118	0	0	720	0	0	0	0	-81.059	29.532	29.532	29.532	
DEC	0	744	0	0	0	0	744	0	0	0	0					
ANNUAL	3135	4478	0	1147	5424	3336	8760	0	0	1147						

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/18/1995 8:13:58 SDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. 7485 BOWLING ALLEY TOPEKA, KS  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR UNIT-HEATR

MONTH	COOLING			HEATING			WET-BULB			DRY-BULB			HEATING			MAXIMUM		
	ENERGY (MBTU)	TIME OF MAX DY HR	TEMP	ENERGY (MBTU)	TIME OF MAX DY HR	TEMP	TEMP	TEMP	TEMP	TEMP	TEMP	LOAD (KBTU/HR)	LOAD (KBTU/HR)	LOAD (KBTU/HR)	LOAD (KBTU/HR)	LOAD (KBTU/HR)	LOAD (KBTU/HR)	LOAD (KBTU/HR)
JAN	0.00000			-19.801	15	7	-7.F	-8.F			-68.725			1384.			2.823	
FEB	0.00000			-13.271	3	7	-5.F	-6.F			-58.491			1235.			2.807	
MAR	0.00000			-7.753	4	7	14.F	12.F			-38.918			1375.			2.773	
APR	0.00000			-0.717	1	6	54.F	50.F			-18.313			1327.			2.741	
MAY	0.00000			0.000							0.000			1333.			2.717	
JUN	0.00000			0.000							0.000			1318.			2.717	
JUL	0.00000			0.000							0.000			1341.			2.717	
AUG	0.00000			0.000							0.000			1363.			2.717	
SEP	0.00000			0.000							0.000			1307.			2.717	
OCT	0.00000			-0.404	20	8	23.F	22.F			-17.871			1337.			2.745	
NOV	0.00000			-6.088	3	7	19.F	17.F			-34.461			1294.			2.769	
DEC	0.00000			-16.079	15	7	11.F	9.F			-59.484			1382.			2.804	
TOTAL	0.000			-64.113							-68.725			15995.			2.823	
MAX																		

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/18/1995 8:13:58 SDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. 7485 BOWLING ALLEY TOPEKA, KS  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR UNIT-HEATR

MONTH	COOLING		HEATING		COINCIDENT		HOURS		HEATING		COOLING		HEATING		COOLING		HEATING		COINCIDENT	
	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD
JAN	0	740	0	744	0	744	0	744	0	744	0	744	0	744	0	744	0	744	0	744
FEB	0	663	0	672	0	672	0	672	0	672	0	672	0	672	0	672	0	672	0	672
MAR	0	546	0	744	0	744	0	744	0	744	0	744	0	744	0	744	0	744	0	744
APR	0	95	0	720	0	720	0	720	0	720	0	720	0	720	0	720	0	720	0	720
MAY	0	0	0	360	0	744	0	744	0	744	0	744	0	744	0	744	0	744	0	744
JUN	0	0	0	0	0	720	0	720	0	720	0	720	0	720	0	720	0	720	0	720
JUL	0	0	0	0	0	744	0	744	0	744	0	744	0	744	0	744	0	744	0	744
AUG	0	0	0	0	0	744	0	744	0	744	0	744	0	744	0	744	0	744	0	744
SEP	0	0	0	0	0	720	0	720	0	720	0	720	0	720	0	720	0	720	0	720
OCT	0	41	0	720	0	744	0	744	0	744	0	744	0	744	0	744	0	744	0	744
NOV	0	430	0	720	0	720	0	720	0	720	0	720	0	720	0	720	0	720	0	720
DEC	0	737	0	744	0	744	0	744	0	744	0	744	0	744	0	744	0	744	0	744
ANNUAL	0	3252	0	5424	0	8760	0	3336	0	5508	0	5508	0	5508	0	5508	0	5508	0	5508

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/18/1995 8:13:58 PDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. 7485 BOWLING ALLEY TOPEKA, KS  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY TOTAL (MBTU) PEAK (KBTU) DY/HR	NATURAL-GAS TOTAL (MBTU) PEAK (KBTU) DY/HR
JAN	282.161 15/20	163.102 282.161 15/20	271.749 886.407 15/7
FEB	279.751 4/21	146.213 279.751 4/21	192.682 813.937 3/7
MAR	276.498 4/11	159.519 276.498 4/11	123.014 621.867 4/7
APR	269.933 5/9	150.703 269.933 5/9	21.117 340.495 5/7
MAY	464.890 31/18	178.956 464.890 31/18	4.776 44.500 1/2
JUN	214.506 28/18	214.506 465.078 28/18	0.000 0.000 30/1
JUL	504.647 23/18	238.951 504.647 23/18	0.000 0.000 31/1
AUG	494.551 21/19	241.447 494.551 21/19	0.000 0.000 31/1
SEP	478.460 5/18	195.091 478.460 5/18	0.000 0.000 30/1
OCT	391.854 1/18	154.578 391.854 1/18	13.661 288.664 20/7
NOV	275.484 2/21	151.120 275.484 2/21	85.526 592.143 3/6
DEC	282.073 9/20	162.683 282.073 9/20	228.001 764.776 13/7
	ONE YEAR USE/PEAK	2156.869 504.647	940.526 886.407

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/18/1995 8:13:58 PDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. 7485 BOWLING ALLEY  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
SPACE HEAT	38.07	940.54
SPACE COOL	319.84	0.00
HVAC AUX	858.71	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	805.78	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	134.53	0.00
TOTAL	2156.93	940.54

TOTAL SITE ENERGY 3097.39 MBTU 88.0 KBTU/SQFT-YR GROSS-AREA 88.7 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 7417.61 MBTU 210.6 KBTU/SQFT-YR GROSS-AREA 212.4 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 41.7  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

INPUT SYSTEMS ..

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$-----$
$ E Z - D O E   S Y S T E M S   I N P U T $
$-----$

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## \$ GENERAL PROJECT DATA

```

TITLE  LINE-1 *      EMC      ENGINEERS      INC.      *
        LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
        LINE-3 *      DENVER,      CO      80227      *

        LINE-4 *RUN #3 ECONOMIZER FOR BLDG. 7485      *
        LINE-5 *BOWLING ALLEY      * ..

ABORT      ERRORS      ..
DIAGNOSTIC      WARNINGS      ..
SYSTEMS-REPORT      VERIFICATION=(SV-A)
                        SUMMARY=(SS-A,SS-C,SS-K,SS-O)
                        HOURLY-DATA-SAVE = YES      ..

```

## \$ SCHEDULES

```

SD_ON      =DAY-SCHEDULE (1,24) (1.) ..
SD_OFF     =DAY-SCHEDULE (1,24) (0.) ..
SD_S_HT_SR =DAY-SCHEDULE (1,7) (84.8)
            (8,24) (71.8) ..
SD_S_CL_SR =DAY-SCHEDULE (1,7) (85.)
            (8,24) (72.) ..
SD_CL_PIN  =DAY-SCHEDULE (1,24) (85.) ..
SD_HT_PIN  =DAY-SCHEDULE (1,24) (55.) ..
SD_W_HT_SR =DAY-SCHEDULE (1,7) (55.)
            (8,24) (74.) ..
SD_W_CL_SR =DAY-SCHEDULE (1,7) (55.2)
            (8,24) (74.2) ..
SD_S_HT_FS =DAY-SCHEDULE (1,2) (71.8)
            (3,7) (84.8)
            (8,24) (71.8) ..
SD_S_CL_FS =DAY-SCHEDULE (1,2) (72.)
            (3,7) (85.)
            (8,24) (72.) ..
SD_W_HT_FS =DAY-SCHEDULE (1,2) (74.)
            (3,7) (55.)
            (8,24) (74.) ..
SD_W_CL_FS =DAY-SCHEDULE (1,2) (74.2)
            (3,7) (55.2)
            (8,24) (74.2) ..
SD_FAN_SR  =DAY-SCHEDULE (1,7) (0.)
            (8,24) (1.) ..
SD_FAN_FS  =DAY-SCHEDULE (1,2) (1.)
            (3,7) (0.)
            (8,24) (1.) ..

SW_ON      =WEEK-SCHEDULE (ALL) SD_ON ..

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SW_OFF      =WEEK-SCHEDULE (ALL) SD_OFF  ..

SW_S_HT_F   =WEEK-SCHEDULE (MON) SD_S_HT_SR
              (TUE) SD_S_HT_SR
              (WED) SD_S_HT_SR
              (THU) SD_S_HT_SR
              (FRI) SD_S_HT_FS
              (SAT) SD_S_HT_FS
              (SUN) SD_S_HT_SR
              (HOL) SD_S_HT_SR ..

SW_S_CL_F   =WEEK-SCHEDULE (MON) SD_S_CL_SR
              (TUE) SD_S_CL_SR
              (WED) SD_S_CL_SR
              (THU) SD_S_CL_SR
              (FRI) SD_S_CL_FS
              (SAT) SD_S_CL_FS
              (SUN) SD_S_CL_SR
              (HOL) SD_S_CL_SR ..

SW_CL_PIN   =WEEK-SCHEDULE (ALL) SD_CL_PIN ..

SW_HT_PIN   =WEEK-SCHEDULE (ALL) SD_HT_PIN ..

SW_W_HT_F   =WEEK-SCHEDULE (MON) SD_W_HT_SR
              (TUE) SD_W_HT_SR
              (WED) SD_W_HT_SR
              (THU) SD_W_HT_SR
              (FRI) SD_W_HT_FS
              (SAT) SD_W_HT_FS
              (SUN) SD_W_HT_SR
              (HOL) SD_W_HT_SR ..

SW_W_CL_F   =WEEK-SCHEDULE (MON) SD_W_CL_SR
              (TUE) SD_W_CL_SR
              (WED) SD_W_CL_SR
              (THU) SD_W_CL_SR
              (FRI) SD_W_CL_FS
              (SAT) SD_W_CL_FS
              (SUN) SD_W_CL_SR
              (HOL) SD_W_CL_SR ..

SW_FAN_CYC  =WEEK-SCHEDULE (MON) SD_FAN_SR
              (TUE) SD_FAN_SR
              (WED) SD_FAN_SR
              (THU) SD_FAN_SR
              (FRI) SD_FAN_FS
              (SAT) SD_FAN_FS
              (SUN) SD_FAN_SR
              (HOL) SD_FAN_SR ..

```

\$ FULL ON SYSTEM

S\_ON =SCHEDULE THRU DEC 31 SW\_ON ..

\$ FULL OFF SYSTEM

S\_OFF =SCHEDULE THRU DEC 31 SW\_OFF ..

\$ HEATING SEASON

S\_HE-SCHED =SCHEDULE THRU MAY 15 SW\_ON  
 THRU OCT 1 SW\_OFF  
 THRU DEC 31 SW\_ON ..

\$ COOLING SEASON

S\_CL\_SCHED =SCHEDULE THRU MAY 15 SW\_OFF  
 THRU OCT 1 SW\_ON  
 THRU DEC 31 SW\_OFF ..

\$ HEATING SET TEMP

S\_HT\_SET\_F =SCHEDULE THRU MAY 15 SW\_W\_HT\_F  
 THRU OCT 1 SW\_S\_HT\_F  
 THRU DEC 31 SW\_W\_HT\_F ..

\$ COOLING SET TEMP

S\_CL\_SET\_F =SCHEDULE THRU MAY 15 SW\_W\_CL\_F  
 THRU OCT 15 SW\_S\_CL\_F  
 THRU DEC 31 SW\_W\_CL\_F ..

\$ HEATING SET TEMP =55F

S\_HTIN\_PIN =SCHEDULE THRU DEC 31 SW\_HT\_PIN ..

\$ COOLING SET TEMP =85F

S\_CLIN\_PIN =SCHEDULE THRU DEC 31 SW\_CL\_PIN ..

S\_HRLY-RPT =SCHEDULE THRU JAN 14 SW\_OFF

THRU JAN 16 SW\_ON  
 THRU AUG 19 SW\_OFF  
 THRU AUG 21 SW\_ON  
 THRU DEC 31 SW\_OFF ..

S\_FAN\_CYCL =SCHEDULE THRU DEC 31 SW\_FAN\_CYC ..

\$ ZONE DESCRIPTION

N\_OLD\_SPAC =ZONE DESIGN-HEAT-T = 55.0 DESIGN-COOL-T = 85.0  
 HEAT-TEMP-SCH = S\_HTIN\_PIN COOL-TEMP-SCH = S\_CLIN\_PIN  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL ASSIGNED-CFM = 2200.  
 SIZING-OPTION = FROM-LOADS  
 HEATING-CAPACITY = -82200.0 ..

CR\_OLD\_SPA =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
 SIZING-OPTION = FROM-LOADS ..

S\_OLD\_SPAC =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED

THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

W\_OLD\_SPAC =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

N\_NEW\_SPAC =ZONE DESIGN-HEAT-T = 55.0 DESIGN-COOL-T = 85.0  
HEAT-TEMP-SCH = S\_HTIN\_PIN COOL-TEMP-SCH = S\_CLIN\_PIN  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL ASSIGNED-CFM = 1630.  
SIZING-OPTION = FROM-LOADS  
HEATING-CAPACITY = -54800.0 ..

CR\_NEW\_SPC =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

S\_NEW\_SPAC =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

E\_NEW\_SPAC =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

\$ SYSTEM DESCRIPTION

OLD\_SYSTEM =SYSTEM SYSTEM-TYPE = DDS  
MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
HEATING-SCHEDULE = S\_HE-SCHED  
COOLING-SCHEDULE = S\_CL\_SCHED PREHEAT-T = 0.0  
ECONO-LIMIT-T = 69.0 ECONO-LOW-LIMIT = 60.0 ←  
SUPPLY-CFM = 16000. RATED-CFM = 16000.  
MIN-OUTSIDE-AIR = 0.2 FAN-SCHEDULE = S\_FAN\_CYCL  
SUPPLY-DELTA-T = 3.4 SUPPLY-KW = 0.00109  
MOTOR-PLACEMENT = OUTSIDE-AIRFLOW  
MAX-FAN-RATIO = 1.0 NIGHT-CYCLE-CTRL = STAY-OFF  
NIGHT-VENT-DT = 0.0 MIN-CFM-RATIO = 1.0  
COOLING-CAPACITY = 557000. COOL-SH-CAP = 354000.  
HEATING-CAPACITY = -640000.  
SIZING-OPTION = COINCIDENT RETURN-AIR-PATH = DIRECT  
ZONE-NAMES = (CR\_OLD\_SPA, S\_OLD\_SPAC, W\_OLD\_SPAC) ..

NEW\_SYSTEM =SYSTEM SYSTEM-TYPE = VAVS  
MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
HEATING-SCHEDULE = S\_HE-SCHED



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COOLING-SCHEDULE = S_CL_SCHED  PREHEAT-T = 0.0
ECONO-LIMIT-T = 69.0  ECONO-LOW-LIMIT = 60.0
COOL-CONTROL = WARMEST  SUPPLY-CFM = 10000.
RATED-CFM = 10000.  MIN-OUTSIDE-AIR = 0.2
FAN-SCHEDULE = S_FAN_CYCL
FAN-CONTROL = CONSTANT-VOLUME  SUPPLY-DELTA-T = 3.4
SUPPLY-KW = 0.00109
MOTOR-PLACEMENT = OUTSIDE-AIRFLOW
MAX-FAN-RATIO = 1.0  NIGHT-CYCLE-CTRL = STAY-OFF
NIGHT-VENT-DT = 0.0  MIN-CFM-RATIO = 1.0
REHEAT-DELTA-T = 65.  COOLING-CAPACITY = 309000.
COOL-SH-CAP = 232000.  COOL-CTRL-RANGE = 2.
HEATING-CAPACITY = -525000.
SIZING-OPTION = COINCIDENT  RETURN-AIR-PATH = DIRECT
ZONE-NAMES = (CR_NEW_SPC, S_NEW_SPC, E_NEW_SPC) ..

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UNIT-HEATR =SYSTEM  SYSTEM-TYPE = UHT
MAX-SUPPLY-T = 120.0  HEATING-SCHEDULE = S_HE-SCHED
RATED-CFM = 4050.  FAN-SCHEDULE = S_HE-SCHED
SUPPLY-DELTA-T = 0.2  SUPPLY-KW = 0.00006
NIGHT-CYCLE-CTRL = CYCLE-ON-ANY
HEATING-CAPACITY = -137000.
ZONE-NAMES = (N_OLD_SPAC, N_NEW_SPAC) ..

```

#### § HOURLY REPORT DESCRIPTION

```

BLOCK_#1  =REPORT-BLOCK VARIABLE-TYPE = N_OLD_SPAC
           VARIABLE-LIST = (17,18,7,6) ..
BLOCK_#2  =REPORT-BLOCK VARIABLE-TYPE = S_OLD_SPAC
           VARIABLE-LIST = (17,18,7,6) ..
AHU_DD    =REPORT-BLOCK VARIABLE-TYPE = OLD_SYSTEM
           VARIABLE-LIST = (1,2,3,4,5,6,17) ..
AHU_VAV   =REPORT-BLOCK VARIABLE-TYPE = NEW_SYSTEM
           VARIABLE-LIST = (1,2,3,4,5,6,17) ..
BLOCK_#5  =REPORT-BLOCK VARIABLE-TYPE = N_NEW_SPAC
           VARIABLE-LIST = (17,18,7,6) ..
BLOCK_#6  =REPORT-BLOCK VARIABLE-TYPE = S_NEW_SPAC
           VARIABLE-LIST = (17,18,7,6) ..
OLD_ZONES = HOURLY-REPORT REPORT-SCHEDULE = S_HRLY-RPT
           REPORT-BLOCK = (BLOCK_#1,BLOCK_#2)
..
NEW_ZONES = HOURLY-REPORT REPORT-SCHEDULE = S_HRLY-RPT
           REPORT-BLOCK = (BLOCK_#5,BLOCK_#6)
..
DD_RPT    = HOURLY-REPORT REPORT-SCHEDULE = S_HRLY-RPT
           REPORT-BLOCK = (AHU_DD)
..
VAV_RPT   = HOURLY-REPORT REPORT-SCHEDULE = S_HRLY-RPT
           REPORT-BLOCK = (AHU_VAV)
..
END ..
COMPUTE SYSTEMS ..

INPUT PLANT ..

```

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/18/1995 9:43:41 SDL RUN 1  
 DENVER, CO 80227 RUN #3 ECONOMIZER FOR BLDG. 7485 BOWLING ALLEY TOPEKA, KS  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR OLD\_SYSTEM

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-78.270	15	8	-6.F	-7.F	-441.163	45.178
FEB	0.00000				-51.837	3	8	-2.F	-3.F	-433.768	45.178
MAR	0.00000				-34.956	3	8	15.F	12.F	-344.690	45.178
APR	0.00000				-11.451	5	8	34.F	30.F	-189.563	45.178
MAY	42.06223	31	19	84.F	-2.801	9	10	62.F	56.F	-94.896	45.178
JUN	117.46651	5	8	65.F	0.000					0.000	45.178
JUL	158.85899	17	19	88.F	0.000					0.000	45.178
AUG	153.06587	20	20	90.F	0.000					0.000	45.178
SEP	78.47227	5	18	90.F	0.000					0.000	45.178
OCT	1.72823	1	18	83.F	-5.721	2	10	64.F	53.F	-143.197	45.178
NOV	0.00000				-27.856	3	8	24.F	21.F	-310.552	45.178
DEC	0.00000				-64.397	13	8	0.F	-1.F	-420.592	45.178
TOTAL	551.654				-277.286					-441.163	45.178
MAX										451.006	

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/18/1995 9:43:41 SDL RUN 1  
 DENVER, CO 80227 RUN #3 ECONOMIZER FOR BLDG. 7485 BOWLING ALLEY TOPEKA, KS  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR OLD\_SYSTEM

MONTH	HOURS				HOURS				HOURS				COINCIDENT LOADS	
	COOLING LOAD	HEATING LOAD	COOL-HEAT LOAD	FLOATING	HEATING AVAIL.	COOLING AVAIL.	FANS ON	NIGHT VENTING	FANS ON	FANS ON	FANS ON	HEATING COOLING PEAK (KBTU/HR)	ELECTRIC COOLING PEAK (KW)	
JAN	0	545	0	199	744	0	545	0	0	0	0	-66.373	42.228	
FEB	0	492	0	180	672	0	492	0	0	0	0	-63.889	42.228	
MAR	0	543	0	201	744	0	543	0	0	0	0	-63.985	42.228	
APR	0	530	0	190	720	0	530	0	0	0	0	-2.664	42.883	
MAY	202	263	0	279	360	384	543	0	0	78	0.000	0.000	43.539	
JUN	457	0	0	263	0	720	526	0	0	69	0.000	0.000	17.440	
JUL	534	0	0	210	0	744	547	0	0	13	0.000	0.000	44.359	
AUG	527	0	0	217	0	744	543	0	0	16	0.000	0.000	45.178	
SEP	399	0	0	321	0	720	528	0	0	129	0.000	0.000	44.359	
OCT	10	526	0	208	720	24	545	0	0	9	0.000	0.000	44.359	
NOV	0	524	0	196	720	0	524	0	0	0	-102.523	42.228		
DEC	0	547	0	197	744	0	547	0	0	0	-95.311	43.539		
ANNUAL	2129	3970	0	2661	5424	3336	6413	0	0	314				

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/18/1995 9:43:41 SDL RUN 1  
 DENVER, CO 80227 RUN #3 ECONOMIZER FOR BLDG. 7485 BOWLING ALLEY TOPEKA, KS  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR NEW SYSTEM

MONTH	C O O L I N G				H E A T I N G				E L E C			
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC- TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				0.000	-81.085	15	8	-7.F	-448.682	15210.	29.532
FEB	0.00000				0.000	-58.036	3	8	-3.F	-447.128	13682.	29.532
MAR	0.00000				0.000	-41.151	3	8	12.F	-346.072	15263.	29.532
APR	0.00000				0.000	-11.031	5	8	30.F	-224.726	14870.	29.532
MAY	35.13863	30	20	75.F	277.398	-2.011	9	8	49.F	-101.034	15058.	29.532
JUN	94.22874	24	20	83.F	290.120	0.000				0.000	14770.	29.532
JUL	124.20753	17	18	88.F	328.197	0.000				0.000	15157.	29.532
AUG	120.34452	20	21	87.F	301.452	0.000				0.000	15263.	29.532
SEP	68.99541	5	18	90.F	296.025	0.000				0.000	14717.	29.532
OCT	1.95892	1	18	83.F	224.576	-5.883	20	8	22.F	-225.442	15108.	29.532
NOV	0.00000				0.000	-29.008	3	8	21.F	-304.499	14515.	29.532
DEC	0.00000				0.000	-67.884	13	8	-1.F	-421.684	15260.	29.532
TOTAL	444.874				328.197	-296.089				-448.682	178868.	29.532
MAX												

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/18/1995 9:43:41 SDL RUN 1  
 DENVER, CO 80227 RUN #3 ECONOMIZER FOR BLDG. 7485 BOWLING ALLEY TOPEKA, KS  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR NEW SYSTEM

MONTH	HOURS				HOURS				HOURS				HOURS			
	COOLING LOAD	HEATING LOAD	COINCIDENT COOL-HEAT LOAD	FLOATING	HEATING AVAIL.	COOLING AVAIL.	FANS ON	VENTING	FANS ON	NIGHT	FLOATING	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)	HEATING LOAD AT COOLING PEAK (KBTU/HR)	COINCIDENT LOADS-- ELECTRIC LOAD AT COOLING PEAK (KW)	
JAN	0	545	0	199	744	0	545	0	0	0	0	-87.915	29.532	-87.915	29.532	
FEB	0	492	0	180	672	0	492	0	0	0	0	-94.261	29.532	-94.261	29.532	
MAR	0	543	0	201	744	0	543	0	0	0	0	-92.486	29.532	-92.486	29.532	
APR	0	389	0	331	720	0	530	0	0	141	0	-2.382	29.532	-2.382	29.532	
MAY	239	138	0	367	360	384	543	0	0	166	0	0.000	29.532	0.000	29.532	
JUN	502	0	0	218	0	720	526	0	0	24	0	0.000	29.532	0.000	29.532	
JUL	545	0	0	199	0	744	547	0	0	2	0	0.000	29.532	0.000	29.532	
AUG	539	0	0	205	0	744	543	0	0	4	0	0.000	29.532	0.000	29.532	
SEP	488	0	0	232	0	720	528	0	0	40	0	0.000	29.532	0.000	29.532	
OCT	17	310	0	417	720	24	545	0	0	218	0	0.000	29.532	0.000	29.532	
NOV	0	496	0	224	720	0	524	0	0	28	0	-113.084	29.532	-113.084	29.532	
DEC	0	547	0	197	744	0	547	0	0	0	0	-106.681	29.532	-106.681	29.532	
ANNUAL	2330	3460	0	2970	5424	3336	6413	0	0	623						

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/18/1995 9:43:41 SDL RUN 1  
 DENVER, CO 80227 RUN #3 ECONOMIZER FOR BLDG. 7485 BOWLING ALLEY TOPEKA, KS  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR UNIT-HEATR

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	ELECTRIC ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-19.801	15	7	-7. F	-8. F	-68.725	2.823
FEB	0.00000				-13.271	3	7	-5. F	-6. F	-58.491	2.807
MAR	0.00000				-7.753	4	7	14. F	12. F	-38.918	2.773
APR	0.00000				-0.717	1	6	54. F	50. F	-18.313	2.741
MAY	0.00000				0.000					0.000	2.717
JUN	0.00000				0.000					0.000	2.717
JUL	0.00000				0.000					0.000	2.717
AUG	0.00000				0.000					0.000	2.717
SEP	0.00000				0.000					0.000	2.717
OCT	0.00000				-0.404	20	8	23. F	22. F	-17.871	2.745
NOV	0.00000				-6.088	3	7	19. F	17. F	-34.461	2.769
DEC	0.00000				-16.079	15	7	11. F	9. F	-59.484	2.804
TOTAL MAX	0.000				-64.113					-68.725	2.823

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/18/1995 9:43:41 SDL RUN 1  
 DENVER, CO 80227 RUN #3 ECONOMIZER FOR BLDG. 7485 BOWLING ALLEY TOPEKA, KS  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR UNIT-HEATR

MONTH	HOURS OF NUMBER				HOURS OF				COINCIDENT LOADS			
	HOURS COOLING LOAD	HOURS HEATING LOAD	HOURS COOL-HEAT LOAD	HOURS COINCIDENT LOAD	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.	HOURS FANS ON	HOURS FANS ON CYCLE ON	HOURS NIGHT VENTING	HOURS FLOATING WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)
JAN	0	740	0	0	744	0	744	0	0	4	-15.695	2.743
FEB	0	663	0	0	672	0	672	0	0	9	-13.177	2.738
MAR	0	546	0	0	744	0	744	0	0	198	-12.723	2.738
APR	0	95	0	0	720	0	720	0	0	625	0.000	2.717
MAY	0	0	0	0	360	0	744	384	0	744	0.000	0.000
JUN	0	0	0	0	0	0	720	720	0	720	0.000	0.000
JUL	0	0	0	0	0	0	744	744	0	744	0.000	0.000
AUG	0	0	0	0	0	0	744	744	0	744	0.000	0.000
SEP	0	0	0	0	0	0	720	720	0	720	0.000	0.000
OCT	0	41	0	0	720	0	744	24	0	703	-0.339	2.717
NOV	0	430	0	0	720	0	720	0	0	290	-20.816	2.751
DEC	0	737	0	0	744	0	744	0	0	7	-20.660	2.751
ANNUAL	0	3252	0	0	5424	0	8760	3336	0	5508		

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/18/1995 9:43:41 PDL RUN 1  
 DENVER, CO 80227 RUN #3 ECONOMIZER FOR BLDG. 7485 BOWLING ALLEY  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY 145.192 288.456 15/20 129.870 286.758 4/21 141.531 282.827 13/12 133.617 279.351 5/10 157.107 476.609 31/18 195.620 477.145 28/18 220.077 515.352 222.174 23/18 505.507 21/19 175.620 488.083 5/18 135.951 407.461 1/18 133.702 282.740 12/11 144.831 288.368 9/20	NATURAL-GAS 270.125 1204.209 15/ 8 195.082 1186.046 3/ 8 138.500 953.987 3/ 8 44.239 625.309 5/ 8 10.944 270.853 9/ 8 0.000 0.000 30/ 1 0.000 0.000 31/ 1 0.000 31/ 1 0.000 31/ 1 0.000 30/ 1 25.844 549.663 20/ 8 107.074 872.909 3/ 8 230.181 1142.743 13/ 8
JAN	TOTAL (MBTU) PEAK (KBTU) DY/HR	145.192 288.456 15/20	270.125 1204.209 15/ 8
FEB	TOTAL (MBTU) PEAK (KBTU) DY/HR	129.870 286.758 4/21	195.082 1186.046 3/ 8
MAR	TOTAL (MBTU) PEAK (KBTU) DY/HR	141.531 282.827 13/12	138.500 953.987 3/ 8
APR	TOTAL (MBTU) PEAK (KBTU) DY/HR	133.617 279.351 5/10	44.239 625.309 5/ 8
MAY	TOTAL (MBTU) PEAK (KBTU) DY/HR	157.107 476.609 31/18	10.944 270.853 9/ 8
JUN	TOTAL (MBTU) PEAK (KBTU) DY/HR	195.620 477.145 28/18	0.000 0.000 30/ 1
JUL	TOTAL (MBTU) PEAK (KBTU) DY/HR	220.077 515.352 222.174 23/18	0.000 0.000 31/ 1 0.000
AUG	TOTAL (MBTU) PEAK (KBTU) DY/HR	505.507 21/19	0.000 31/ 1
SEP	TOTAL (MBTU) PEAK (KBTU) DY/HR	175.620 488.083 5/18	0.000 0.000 30/ 1
OCT	TOTAL (MBTU) PEAK (KBTU) DY/HR	135.951 407.461 1/18	25.844 549.663 20/ 8
NOV	TOTAL (MBTU) PEAK (KBTU) DY/HR	133.702 282.740 12/11	107.074 872.909 3/ 8
DEC	TOTAL (MBTU) PEAK (KBTU) DY/HR	144.831 288.368 9/20	230.181 1142.743 13/ 8
	ONE YEAR USE/PEAK	1935.292 515.352	1021.989 1204.209

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOB-2.1D 5/18/1995 9:43:41 PDL RUN 1  
 DENVER, CO 80227 RUN #3 ECONOMIZER FOR BLDG. 7485 BOWLING ALLEY  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE	ELECTRICITY	NATURAL-GAS
IN SITE MBTU -		
CATEGORY OF USE		
SPACE HEAT	44.65	1021.99
SPACE COOL	316.43	0.00
HVAC AUX	633.94	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	805.78	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	134.53	0.00
TOTAL	1935.33	1021.99

TOTAL SITE ENERGY 2957.28 MBTU 84.0 KBTU/SQFT-YR GROSS-AREA 84.7 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 6833.68 MBTU 194.1 KBTU/SQFT-YR GROSS-AREA 195.7 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 42.1  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

INPUT SYSTEMS ..

```

$-----$
$ E Z - D O E   S Y S T E M S   I N P U T $
$-----$

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\$ GENERAL PROJECT DATA

```

TITLE  LINE-1 *      EMC      ENGINEERS      INC.      *
        LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
        LINE-3 *      DENVER,      CO      80227      *

        LINE-4 *RUN #4 NIGHT INFILTRATION FOR BLDG. 7485*
        LINE-5 *BOWLING ALLEY      * ..

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ABORT      ERRORS ..
DIAGNOSTIC WARNINGS ..
SYSTEMS-REPORT VERIFICATION=(SV-A)
              SUMMARY=(SS-A,SS-C,SS-K,SS-O)
              HOURLY-DATA-SAVE = YES ..

```

\$ SCHEDULES

```

SD_ON      =DAY-SCHEDULE (1,24) (1.) ..
SD_OFF     =DAY-SCHEDULE (1,24) (0.) ..
SD_S_HT_F  =DAY-SCHEDULE (1,24) (71.8) ..
SD_S_CL_F  =DAY-SCHEDULE (1,24) (72.) ..
SD_CL_PIN  =DAY-SCHEDULE (1,24) (85.) ..
SD_HT_PIN  =DAY-SCHEDULE (1,24) (55.) ..
SD_W_HT_F  =DAY-SCHEDULE (1,24) (74.) ..
SD_W_CL_F  =DAY-SCHEDULE (1,24) (74.2) ..
S_OA%_SNTR =DAY-SCHEDULE (1,7) (0.)
              (8,24) (0.2) ..
S_OA%_FRSA =DAY-SCHEDULE (1,2) (0.2)
              (3,7) (0.)
              (8,24) (0.2) ..

SW_ON      =WEEK-SCHEDULE (ALL) SD_ON ..
SW_OFF     =WEEK-SCHEDULE (ALL) SD_OFF ..
SW_S_HT_F  =WEEK-SCHEDULE (ALL) SD_S_HT_F ..
SW_S_CL_F  =WEEK-SCHEDULE (ALL) SD_S_CL_F ..
SW_CL_PIN  =WEEK-SCHEDULE (ALL) SD_CL_PIN ..
SW_HT_PIN  =WEEK-SCHEDULE (ALL) SD_HT_PIN ..
SW_W_HT_F  =WEEK-SCHEDULE (ALL) SD_W_HT_F ..
SW_W_CL_F  =WEEK-SCHEDULE (ALL) SD_W_CL_F ..
SW_OA%     =WEEK-SCHEDULE (MON) S_OA%_SNTR
              (TUE) S_OA%_SNTR

```



(WED) S\_OA%\_SNTR  
 (THU) S\_OA%\_SNTR  
 (FRI) S\_OA%\_FRSA  
 (SAT) S\_OA%\_FRSA  
 (SUN) S\_OA%\_SNTR  
 (HOL) S\_OA%\_SNTR ..

\$ FULL ON SYSTEM

S\_ON =SCHEDULE THRU DEC 31 SW\_ON ..

\$ FULL OFF SYSTEM

S\_OFF =SCHEDULE THRU DEC 31 SW\_OFF ..

\$ HEATING SEASON

S\_HE-SCHED =SCHEDULE THRU MAY 15 SW\_ON  
 THRU OCT 1 SW\_OFF  
 THRU DEC 31 SW\_ON ..

\$ COOLING SEASON

S\_CL\_SCHED =SCHEDULE THRU MAY 15 SW\_OFF  
 THRU OCT 1 SW\_ON  
 THRU DEC 31 SW\_OFF ..

\$ HEATING SET TEMP

S\_HT\_SET\_F =SCHEDULE THRU MAY 15 SW\_W\_HT\_F  
 THRU OCT 1 SW\_S\_HT\_F  
 THRU DEC 31 SW\_W\_HT\_F ..

\$ COOLING SET TEMP

S\_CL\_SET\_F =SCHEDULE THRU MAY 15 SW\_W\_CL\_F  
 THRU OCT 15 SW\_S\_CL\_F  
 THRU DEC 31 SW\_W\_CL\_F ..

\$ HEATING SET TEMP =55F

S\_HTIN\_PIN =SCHEDULE THRU DEC 31 SW\_HT\_PIN ..

\$ COOLING SET TEMP =85F

S\_CLIN\_PIN =SCHEDULE THRU DEC 31 SW\_CL\_PIN ..

S\_HRLY-RPT =SCHEDULE THRU JAN 13 SW\_OFF

THRU JAN 15 SW\_ON  
 THRU AUG 20 SW\_OFF  
 THRU AUG 22 SW\_ON  
 THRU DEC 31 SW\_OFF ..

S\_OA% =SCHEDULE THRU DEC 31 SW\_OA% ..

\$ ZONE DESCRIPTION

N\_OLD\_SPAC =ZONE DESIGN-HEAT-T = 55.0 DESIGN-COOL-T = 85.0  
 HEAT-TEMP-SCH = S\_HTIN\_PIN COOL-TEMP-SCH = S\_CLIN\_PIN  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL ASSIGNED-CFM = 2200.



SIZING-OPTION = FROM-LOADS  
HEATING-CAPACITY = -82200.0 ..

CR\_OLD\_SPA =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

S\_OLD\_SPAC =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

W\_OLD\_SPAC =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

N\_NEW\_SPAC =ZONE DESIGN-HEAT-T = 55.0 DESIGN-COOL-T = 85.0  
HEAT-TEMP-SCH = S\_HTIN\_PIN COOL-TEMP-SCH = S\_CLIN\_PIN  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL ASSIGNED-CFM = 1630.  
SIZING-OPTION = FROM-LOADS  
HEATING-CAPACITY = -54800.0 ..

CR\_NEW\_SPC =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

S\_NEW\_SPAC =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

E\_NEW\_SPAC =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

§ SYSTEM DESCRIPTION

OLD\_SYSTEM =SYSTEM SYSTEM-TYPE = DDS  
MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
HEATING-SCHEDULE = S\_HE-SCHED  
COOLING-SCHEDULE = S\_CL\_SCHED PREHEAT-T = 0.0  
OA-CONTROL = FIXED SUPPLY-CFM = 16000.  
RATED-CFM = 16000. MIN-AIR-SCH = S\_OA ←  
MAX-OA-FRACTION = 0.2 SUPPLY-DELTA-T = 3.4

SUPPLY-KW = 0.00109  
 MOTOR-PLACEMENT = OUTSIDE-AIRFLOW  
 MAX-FAN-RATIO = 1.0 NIGHT-CYCLE-CTRL = STAY-OFF  
 NIGHT-VENT-DT = 0.0 MIN-CFM-RATIO = 1.0  
 COOLING-CAPACITY = 557000. COOL-SH-CAP = 354000.  
 HEATING-CAPACITY = -640000.  
 SIZING-OPTION = COINCIDENT RETURN-AIR-PATH = DIRECT  
 ZONE-NAMES = (CR\_OLD\_SPA, S\_OLD\_SPAC, W\_OLD\_SPAC) ..

NEW\_SYSTEM =SYSTEM SYSTEM-TYPE = VAVS  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_HE-SCHED  
 COOLING-SCHEDULE = S\_CL\_SCHED PREHEAT-T = 0.0  
 COOL-CONTROL = WARMEST OA-CONTROL = FIXED  
 SUPPLY-CFM = 10000. RATED-CFM = 10000.  
 MIN-AIR-SCH = S\_OA% MAX-OA-FRACTION = 0.2 ←  
 FAN-CONTROL = CONSTANT-VOLUME SUPPLY-DELTA-T = 3.4  
 SUPPLY-KW = 0.00109  
 MOTOR-PLACEMENT = OUTSIDE-AIRFLOW  
 MAX-FAN-RATIO = 1.0 NIGHT-CYCLE-CTRL = STAY-OFF  
 NIGHT-VENT-DT = 0.0 MIN-CFM-RATIO = 1.0  
 REHEAT-DELTA-T = 65. COOLING-CAPACITY = 309000.  
 COOL-SH-CAP = 232000. COOL-CTRL-RANGE = 2.  
 HEATING-CAPACITY = -525000.  
 SIZING-OPTION = COINCIDENT RETURN-AIR-PATH = DIRECT  
 ZONE-NAMES = (CR\_NEW\_SPC, S\_NEW\_SPAC, E\_NEW\_SPAC) ..

UNIT-HEATR =SYSTEM SYSTEM-TYPE = UHT  
 MAX-SUPPLY-T = 120.0 HEATING-SCHEDULE = S\_HE-SCHED  
 RATED-CFM = 4050. FAN-SCHEDULE = S\_HE-SCHED  
 SUPPLY-DELTA-T = 0.2 SUPPLY-KW = 0.00006  
 NIGHT-CYCLE-CTRL = CYCLE-ON-ANY  
 HEATING-CAPACITY = -137000.  
 ZONE-NAMES = (N\_OLD\_SPAC, N\_NEW\_SPAC) ..

\$ HOURLY REPORT DESCRIPTION

BLOCK\_#1 =REPORT-BLOCK VARIABLE-TYPE = N\_OLD\_SPAC  
 VARIABLE-LIST = (17,18,7,6) ..  
 BLOCK\_#2 =REPORT-BLOCK VARIABLE-TYPE = S\_OLD\_SPAC  
 VARIABLE-LIST = (17,18,7,6) ..  
 AHU\_DD =REPORT-BLOCK VARIABLE-TYPE = OLD\_SYSTEM  
 VARIABLE-LIST = (1,2,3,4,5,6,17) ..  
 AHU\_VAV =REPORT-BLOCK VARIABLE-TYPE = NEW\_SYSTEM  
 VARIABLE-LIST = (1,2,3,4,5,6,17) ..  
 BLOCK\_#5 =REPORT-BLOCK VARIABLE-TYPE = N\_NEW\_SPAC  
 VARIABLE-LIST = (17,18,7,6) ..  
 BLOCK\_#6 =REPORT-BLOCK VARIABLE-TYPE = S\_NEW\_SPAC  
 VARIABLE-LIST = (17,18,7,6) ..  
 OLD\_ZONES = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (BLOCK\_#1,BLOCK\_#2)  
 ..  
 NEW\_ZONES = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (BLOCK\_#5,BLOCK\_#6)  
 ..

DD\_RPT = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
REPORT-BLOCK = (AHU\_DD)

VAV\_RPT = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
REPORT-BLOCK = (AHU\_VAV)

END ..  
COMPUTE SYSTEMS ..

INPUT PLANT ..

-----\$  
\$ EZ - DOE P L A N T S I N P U T \$  
-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
LINE-3 \* DENVER, CO 80227 \*

LINE-4 \*RUN #4 NIGHT INFILTRATION FOR BLDG. 7485\*  
LINE-5 \*BOWLING ALLEY \* ..

ABORT ERRORS ..  
DIAGNOSTIC WARNINGS ..  
PLANT-REPORT VERIFICATION=(PV-A)  
SUMMARY=(PS-B,BEPS)  
HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

PD\_ON =DAY-SCHEDULE (1,24) (1.) ..

PD\_OFF =DAY-SCHEDULE (1,24) (0.) ..

PW\_ON =WEEK-SCHEDULE (ALL) PD\_ON ..

PW\_OFF =WEEK-SCHEDULE (ALL) PD\_OFF ..

\$ HEATING SEASON

P\_HEAT =SCHEDULE THRU MAY 15 PW\_ON  
THRU OCT 1 PW\_OFF  
THRU DEC 31 PW\_ON ..

\$ COOLING SEASON

P\_COOL =SCHEDULE THRU MAY 15 PW\_OFF  
THRU OCT 1 PW\_ON  
THRU DEC 31 PW\_OFF ..

\$ EQUIPMENT DESCRIPTION

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/18/1995 10: 3:35 SDL RUN 1												
DENVER, CO 80227 RUN #4 NIGHT INFILTRATION FOR BLDG. 7485BOWLING ALLEY TOPEKA, KS												
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR OLD_SYSTEM												
----- C O O L I N G ----- H E A T I N G ----- E L E C -----												
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC-TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				0.000	-94.335	15	8	-6.F	-7.F	25782.	45.178
FEB	0.00000				0.000	-62.096	3	8	-2.F	-3.F	23218.	45.178
MAR	0.00000				0.000	-36.295	3	8	15.F	12.F	25857.	45.178
APR	0.00000				0.000	-4.005	1	2	34.F	30.F	25125.	45.178
MAY	63.06487	16	2	62.F	59.F	-0.610	1	8	45.F	42.F	25601.	45.178
JUN	142.92651	24	20	83.F	74.F	0.000				0.000	25020.	45.178
JUL	180.65172	17	19	88.F	80.F	0.000				0.000	25707.	45.178
AUG	175.30405	20	20	90.F	75.F	0.000				0.000	25857.	45.178
SEP	103.13426	5	18	90.F	77.F	0.000				0.000	24945.	45.178
OCT	2.96771	1	18	83.F	68.F	-2.509	20	9	29.F	29.F	25654.	45.178
NOV	0.00000				0.000	-25.384	3	8	24.F	21.F	24711.	45.178
DEC	0.00000				0.000	-77.537	13	8	0.F	-1.F	25835.	45.178
TOTAL	668.049				543.093	-302.769					303316.	45.178
MAX												

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/18/1995 10: 3:35 SDL RUN 1												
DENVER, CO 80227 RUN #4 NIGHT INFILTRATION FOR BLDG. 7485BOWLING ALLEY TOPEKA, KS												
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR OLD_SYSTEM												
----- N U M B E R O F H O U R S -----												
MONTH	HOURS COOLING LOAD	HOURS HEATING LOAD	HOURS COINCIDENT COOL-HEAT LOAD	HOURS FLOATING	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.	HOURS FANS ON	HOURS FANS ON CYCLE	HOURS NIGHT VENTING	HOURS FLOATING WHEN FANS ON	COINCIDENT HEATING LOAD AT COOLING PEAK (KBTU/HR)	COINCIDENT ELECTRIC LOAD AT COOLING PEAK (KW)
JAN	0	744	0	0	744	0	744	0	0	0	-100.097	42.228
FEB	0	672	0	0	672	0	672	0	0	0	-95.418	42.228
MAR	0	744	0	0	744	0	744	0	0	0	-97.970	42.228
APR	0	720	0	0	720	0	720	0	0	0	-5.106	42.883
MAY	384	360	0	0	360	384	720	0	0	0	0.000	17.440
JUN	719	0	0	1	0	720	720	0	0	0	0.000	45.178
JUL	744	0	0	0	0	744	744	0	0	0	0.000	44.359
AUG	744	0	0	0	0	744	744	0	0	0	0.000	45.178
SEP	643	0	0	77	0	720	720	0	77	0.000	0.000	44.359
OCT	21	720	0	3	24	0	720	0	3	0.000	0.000	44.359
NOV	0	720	0	0	0	0	720	0	0	0.000	-142.979	42.228
DEC	0	744	0	0	744	0	744	0	0	0	-132.023	43.539
ANNUAL	3255	5424	0	81	5424	3336	8760	0	0	81		

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/18/1995 10: 3:35 SDL RUN 1  
 DENVER, CO 80227 RUN #4 NIGHT INFILTRATION FOR BLDG. 7485BOWLING ALLEY  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR NEW\_SYSTEM TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC-TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-78.147	15	8	-6.F	-7.F	17379.	29.532
FEB	0.00000				-54.905	3	8	-2.F	-3.F	15644.	29.532
MAR	0.00000				-35.519	3	8	15.F	12.F	17454.	29.532
APR	0.00000				-5.084	5	8	34.F	30.F	16941.	29.532
MAY	45.54992	16	2	62.F	0.000	1	8	45.F	42.F	17249.	29.532
JUN	106.77282	24	20	83.F	0.000				0.000	16885.	29.532
JUL	134.64278	17	18	88.F	0.000				0.000	17305.	29.532
AUG	132.73920	20	21	87.F	0.000				0.000	17454.	29.532
SEP	81.98801	5	18	90.F	0.000				0.000	16810.	29.532
OCT	2.49712	1	18	83.F	-2.438	20	9	29.F	29.F	17277.	29.532
NOV	0.00000				-22.886	3	8	24.F	21.F	16652.	29.532
DEC	0.00000				-64.603	13	8	0.F	-1.F	17407.	29.532
TOTAL	504.190				-263.970					204455.	
MAX											29.532

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/18/1995 10: 3:35 SDL RUN 1  
 DENVER, CO 80227 RUN #4 NIGHT INFILTRATION FOR BLDG. 7485BOWLING ALLEY  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR NEW\_SYSTEM TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C		
	HOURS COOLING LOAD	HOURS HEATING LOAD	HOURS COINCIDENT COOL-HEAT LOAD	HOURS FLOATING LOAD	HOURS COOLING AVAIL.	HOURS HEATING AVAIL.	HOURS FANS ON CYCLE	HOURS NIGHT VENTING	HOURS FLOATING WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)
JAN	0	744	0	0	0	744	0	0	0	-80.375	29.532
FEB	0	672	0	0	0	672	0	0	0	-81.733	29.532
MAR	0	733	0	11	0	744	0	0	11	-85.166	29.532
APR	0	470	0	250	0	720	0	0	250	-3.167	29.532
MAY	381	183	0	180	384	360	0	0	180	0.000	10.900
JUN	718	0	0	2	720	720	0	0	2	0.000	29.532
JUL	744	0	0	0	744	744	0	0	0	0.000	29.532
AUG	744	0	0	0	744	744	0	0	0	0.000	29.532
SEP	705	0	0	15	744	720	0	0	15	0.000	29.532
OCT	21	438	0	285	24	744	0	0	285	0.000	29.532
NOV	0	632	0	88	0	720	0	0	88	-109.374	29.532
DEC	0	744	0	0	744	744	0	0	0	-102.670	29.532
ANNUAL	3313	4616	0	831	3336	8760	0	0	831		

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/18/1995 10: 3:35 SDL RUN 1  
 DENVER, CO 80227 RUN #4 NIGHT INFILTRATION FOR BLDG. 7485BOWLING ALLEY  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR UNIT-HEATR TOPEKA, KS

MONTH	COOLING ENERGY (MBTU)		TIME OF MAX DY HR		DRY-BULB TEMP		WET-BULB TEMP		HEATING ENERGY (MBTU)		TIME OF MAX DY HR		DRY-BULB TEMP		WET-BULB TEMP		MAXIMUM COOLING LOAD (KBTU/HR)		HEATING LOAD (KBTU/HR)		ELECTRIC ENERGY (KWH)		MAXIMUM ELEC LOAD (KW)	
	COOLING ENERGY (MBTU)	MAXIMUM COOLING LOAD (KBTU/HR)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELECTRIC ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)												
JAN	0.00000	0.000	15	7	-7.F	-8.F	-19.801	15	7	-7.F	-8.F	-68.725	1384.	2.823										
FEB	0.00000	0.000	3	7	-5.F	-6.F	-13.271	3	7	-5.F	-6.F	-58.491	1235.	2.807										
MAR	0.00000	0.000	4	7	14.F	12.F	-7.753	4	7	14.F	12.F	-38.918	1375.	2.773										
APR	0.00000	0.000	1	6	54.F	50.F	-0.717	1	6	54.F	50.F	-18.313	1327.	2.741										
MAY	0.00000	0.000					0.000					0.000	1333.	2.717										
JUN	0.00000	0.000					0.000					0.000	1318.	2.717										
JUL	0.00000	0.000					0.000					0.000	1341.	2.717										
AUG	0.00000	0.000					0.000					0.000	1363.	2.717										
SEP	0.00000	0.000					0.000					0.000	1307.	2.717										
OCT	0.00000	0.000	20	8	23.F	22.F	-0.404	20	8	23.F	22.F	-17.871	1337.	2.745										
NOV	0.00000	0.000	3	7	19.F	17.F	-6.088	3	7	19.F	17.F	-34.461	1294.	2.769										
DEC	0.00000	0.000	15	7	11.F	9.F	-16.079	15	7	11.F	9.F	-59.484	1382.	2.804										
TOTAL MAX	0.000	0.000					-64.113					-68.725	15995.	2.823										

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/18/1995 10: 3:35 SDL RUN 1  
 DENVER, CO 80227 RUN #4 NIGHT INFILTRATION FOR BLDG. 7485BOWLING ALLEY  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR UNIT-HEATR TOPEKA, KS

MONTH	COOLING LOAD		HEATING LOAD		HOURS COINCIDENT COOL-HEAT LOAD		HOURS FLOATING		HOURS HEATING AVAIL.		HOURS COOLING AVAIL.		HOURS FANS ON CYCLE ON		HOURS NIGHT VENTING		HOURS FLOATING WHEN FANS ON		HEATING LOAD AT COOLING PEAK (KBTU/HR)		ELECTRIC LOAD AT COOLING PEAK (KW)	
	COOLING LOAD	HEATING LOAD	HOURS COINCIDENT COOL-HEAT LOAD	HOURS FLOATING	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.	HOURS FANS ON CYCLE ON	HOURS NIGHT VENTING	HOURS FLOATING WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)											
JAN	0	740	0	4	744	0	744	0	744	0	4	-15.695	2.743									
FEB	0	663	0	9	672	0	672	0	672	0	9	-13.177	2.738									
MAR	0	546	0	198	744	0	744	0	744	0	198	-12.723	2.738									
APR	0	95	0	625	720	0	720	0	720	0	625	0.000	2.717									
MAY	0	0	0	744	360	0	744	384	744	0	744	0.000	0.000									
JUN	0	0	0	720	0	0	720	720	720	0	720	0.000	0.000									
JUL	0	0	0	744	0	0	744	744	744	0	744	0.000	0.000									
AUG	0	0	0	744	0	0	744	744	744	0	744	0.000	0.000									
SEP	0	0	0	720	0	0	720	720	720	0	720	0.000	0.000									
OCT	0	41	0	703	720	0	744	24	744	0	703	-0.339	2.717									
NOV	0	430	0	290	720	0	744	0	744	0	290	-20.816	2.751									
DEC	0	737	0	7	744	0	744	0	744	0	7	-20.660	2.751									
ANNUAL	0	3252	0	5508	5424	0	8760	3336	8760	0	5508	-68.725	2.823									

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/18/1995 10: 3:35 PDL RUN 1  
 DENVER, CO 80227 RUN #4 NIGHT INFILTRATION FOR BLDG. 7485BOWLING ALLEY  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY 164.447 284.072 15/20	NATURAL-GAS 286.002 982.884 15/ 8
JAN	TOTAL (MBTU) PEAK (KBTU) DY/HR	147.409 283.942 4/20	204.818 912.175 3/ 8
FEB	TOTAL (MBTU) PEAK (KBTU) DY/HR	160.300 283.894 5/22	130.520 706.301 3/ 8
MAR	TOTAL (MBTU) PEAK (KBTU) DY/HR	150.950 275.416 1/ 1	22.866 383.127 5/ 8
APR	TOTAL (MBTU) PEAK (KBTU) DY/HR	186.215 489.249 31/18	5.074 75.002 1/ 8
MAY	TOTAL (MBTU) PEAK (KBTU) DY/HR	227.119 488.467 28/18	0.000 0.000 30/ 1
JUN	TOTAL (MBTU) PEAK (KBTU) DY/HR	251.023 532.616 23/18	0.000 0.000 31/ 1
JUL	TOTAL (MBTU) PEAK (KBTU) DY/HR	254.099 517.022 21/19	0.000 0.000 31/ 1
AUG	TOTAL (MBTU) PEAK (KBTU) DY/HR	207.148 501.212 5/18	0.000 0.000 30/ 1
SEP	TOTAL (MBTU) PEAK (KBTU) DY/HR	155.326 416.984 1/18	15.627 288.338 20/ 9
OCT	TOTAL (MBTU) PEAK (KBTU) DY/HR	151.821 278.356 12/11	92.914 624.646 3/ 8
NOV	TOTAL (MBTU) PEAK (KBTU) DY/HR	163.781 283.984 9/20	241.896 870.975 13/ 8
DEC	TOTAL (MBTU) PEAK (KBTU) DY/HR		
	ONE YEAR USE/PEAK	2219.639 532.616	999.717 982.884

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/18/1995 10: 3:35 PDL RUN 1  
 DENVER, CO 80227 RUN #4 NIGHT INFILTRATION FOR BLDG. 7485BOWLING ALLEY  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE	ELECTRICITY	NATURAL-GAS
IN SITE MBTU -		
CATEGORY OF USE		
SPACE HEAT	42.64	999.70
SPACE COOL	376.89	0.00
HVAC AUX	859.86	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	805.78	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	134.53	0.00
TOTAL	2219.71	999.70

TOTAL SITE ENERGY 3219.36 MBTU 91.4 KBTU/SQFT-YR GROSS-AREA 92.2 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 7665.30 MBTU 217.7 KBTU/SQFT-YR GROSS-AREA 219.5 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTILING RANGE = 41.8  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.



INPUT SYSTEMS ..

```

$-----$
$ E Z - D O E   S Y S T E M S   I N P U T $
$-----$

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\$ GENERAL PROJECT DATA

```

TITLE  LINE-1 *   EMC       ENGINEERS   INC.   *
        LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
        LINE-3 *   DENVER,     CO       80227   *

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        LINE-4 *RUN #5 DAY INFILTRATION FOR BLDG. 7485 *
        LINE-5 *BOWLING ALLEY * ..

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ABORT      ERRORS ..
DIAGNOSTIC WARNINGS ..
SYSTEMS-REPORT VERIFICATION=(SV-A)
              SUMMARY=(SS-A,SS-C,SS-K,SS-O)
              HOURLY-DATA-SAVE = YES ..

```

\$ SCHEDULES

```

SD_ON      =DAY-SCHEDULE (1,24) (1.) ..
SD_OFF     =DAY-SCHEDULE (1,24) (0.) ..
SD_S_HT_F  =DAY-SCHEDULE (1,24) (71.8) ..
SD_S_CL_F  =DAY-SCHEDULE (1,24) (72.) ..
SD_CL_PIN  =DAY-SCHEDULE (1,24) (85.) ..
SD_HT_PIN  =DAY-SCHEDULE (1,24) (55.) ..
SD_W_HT_F  =DAY-SCHEDULE (1,24) (74.) ..
SD_W_CL_F  =DAY-SCHEDULE (1,24) (74.2) ..
S_OA%_SNTR =DAY-SCHEDULE (1,7) (0.2)
              (8,24) (0.) ..
S_OA%_FRSA =DAY-SCHEDULE (1,2) (0.)
              (3,7) (0.2)
              (8,24) (0.) ..

```



```

SW_ON      =WEEK-SCHEDULE (ALL) SD_ON ..
SW_OFF     =WEEK-SCHEDULE (ALL) SD_OFF ..
SW_S_HT_F  =WEEK-SCHEDULE (ALL) SD_S_HT_F ..
SW_S_CL_F  =WEEK-SCHEDULE (ALL) SD_S_CL_F ..
SW_CL_PIN  =WEEK-SCHEDULE (ALL) SD_CL_PIN ..
SW_HT_PIN  =WEEK-SCHEDULE (ALL) SD_HT_PIN ..
SW_W_HT_F  =WEEK-SCHEDULE (ALL) SD_W_HT_F ..
SW_W_CL_F  =WEEK-SCHEDULE (ALL) SD_W_CL_F ..
SW_OA%     =WEEK-SCHEDULE (MON) S_OA%_SNTR
              (TUE) S_OA%_SNTR

```

(WED) S\_OA%\_SNTR  
 (THU) S\_OA%\_SNTR  
 (FRI) S\_OA%\_FRSA  
 (SAT) S\_OA%\_FRSA  
 (SUN) S\_OA%\_SNTR  
 (HOL) S\_OA%\_SNTR ..

## \$ FULL ON SYSTEM

S\_ON =SCHEDULE THRU DEC 31 SW\_ON ..

## \$ FULL OFF SYSTEM

S\_OFF =SCHEDULE THRU DEC 31 SW\_OFF ..

## \$ HEATING SEASON

S\_HE-SCHED =SCHEDULE THRU MAY 15 SW\_ON  
 THRU OCT 1 SW\_OFF  
 THRU DEC 31 SW\_ON ..

## \$ COOLING SEASON

S\_CL\_SCHED =SCHEDULE THRU MAY 15 SW\_OFF  
 THRU OCT 1 SW\_ON  
 THRU DEC 31 SW\_OFF ..

## \$ HEATING SET TEMP

S\_HT\_SET\_F =SCHEDULE THRU MAY 15 SW\_W\_HT\_F  
 THRU OCT 1 SW\_S\_HT\_F  
 THRU DEC 31 SW\_W\_HT\_F ..

## \$ COOLING SET TEMP

S\_CL\_SET\_F =SCHEDULE THRU MAY 15 SW\_W\_CL\_F  
 THRU OCT 15 SW\_S\_CL\_F  
 THRU DEC 31 SW\_W\_CL\_F ..

## \$ HEATING SET TEMP =55F

S\_HTIN\_PIN =SCHEDULE THRU DEC 31 SW\_HT\_PIN ..

## \$ COOLING SET TEMP =85F

S\_CLIN\_PIN =SCHEDULE THRU DEC 31 SW\_CL\_PIN ..

S\_HRLY-RPT =SCHEDULE THRU JAN 13 SW\_OFF

THRU JAN 15 SW\_ON

THRU AUG 20 SW\_OFF

THRU AUG 22 SW\_ON

THRU DEC 31 SW\_OFF ..

S\_OA% =SCHEDULE THRU DEC 31 SW\_OA% ..

## \$ ZONE DESCRIPTION

N\_OLD\_SPAC =ZONE DESIGN-HEAT-T = 55.0 DESIGN-COOL-T = 85.0  
 HEAT-TEMP-SCH = S\_HTIN\_PIN COOL-TEMP-SCH = S\_CLIN\_PIN  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL ASSIGNED-CFM = 2200.

SIZING-OPTION = FROM-LOADS  
HEATING-CAPACITY = -82200.0 ..

CR\_OLD\_SPA =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

S\_OLD\_SPAC =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

W\_OLD\_SPAC =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

N\_NEW\_SPAC =ZONE DESIGN-HEAT-T = 55.0 DESIGN-COOL-T = 85.0  
HEAT-TEMP-SCH = S\_HTIN\_PIN COOL-TEMP-SCH = S\_CLIN\_PIN  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL ASSIGNED-CFM = 1630.  
SIZING-OPTION = FROM-LOADS  
HEATING-CAPACITY = -54800.0 ..

CR\_NEW\_SPC =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

S\_NEW\_SPAC =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

E\_NEW\_SPAC =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

§ SYSTEM DESCRIPTION

OLD\_SYSTEM =SYSTEM SYSTEM-TYPE = DDS  
MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
HEATING-SCHEDULE = S\_HE-SCHED  
COOLING-SCHEDULE = S\_CL\_SCHED PREHEAT-T = 0.0  
OA-CONTROL = FIXED SUPPLY-CFM = 16000.  
RATED-CFM = 16000. MIN-AIR-SCH = S OA ←  
MAX-OA-FRACTION = 0.2 SUPPLY-DELTA-T = 3.4

SUPPLY-KW = 0.00109  
 MOTOR-PLACEMENT = OUTSIDE-AIRFLOW  
 MAX-FAN-RATIO = 1.0 NIGHT-CYCLE-CTRL = STAY-OFF  
 NIGHT-VENT-DT = 0.0 MIN-CFM-RATIO = 1.0  
 COOLING-CAPACITY = 557000. COOL-SH-CAP = 354000.  
 HEATING-CAPACITY = -640000.  
 SIZING-OPTION = COINCIDENT RETURN-AIR-PATH = DIRECT  
 ZONE-NAMES = (CR\_OLD\_SPA, S\_OLD\_SPAC, W\_OLD\_SPAC) ..

NEW\_SYSTEM =SYSTEM SYSTEM-TYPE = VAVS  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_HE-SCHED  
 COOLING-SCHEDULE = S\_CL\_SCHED PREHEAT-T = 0.0  
 COOL-CONTROL = WARMEST OA-CONTROL = FIXED  
 SUPPLY-CFM = 10000. RATED-CFM = 10000.  
 MIN-AIR-SCH = S\_OA% MAX-OA-FRACTION = 0.2 ←  
 FAN-CONTROL = CONSTANT-VOLUME SUPPLY-DELTA-T = 3.4  
 SUPPLY-KW = 0.00109  
 MOTOR-PLACEMENT = OUTSIDE-AIRFLOW  
 MAX-FAN-RATIO = 1.0 NIGHT-CYCLE-CTRL = STAY-OFF  
 NIGHT-VENT-DT = 0.0 MIN-CFM-RATIO = 1.0  
 REHEAT-DELTA-T = 65. COOLING-CAPACITY = 309000.  
 COOL-SH-CAP = 232000. COOL-CTRL-RANGE = 2.  
 HEATING-CAPACITY = -525000.  
 SIZING-OPTION = COINCIDENT RETURN-AIR-PATH = DIRECT  
 ZONE-NAMES = (CR\_NEW\_SPC, S\_NEW\_SPAC, E\_NEW\_SPAC) ..

UNIT-HEATR =SYSTEM SYSTEM-TYPE = UHT  
 MAX-SUPPLY-T = 120.0 HEATING-SCHEDULE = S\_HE-SCHED  
 RATED-CFM = 4050. FAN-SCHEDULE = S\_HE-SCHED  
 SUPPLY-DELTA-T = 0.2 SUPPLY-KW = 0.00006  
 NIGHT-CYCLE-CTRL = CYCLE-ON-ANY  
 HEATING-CAPACITY = -137000.  
 ZONE-NAMES = (N\_OLD\_SPAC, N\_NEW\_SPAC) ..

## \$ HOURLY REPORT DESCRIPTION

BLOCK\_#1 =REPORT-BLOCK VARIABLE-TYPE = N\_OLD\_SPAC  
 VARIABLE-LIST = (17,18,7,6) ..  
 BLOCK\_#2 =REPORT-BLOCK VARIABLE-TYPE = S\_OLD\_SPAC  
 VARIABLE-LIST = (17,18,7,6) ..  
 AHU\_DD =REPORT-BLOCK VARIABLE-TYPE = OLD\_SYSTEM  
 VARIABLE-LIST = (1,2,3,4,5,6,17) ..  
 AHU\_VAV =REPORT-BLOCK VARIABLE-TYPE = NEW\_SYSTEM  
 VARIABLE-LIST = (1,2,3,4,5,6,17) ..  
 BLOCK\_#5 =REPORT-BLOCK VARIABLE-TYPE = N\_NEW\_SPAC  
 VARIABLE-LIST = (17,18,7,6) ..  
 BLOCK\_#6 =REPORT-BLOCK VARIABLE-TYPE = S\_NEW\_SPAC  
 VARIABLE-LIST = (17,18,7,6) ..  
 OLD\_ZONES = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (BLOCK\_#1,BLOCK\_#2)  
 ..  
 NEW\_ZONES = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (BLOCK\_#5,BLOCK\_#6)  
 ..

DD\_RPT = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (AHU\_DD)

VAV\_RPT = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
 REPORT-BLOCK = (AHU\_VAV)

END ..  
 COMPUTE SYSTEMS ..

INPUT PLANT ..

\$-----\$  
 \$ E Z - D O E P L A N T S I N P U T \$  
 \$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
 LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
 LINE-3 \* DENVER, CO 80227 \*  
 LINE-4 \*RUN #5 DAY INFILTRATION FOR BLDG. 7485 \*  
 LINE-5 \*BOWLING ALLEY \* ..

ABORT ERRORS ..  
 DIAGNOSTIC WARNINGS ..  
 PLANT-REPORT VERIFICATION=(PV-A)  
 SUMMARY=(PS-B,BEPS)  
 HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

PD\_ON =DAY-SCHEDULE (1,24) (1.) ..

PD\_OFF =DAY-SCHEDULE (1,24) (0.) ..

PW\_ON =WEEK-SCHEDULE (ALL) PD\_ON ..

PW\_OFF =WEEK-SCHEDULE (ALL) PD\_OFF ..

\$ HEATING SEASON

P\_HEAT =SCHEDULE THRU MAY 15 PW\_ON  
 THRU OCT 1 PW\_OFF  
 THRU DEC 31 PW\_ON ..

\$ COOLING SEASON

P\_COOL =SCHEDULE THRU MAY 15 PW\_OFF  
 THRU OCT 1 PW\_ON  
 THRU DEC 31 PW\_OFF ..

\$ EQUIPMENT DESCRIPTION

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/18/1995 10:33: 1 SDL RUN 1  
 DENVER, CO 80227 RUN #5 DAY INFILTRATION FOR BLDG. 7485 BOWLING ALLEY  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR OLD\_SYSTEM TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-44.644	15	-7.7	-8.7	25782.	-397.178	45.178
FEB	0.00000				-28.158	3	-5.7	-6.7	23218.	-370.632	45.178
MAR	0.00000				-15.745	3	14.7	12.7	25857.	-254.469	45.178
APR	0.00000				-2.564	5	30.7	27.7	25125.	-66.765	45.178
MAY	61.04487	16	62.7	59.7	-1.072	1	44.7	41.7	25601.	-40.685	45.178
JUN	120.07435	24	83.7	74.7	0.000				25020.	0.000	45.178
JUL	143.32259	23	91.7	77.7	0.000				25707.	0.000	45.178
AUG	141.40668	12	92.7	72.7	0.000				25857.	0.000	45.178
SEP	101.57951	3	79.7	71.7	0.000				24945.	0.000	45.178
OCT	2.98430	1	70.7	64.7	-2.111	19	29.7	27.7	25654.	-45.173	45.178
NOV	0.00000				-8.982	3	13.7	12.7	24711.	-185.575	45.178
DEC	0.00000				-34.314	13	2.7	1.7	25835.	-348.819	45.178
TOTAL MAX	570.413				-137.590				303316.	-397.178	45.178

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/18/1995 10:33: 1 SDL RUN 1  
 DENVER, CO 80227 RUN #5 DAY INFILTRATION FOR BLDG. 7485 BOWLING ALLEY  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR OLD\_SYSTEM TOPEKA, KS

MONTH	HOURS				HOURS				HOURS				COINCIDENT LOADS	
	COOLING LOAD	HEATING LOAD	COOL-HEAT LOAD	FLOATING	HEATING AVAIL.	COOLING AVAIL.	FANS ON	NIGHT VENTING	FANS ON	CYCLE ON	FANS ON	FLOATING WHEN	HEATING COOLING PEAK (KBTU/HR)	ELECTRIC COOLING PEAK (KW)
JAN	0	744	0	0	744	0	744	0	0	0	0	0	-2.748	42.228
FEB	0	672	0	0	672	0	672	0	0	0	0	0	-0.785	42.228
MAR	0	744	0	0	744	0	744	0	0	0	0	0	-0.609	42.228
APR	0	720	0	0	720	0	720	0	0	0	0	0	-1.412	42.883
MAY	372	360	0	12	384	360	744	0	0	0	12	9	0.000	17.440
JUN	711	0	0	9	720	720	744	0	0	0	0	0	0.000	45.178
JUL	744	0	0	0	744	744	744	0	0	0	0	0	0.000	45.178
AUG	742	0	0	2	744	744	744	0	0	0	2	2	0.000	45.178
SEP	644	0	0	76	720	720	744	0	0	0	76	5	0.000	45.178
OCT	19	720	0	5	24	744	744	0	0	0	0	0	0.000	45.178
NOV	0	720	0	0	0	720	744	0	0	0	0	0	-5.430	42.228
DEC	0	744	0	0	744	0	744	0	0	0	0	0	-10.937	43.539
ANNUAL	3232	5424	0	104	3336	5424	8760	0	0	0	104	0		

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/18/1995 10:33: 1 SDL RUN 1  
 DENVER, CO 80227 RUN #5 DAY INFILTRATION FOR BLDG. 7485 BOWLING ALLEY TOPEKA, KS  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR NEW\_SYSTEM

MONTH	COOLING			HEATING			ELECTRIC		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	WET-BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	ELECTRIC ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000			-45.354	15	-7.F	17379.	-324.596	29.532
FEB	0.00000			-31.798	3	-5.F	15644.	-296.073	29.532
MAR	0.00000			-20.370	3	14.F	17454.	-218.460	29.532
APR	0.00000			-2.954	5	30.F	16941.	-103.806	29.532
MAY	43.19068	16	62.F	-0.596	1	44.F	17249.	-20.937	29.532
JUN	90.50021	24	83.F	0.000			16885.	0.000	29.532
JUL	109.73031	23	91.F	0.000			17305.	0.000	29.532
AUG	110.16496	20	90.F	0.000			17454.	0.000	29.532
SEP	79.23198	3	79.F	0.000			16810.	0.000	29.532
OCT	2.39482	1	70.F	-1.585	2	53.F	17277.	-39.134	29.532
NOV	0.00000			-11.283	3	13.F	16652.	-183.299	29.532
DEC	0.00000			-35.769	13	2.F	17407.	-276.104	29.532
TOTAL	435.213			-149.709			204455.	-324.596	29.532
MAX									

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/18/1995 10:33: 1 SDL RUN 1  
 DENVER, CO 80227 RUN #5 DAY INFILTRATION FOR BLDG. 7485 BOWLING ALLEY TOPEKA, KS  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR NEW\_SYSTEM

MONTH	COOLING			HEATING			ELECTRIC		
	COOLING LOAD	HEATING LOAD	COINCIDENT LOAD	COOLING AVAIL.	HEATING AVAIL.	COOLING AVAIL.	HEATING AVAIL.	COINCIDENT LOAD AT PEAK	ELECTRIC PEAK
JAN	0	734	0	744	0	0	0	-6.431	29.532
FEB	0	653	0	672	0	0	0	-6.965	29.532
MAR	0	575	0	744	0	0	0	-8.236	29.532
APR	0	320	0	720	0	0	0	-1.561	29.532
MAY	362	145	0	384	744	744	744	0.000	10.900
JUN	705	0	0	720	744	744	744	0.000	29.532
JUL	744	0	0	744	744	744	744	0.000	29.532
AUG	742	0	0	744	744	744	744	0.000	29.532
SEP	655	0	0	720	744	744	744	0.000	29.532
OCT	19	296	0	24	744	744	744	0.000	29.532
NOV	0	481	0	720	744	744	744	-14.861	29.532
DEC	0	700	0	744	744	744	744	-21.003	29.532
ANNUAL	3227	3904	0	5424	8760	8760	8760		

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/18/1995 10:33: 1 SDL RUN 1  
DENVER, CO 80227 RUN #5 DAY INFILTRATION FOR BLDG. 7485 BOWLING ALLEY  
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR UNIT-HEATR TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-19.801	15	7	-7.F	-8.F	-68.725	2.823
FEB	0.00000				-13.271	3	7	-5.F	-6.F	-58.491	2.807
MAR	0.00000				-7.753	4	7	14.F	12.F	-38.918	2.773
APR	0.00000				-0.717	1	6	54.F	50.F	-18.313	2.741
MAY	0.00000				0.000					0.000	2.717
JUN	0.00000				0.000					0.000	2.717
JUL	0.00000				0.000					0.000	2.717
AUG	0.00000				0.000					0.000	2.717
SEP	0.00000				0.000					0.000	2.717
OCT	0.00000				-0.404	20	8	23.F	22.F	-17.871	2.745
NOV	0.00000				-6.088	3	7	19.F	17.F	-34.461	2.769
DEC	0.00000				-16.079	15	7	11.F	9.F	-59.484	2.804
TOTAL	0.000				-64.113					-68.725	2.823
MAX											

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/18/1995 10:33: 1 SDL RUN 1  
DENVER, CO 80227 RUN #5 DAY INFILTRATION FOR BLDG. 7485 BOWLING ALLEY  
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR UNIT-HEATR TOPEKA, KS

MONTH	HOURS				HOURS				HOURS				COINCIDENT LOADS	
	COOLING LOAD	HEATING LOAD	COINCIDENT LOAD	FLOATING	HEATING AVAIL.	COOLING AVAIL.	FANS ON CYCLE	NIGHT VENTING	FLOATING WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)			
JAN	0	740	0	4	744	0	744	0	0	4	-15.695	2.743		
FEB	0	663	0	9	672	0	672	0	0	9	-13.177	2.738		
MAR	0	546	0	198	744	0	744	0	0	198	-12.723	2.738		
APR	0	95	0	625	720	0	720	0	0	625	0.000	2.717		
MAY	0	0	0	744	360	0	744	384	0	744	0.000	0.000		
JUN	0	0	0	720	0	0	720	720	0	720	0.000	0.000		
JUL	0	0	0	744	0	0	744	744	0	744	0.000	0.000		
AUG	0	0	0	744	0	0	744	744	0	744	0.000	0.000		
SEP	0	0	0	720	0	0	720	720	0	720	0.000	0.000		
OCT	0	41	0	703	720	0	744	24	0	703	-0.339	2.717		
NOV	0	430	0	290	720	0	720	0	0	290	-20.816	2.751		
DEC	0	737	0	7	744	0	744	0	0	7	-20.660	2.751		
ANNUAL	0	3252	0	5508	5424	0	8760	3336	0	5508				



EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/18/1995 10:33: 1 PDL RUN 1  
 DENVER, CO 80227 RUN #5 DAY INFILTRATION FOR BLDG. 7485 BOWLING ALLEY  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY TOTAL (MBTU) PEAK (KBTU) DY/HR	NATURAL-GAS TOTAL (MBTU) PEAK (KBTU) DY/HR
JAN	160.733 279.628 14/22	160.733 279.628 14/22	169.971 995.532 15/ 7
FEB	143.578 275.443 3/ 9	143.578 275.443 3/ 9	117.641 926.592 3/ 7
MAR	157.708 269.597 3/ 9	157.708 269.597 3/ 9	74.958 685.938 3/ 7
APR	150.669 267.094 1/20	150.669 267.094 1/20	17.163 315.155 5/ 7
MAY	184.615 452.387 16/18	184.615 452.387 16/18	6.212 110.384 1/ 2
JUN	215.288 448.644 24/20	215.288 448.644 24/20	0.000 0.000 30/ 1
JUL	232.839 473.041 23/20	232.839 473.041 23/20	0.000 0.000 31/ 1
AUG	235.991 471.441 12/20	235.991 471.441 12/20	0.000 0.000 31/ 1
SEP	204.432 443.494 3/20	204.432 443.494 3/20	0.000 0.000 30/ 1
OCT	155.155 398.731 1/18	155.155 398.731 1/18	13.673 131.480 19/ 1
NOV	149.714 268.129 12/20	149.714 268.129 12/20	48.948 570.489 3/ 6
DEC	159.970 275.433 15/ 9	159.970 275.433 15/ 9	137.232 879.601 13/ 7
	ONE YEAR USE/PEAK	2150.691 473.041	585.798 995.532

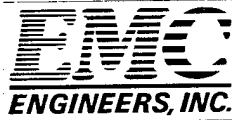
EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/18/1995 10:33: 1 PDL RUN 1  
 DENVER, CO 80227 RUN #5 DAY INFILTRATION FOR BLDG. 7485 BOWLING ALLEY  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE	ELECTRICITY	NATURAL-GAS
IN SITE MBTU -		
SPACE HEAT	26.14	585.80
SPACE COOL	324.29	0.00
HVAC AUX	860.01	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	805.78	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	134.53	0.00
TOTAL	2150.74	585.80

TOTAL SITE ENERGY 2736.49 MBTU 77.7 KBTU/SQFT-YR GROSS-AREA 78.4 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 7044.33 MBTU 200.0 KBTU/SQFT-YR GROSS-AREA 201.8 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 41.8  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

**COMPUTER ENERGY SIMULATIONS**

**BLDG. 7866  
THEATER BUILDINGS**



DENVER - ATLANTA

PROJECT: FEASIBILITY STUDY FOR  
 INSTALLATION OF UMCS  
 LOCATION: FORT RILEY, KANSAS

BUILDING NO.: 7866  
 BLDG. TYPE: THEATER

EMC NO.: 1406-001  
 CALC. BY: AJN  
 CHECKED BY: CEL  
 DATE: 05-Jul-95

**ENERGY CONSTANT CALCULATIONS**

	BASERUN	RUN1	RUN2	RUN3	RUN4	RUN5
HEATING (MBtu)	1073.8	401.0	686.8	414.7	514.8	951.2
COOLING (KWH)	213,352	154,500	196,050	149,856	200,952	202,789

SUPPLY AIR FAN	16,952 CFM
FLOOR AREA	8,449 FT <sup>2</sup>
CFMI	2882 CFM
UA	3333 BTU/HR-°F
BLDG CONSTR.	2 (1 FOR LIGHT ) (2 FOR HEAVY)

EZDOE COMPUTER RUN DEFINITION:	
BASERUN	EXISTING OPERATION
RUN1	NIGHT SETBACK
RUN2	DDC CONTROL
RUN3	ECONOMIZER
RUN4	NIGHTTIME INFILTRATION (OA)
RUN5	DAYTIME INFILTRATION (OA)

HOURS OF OCCUPANCY			ANNUAL HEATING & COOLING HOURS		
TH-F	1700	2400	14 HR	HR. ON HEATING	908 HR/YR
SAT.	1700	2400	7 HR	HR. ON COOLING	552 HR/YR
SUN.	1700	2400	7 HR	HR. OFF HEATING	4540 HR/YR
	TOTAL OCCUPY HR.		28 HR/WK	HR. OFF COOLING	2760 HR/YR
	TOTAL UNOCC. HR.		140 HR/WK		
	ANNUAL OCCUPY HR.		1460 HR/YR		
	ANNUAL UNOCC. HR.		7300 HR/YR		

PRESENT HR. OF OPERATION FOR SYS. WITH HEATING AND COOLING 8760 HR/YR  
 PRESENT HR. OF OPERATION FOR SYS. WITH HEATING ONLY 5448 HR/YR  
 PRESENT HR. OF OPERATION FOR SYS. WITH COOLING ONLY 3312 HR/YR  
 HRS SAVED (HTG ONLY) 5448 - 908 = 4540 HR/YR  
 HRS SAVED (CLG ONLY) 3312 - 552 = 2760 HR/YR

HOAUHC	1073.81 MBtu	-	514.8 MBtu	=	2.66E+01 Btu/CFM-HR	
	2881.84 CFM	x	7300 HR/YR			
HOAUH	1073.81 MBtu	-	514.8 MBtu	=	4.27E+01 Btu/CFM-HR	
	2881.84 CFM	x	4540 HR/YR			
COAUHC	213,351.9 kWH	-	200,952.2 kWH	=	5.89E-04 kWH/CFM-HR	
	2881.84 CFM	x	7300 HR/YR			
COAUC	213,351.9 kWH	-	200,952.2 kWH	=	1.56E-03 kWH/CFM-HR	
	2881.84 CFM	x	2760 HR/YR			
HOAOHC	1073.81 MBtu	-	951.16 MBtu	=	2.92E+01 Btu/CFM-HR	
	2881.84 CFM	x	1460 HR/YR			
HOAOH	1073.81 MBtu	-	951.16 MBtu	=	4.69E+01 Btu/CFM-HR	
	2881.84 CFM	x	908 HR/YR			
COAOHC	213,351.9 kWH	-	202,789.3 kWH	=	2.51E-03 kWH/CFM-HR	
	2881.84 CFM	x	1460 HR/YR			
COAOC	213,351.9 kWH	-	202,789.3 kWH	=	6.64E-03 kWH/CFM-HR	
	2881.84 CFM	x	552 HR/YR			
DC DUTY	1 / 6 (10 MINUTES PER HOUR)			=	0.17	
DC DEMAND	1 / 6 (10 MINUTES PER HOUR)			=	0.17	
ECC	154,500.4 kWH	-	149,856.4 kWH	=	4.96E-04 kWH/CFM-HR	
	16952 CFM	x	552 HR/YR			
ECHC	154,500.4 kWH	-	149,856.4 kWH	=	1.88E-04 kWH/CFM-HR	
	16952 CFM	x	1460 HR/YR			
NSUCHC	213,351.9 kWH	-	154,500.4 kWH	=	4.76E-04 kWH/CFM-HR	
	16952 CFM	x	7300 HR/YR			
NSUCC	213,351.9 kWH	-	154,500.4 kWH	=	1.26E-03 kWH/CFM-HR	
	16952 CFM	x	2760 HR/YR			
DDCCHC	213,351.9 kWH	-	196,050.4 kWH	=	6.99E-04 kWH/CFM-HR	
	16952 CFM	x	1460 HR/YR			
DDCCC	213,351.9 kWH	-	196,050.4 kWH	=	1.85E-03 kWH/CFM-HR	
	16952 CFM	x	552 HR/YR			
NSC	1073.81 MBtu	-	400.95 MBtu	=	2.02E+05 Btu/UA	
	3333.12 UA					
DDCH	1073.81 MBtu	-	686.84 MBtu	=	1.16E+05 Btu/UA	
	3333.12 UA					
OPT	(2 HR/DAY X 240 DAY/YR)		-	175 HR/YR	=	305 HR/YR
CHWR	(1.10 kW X 0.012 Eff. X 664 HRS X 2 Degrees of Reset)				=	17.5 kWH/TON
OAR	567 HR/YR	x	0.01	=	5.67 HR/YR	



INPUT LOADS ..

-----\$  
\$ E Z - D O E L O A D S I N P U T \$  
-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
LINE-3 \* DENVER, CO 80227 \*  
  
LINE-4 \*BASELINE SIMULATION FOR BLDG. #7866 \*  
LINE-5 \*THEATER W/DRESS RM \* ..

ABORT ERRORS ..  
DIAGNOSTIC WARNINGS ..  
LOADS-REPORT VERIFICATION=(LV-D)  
SUMMARY=(LS-C,LS-D)  
HOURLY-DATA-SAVE = YES ..  
BUILDING-LOCATION LATITUDE = 39.0  
LONGITUDE = 96.5  
ALTITUDE = 1065.  
TIME-ZONE = 6  
GROSS-AREA = 8450  
SHIELDING-COEF = 0.29  
X-REF = 0.0  
Y-REF = 0.0 ..  
RUN-PERIOD JAN 1 1994 THRU DEC 31 1994 ..

\$ SCHEDULES

LD\_LITES =DAY-SCHEDULE (1,16) (0.)  
(17,21) (1.,0.1,0.5,0.1,0.5)  
(22,24) (0.1,0.5,1.) ..  
  
LD\_LOB-PEO =DAY-SCHEDULE (1,16) (0.)  
(17,21) (0.75,0.15,0.75,0.15,0.75)  
(22,23) (0.15,0.75)  
(24) (0.) ..  
  
LD\_ON =DAY-SCHEDULE (1,24) (1.) ..  
  
LD\_OFF =DAY-SCHEDULE (1,24) (0.) ..  
  
LD\_R-SN\_PE =DAY-SCHEDULE (1,16) (0.)  
(17) (0.1)  
(18,21) (0.95)  
(22,24) (0.8) ..  
  
LD\_LOB\_LIT =DAY-SCHEDULE (1,16) (0.)  
(17,24) (1.) ..

LW\_ON =WEEK-SCHEDULE (ALL) LD\_ON ..

LW\_OFF =WEEK-SCHEDULE (ALL) LD\_OFF ..

LW\_PEOP-TE =WEEK-SCHEDULE (MON) LD\_OFF
(TUE) LD\_OFF
(WED) LD\_OFF
(THU) LD\_R-SN\_PE
(FRI) LD\_R-SN\_PE
(SAT) LD\_R-SN\_PE
(SUN) LD\_R-SN\_PE
(HOL) LD\_R-SN\_PE ..

LW\_LITE-TE =WEEK-SCHEDULE (MON) LD\_OFF
(TUE) LD\_OFF
(WED) LD\_OFF
(THU) LD\_LITES
(FRI) LD\_LITES
(SAT) LD\_LITES
(SUN) LD\_LITES
(HOL) LD\_LITES ..

LW\_LOB-PEO =WEEK-SCHEDULE (MON) LD\_OFF
(TUE) LD\_OFF
(WED) LD\_OFF
(THU) LD\_LOB-PEO
(FRI) LD\_LOB-PEO
(SAT) LD\_LOB-PEO
(SUN) LD\_LOB-PEO
(HOL) LD\_LOB-PEO ..

LW\_LOB-LIT =WEEK-SCHEDULE (MON) LD\_OFF
(TUE) LD\_OFF
(WED) LD\_OFF
(THU) LD\_LOB\_LIT
(FRI) LD\_LOB\_LIT
(SAT) LD\_LOB\_LIT
(SUN) LD\_LOB\_LIT
(HOL) LD\_LOB\_LIT ..

\$ ON 100% OF THE TIME

L\_ON =SCHEDULE THRU DEC 31 LW\_ON ..

\$ OFF 100% OF THE TIME

L\_OFF =SCHEDULE THRU DEC 31 LW\_OFF ..

\$ PEOPLE LOAD IN THEATER

L\_PEOP-THE =SCHEDULE THRU DEC 31 LW\_PEOP-TE ..

\$ LIGHTING LOAD IN THEATER

L\_LIT-THE =SCHEDULE THRU DEC 31 LW\_LITE-TE ..

\$ PEOPLE LOAD IN LOBBY

L\_PEOP-LOB =SCHEDULE THRU DEC 31 LW\_LOB-PEO ..

## \$ LIGHT/EQUIP LOAD LOBBY

L\_LIT-LOEB =SCHEDULE THRU DEC 31 LW\_LOB-LIT ..

## \$ CONSTRUCTION TYPES

## \$ HIGH WALL BRICK, 12IN CMU

WALL-1 =LAYERS MATERIAL=(BK01,AL11,CB36) I-F-R= 0.6100  
THICKNESS=(0.333,0.000,1.000) ..EXWALL-1 =CONSTRUCTION LAYERS = WALL-1  
ABSORPTANCE = 0.880  
ROUGHNESS = 2 ..FLOOR =CONSTRUCTION U-VALUE = 0.020  
ABSORPTANCE = 0.610  
ROUGHNESS = 5 ..

## \$ BUILT-UP ROOF W/INSL&amp; NO CEILING

BLT-ROOF =LAYERS MATERIAL=(HF-E2, HF-A3, IN74, HF-A3, AL33, GP04)  
THICKNESS=(0.042,0.005,0.167,0.005,0.000,0.063) ..ROOF-1 =CONSTRUCTION LAYERS = BLT-ROOF  
ABSORPTANCE = 0.800  
ROUGHNESS = 1 ..

## \$ STANDARD METAL DOOR

DOOR-STD =LAYERS MATERIAL=(HF-A3, IN34, HF-A3) I-F-R= 0.6100  
THICKNESS=(0.005,0.104,0.005) ..DOOR-MET =CONSTRUCTION LAYERS = DOOR-STD  
ABSORPTANCE = 0.860  
ROUGHNESS = 5 ..

## \$ SHORT EXTERIOR WALL CMU

SHRT-WAL =LAYERS MATERIAL=(CB26,AL11,CB21) I-F-R= 0.6100  
THICKNESS=(0.500,0.000,0.333) ..EXWALL-2 =CONSTRUCTION LAYERS = SHRT-WAL  
ABSORPTANCE = 0.880  
ROUGHNESS = 2 ..2\_PN\_STD =GLASS-TYPE GLASS-TYPE-CODE = 2  
PANES = 2 ..

## \$ SPACE DESCRIPTION

THEATER =SPACE AREA = 5589.0 VOLUME = 139725.0  
TEMPERATURE = (73.) ZONE-TYPE = CONDITIONED  
PEOPLE-SCHEDULE = L\_PEEP-THE  
NUMBER-OF-PEOPLE = 288.0 PEOPLE-HG-LAT = 105.0  
PEOPLE-HG-SENS = 245.0 LIGHTING-TYPE = INCAND  
LIGHTING-KW = 11.98 LIGHT-TO-SPACE = 1.0



LIGHTING-SCHEDULE = L\_LIT-THE SOURCE-SENSIBLE = 0.0  
 FURN-WEIGHT = 0.5 INF-METHOD = NONE ..

E-W HEIGHT = 24.0 WIDTH = 94.0 CONS = EXWALL-1  
 AZIMUTH = 291 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

DOOR HEIGHT = 7.5 WIDTH = 2.5 CONS = DOOR-MET  
 MULTIPLIER = 3.0 SETBACK = 0.2  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 24.0 WIDTH = 94.0 CONS = EXWALL-1  
 AZIMUTH = 111 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

DOOR HEIGHT = 7.5 WIDTH = 2.5 CONS = DOOR-MET  
 MULTIPLIER = 3.0 SETBACK = 0.2  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 24.0 WIDTH = 61.0 CONS = EXWALL-1  
 AZIMUTH = 201 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

DOOR HEIGHT = 7.5 WIDTH = 2.5 CONS = DOOR-MET  
 SETBACK = 0.2 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

ROOF HEIGHT = 61.0 WIDTH = 94.0 CONS = ROOF-1  
 TILT = 0 SKY-FORM-FACTOR = 1.0 ..

U-W HEIGHT = 61.0 WIDTH = 94.0 CONS = FLOOR ..

LOBBY =SPACE AREA = 2268.0 VOLUME = 38556.0  
 TEMPERATURE = (73.) ZONE-TYPE = CONDITIONED  
 PEOPLE-SCHEDULE = L\_PEOP-LOB NUMBER-OF-PEOPLE = 96.0  
 PEOPLE-HG-LAT = 250.0 PEOPLE-HG-SENS = 250.0  
 LIGHTING-TYPE = INCAND LIGHTING-KW = 3.92  
 LIGHT-TO-SPACE = 1.0 LIGHTING-SCHEDULE = L\_LIT-LOBB  
 EQUIP-SCHEDULE = L\_LIT-LOBB EQUIPMENT-KW = 2.29  
 SOURCE-SENSIBLE = 0.0 FURN-WEIGHT = 0.5  
 INF-METHOD = NONE ..

E-W HEIGHT = 17.0 WIDTH = 36.0 CONS = EXWALL-2  
 AZIMUTH = 291 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

DOOR HEIGHT = 7.5 WIDTH = 2.5 CONS = DOOR-MET  
 SETBACK = 0.2 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 17.0 WIDTH = 61.0 CONS = EXWALL-2  
 AZIMUTH = 21 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 4.0 WIDTH = 2.5 G-T = 2\_PN\_STD

MULTIPLIER = 6.0 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 11.0 WIDTH = 9.0 G-T = 2\_PN\_STD  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 17.0 WIDTH = 36.0 CONS = EXWALL-2  
 AZIMUTH = 111 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

DOOR HEIGHT = 7.5 WIDTH = 2.5 CONS = DOOR-MET  
 SETBACK = 0.2 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

ROOF HEIGHT = 36.0 WIDTH = 61.0 CONS = ROOF-1  
 TILT = 0 SKY-FORM-FACTOR = 1.0 ..

U-W HEIGHT = 36.0 WIDTH = 61.0 CONS = FLOOR ..

PROJ-ROOM =SPACE AREA = 592.0 VOLUME = 6512.0  
 TEMPERATURE = (73.) ZONE-TYPE = CONDITIONED  
 PEOPLE-SCHEDULE = L\_LIT-LOBB NUMBER-OF-PEOPLE = 1.0  
 PEOPLE-HG-LAT = 250.0 PEOPLE-HG-SENS = 250.0  
 LIGHTING-TYPE = INCAND LIGHTING-W/SQFT = 1.75  
 LIGHT-TO-SPACE = 1.0 LIGHTING-SCHEDULE = L\_LIT-LOBB  
 EQUIP-SCHEDULE = L\_LIT-LOBB EQUIPMENT-KW = 4.84  
 SOURCE-SENSIBLE = 0.0 FURN-WEIGHT = 0.5  
 INF-METHOD = NONE ..

E-W HEIGHT = 11.0 WIDTH = 16.0 CONS = EXWALL-2  
 AZIMUTH = 291 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 11.0 WIDTH = 16.0 CONS = EXWALL-2  
 AZIMUTH = 111 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

DOOR HEIGHT = 7.5 WIDTH = 2.5 CONS = DOOR-MET  
 SETBACK = 0.2 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 11.0 WIDTH = 37.0 CONS = EXWALL-2  
 AZIMUTH = 21 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

ROOF HEIGHT = 16.0 WIDTH = 37.0 CONS = ROOF-1  
 TILT = 0 SKY-FORM-FACTOR = 1.0 ..

U-W HEIGHT = 16.0 WIDTH = 37.0 CONS = FLOOR ..

END ..  
 COMPUTE LOADS ..  
 INPUT SYSTEMS ..

```

$-----$
$ E Z - D O E   S Y S T E M S   I N P U T $
$-----$

```

\$ GENERAL PROJECT DATA

```

TITLE  LINE-1 *   EMC      ENGINEERS      INC.      *
        LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
        LINE-3 *   DENVER,      CO      80227      *

        LINE-4 *BASELINE SIMULATION FOR BLDG. #7866      *
        LINE-5 *THEATER W/DRESS RM                        * ..

ABORT      ERRORS ..
DIAGNOSTIC WARNINGS ..
SYSTEMS-REPORT  VERIFICATION=(SV-A)
                SUMMARY=(SS-A,SS-C,SS-K,SS-O)
                HOURLY-DATA-SAVE = YES ..

```

\$ SCHEDULES

```

SD_ON      =DAY-SCHEDULE (1,24) (1.) ..
SD_OFF     =DAY-SCHEDULE (1,24) (0.) ..
SD_WT_HT   =DAY-SCHEDULE (1,24) (74.) ..
SD_SM_CL   =DAY-SCHEDULE (1,24) (72.) ..
SD_WT_CL   =DAY-SCHEDULE (1,24) (74.2) ..
SD_SM_HT   =DAY-SCHEDULE (1,24) (71.8) ..
SD_OA%     =DAY-SCHEDULE (1,24) (0.17) ..

SW_ON      =WEEK-SCHEDULE (ALL) SD_ON ..
SW_OFF     =WEEK-SCHEDULE (ALL) SD_OFF ..

SW_WT_HT   =WEEK-SCHEDULE (ALL) SD_WT_HT ..
SW_SM_CL   =WEEK-SCHEDULE (ALL) SD_SM_CL ..
SW_WT_CL   =WEEK-SCHEDULE (ALL) SD_WT_CL ..
SW_SM_HT   =WEEK-SCHEDULE (ALL) SD_SM_HT ..
SW_OA%     =WEEK-SCHEDULE (ALL) SD_OA% ..

```

\$ FULL ON SYSTEM

S\_ON =SCHEDULE THRU DEC 31 SW\_ON ..

\$ FULL OFF SYSTEM

S\_OFF =SCHEDULE THRU DEC 31 SW\_OFF ..

\$ HEATING SEASON

```

S_HE-SCHED =SCHEDULE THRU MAY 15 SW_ON
                THRU OCT 1 SW_OFF
                THRU DEC 31 SW_ON ..

```

## \$ COOLING SEASON

S\_CL\_SCHED =SCHEDULE THRU MAY 15 SW\_OFF  
 THRU OCT 1 SW\_ON  
 THRU DEC 31 SW\_OFF ..

## \$ HEATING SET TEMP

S\_HT\_SET\_F =SCHEDULE THRU MAY 15 SW\_WT\_HT  
 THRU OCT 1 SW\_SM\_HT  
 THRU DEC 31 SW\_WT\_HT ..

## \$ COOLING SET TEMP

S\_CL\_SET\_F =SCHEDULE THRU MAY 15 SW\_WT\_CL  
 THRU OCT 1 SW\_SM\_CL  
 THRU DEC 31 SW\_WT\_CL ..

S\_HRLY\_RPT =SCHEDULE THRU JAN 9 SW\_OFF  
 THRU JAN 10 SW\_ON  
 THRU JAN 22 SW\_OFF  
 THRU JAN 23 SW\_ON  
 THRU JUL 18 SW\_OFF  
 THRU JUL 19 SW\_ON  
 THRU JUL 22 SW\_OFF  
 THRU JUL 23 SW\_ON  
 THRU DEC 31 SW\_OFF ..

S\_OA% =SCHEDULE THRU DEC 31 SW\_OA% ..

## \$ ZONE DESCRIPTION

THEATER =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
 SIZING-OPTION = FROM-LOADS ..

LOBBY =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
 SIZING-OPTION = FROM-LOADS ..

PROJ-ROOM =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
 SIZING-OPTION = FROM-LOADS ..

## \$ SYSTEM DESCRIPTION

AHU-1 =SYSTEM SYSTEM-TYPE = SZRH  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_HE-SCHED  
 COOLING-SCHEDULE = S\_CL\_SCHED HEAT-SET-T = 55.0

PREHEAT-T = 0.0 OA-CONTROL = FIXED  
 SUPPLY-CFM = 14500. RATED-CFM = 14500.  
 MIN-AIR-SCH = S\_OA% MAX-OA-FRACTION = 0.17  
 SUPPLY-DELTA-T = 2.4 SUPPLY-KW = 0.00078  
 FAN-PLACEMENT = BLOW-THROUGH  
 NIGHT-CYCLE-CTRL = STAY-OFF NIGHT-VENT-DT = 0.0  
 MIN-CFM-RATIO = 1.0 REHEAT-DELTA-T = 27.8  
 COOLING-CAPACITY = 453656. COOL-SH-CAP = 380832.  
 HEATING-CAPACITY = -417300.  
 SIZING-OPTION = COINCIDENT RETURN-AIR-PATH = DUCT  
 ZONE-NAMES = (THEATER, LOBBY) ..

AHU-2 =SYSTEM SYSTEM-TYPE = SZRH  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_ON COOLING-SCHEDULE = S\_ON  
 HEAT-SET-T = 55.0 PREHEAT-T = 0.0  
 OA-CONTROL = FIXED SUPPLY-CFM = 1800.  
 RATED-CFM = 1800. MIN-AIR-SCH = S\_OA%  
 MAX-OA-FRACTION = 0.17 SUPPLY-DELTA-T = 2.4  
 SUPPLY-KW = 0.00078 FAN-PLACEMENT = BLOW-THROUGH  
 NIGHT-CYCLE-CTRL = STAY-OFF NIGHT-VENT-DT = 0.0  
 MIN-CFM-RATIO = 1.0 REHEAT-DELTA-T = 17.  
 COOLING-CAPACITY = 48900. COOL-SH-CAP = 48900.  
 HEATING-CAPACITY = -30709.3  
 ZONE-HEAT-SOURCE = ELECTRIC  
 SIZING-OPTION = COINCIDENT RETURN-AIR-PATH = DUCT  
 ZONE-NAMES = (PROJ-ROOM) ..

\$ HOURLY REPORT DESCRIPTION

THEAT-BLK =REPORT-BLOCK VARIABLE-TYPE = THEATER  
 VARIABLE-LIST = (17,18,7,6) ..  
 LOBBY-BLK =REPORT-BLOCK VARIABLE-TYPE = LOBBY  
 VARIABLE-LIST = (17,18,7,6) ..  
 PROJ-BLK =REPORT-BLOCK VARIABLE-TYPE = PROJ-ROOM  
 VARIABLE-LIST = (17,18,7,6) ..  
 AHU-1-BLK =REPORT-BLOCK VARIABLE-TYPE = AHU-1  
 VARIABLE-LIST = (3,5,6,17,39) ..  
 AHU-2-BLK =REPORT-BLOCK VARIABLE-TYPE = AHU-2  
 VARIABLE-LIST = (3,5,6,17,39) ..  
 ZONES-HRLY = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY\_RPT  
 REPORT-BLOCK = (THEAT-BLK, LOBBY-BLK, PROJ-BLK)  
 ..  
 AHU-HRLY = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY\_RPT  
 REPORT-BLOCK = (AHU-1-BLK, AHU-2-BLK)  
 ..  
 END ..  
 COMPUTE SYSTEMS ..

INPUT PLANT ..

\$-----\$  
 \$ E Z - D O E P L A N T S I N P U T \$  
 \$-----\$

## \$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
 LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
 LINE-3 \* DENVER, CO 80227 \*  
 LINE-4 \*BASELINE SIMULATION FOR BLDG. #7866 \*  
 LINE-5 \*THEATER W/DRESS RM \* ..

ABORT ERRORS ..  
 DIAGNOSTIC WARNINGS ..  
 PLANT-REPORT VERIFICATION=(PV-A)  
 SUMMARY=(PS-B,BEPS)  
 HOURLY-DATA-SAVE = YES ..

## \$ SCHEDULES

PD\_ON =DAY-SCHEDULE (1,24) (1.) ..  
 PD\_OFF =DAY-SCHEDULE (1,24) (0.) ..  
 PW\_ON =WEEK-SCHEDULE (ALL) PD\_ON ..  
 PW\_OFF =WEEK-SCHEDULE (ALL) PD\_OFF ..

## \$ HEATING SEASON

P\_HEAT =SCHEDULE THRU MAY 15 PW\_ON  
 THRU OCT 1 PW\_OFF  
 THRU DEC 31 PW\_ON ..

## \$ COOLING SEASON

P\_COOL =SCHEDULE THRU MAY 15 PW\_OFF  
 THRU OCT 1 PW\_ON  
 THRU DEC 31 PW\_OFF ..

## \$ EQUIPMENT DESCRIPTION

BOILER-HW =PLANT-EQUIPMENT TYPE = HW-BOILER  
 SIZE = -999. ..

CHILLER-RC =PLANT-EQUIPMENT TYPE = HERM-REC-CHLR  
 SIZE = -999. ..

PLANT-PARAMETERS BOILER-FUEL = NATURAL-GAS HERM-REC-COND-TYPE = AIR  
 CCIRC-HEAD = 25.0 HCIRC-HEAD = 25.0 ..

ENERGY-RESOURCE RESOURCE = ELECTRICITY ..  
 ENERGY-RESOURCE RESOURCE = NATURAL-GAS ..

END ..  
COMPUTE PLANT ..  
STOP ..

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/19/1995 10:13:39 LDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #7866 THEATER W/DRESS RM  
 REPORT- LV-D DETAILS OF EXTERIOR SURFACES IN THE PROJECT TOPEKA, KS

NUMBER OF EXTERIOR SURFACES 12 RECTANGULAR 12 OTHER 0  
 (U-VALUE INCLUDES INSIDE AIR FILM PLUS OUTSIDE AIR FILM AT 7.5 MPH WINDSPEED )

SURFACE	SPACE	G L A S S		W A L L		U - V A L U E		T H E A T E R		O P A Q U E		A Z I M U T H
		U-VALUE (BTU/HR-SQFT-F)	AREA (SQFT)	U-VALUE (BTU/HR-SQFT-F)	AREA (SQFT)	U-VALUE (BTU/HR-SQFT-F)	AREA (SQFT)	U-VALUE (BTU/HR-SQFT-F)	AREA (SQFT)	U-VALUE (BTU/HR-SQFT-F)	AREA (SQFT)	
LOBBY		0.490	159.00	0.236	878.00	0.275	1037.00	0.236	176.00	0.220	1464.00	NORTH
PROJ-ROOM		0.000	0.00	0.236	407.00	0.236	407.00	0.236	612.00	0.236	612.00	NORTH
LOBBY		0.000	0.00	0.236	0.00	0.236	0.00	0.236	176.00	0.236	176.00	EAST
PROJ-ROOM		0.000	0.00	0.236	0.00	0.236	0.00	0.236	2256.00	0.220	2256.00	EAST
THEATER		0.000	0.00	0.220	0.00	0.220	0.00	0.220	1464.00	0.220	1464.00	SOUTH
THEATER		0.000	0.00	0.236	176.00	0.236	176.00	0.236	176.00	0.236	176.00	WEST
PROJ-ROOM		0.000	0.00	0.220	0.00	0.220	0.00	0.220	2256.00	0.220	2256.00	WEST
THEATER		0.000	0.00	0.236	612.00	0.236	612.00	0.236	612.00	0.236	612.00	WEST
LOBBY		0.000	0.00	0.127	2196.00	0.127	2196.00	0.127	5734.00	0.127	5734.00	ROOF
THEATER		0.000	0.00	0.127	0.00	0.127	0.00	0.127	5734.00	0.127	5734.00	ROOF
PROJ-ROOM		0.000	0.00	0.020	0.00	0.020	0.00	0.020	5734.00	0.020	5734.00	ROOF
THEATER		0.000	0.00	0.020	0.00	0.020	0.00	0.020	2196.00	0.020	2196.00	UNDERGRND
LOBBY		0.000	0.00	0.020	0.00	0.020	0.00	0.020	2196.00	0.020	2196.00	UNDERGRND
PROJ-ROOM		0.000	0.00	0.020	0.00	0.020	0.00	0.020	592.00	0.020	592.00	UNDERGRND

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/19/1995 10:13:39 LDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #7866 THEATER W/DRESS RM  
 REPORT- LV-D DETAILS OF EXTERIOR SURFACES IN THE PROJECT TOPEKA, KS

SURFACE	SPACE	A V E R A G E		A V E R A G E		G L A S S		O P A Q U E		G L A S S + O P A Q U E
		U-VALUE/GLASS (BTU/HR-SQFT-F)	U-VALUE/WALLS (BTU/HR-SQFT-F)	U-VALUE/WALLS (BTU/HR-SQFT-F)	U-VALUE/WALLS (BTU/HR-SQFT-F)	GLASS AREA (SQFT)	GLASS AREA (SQFT)	OPAQUE AREA (SQFT)	GLASS+OPAQUE AREA (SQFT)	
NORTH		0.490	0.236	0.264	159.00	159.00	1285.00	1444.00	1444.00	
EAST		0.000	0.224	0.224	0.00	0.00	3044.00	3044.00	3044.00	
SOUTH		0.000	0.220	0.220	0.00	0.00	1464.00	1464.00	1464.00	
WEST		0.000	0.224	0.224	0.00	0.00	3044.00	3044.00	3044.00	
ROOF		0.000	0.127	0.127	0.00	0.00	8522.00	8522.00	8522.00	
ALL WALLS		0.490	0.225	0.230	159.00	159.00	8837.00	8996.00	8996.00	
WALLS+ROOFS		0.490	0.177	0.180	159.00	159.00	17359.00	17518.00	17518.00	
UNDERGRND		0.000	0.020	0.020	0.00	0.00	8522.00	8522.00	8522.00	
BUILDING		0.490	0.125	0.128	159.00	159.00	25881.00	26040.00	26040.00	



EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/19/1995 10:13:39 LDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #7866 THEATER W/DRESS RM TOPEKA, KS  
 REPORT- LS-C BUILDING PEAK LOAD COMPONENTS

\*\*\* BUILDING \*\*\*

FLOOR AREA 8449 SQFT 785 SQMT  
 VOLUME 184793 CUFT 5233 CUMT

COOLING LOAD  
 JUL 23 9PM  
 DRY-BULB TEMP 88F 31C  
 WET-BULB TEMP 76F 24C

HEATING LOAD  
 JAN 15 9AM  
 -5F -21C  
 -6F -21C

	SENSIBLE (KBTU/H)		LATENT (KBTU/H)		SENSIBLE (KBTU/H)		SENSIBLE (KW)	
	(KBTU/H)	(KW)	(KBTU/H)	(KW)	(KBTU/H)	(KW)	(KBTU/H)	(KW)
WALLS	39.051	11.437	0.000	0.000	-149.588	-43.810	-149.588	-43.810
ROOFS	32.522	9.525	0.000	0.000	-90.887	-26.618	-90.887	-26.618
GLASS CONDUCTION	1.057	0.309	0.000	0.000	-6.114	-1.791	-6.114	-1.791
GLASS SOLAR	3.176	0.930	0.000	0.000	0.320	0.094	0.320	0.094
DOOR	0.533	0.156	0.000	0.000	-2.455	-0.719	-2.455	-0.719
INTERNAL SURFACES	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
UNDERGROUND SURFACES	-1.530	-0.448	0.000	0.000	-4.894	-1.433	-4.894	-1.433
OCCUPANTS TO SPACE	67.929	19.895	46.978	13.759	4.888	1.432	4.888	1.432
LIGHT TO SPACE	26.464	7.751	0.000	0.000	4.249	1.244	4.249	1.244
EQUIPMENT TO SPACE	20.221	5.922	0.000	0.000	1.772	0.519	1.772	0.519
PROCESS TO SPACE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
INFILTRATION	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TOTAL	189.421	55.477	46.978	13.759	-242.708	-71.083	-242.708	-71.083
TOTAL LOAD	236.399	KBTU/H	69.235	KW	-242.708	KBTU/H	-242.708	KW
TOTAL LOAD / AREA	27.98	BTU/H.SQFT	88.205	W /SQMT	28.726	BTU/H.SQFT	28.726	W /SQMT

\*\*\*\*\*  
 \* NOTE 1) THE ABOVE LOADS EXCLUDE OUTSIDE VENTILATION AIR \*  
 \* --- LOADS \*  
 \* 2) TIMES GIVEN IN STANDARD TIME FOR THE LOCATION \*  
 \* IN CONSIDERATION \*  
 \*\*\*\*\*

EMC ENGINEERS INC. DOE-2.1D 5/19/1995 10:13:39 SDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #7866 THEATER W/DRESS RM  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR AHU-1 TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	ELEC-TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-161.166	15	-7. F	-8. F	10128.	-412.923	29.492
FEB	0.00000				-121.051	3	-5. F	-6. F	9218.	-380.777	29.492
MAR	0.00000				-98.088	3	15. F	12. F	10032.	-285.406	29.492
APR	0.00000				-29.829	5	30. F	27. F	9856.	-197.893	29.492
MAY	29.41631	30	80. F	74. F	-6.597	5	44. F	40. F	10128.	-118.576	29.492
JUN	86.51686	19	86. F	75. F	0.000				9761.	0.000	29.492
JUL	123.17043	17	88. F	80. F	0.000				10318.	0.000	29.492
AUG	115.33618	21	95. F	76. F	0.000				9951.	0.000	29.492
SEP	51.45018	5	87. F	76. F	-26.120	20	23. F	22. F	10223.	-226.713	29.492
OCT	0.65577	1	81. F	66. F	-79.999	3	13. F	12. F	9666.	-288.265	29.492
NOV	0.00000				-142.480	13	0. F	-1. F	10318.	-366.429	29.492
DEC	0.00000										
TOTAL	406.545				-665.331				119543.	-412.923	29.492
MAX											

EMC ENGINEERS INC. DOE-2.1D 5/19/1995 10:13:39 SDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #7866 THEATER W/DRESS RM  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR AHU-1 TOPEKA, KS

MONTH	HOURS				HOURS				HOURS				HOURS			
	COOLING LOAD	HEATING LOAD	COINCIDENT COOL-HEAT LOAD	FLOATING	HEATING AVAIL.	HEATING AVAIL.	COOLING AVAIL.	FANS ON	FANS ON	FANS ON	FANS ON	VENTING	NIGHT	FLOATING WHEN	HEATING COOLING PEAK	ELECTRIC LOAD AT COOLING PEAK
JAN	0	744	0	0	744	0	0	744	0	0	0	0	0	0	-186.288	11.310
FEB	0	672	0	27	672	0	0	672	0	0	0	0	0	0	-191.095	11.310
MAR	0	717	0	154	744	0	0	744	0	0	0	0	27	0	-76.927	29.492
APR	0	566	0	198	720	0	0	720	0	0	0	0	154	0	-20.192	11.310
MAY	314	232	0	44	360	0	314	744	0	0	0	0	198	0	0.000	23.505
JUN	676	0	0	44	0	0	676	720	0	0	0	0	44	0	0.000	23.505
JUL	744	0	0	9	0	0	744	744	0	0	0	0	9	0	0.000	23.505
AUG	735	0	0	246	0	0	735	744	0	0	0	0	246	0	0.000	23.505
SEP	474	0	0	199	0	0	474	720	0	0	0	0	199	0	0.000	23.505
OCT	7	538	0	31	720	0	7	744	0	0	0	0	31	0	0.000	23.505
NOV	0	689	0	0	720	0	0	744	0	0	0	0	0	0	-224.668	11.310
DEC	0	744	0	0	744	0	0	744	0	0	0	0	0	0	-127.474	29.492
ANNUAL	2950	4902	0	908	5424	0	2950	8760	0	0	0	0	908	0		

EMC ENGINEERS INC. DOE-2.1D 5/19/1995 10:13:39 SDL RUN 1  
 DENVER, CO 80227 THEATER W/DRESS RM  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR AHU-2 TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	MAXIMUM ELEC LOAD (KW)
JAN	0.01382	22 24	40.F	38.F	-14.732	15 1	-6.F	-7.F	1890.	-34.136	7.278
FEB	0.08504	26 18	52.F	41.F	-11.118	2 23	1.F	0.F	1742.	-31.827	7.278
MAR	0.61859	24 18	65.F	64.F	-9.280	3 7	14.F	12.F	1843.	-29.962	7.278
APR	2.09687	28 19	71.F	68.F	-2.951	5 7	30.F	27.F	1857.	-20.561	7.278
MAY	5.56339	30 23	78.F	74.F	-0.846	5 7	44.F	40.F	1890.	-12.274	7.278
JUN	10.54200	19 20	84.F	75.F	-0.066	2 7	50.F	49.F	1810.	-6.846	7.278
JUL	14.54958	17 19	88.F	80.F	0.000				1984.	0.000	7.278
AUG	13.45136	21 20	92.F	76.F	-0.013	4 7	54.F	53.F	1796.	-3.031	7.278
SEP	7.26632	5 18	90.F	77.F	-0.721	11 7	40.F	40.F	1904.	-9.519	7.278
OCT	2.63453	1 18	83.F	68.F	-2.787	20 8	23.F	22.F	1937.	-24.282	7.278
NOV	0.47483	6 24	59.F	55.F	-7.365	3 6	13.F	12.F	1763.	-30.542	7.278
DEC	0.12957	3 23	49.F	42.F	-13.002	13 6	2.F	1.F	1984.	-31.360	7.278
TOTAL	57.426				-62.881				22402.	-34.136	7.278
MAX											

EMC ENGINEERS INC. DOE-2.1D 5/19/1995 10:13:39 SDL RUN 1  
 DENVER, CO 80227 THEATER W/DRESS RM  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR AHU-2 TOPEKA, KS

MONTH	HOURS COINCIDENT COOL-HEAT LOAD				HOURS COINCIDENT HEATING LOAD AT COOLING PEAK				HOURS COINCIDENT ELECTRIC LOAD AT COOLING PEAK			
	HOURS COOLING LOAD	HOURS HEATING LOAD	HOURS COINCIDENT COOL-HEAT LOAD	HOURS FLOATING LOAD	HOURS COOLING AVAIL.	HOURS HEATING AVAIL.	HOURS COINCIDENT HEATING LOAD AT COOLING PEAK	HOURS COINCIDENT HEATING LOAD AT COOLING PEAK	HOURS COINCIDENT ELECTRIC LOAD AT COOLING PEAK	HOURS COINCIDENT ELECTRIC LOAD AT COOLING PEAK	HOURS COINCIDENT ELECTRIC LOAD AT COOLING PEAK	HOURS COINCIDENT ELECTRIC LOAD AT COOLING PEAK
JAN	16	728	0	0	744	744	744	744	0.000	0.000	0.000	7.278
FEB	30	642	0	0	672	672	672	672	0.000	0.000	0.000	7.278
MAR	92	652	0	0	744	744	744	744	0.000	0.000	0.000	7.278
APR	279	441	0	0	720	720	720	720	0.000	0.000	0.000	7.278
MAY	529	215	0	0	744	744	744	744	0.000	0.000	0.000	7.278
JUN	689	31	0	0	720	720	720	720	0.000	0.000	0.000	7.278
JUL	744	0	0	0	744	744	744	744	0.000	0.000	0.000	7.278
AUG	735	9	0	0	744	744	744	744	0.000	0.000	0.000	7.278
SEP	555	165	0	0	720	720	720	720	0.000	0.000	0.000	7.278
OCT	301	443	0	0	744	744	744	744	0.000	0.000	0.000	7.278
NOV	109	611	0	0	720	720	720	720	0.000	0.000	0.000	7.278
DEC	54	690	0	0	744	744	744	744	0.000	0.000	0.000	7.278
ANNUAL	4133	4627	0	0	8760	8760	8760	8760	0	0	0	7.278

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY 48.858 139.928 8/17	NATURAL-GAS 245.745 559.939 15/7
JAN	TOTAL (MBTU) PEAK (KBTU) DY/HR	44.462 139.399 20/17	191.132 526.553 3/7
FEB	TOTAL (MBTU) PEAK (KBTU) DY/HR	47.949 138.892 24/17	161.473 421.329 3/8
MAR	TOTAL (MBTU) PEAK (KBTU) DY/HR	45.330 140.738 28/17	54.826 312.255 5/7
APR	TOTAL (MBTU) PEAK (KBTU) DY/HR	58.767 229.335 30/24	13.913 210.030 5/7
MAY	TOTAL (MBTU) PEAK (KBTU) DY/HR	80.733 235.404 19/17	0.302 17.435 2/7
JUN	TOTAL (MBTU) PEAK (KBTU) DY/HR	97.641 265.514 23/17	0.000 0.000 31/1
JUL	TOTAL (MBTU) PEAK (KBTU) DY/HR	94.553 255.682 21/17	0.078 11.201 4/7
AUG	TOTAL (MBTU) PEAK (KBTU) DY/HR	67.166 238.327 5/17	2.209 21.804 11/7
SEP	TOTAL (MBTU) PEAK (KBTU) DY/HR	47.328 180.544 1/24	49.255 349.363 20/8
OCT	TOTAL (MBTU) PEAK (KBTU) DY/HR	45.561 139.746 5/17	133.408 425.181 3/6
NOV	TOTAL (MBTU) PEAK (KBTU) DY/HR	49.849 140.416 16/17	221.470 513.028 13/8
DEC	TOTAL (MBTU) PEAK (KBTU) DY/HR	728.196 265.514	1073.813 559.939
	ONE YEAR USE/PEAK		

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/19/1995 10:13:39 PDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #7866 THEATER W/DRESS RM  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
SPACE HEAT	38.10	1073.81
SPACE COOL	193.23	0.00
HVAC AUX	392.49	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	62.50	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	41.86	0.00
TOTAL	728.17	1073.81

TOTAL SITE ENERGY 1802.01 MBTU 213.3 KBTU/SQFT-YR GROSS-AREA 213.3 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 3260.59 MBTU 385.9 KBTU/SQFT-YR GROSS-AREA 385.9 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 4.8  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

-----\$
\$ E Z - D O E S Y S T E M S I N P U T \$
-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*
LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*
LINE-3 \* DENVER, CO 80227 \*

LINE-4 \*RUN #1 NIGHT SETBACK FOR BLDG. #7866 \*
LINE-5 \*THEATER W/DRESS RM \* ..

ABORT ERRORS ..
DIAGNOSTIC WARNINGS ..
SYSTEMS-REPORT VERIFICATION=(SV-A)
SUMMARY=(SS-A,SS-C,SS-K,SS-O)
HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

SD\_ON =DAY-SCHEDULE (1,24) (1.) ..
SD\_OFF =DAY-SCHEDULE (1,24) (0.) ..
SD\_WT\_HT =DAY-SCHEDULE (1,16) (55.)
(17,24) (74.) ..
SD\_SM\_CL =DAY-SCHEDULE (1,16) (85.)
(17,24) (72.) ..
SD\_WT\_CL =DAY-SCHEDULE (1,16) (55.2)
(17,24) (74.2) ..
SD\_SM\_HT =DAY-SCHEDULE (1,16) (84.8)
(17,24) (71.8) ..
SD\_FAN\_CYC =DAY-SCHEDULE (1,6) (-1.)
(7,16) (0.)
(17,24) (1.) ..
SD\_WT\_HT\_D =DAY-SCHEDULE (1,24) (55.) ..
SD\_WT\_CL\_D =DAY-SCHEDULE (1,24) (55.2) ..
SD\_SM\_CL\_D =DAY-SCHEDULE (1,24) (85.) ..
SD\_SM\_HT\_D =DAY-SCHEDULE (1,24) (84.8) ..



SW\_ON =WEEK-SCHEDULE (ALL) SD\_ON ..
SW\_OFF =WEEK-SCHEDULE (ALL) SD\_OFF ..
SW\_WT\_HT =WEEK-SCHEDULE (MON) SD\_WT\_HT\_D
(TUE) SD\_WT\_HT\_D
(WED) SD\_WT\_HT\_D
(THU) SD\_WT\_HT
(FRI) SD\_WT\_HT
(SAT) SD\_WT\_HT
(SUN) SD\_WT\_HT
(HOL) SD\_WT\_HT ..
SW\_SM\_CL =WEEK-SCHEDULE (MON) SD\_SM\_CL\_D
(TUE) SD\_SM\_CL\_D
(WED) SD\_SM\_CL\_D

```

(THU) SD_SM_CL
(FRI) SD_SM_CL
(SAT) SD_SM_CL
(SUN) SD_SM_CL
(HOL) SD_SM_CL ..

```

```

SW_WT_CL =WEEK-SCHEDULE (MON) SD_WT_CL_D
(TUE) SD_WT_CL_D
(WED) SD_WT_CL_D
(THU) SD_WT_CL
(FRI) SD_WT_CL
(SAT) SD_WT_CL
(SUN) SD_WT_CL
(HOL) SD_WT_CL ..

```

```

SW_SM_HT =WEEK-SCHEDULE (MON) SD_SM_HT_D
(TUE) SD_SM_HT_D
(WED) SD_SM_HT_D
(THU) SD_SM_HT
(FRI) SD_SM_HT
(SAT) SD_SM_HT
(SUN) SD_SM_HT
(HOL) SD_SM_HT ..

```

```

SW_FAN_CYC =WEEK-SCHEDULE (MON) SD_OFF
(TUE) SD_OFF
(WED) SD_OFF
(THU) SD_FAN_CYC
(FRI) SD_FAN_CYC
(SAT) SD_FAN_CYC
(SUN) SD_FAN_CYC
(HOL) SD_FAN_CYC ..

```

\$ FULL ON SYSTEM

S\_ON =SCHEDULE THRU DEC 31 SW\_ON ..

\$ FULL OFF SYSTEM

S\_OFF =SCHEDULE THRU DEC 31 SW\_OFF ..

\$ HEATING SEASON

```

S_HE-SCHED =SCHEDULE THRU MAY 15 SW_ON
                THRU OCT 1 SW_OFF
                THRU DEC 31 SW_ON ..

```

\$ COOLING SEASON

```

S_CL_SCHED =SCHEDULE THRU MAY 15 SW_OFF
                THRU OCT 1 SW_ON
                THRU DEC 31 SW_OFF ..

```

\$ HEATING SET TEMP

```

S_HT_SET_F =SCHEDULE THRU MAY 15 SW_WT_HT
                THRU OCT 1 SW_SM_HT
                THRU DEC 31 SW_WT_HT ..

```

\$ COOLING SET TEMP

S\_CL\_SET\_F =SCHEDULE THRU MAY 15 SW\_WT\_CL  
 THRU OCT 1 SW\_SM\_CL  
 THRU DEC 31 SW\_WT\_CL ..

S\_HRLY\_RPT =SCHEDULE THRU JAN 9 SW\_OFF  
 THRU JAN 10 SW\_ON  
 THRU JAN 22 SW\_OFF  
 THRU JAN 23 SW\_ON  
 THRU JUL 18 SW\_OFF  
 THRU JUL 19 SW\_ON  
 THRU JUL 22 SW\_OFF  
 THRU JUL 23 SW\_ON  
 THRU DEC 31 SW\_OFF ..

S\_FAN\_CYCL =SCHEDULE THRU DEC 31 SW\_FAN\_CYC ..

\$ ZONE DESCRIPTION

THEATER =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
 SIZING-OPTION = FROM-LOADS ..

LOBBY =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
 SIZING-OPTION = FROM-LOADS ..

PROJ-ROOM =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
 SIZING-OPTION = FROM-LOADS ..

\$ SYSTEM DESCRIPTION

AHU-1 =SYSTEM SYSTEM-TYPE = SZRH  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_HE-SCHED  
 COOLING-SCHEDULE = S\_CL\_SCHED HEAT-SET-T = 55.0  
 PREHEAT-T = 0.0 OA-CONTROL = FIXED  
 SUPPLY-CFM = 14500. RATED-CFM = 14500.  
 MIN-OUTSIDE-AIR = 0.17 MAX-OA-FRACTION = 0.17  
 FAN-SCHEDULE = S\_FAN\_CYCL SUPPLY-DELTA-T = 2.4  
 SUPPLY-KW = 0.00078 FAN-PLACEMENT = BLOW-THROUGH  
 NIGHT-CYCLE-CTRL = CYCLE-ON-ANY NIGHT-VENT-DT = 0.0  
 MIN-CFM-RATIO = 1.0 REHEAT-DELTA-T = 27.8  
 COOLING-CAPACITY = 453656. COOL-SH-CAP = 380832.  
 HEATING-CAPACITY = -417300.  
 SIZING-OPTION = COINCIDENT RETURN-AIR-PATH = DUCT  
 ZONE-NAMES = (THEATER, LOBBY) ..



```

AHU-2      =SYSTEM      SYSTEM-TYPE = SZRH
                MAX-SUPPLY-T = 120.0  MIN-SUPPLY-T = 55.0
                HEATING-SCHEDULE = S_ON  COOLING-SCHEDULE = S_ON
                HEAT-SET-T = 55.0  PREHEAT-T = 0.0
                OA-CONTROL = FIXED  SUPPLY-CFM = 1800.
                RATED-CFM = 1800.  MIN-OUTSIDE-AIR = 0.17
                MAX-OA-FRACTION = 0.17  FAN-SCHEDULE = S_FAN_CYCL
                SUPPLY-DELTA-T = 2.4  SUPPLY-KW = 0.00078
                FAN-PLACEMENT = BLOW-THROUGH
                NIGHT-CYCLE-CTRL = CYCLE-ON-ANY  NIGHT-VENT-DT = 0.0
                MIN-CFM-RATIO = 1.0  REHEAT-DELTA-T = 17.
                COOLING-CAPACITY = 48900.  COOL-SH-CAP = 48900.
                HEATING-CAPACITY = -30709.3
                ZONE-HEAT-SOURCE = ELECTRIC
                SIZING-OPTION = COINCIDENT  RETURN-AIR-PATH = DUCT
                ZONE-NAMES = (PROJ-ROOM) ..

```



\$ HOURLY REPORT DESCRIPTION

```

THEAT-BLK =REPORT-BLOCK VARIABLE-TYPE = THEATER
                VARIABLE-LIST = (17,18,7,6) ..
LOBBY-BLK =REPORT-BLOCK VARIABLE-TYPE = LOBBY
                VARIABLE-LIST = (17,18,7,6) ..
PROJ-BLK  =REPORT-BLOCK VARIABLE-TYPE = PROJ-ROOM
                VARIABLE-LIST = (17,18,7,6) ..
AHU-1-BLK =REPORT-BLOCK VARIABLE-TYPE = AHU-1
                VARIABLE-LIST = (3,5,6,17,39) ..
AHU-2-BLK =REPORT-BLOCK VARIABLE-TYPE = AHU-2
                VARIABLE-LIST = (3,5,6,17,39) ..
ZONES-HRLY = HOURLY-REPORT  REPORT-SCHEDULE = S_HRLY_RPT
                REPORT-BLOCK = (THEAT-BLK,LOBBY-BLK,PROJ-BLK)
..
AHU-HRLY  = HOURLY-REPORT  REPORT-SCHEDULE = S_HRLY_RPT
                REPORT-BLOCK = (AHU-1-BLK,AHU-2-BLK)
..
END ..
COMPUTE SYSTEMS ..

```

INPUT PLANT ..

```

$-----$
$ E Z - D O E  P L A N T S  I N P U T $
$-----$

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\$ GENERAL PROJECT DATA

```

TITLE  LINE-1 *   EMC      ENGINEERS      INC.      *
        LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
        LINE-3 *   DENVER,      CO      80227      *

        LINE-4 *RUN #1 NIGHT SETBACK FOR BLDG. #7866      *
        LINE-5 *THEATER W/DRESS RM                          * ..

```

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/19/1995 9: 3:30 SDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SETBACK FOR BLDG. #7866 THEATER W/DRESS RM  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR AHU-1 TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-68.261	14 18	-1.1 F	-2. F	8239.	-421.309	29.492
FEB	0.00000				-46.591	3 18	21.1 F	18. F	7589.	-387.485	29.492
MAR	0.00000				-29.776	3 18	28. F	23. F	8506.	-352.398	29.492
APR	0.00000				-4.338	14 17	51.1 F	42. F	8556.	-194.999	29.492
MAY	16.35864	22 19	77. F	70. F	-0.421	5 17	65.1 F	52. F	8883.	-81.935	29.492
JUN	40.97293	30 17	88. F	73. F	0.000				8494.	0.000	29.492
JUL	58.98399	17 19	88. F	80. F	0.000				8870.	0.000	29.492
AUG	50.94439	11 17	98. F	71. F	0.000				8478.	0.000	29.492
SEP	29.03647	8 17	89. F	72. F	0.000				8572.	0.000	29.492
OCT	0.78622	1 19	81. F	66. F	-3.645	20 17	52. F	43. F	8888.	-281.855	29.492
NOV	0.00000				-22.794	3 18	44. F	35. F	8162.	-302.685	29.492
DEC	0.00000				-61.287	8 18	14. F	11. F	8452.	-385.112	29.492
TOTAL MAX	197.083				-237.112				101693.	-421.309	29.492

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/19/1995 9: 3:30 SDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SETBACK FOR BLDG. #7866 THEATER W/DRESS RM  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR AHU-1 TOPEKA, KS

MONTH	HOURS				HOURS				HOURS				HOURS			
	COOLING LOAD	HEATING LOAD	COINCIDENT COOL-HEAT LOAD	FLOATING	HEATING AVAIL.	COOLING AVAIL.	FANS ON	FANS ON CYCLE	FANS ON	NIGHT VENTING	FLOATING WHEN FANS ON	HEATING LOAD AT PEAK (KBTU/HR)	ELECTRIC LOAD AT PEAK (KW)	HEATING LOAD AT PEAK (KBTU/HR)	COOLING LOAD AT PEAK (KW)	
JAN	0	540	0	204	744	0	577	433	0	37	0.000	0.000	0.000	0.000	0.000	
FEB	0	483	0	189	672	0	528	392	0	45	-45.170	11.310	11.310	-142.147	29.492	
MAR	0	487	0	257	744	0	609	473	0	122	-142.147	29.492	29.492	0.000	0.000	
APR	0	301	0	419	720	0	605	461	0	304	0.000	0.000	0.000	0.000	0.000	
MAY	80	130	0	534	360	137	634	490	0	424	0.000	0.000	23.505	0.000	23.505	
JUN	218	0	0	502	0	330	608	472	0	390	0.000	0.000	29.492	0.000	29.492	
JUL	266	0	0	478	0	394	616	456	0	350	0.000	0.000	23.505	0.000	23.505	
AUG	291	0	0	453	0	420	615	487	0	324	0.000	0.000	29.492	0.000	29.492	
SEP	165	0	0	555	0	287	598	446	0	433	0.000	0.000	29.492	0.000	29.492	
OCT	7	339	0	398	720	13	626	474	0	280	0.000	0.000	23.505	0.000	23.505	
NOV	0	424	0	296	720	0	587	459	0	163	0.000	0.000	0.000	0.000	0.000	
DEC	0	536	0	208	744	0	579	419	0	43	-175.869	29.492	29.492	0.000	0.000	
ANNUAL	1027	3240	0	4493	5424	1581	7182	5462	0	2915						

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/19/1995 9: 3:30 SDL RUN 1  
DENVER, CO 80227 RUN #1 NIGHT SETBACK FOR BLDG. #7866 THEATER W/DRESS RM  
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR AHU-2 TOPEKA, KS

MONTH	COOLING ENERGY (MBTU)		TIME OF MAX		DRY- BULB TEMP		WET- BULB TEMP		HEATING ENERGY (MBTU)		TIME OF MAX		DRY- BULB TEMP		WET- BULB TEMP		HEATING ENERGY (KWH)		MAXIMUM HEATING LOAD (KBTU/HR)		ELECTRIC LOAD (KW)	
	COOLING ENERGY (MBTU)	MAXIMUM COOLING LOAD (KBTU/HR)	TIME OF MAX DY HR	WET- BULB TEMP	DRY- BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	HEATING ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	ELECTRIC LOAD (KW)										
JAN	0.25016	12.954	24	1	36.F	35.F	-4.731	14	21	-3.F	-4.F	1447.	-29.260	1447.	7.278							
FEB	0.28104	13.599	14	1	32.F	31.F	-2.929	3	10	10.F	8.F	1325.	-28.379	1325.	7.278							
MAR	1.14126	17.928	28	1	46.F	42.F	-1.781	3	18	28.F	23.F	1439.	-25.095	1439.	7.278							
APR	4.85503	22.679	29	7	62.F	61.F	-0.163	14	17	51.F	42.F	1635.	-12.316	1635.	7.278							
MAY	5.74571	39.398	30	18	86.F	75.F	-0.833	19	7	50.F	49.F	1539.	-14.404	1539.	7.278							
JUN	4.99110	44.615	30	18	86.F	73.F	-0.760	11	7	58.F	56.F	1320.	-15.704	1320.	7.278							
JUL	6.69658	50.459	17	18	88.F	80.F	-0.379	29	7	59.F	58.F	1485.	-11.214	1485.	7.278							
AUG	5.65014	46.942	21	17	95.F	77.F	-0.372	26	7	65.F	63.F	1288.	-10.626	1288.	7.278							
SEP	4.28277	42.858	5	18	90.F	77.F	-1.685	11	8	43.F	42.F	1423.	-22.138	1423.	7.278							
OCT	5.69723	29.233	1	18	83.F	68.F	-0.265	1	8	47.F	45.F	1711.	-23.422	1711.	7.278							
NOV	1.96935	21.626	7	1	59.F	56.F	-1.414	3	8	24.F	21.F	1407.	-20.018	1407.	7.278							
DEC	0.43146	16.357	19	1	42.F	37.F	-3.941	8	20	14.F	11.F	1556.	-27.080	1556.	7.278							
TOTAL	41.992	50.459					-19.253					17576.	-29.260									7.278

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/19/1995 9: 3:30 SDL RUN 1  
DENVER, CO 80227 RUN #1 NIGHT SETBACK FOR BLDG. #7866 THEATER W/DRESS RM  
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR AHU-2 TOPEKA, KS

MONTH	COOLING LOAD		HEATING LOAD		COINCIDENT COOL-HEAT LOAD		HOURS COINCIDENT		HOURS HEATING AVAIL.		HOURS COOLING AVAIL.		HOURS FANS ON CYCLE		HOURS NIGHT VENTING		HOURS FLOATING WHEN FANS ON		HEATING COOLING PEAK (KBTU/HR)		ELECTRIC LOAD AT COOLING PEAK (KW)	
	COOLING LOAD	HEATING LOAD	COINCIDENT COOL-HEAT LOAD	HOURS COINCIDENT	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.	HOURS FANS ON CYCLE	HOURS NIGHT VENTING	HOURS FLOATING WHEN FANS ON	HEATING COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)											
JAN	80	348	0	0	316	744	428	284	0	0	0.000	0.000	0	0	0.000	0	0	0.000	1.404			
FEB	78	297	0	0	297	672	375	239	0	0	0.000	0.000	0	0	0.000	0	0	0.000	1.404			
MAR	213	242	0	0	289	744	562	320	0	1	0.000	0.000	0	0	0.000	0	0	0.000	1.404			
APR	513	49	0	0	158	720	494	418	0	0	0.000	0.000	0	0	0.000	0	0	0.000	1.404			
MAY	368	126	0	0	250	744	494	350	0	0	0.000	0.000	0	0	0.000	0	0	0.000	7.278			
JUN	213	158	0	0	349	720	371	235	0	0	0.000	0.000	0	0	0.000	0	0	0.000	7.278			
JUL	260	128	0	0	356	744	388	228	0	0	0.000	0.000	0	0	0.000	0	0	0.000	7.278			
AUG	274	108	0	0	362	744	382	254	0	0	0.000	0.000	0	0	0.000	0	0	0.000	7.278			
SEP	179	199	0	0	342	720	378	226	0	0	0.000	0.000	0	0	0.000	0	0	0.000	7.278			
OCT	540	43	0	0	161	744	583	431	0	0	0.000	0.000	0	0	0.000	0	0	0.000	7.278			
NOV	281	185	0	0	253	720	467	339	0	0	0.000	0.000	0	0	0.000	0	0	0.000	1.404			
DEC	107	332	0	0	305	744	439	279	0	0	0.000	0.000	0	0	0.000	0	0	0.000	1.404			
ANNUAL	3106	2216	0	0	3438	8760	5323	3603	0	1	0.000	0.000	0	0	0.000	0	0	0.000	1.404			

EMC ENGINEERS INC. 80227 DOE-2.1D 5/19/1995 9: 3:30 PDL RUN 1  
 DENVER, CO MONTHLY PEAK AND TOTAL ENERGY USE EZDOE - ELITE SOFTWARE DEVELOPMENT INC THEATER W/DRESS RM  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE RUN #1 NIGHT SETBACK FOR BLDG. #7866 TOPEKA, KS

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY 37.627 136.184 30/24	NATURAL-GAS 106.720 564.963 14/18
JAN	TOTAL (MBTU) PEAK (KBTU) DY/HR	37.627 136.184 30/24	106.720 564.963 14/18
FEB	TOTAL (MBTU) PEAK (KBTU) DY/HR	34.241 136.696 26/24	75.502 528.309 3/18
MAR	TOTAL (MBTU) PEAK (KBTU) DY/HR	38.176 139.127 6/24	51.033 489.891 3/18
APR	TOTAL (MBTU) PEAK (KBTU) DY/HR	40.374 137.726 28/24	9.169 299.988 14/17
MAY	TOTAL (MBTU) PEAK (KBTU) DY/HR	45.896 231.934 30/24	3.644 148.507 5/17
JUN	TOTAL (MBTU) PEAK (KBTU) DY/HR	50.765 270.808 30/17	2.239 31.966 11/ 7
JUL	TOTAL (MBTU) PEAK (KBTU) DY/HR	58.651 289.322 23/17	1.426 24.629 29/ 7
AUG	TOTAL (MBTU) PEAK (KBTU) DY/HR	55.769 290.235 11/17	1.288 23.668 26/ 7
SEP	TOTAL (MBTU) PEAK (KBTU) DY/HR	47.161 268.508 8/17	4.008 42.481 11/ 8
OCT	TOTAL (MBTU) PEAK (KBTU) DY/HR	42.588 187.094 1/24	8.222 398.007 20/17
NOV	TOTAL (MBTU) PEAK (KBTU) DY/HR	37.069 136.768 20/24	39.471 429.419 3/18
DEC	TOTAL (MBTU) PEAK (KBTU) DY/HR	39.015 137.210 18/24	98.233 523.764 8/18
	ONE YEAR USE/PEAK	527.331 290.235	400.954 564.963

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/19/1995 9: 3:30 PDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SETBACK FOR BLDG. #7866 THEATER W/DRESS RM  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
SPACE HEAT	15.77	400.95
SPACE COOL	93.99	0.00
HVAC AUX	313.21	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	62.50	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	41.86	0.00
TOTAL	527.31	400.95

TOTAL SITE ENERGY 928.28 MBTU 109.9 KBTU/SQFT-YR GROSS-AREA 109.9 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 1984.53 MBTU 234.9 KBTU/SQFT-YR GROSS-AREA 234.9 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 27.4  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

\$-----\$  
\$ E Z - D O E S Y S T E M S I N P U T \$  
\$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
LINE-3 \* DENVER, CO 80227 \*  
  
LINE-4 \*RUN #2 DDC CONTROL FOR BLDG. #7866 \*  
LINE-5 \*THEATER W/DRESS RM \* ..

ABORT ERRORS ..  
DIAGNOSTIC WARNINGS ..  
SYSTEMS-REPORT VERIFICATION=(SV-A)  
SUMMARY=(SS-A,SS-C,SS-K,SS-O)  
HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

SD\_ON =DAY-SCHEDULE (1,24) (1.) ..  
SD\_OFF =DAY-SCHEDULE (1,24) (0.) ..  
SD\_WT\_HT =DAY-SCHEDULE (1,24) (70.) ..  
SD\_SM\_CL =DAY-SCHEDULE (1,24) (76.) ..  
SD\_WT\_CL =DAY-SCHEDULE (1,24) (70.2) ..  
SD\_SM\_HT =DAY-SCHEDULE (1,24) (75.8) ..



SW\_ON =WEEK-SCHEDULE (ALL) SD\_ON ..  
SW\_OFF =WEEK-SCHEDULE (ALL) SD\_OFF ..  
SW\_WT\_HT =WEEK-SCHEDULE (ALL) SD\_WT\_HT ..  
SW\_SM\_CL =WEEK-SCHEDULE (ALL) SD\_SM\_CL ..  
SW\_WT\_CL =WEEK-SCHEDULE (ALL) SD\_WT\_CL ..  
SW\_SM\_HT =WEEK-SCHEDULE (ALL) SD\_SM\_HT ..

\$ FULL ON SYSTEM

S\_ON =SCHEDULE THRU DEC 31 SW\_ON ..

\$ FULL OFF SYSTEM

S\_OFF =SCHEDULE THRU DEC 31 SW\_OFF ..

\$ HEATING SEASON

S\_HE-SCHED =SCHEDULE THRU MAY 15 SW\_ON  
THRU OCT 1 SW\_OFF  
THRU DEC 31 SW\_ON ..

\$ COOLING SEASON

S\_CL\_SCHED =SCHEDULE THRU MAY 15 SW\_OFF  
THRU OCT 1 SW\_ON

THRU DEC 31 SW\_OFF ..

\$ HEATING SET TEMP

S\_HT\_SET\_F =SCHEDULE THRU MAY 15 SW\_WT\_HT  
THRU OCT 1 SW\_SM\_HT  
THRU DEC 31 SW\_WT\_HT ..

\$ COOLING SET TEMP

S\_CL\_SET\_F =SCHEDULE THRU MAY 15 SW\_WT\_CL  
THRU OCT 1 SW\_SM\_CL  
THRU DEC 31 SW\_WT\_CL ..

S\_HRLY\_RPT =SCHEDULE THRU JAN 9 SW\_OFF  
THRU JAN 10 SW\_ON  
THRU JAN 22 SW\_OFF  
THRU JAN 23 SW\_ON  
THRU JUL 18 SW\_OFF  
THRU JUL 19 SW\_ON  
THRU JUL 22 SW\_OFF  
THRU JUL 23 SW\_ON  
THRU DEC 31 SW\_OFF ..

\$ ZONE DESCRIPTION

THEATER =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

LOBBY =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

PROJ-ROOM =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

\$ SYSTEM DESCRIPTION

AHU-1 =SYSTEM SYSTEM-TYPE = SZRH  
MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
HEATING-SCHEDULE = S\_HE-SCHED  
COOLING-SCHEDULE = S\_CL\_SCHED HEAT-SET-T = 55.0  
PREHEAT-T = 0.0 OA-CONTROL = FIXED  
SUPPLY-CFM = 14500. RATED-CFM = 14500.  
MIN-OUTSIDE-AIR = 0.17 MAX-OA-FRACTION = 0.17  
SUPPLY-DELTA-T = 2.4 SUPPLY-KW = 0.00078  
FAN-PLACEMENT = BLOW-THROUGH

NIGHT-CYCLE-CTRL = STAY-OFF NIGHT-VENT-DT = 0.0  
 MIN-CFM-RATIO = 1.0 REHEAT-DELTA-T = 27.8  
 COOLING-CAPACITY = 453656. COOL-SH-CAP = 380832.  
 HEATING-CAPACITY = -417300.  
 SIZING-OPTION = COINCIDENT RETURN-AIR-PATH = DUCT  
 ZONE-NAMES = (THEATER, LOBBY) ..

AHU-2 =SYSTEM SYSTEM-TYPE = SZRH  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_ON COOLING-SCHEDULE = S\_ON  
 HEAT-SET-T = 55.0 PREHEAT-T = 0.0  
 OA-CONTROL = FIXED SUPPLY-CFM = 1800.  
 RATED-CFM = 1800. MIN-OUTSIDE-AIR = 0.17  
 MAX-OA-FRACTION = 0.17 SUPPLY-DELTA-T = 2.4  
 SUPPLY-KW = 0.00078 FAN-PLACEMENT = BLOW-THROUGH  
 NIGHT-CYCLE-CTRL = STAY-OFF NIGHT-VENT-DT = 0.0  
 MIN-CFM-RATIO = 1.0 REHEAT-DELTA-T = 17.  
 COOLING-CAPACITY = 48900. COOL-SH-CAP = 48900.  
 HEATING-CAPACITY = -30709.3  
 ZONE-HEAT-SOURCE = ELECTRIC  
 SIZING-OPTION = COINCIDENT RETURN-AIR-PATH = DUCT  
 ZONE-NAMES = (PROJ-ROOM) ..

\$ HOURLY REPORT DESCRIPTION

THEAT-BLK =REPORT-BLOCK VARIABLE-TYPE = THEATER  
 VARIABLE-LIST = (17,18,7,6) ..  
 LOBBY-BLK =REPORT-BLOCK VARIABLE-TYPE = LOBBY  
 VARIABLE-LIST = (17,18,7,6) ..  
 PROJ-BLK =REPORT-BLOCK VARIABLE-TYPE = PROJ-ROOM  
 VARIABLE-LIST = (17,18,7,6) ..  
 AHU-1-BLK =REPORT-BLOCK VARIABLE-TYPE = AHU-1  
 VARIABLE-LIST = (3,5,6,17,39) ..  
 AHU-2-BLK =REPORT-BLOCK VARIABLE-TYPE = AHU-2  
 VARIABLE-LIST = (3,5,6,17,39) ..  
 ZONES-HRLY = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY\_RPT  
 REPORT-BLOCK = (THEAT-BLK, LOBBY-BLK, PROJ-BLK)  
 ..  
 AHU-HRLY = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY\_RPT  
 REPORT-BLOCK = (AHU-1-BLK, AHU-2-BLK)  
 ..  
 END ..  
 COMPUTE SYSTEMS ..

INPUT PLANT ..

\$-----\$  
 \$ E Z - D O E P L A N T S I N P U T \$  
 \$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
 LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*



EMC ENGINEERS INC. EZZOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/19/1995 9:19:58 SDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. #7866 THEATER W/DRESS RM  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR AHU-1 TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC-TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-111.924	15	-6.F	-7.F	-313.024	10128.	29.492
FEB	0.00000				-80.723	3	-5.F	-6.F	-283.665	9218.	29.492
MAR	0.00000				-60.581	3	15.F	12.F	-207.738	10032.	29.492
APR	0.00000				-12.501	5	30.F	27.F	-134.574	9856.	29.492
MAY	21.38521	30	80.F	74.F	-1.533	5	44.F	40.F	-68.468	10128.	29.492
JUN	62.46119	19	86.F	75.F	0.000				0.000	9761.	29.492
JUL	90.89182	17	88.F	80.F	0.000				0.000	10318.	29.492
AUG	85.14179	21	95.F	76.F	0.000				0.000	9937.	29.492
SEP	36.06384	5	87.F	76.F	0.000				0.000	9951.	29.492
OCT	0.26714	1	64.F	60.F	-9.539	20	23.F	22.F	-157.988	10223.	29.492
NOV	0.00000				-46.770	3	13.F	12.F	-210.248	9666.	29.492
DEC	0.00000				-96.368	13	0.F	-1.F	-276.082	10318.	29.492
TOTAL	296.211				-419.938				-313.024	119543.	29.492
MAX											

EMC ENGINEERS INC. EZZOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/19/1995 9:19:58 SDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. #7866 THEATER W/DRESS RM  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR AHU-1 TOPEKA, KS

MONTH	HOURS OF				HOURS				COINCIDENT LOADS--				
	COOLING LOAD	HEATING LOAD	COOL-HEAT LOAD	COINCIDENT LOAD	HEATING AVAIL.	COOLING AVAIL.	FANS ON CYCLE	FANS ON VENTING	HOURS FLOATING WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)
JAN	0	0	0	0	744	0	0	0	0	-126.342	11.310	-126.342	11.310
FEB	0	662	0	0	672	0	0	0	10	-130.280	11.310	-130.280	11.310
MAR	0	681	0	0	744	0	0	0	63	-16.891	29.492	-16.891	29.492
APR	0	471	0	0	720	0	0	0	249	-19.905	11.310	-19.905	11.310
MAY	267	192	0	0	267	0	0	0	285	0.000	23.505	0.000	23.505
JUN	646	0	0	0	646	0	0	0	74	0.000	23.505	0.000	23.505
JUL	744	0	0	0	744	0	0	0	0	0.000	23.505	0.000	23.505
AUG	733	0	0	0	733	0	0	0	11	0.000	23.505	0.000	23.505
SEP	425	0	0	0	425	0	0	0	295	0.000	23.505	0.000	23.505
OCT	5	461	0	0	5	0	0	0	278	0.000	29.492	0.000	29.492
NOV	0	630	0	0	720	0	0	0	90	-158.619	11.310	-158.619	11.310
DEC	0	731	0	0	744	0	0	0	13	-63.895	29.492	-63.895	29.492
ANNUAL	2820	4572	0	0	2820	8760	0	0	1368				

EMC ENGINEERS INC. EZZOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/19/1995 9:19:58 SDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. #7866 THEATER W/DRESS RM  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR AHU-2 TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	MAXIMUM ELEC LOAD (KW)
JAN	0.27998	22	24	40.F	38.F	15	6	-9.F	1890.	-30.921	7.278
FEB	0.47266	26	24	43.F	37.F	3	7	-6.F	1742.	-30.442	7.278
MAR	1.11419	24	18	65.F	64.F	3	8	12.F	1843.	-21.892	7.278
APR	3.23906	28	19	71.F	68.F	5	7	27.F	1857.	-14.150	7.278
MAY	5.32427	30	23	78.F	74.F	5	7	40.F	1890.	-7.278	7.278
JUN	7.99071	19	20	84.F	75.F	2	7	49.F	1810.	-6.584	7.278
JUL	11.12780	17	19	88.F	80.F	0	0	0.000	1984.	0.000	7.278
AUG	10.23586	21	20	92.F	76.F	4	7	53.F	1796.	-3.149	7.278
SEP	5.58561	5	19	87.F	76.F	13	7	44.F	1904.	-8.187	7.278
OCT	3.76598	10	19	74.F	67.F	8	8	23.F	1937.	-17.154	7.278
NOV	1.22012	6	24	59.F	55.F	3	6	13.F	1763.	-22.473	7.278
DEC	0.56648	3	23	49.F	42.F	13	8	0.F	1984.	-28.756	7.278
TOTAL	50.923								22402.		
MAX										-30.921	7.278

EMC ENGINEERS INC. EZZOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/19/1995 9:19:58 SDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. #7866 THEATER W/DRESS RM  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR AHU-2 TOPEKA, KS

MONTH	HOURS				HOURS				HOURS				HOURS			
	COOLING LOAD	HEATING LOAD	COINCIDENT COOL-HEAT LOAD	FLOATING	HEATING AVAIL.	COOLING AVAIL.	FANS ON CYCLE	FANS ON	NIGHT VENTING	FLOATING WHEN FANS ON	HEATING AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)	HEATING AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)		
JAN	84	660	0	0	744	744	744	744	0	0	0.000	7.278	0.000	7.278		
FEB	102	570	0	0	672	672	672	672	0	0	0.000	7.278	0.000	7.278		
MAR	137	607	0	0	744	744	744	744	0	0	0.000	7.278	0.000	7.278		
APR	440	280	0	0	720	720	720	720	0	0	0.000	7.278	0.000	7.278		
MAY	565	179	0	0	744	744	744	744	0	0	0.000	7.278	0.000	7.278		
JUN	675	45	0	0	720	720	720	720	0	0	0.000	7.278	0.000	7.278		
JUL	744	0	0	0	744	744	744	744	0	0	0.000	7.278	0.000	7.278		
AUG	731	13	0	0	744	744	744	744	0	0	0.000	7.278	0.000	7.278		
SEP	538	182	0	0	720	720	720	720	0	0	0.000	7.278	0.000	7.278		
OCT	461	283	0	0	744	744	744	744	0	0	0.000	7.278	0.000	7.278		
NOV	234	486	0	0	720	720	720	720	0	0	0.000	7.278	0.000	7.278		
DEC	98	646	0	0	744	744	744	744	0	0	0.000	7.278	0.000	7.278		
ANNUAL	4809	3951	0	0	8760	8760	8760	8760	0	0						

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/19/1995 9:19:58 PDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. #7866 THEATER W/DRESS RM  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY 47.250 138.256 6/17	NATURAL-GAS 172.968 433.470 15/ 8
JAN	TOTAL (MBTU) PEAK (KBTU) DY/HR	43.010 138.181 18/17	129.719 402.096 3/ 7
FEB	TOTAL (MBTU) PEAK (KBTU) DY/HR	46.062 137.777 4/17	101.794 310.124 3/ 8
MAR	TOTAL (MBTU) PEAK (KBTU) DY/HR	44.686 140.466 28/17	24.455 218.214 5/ 7
APR	TOTAL (MBTU) PEAK (KBTU) DY/HR	54.408 210.345 30/24	4.576 128.642 5/ 7
MAY	TOTAL (MBTU) PEAK (KBTU) DY/HR	70.030 214.368 19/24	0.354 15.596 2/ 7
JUN	TOTAL (MBTU) PEAK (KBTU) DY/HR	84.104 236.464 23/17	0.000 0.000 31/ 1
JUL	TOTAL (MBTU) PEAK (KBTU) DY/HR	81.397 229.059 21/17	0.092 9.984 4/ 7
AUG	TOTAL (MBTU) PEAK (KBTU) DY/HR	59.615 215.291 5/24	2.067 18.216 13/ 7
SEP	TOTAL (MBTU) PEAK (KBTU) DY/HR	46.418 168.883 1/24	19.465 248.637 20/ 8
OCT	TOTAL (MBTU) PEAK (KBTU) DY/HR	44.060 137.648 3/17	79.338 313.562 3/ 6
NOV	TOTAL (MBTU) PEAK (KBTU) DY/HR	48.114 137.344 16/17	152.014 392.204 13/ 8
DEC	TOTAL (MBTU) PEAK (KBTU) DY/HR		
	ONE YEAR USE/PEAK	669.153 236.464	686.842 433.470

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/19/1995 9:19:58 PDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. #7866 THEATER W/DRESS RM  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
SPACE HEAT	25.02	686.84
SPACE COOL	148.67	0.00
HVAC AUX	391.08	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	62.50	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	41.86	0.00
TOTAL	669.12	686.84

TOTAL SITE ENERGY 1355.99 MBTU 160.5 KBTU/SQFT-YR GROSS-AREA 160.5 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 2696.31 MBTU 319.1 KBTU/SQFT-YR GROSS-AREA 319.1 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 3.7  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.



\$-----\$  
\$ EZ - DOE SYSTEMS INPUT \$  
\$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
LINE-3 \* DENVER, CO 80227 \*  
  
LINE-4 \*RUN #3 ECONOMIZER FOR BLDG. #7866 \*  
LINE-5 \*THEATER W/DRESS RM \* ..

ABORT ERRORS ..  
DIAGNOSTIC WARNINGS ..  
SYSTEMS-REPORT VERIFICATION=(SV-A)  
SUMMARY=(SS-A,SS-C,SS-K,SS-O)  
HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

SD\_ON =DAY-SCHEDULE (1,24) (1.) ..  
SD\_OFF =DAY-SCHEDULE (1,24) (0.) ..  
SD\_WT\_HT =DAY-SCHEDULE (1,16) (55.)  
(17,24) (74.) ..  
SD\_SM\_CL =DAY-SCHEDULE (1,16) (85.)  
(17,24) (72.) ..  
SD\_WT\_CL =DAY-SCHEDULE (1,16) (55.2)  
(17,24) (74.2) ..  
SD\_SM\_HT =DAY-SCHEDULE (1,16) (84.8)  
(17,24) (71.8) ..  
SD\_FAN\_CYC =DAY-SCHEDULE (1,6) (-1.)  
(7,16) (0.)  
(17,24) (1.) ..  
SD\_WT\_HT\_D =DAY-SCHEDULE (1,24) (55.) ..  
SD\_WT\_CL\_D =DAY-SCHEDULE (1,24) (55.2) ..  
SD\_SM\_CL\_D =DAY-SCHEDULE (1,24) (85.) ..  
SD\_SM\_HT\_D =DAY-SCHEDULE (1,24) (84.8) ..

SW\_ON =WEEK-SCHEDULE (ALL) SD\_ON ..  
SW\_OFF =WEEK-SCHEDULE (ALL) SD\_OFF ..

SW\_WT\_HT =WEEK-SCHEDULE (MON) SD\_WT\_HT\_D  
(TUE) SD\_WT\_HT\_D  
(WED) SD\_WT\_HT\_D  
(THU) SD\_WT\_HT  
(FRI) SD\_WT\_HT  
(SAT) SD\_WT\_HT  
(SUN) SD\_WT\_HT  
(HOL) SD\_WT\_HT ..

SW\_SM\_CL =WEEK-SCHEDULE (MON) SD\_SM\_CL\_D  
(TUE) SD\_SM\_CL\_D  
(WED) SD\_SM\_CL\_D

(THU) SD\_SM\_CL  
(FRI) SD\_SM\_CL  
(SAT) SD\_SM\_CL  
(SUN) SD\_SM\_CL  
(HOL) SD\_SM\_CL ..

SW\_WT\_CL =WEEK-SCHEDULE (MON) SD\_WT\_CL\_D  
(TUE) SD\_WT\_CL\_D  
(WED) SD\_WT\_CL\_D  
(THU) SD\_WT\_CL  
(FRI) SD\_WT\_CL  
(SAT) SD\_WT\_CL  
(SUN) SD\_WT\_CL  
(HOL) SD\_WT\_CL ..

SW\_SM\_HT =WEEK-SCHEDULE (MON) SD\_SM\_HT\_D  
(TUE) SD\_SM\_HT\_D  
(WED) SD\_SM\_HT\_D  
(THU) SD\_SM\_HT  
(FRI) SD\_SM\_HT  
(SAT) SD\_SM\_HT  
(SUN) SD\_SM\_HT  
(HOL) SD\_SM\_HT ..

SW\_FAN\_CYC =WEEK-SCHEDULE (MON) SD\_OFF  
(TUE) SD\_OFF  
(WED) SD\_OFF  
(THU) SD\_FAN\_CYC  
(FRI) SD\_FAN\_CYC  
(SAT) SD\_FAN\_CYC  
(SUN) SD\_FAN\_CYC  
(HOL) SD\_FAN\_CYC ..

\$ FULL ON SYSTEM

S\_ON =SCHEDULE THRU DEC 31 SW\_ON ..

\$ FULL OFF SYSTEM

S\_OFF =SCHEDULE THRU DEC 31 SW\_OFF ..

\$ HEATING SEASON

S\_HE-SCHED =SCHEDULE THRU MAY 15 SW\_ON  
THRU OCT 1 SW\_OFF  
THRU DEC 31 SW\_ON ..

\$ COOLING SEASON

S\_CL\_SCHED =SCHEDULE THRU MAY 15 SW\_OFF  
THRU OCT 1 SW\_ON  
THRU DEC 31 SW\_OFF ..

\$ HEATING SET TEMP

S\_HT\_SET\_F =SCHEDULE THRU MAY 15 SW\_WT\_HT  
THRU OCT 1 SW\_SM\_HT  
THRU DEC 31 SW\_WT\_HT ..

\$ COOLING SET TEMP

S\_CL\_SET\_F =SCHEDULE THRU MAY 15 SW\_WT\_CL  
 THRU OCT 1 SW\_SM\_CL  
 THRU DEC 31 SW\_WT\_CL ..

S\_HRLY\_RPT =SCHEDULE THRU JAN 9 SW\_OFF  
 THRU JAN 10 SW\_ON  
 THRU JAN 22 SW\_OFF  
 THRU JAN 23 SW\_ON  
 THRU JUL 18 SW\_OFF  
 THRU JUL 19 SW\_ON  
 THRU JUL 22 SW\_OFF  
 THRU JUL 23 SW\_ON  
 THRU DEC 31 SW\_OFF ..

S\_FAN\_CYCL =SCHEDULE THRU DEC 31 SW\_FAN\_CYC ..

\$ ZONE DESCRIPTION

THEATER =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
 SIZING-OPTION = FROM-LOADS ..

LOBBY =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
 SIZING-OPTION = FROM-LOADS ..

PROJ-ROOM =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
 SIZING-OPTION = FROM-LOADS ..

\$ SYSTEM DESCRIPTION

AHU-1 =SYSTEM SYSTEM-TYPE = SZRH  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_HE-SCHED  
 COOLING-SCHEDULE = S\_CL\_SCHED HEAT-SET-T = 55.0  
 PREHEAT-T = 0.0 ECONO-LIMIT-T = 69.0 ←  
 SUPPLY-CFM = 14500. RATED-CFM = 14500.  
 MIN-OUTSIDE-AIR = 0.17 FAN-SCHEDULE = S\_FAN\_CYCL  
 SUPPLY-DELTA-T = 2.4 SUPPLY-KW = 0.00078  
 FAN-PLACEMENT = BLOW-THROUGH  
 NIGHT-CYCLE-CTRL = CYCLE-ON-ANY NIGHT-VENT-DT = 0.0  
 MIN-CFM-RATIO = 1.0 REHEAT-DELTA-T = 27.8  
 COOLING-CAPACITY = 453656. COOL-SH-CAP = 380832.  
 HEATING-CAPACITY = -417300.  
 SIZING-OPTION = COINCIDENT RETURN-AIR-PATH = DUCT  
 ZONE-NAMES = (THEATER, LOBBY) ..



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AHU-2      =SYSTEM      SYSTEM-TYPE = SZRH
                MAX-SUPPLY-T = 120.0  MIN-SUPPLY-T = 55.0
                HEATING-SCHEDULE = S_ON  COOLING-SCHEDULE = S_ON
                HEAT-SET-T = 55.0  PREHEAT-T = 0.0
                ECONO-LIMIT-T = 69.0  SUPPLY-CFM = 1800.
                RATED-CFM = 1800.  MIN-OUTSIDE-AIR = 0.17
                FAN-SCHEDULE = S_FAN_CYCL  SUPPLY-DELTA-T = 2.4
                SUPPLY-KW = 0.00078  FAN-PLACEMENT = BLOW-THROUGH
                NIGHT-CYCLE-CTRL = CYCLE-ON-ANY  NIGHT-VENT-DT = 0.0
                MIN-CFM-RATIO = 1.0  REHEAT-DELTA-T = 17.
                COOLING-CAPACITY = 48900.  COOL-SH-CAP = 48900.
                HEATING-CAPACITY = -30709.3
                ZONE-HEAT-SOURCE = ELECTRIC
                SIZING-OPTION = COINCIDENT  RETURN-AIR-PATH = DUCT
                ZONE-NAMES = (PROJ-ROOM) ..

```



\$ HOURLY REPORT DESCRIPTION

```

THEAT-BLK =REPORT-BLOCK VARIABLE-TYPE = THEATER
                VARIABLE-LIST = (17,18,7,6) ..
LOBBY-BLK =REPORT-BLOCK VARIABLE-TYPE = LOBBY
                VARIABLE-LIST = (17,18,7,6) ..
PROJ-BLK  =REPORT-BLOCK VARIABLE-TYPE = PROJ-ROOM
                VARIABLE-LIST = (17,18,7,6) ..
AHU-1-BLK =REPORT-BLOCK VARIABLE-TYPE = AHU-1
                VARIABLE-LIST = (3,5,6,17,39) ..
AHU-2-BLK =REPORT-BLOCK VARIABLE-TYPE = AHU-2
                VARIABLE-LIST = (3,5,6,17,39) ..
ZONES-HRLY = HOURLY-REPORT  REPORT-SCHEDULE = S_HRLY_RPT
                REPORT-BLOCK = (THEAT-BLK,LOBBY-BLK,PROJ-BLK)
..
AHU-HRLY  = HOURLY-REPORT  REPORT-SCHEDULE = S_HRLY_RPT
                REPORT-BLOCK = (AHU-1-BLK,AHU-2-BLK)
..
END ..
COMPUTE SYSTEMS ..

INPUT PLANT ..

```

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$-----$
$ E Z - D O E   P L A N T S   I N P U T $
$-----$

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\$ GENERAL PROJECT DATA

```

TITLE  LINE-1 *   EMC      ENGINEERS      INC.      *
        LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
        LINE-3 *   DENVER,      CO      80227      *

        LINE-4 *RUN #3 ECONOMIZER FOR BLDG. #7866      *
        LINE-5 *THEATER W/DRESS RM                      * ..

```

ABORT ERRORS ..

EMC ENGINEERS INC. DOE-2.1D 5/19/1995 9:42: 2 SDL RUN 1  
 DENVER, CO 80227 EZDOE - ELITE SOFTWARE DEVELOPMENT INC THEATER W/DRESS RM  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR AHU-1 TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC LOAD (KW)
JAN	0.00000				-69.561	14	20	-2. F	-3. F	-400.239	8137.
FEB	0.00000				-47.884	3	19	19. F	16. F	-367.491	7488.
MAR	0.00000				-33.029	3	19	24. F	20. F	-324.840	8268.
APR	0.00000				-6.979	14	17	51. F	42. F	-255.891	8510.
MAY	13.19868	22	19	77. F	-0.993	5	17	65. F	52. F	-189.644	8883.
JUN	38.60798	30	17	88. F	0.000					0.000	8494.
JUL	59.07546	17	19	88. F	0.000					0.000	8870.
AUG	50.45203	11	17	98. F	0.000					0.000	8478.
SEP	23.16676	8	17	89. F	0.000					0.000	8572.
OCT	0.36147	1	19	81. F	-5.384	20	18	51. F	42. F	-274.606	8752.
NOV	0.00000				-27.101	3	17	46. F	36. F	-296.323	7958.
DEC	0.00000				-63.400	8	19	14. F	11. F	-355.024	8429.
TOTAL	184.863				-254.330					-400.239	100844.
MAX										438.143	29.492

EMC ENGINEERS INC. DOE-2.1D 5/19/1995 9:42: 2 SDL RUN 1  
 DENVER, CO 80227 EZDOE - ELITE SOFTWARE DEVELOPMENT INC THEATER W/DRESS RM  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR AHU-1 TOPEKA, KS

MONTH	HOURS OF				HOURS OF				HOURS OF				COINCIDENT LOADS--	
	COOLING LOAD	HEATING LOAD	COOL-HEAT LOAD	COINCIDENT LOAD	HEATING AVAIL.	COOLING AVAIL.	FANS ON	FANS ON	HEATING AVAIL.	COOLING AVAIL.	FANS ON	FANS ON	HEATING LOAD AT PEAK (KBTU/HR)	ELECTRIC LOAD AT PEAK (KW)
JAN	0	449	0	0	744	0	568	424	0	0	119	0	-47.129	11.310
FEB	0	379	0	0	672	0	519	383	0	0	140	0	-51.384	11.310
MAR	0	346	0	0	744	0	588	452	0	0	242	0	-142.207	29.492
APR	0	116	0	0	720	0	601	457	0	0	485	0	0.000	0.000
MAY	68	22	0	0	360	127	634	490	0	0	544	0	0.000	23.505
JUN	209	0	0	0	0	330	608	472	0	0	399	0	0.000	29.492
JUL	266	0	0	0	0	394	616	456	0	0	350	0	0.000	23.505
AUG	291	0	0	0	0	420	615	487	0	0	324	0	0.000	29.492
SEP	126	0	0	0	0	287	598	446	0	0	472	0	0.000	29.492
OCT	4	91	0	0	720	13	614	462	0	0	519	0	0.000	23.505
NOV	0	232	0	0	720	0	569	441	0	0	337	0	-106.852	11.310
DEC	0	443	0	0	744	0	577	417	0	0	134	0	-177.152	29.492
ANNUAL	964	2078	0	0	5424	1571	7107	5387	0	0	4065	0		

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/19/1995 9:42: 2 SDL RUN 1  
 DENVER, CO 80227 RUN #3 ECONOMIZER FOR BLDG. #7866 THEATER W/DRESS RM  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR AHU-2 TOPEKA, KS

MONTH	COOLING				HEATING				WET-BULB				DRY-BULB				HEATING				MAXIMUM				ELEC-TRICAL			
	ENERGY (MBTU)	OF MAX DY HR	TIME HR	WET-BULB TEMP	ENERGY (MBTU)	OF MAX DY HR	TIME HR	WET-BULB TEMP	ENERGY (MBTU)	OF MAX DY HR	TIME HR	DRY-BULB TEMP	ENERGY (MBTU)	OF MAX DY HR	TIME HR	DRY-BULB TEMP	ENERGY (MBTU)	OF MAX DY HR	TIME HR	WET-BULB TEMP	ENERGY (KBTU/HR)	MAXIMUM HEATING LOAD (KBTU/HR)	MAXIMUM HEATING LOAD (KBTU/HR)	TRICAL ENERGY (KWH)	ELEC LOAD (KW)			
JAN	0.00587	18	15	56.F	46.F	2.831	14	23	-4.708	14	23	-4.F	-5.F	-4.708	14	23	-4.F	-5.F	-4.708	14	23	-28.135	-28.135	1451.	7.278			
FEB	0.06966	26	15	60.F	45.F	7.920	3	9	-2.908	3	9	3.F	1.F	-2.908	3	9	3.F	1.F	-2.908	3	9	-25.716	-25.716	1325.	7.278			
MAR	0.42636	12	11	68.F	48.F	13.380	3	19	-1.761	3	19	24.F	20.F	-1.761	3	19	24.F	20.F	-1.761	3	19	-23.480	-23.480	1439.	7.278			
APR	3.48912	29	7	62.F	61.F	29.521	14	17	-0.160	14	17	51.F	42.F	-0.160	14	17	51.F	42.F	-0.160	14	17	-12.061	-12.061	1635.	7.278			
MAY	4.78570	14	7	66.F	63.F	41.775	19	8	-0.781	19	8	58.F	55.F	-0.781	19	8	58.F	55.F	-0.781	19	8	-14.414	-14.414	1573.	7.278			
JUN	4.76349	30	18	86.F	73.F	44.615	2	8	-0.755	2	8	55.F	52.F	-0.755	2	8	55.F	52.F	-0.755	2	8	-16.028	-16.028	1355.	7.278			
JUL	6.73750	17	18	88.F	80.F	50.458	26	8	-0.372	26	8	64.F	61.F	-0.372	26	8	64.F	61.F	-0.372	26	8	-10.746	-10.746	1496.	7.278			
AUG	5.59883	21	17	95.F	77.F	46.942	30	10	-0.362	30	10	47.F	45.F	-0.362	30	10	47.F	45.F	-0.362	30	10	-10.482	-10.482	1299.	7.278			
SEP	3.34041	1	22	68.F	67.F	46.283	1	8	-1.681	1	8	47.F	45.F	-1.681	1	8	47.F	45.F	-1.681	1	8	-21.564	-21.564	1481.	7.278			
OCT	3.86041	7	3	83.F	68.F	29.184	3	7	-0.264	3	7	19.F	17.F	-0.264	3	7	19.F	17.F	-0.264	3	7	-19.644	-19.644	1711.	7.278			
NOV	1.26098	18	16	60.F	56.F	14.829	8	21	-1.401	8	21	13.F	10.F	-1.401	8	21	13.F	10.F	-1.401	8	21	-19.582	-19.582	1407.	7.278			
DEC	0.02959	18	16	55.F	44.F	4.957	8	21	-3.912	8	21	13.F	10.F	-3.912	8	21	13.F	10.F	-3.912	8	21	-25.768	-25.768	1559.	7.278			
TOTAL	34.368								-19.065					-19.065					-19.065			-28.135	-28.135	17732.	7.278			
MAX						50.458																						

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/19/1995 9:42: 2 SDL RUN 1  
 DENVER, CO 80227 RUN #3 ECONOMIZER FOR BLDG. #7866 THEATER W/DRESS RM  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR AHU-2 TOPEKA, KS

MONTH	COOLING LOAD				HEATING LOAD				WET-BULB				DRY-BULB				HEATING				MAXIMUM				ELEC-TRICAL							
	LOAD	HOURS	HEATING	COOLING	LOAD	HOURS	HEATING	COOLING	LOAD	HOURS	HEATING	COOLING	LOAD	HOURS	HEATING	COOLING	LOAD	HOURS	HEATING	COOLING	LOAD	HOURS	HEATING	COOLING	LOAD	HOURS	HEATING	COOLING	LOAD	HOURS	HEATING	COOLING
JAN	3	357	0	384	744	431	287	744	431	287	0	71	0.000	0.000	0.000	1.404	1.404	0.000	0.000	0.000	0.000	71	0.000	0.000	1.404	1.404	0.000	0.000	0.000	1.404	1.404	
FEB	13	297	0	362	672	375	239	672	375	239	0	65	0.000	0.000	0.000	1.404	1.404	0.000	0.000	0.000	0.000	65	0.000	0.000	1.404	1.404	0.000	0.000	0.000	1.404	1.404	
MAR	65	240	0	439	744	456	320	744	456	320	0	151	0.000	0.000	0.000	1.404	1.404	0.000	0.000	0.000	0.000	151	0.000	0.000	1.404	1.404	0.000	0.000	0.000	1.404	1.404	
APR	335	46	0	339	720	562	418	720	562	418	0	84	0.000	0.000	0.000	1.404	1.404	0.000	0.000	0.000	0.000	84	0.000	0.000	1.404	1.404	0.000	0.000	0.000	1.404	1.404	
MAY	304	130	0	310	744	518	374	744	518	374	0	16	0.000	0.000	0.000	1.404	1.404	0.000	0.000	0.000	0.000	16	0.000	0.000	1.404	1.404	0.000	0.000	0.000	1.404	1.404	
JUN	207	173	0	340	720	396	260	720	396	260	0	1	0.000	0.000	0.000	1.404	1.404	0.000	0.000	0.000	0.000	1	0.000	0.000	1.404	1.404	0.000	0.000	0.000	1.404	1.404	
JUL	263	132	0	349	744	396	236	744	396	236	0	6	0.000	0.000	0.000	1.404	1.404	0.000	0.000	0.000	0.000	6	0.000	0.000	1.404	1.404	0.000	0.000	0.000	1.404	1.404	
AUG	272	112	0	360	744	419	267	744	419	267	0	1	0.000	0.000	0.000	1.404	1.404	0.000	0.000	0.000	0.000	1	0.000	0.000	1.404	1.404	0.000	0.000	0.000	1.404	1.404	
SEP	144	209	0	367	720	583	431	720	583	431	0	66	0.000	0.000	0.000	1.404	1.404	0.000	0.000	0.000	0.000	66	0.000	0.000	1.404	1.404	0.000	0.000	0.000	1.404	1.404	
OCT	347	44	0	353	744	431	339	744	431	339	0	192	0.000	0.000	0.000	1.404	1.404	0.000	0.000	0.000	0.000	192	0.000	0.000	1.404	1.404	0.000	0.000	0.000	1.404	1.404	
NOV	140	185	0	395	720	467	339	720	467	339	0	142	0.000	0.000	0.000	1.404	1.404	0.000	0.000	0.000	0.000	142	0.000	0.000	1.404	1.404	0.000	0.000	0.000	1.404	1.404	
DEC	10	332	0	402	744	441	281	744	441	281	0	99	0.000	0.000	0.000	1.404	1.404	0.000	0.000	0.000	0.000	99	0.000	0.000	1.404	1.404	0.000	0.000	0.000	1.404	1.404	
ANNUAL	2103	2257	0	4400	8760	5434	3714	8760	5434	3714	0	1074																				

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/19/1995 9:42: 2 PDL RUN 1  
 DENVER, CO 80227 RUN #3 ECONOMIZER FOR BLDG. #7866 THEATER W/DRESS RM  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY 36.581 135.664 30/24	NATURAL-GAS 106.994 537.348 14/20
JAN	TOTAL (MBTU) PEAK (KBTU) DY/HR	33.277 135.664 27/24	75.887 500.254 3/19
FEB	TOTAL (MBTU) PEAK (KBTU) DY/HR	36.214 135.664 31/24	54.370 454.355 3/19
MAR	TOTAL (MBTU) PEAK (KBTU) DY/HR	38.643 139.742 24/17	11.884 365.786 14/17
APR	TOTAL (MBTU) PEAK (KBTU) DY/HR	44.251 231.930 30/24	3.747 281.766 5/17
MAY	TOTAL (MBTU) PEAK (KBTU) DY/HR	49.992 270.808 30/17	2.272 32.188 2/ 8
JUN	TOTAL (MBTU) PEAK (KBTU) DY/HR	58.730 289.321 23/17	1.399 23.556 29/ 8
JUL	TOTAL (MBTU) PEAK (KBTU) DY/HR	55.695 290.235 11/17	1.264 23.126 26/ 8
AUG	TOTAL (MBTU) PEAK (KBTU) DY/HR	44.706 268.508 8/17	4.000 41.234 30/10
SEP	TOTAL (MBTU) PEAK (KBTU) DY/HR	39.988 179.153 1/19	9.278 385.773 20/18
OCT	TOTAL (MBTU) PEAK (KBTU) DY/HR	35.280 135.664 27/17	44.116 411.013 3/17
NOV	TOTAL (MBTU) PEAK (KBTU) DY/HR	38.068 135.664 31/24	99.511 486.897 8/19
DEC	TOTAL (MBTU) PEAK (KBTU) DY/HR		
	ONE YEAR USE/PEAK	511.425 290.235	414.721 537.348

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/19/1995 9:42: 2 PDL RUN 1  
 DENVER, CO 80227 RUN #3 ECONOMIZER FOR BLDG. #7866 THEATER W/DRESS RM  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE	ELECTRICITY	NATURAL-GAS
IN SITE MBTU -		
CATEGORY OF USE		
SPACE HEAT	15.69	414.72
SPACE COOL	83.66	0.00
HVAC AUX	307.71	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	62.50	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	41.85	0.00
TOTAL	511.40	414.72

TOTAL SITE ENERGY 926.15 MBTU 109.6 KBTU/SQFT-YR GROSS-AREA 109.6 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 1950.53 MBTU 230.8 KBTU/SQFT-YR GROSS-AREA 230.9 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 34.1  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

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$-----$
$ E Z - D O E   S Y S T E M S   I N P U T $
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\$ GENERAL PROJECT DATA

```

TITLE  LINE-1 *      EMC      ENGINEERS      INC.      *
        LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
        LINE-3 *      DENVER,      CO      80227      *

        LINE-4 *RUN #4 NIGHT INFILTRATION OR BLDG. #7866*
        LINE-5 *THEATER W/DRESS RM      * ..

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ABORT          ERRORS ..
DIAGNOSTIC     WARNINGS ..
SYSTEMS-REPORT VERIFICATION=(SV-A)
                SUMMARY=(SS-A,SS-C,SS-K,SS-O)
                HOURLY-DATA-SAVE = YES ..


```

\$ SCHEDULES

```

SD_ON    =DAY-SCHEDULE (1,24) (1.) ..
SD_OFF   =DAY-SCHEDULE (1,24) (0.) ..
SD_WT_HT =DAY-SCHEDULE (1,24) (74.) ..
SD_SM_CL =DAY-SCHEDULE (1,24) (72.) ..
SD_WT_CL =DAY-SCHEDULE (1,24) (74.2) ..
SD_SM_HT =DAY-SCHEDULE (1,24) (71.8) ..
SD_OA%   =DAY-SCHEDULE (1,16) (0.) ..
          (17,24) (0.17) ..

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```

SW_ON    =WEEK-SCHEDULE (ALL) SD_ON ..
SW_OFF   =WEEK-SCHEDULE (ALL) SD_OFF ..
SW_WT_HT =WEEK-SCHEDULE (ALL) SD_WT_HT ..
SW_SM_CL =WEEK-SCHEDULE (ALL) SD_SM_CL ..
SW_WT_CL =WEEK-SCHEDULE (ALL) SD_WT_CL ..
SW_SM_HT =WEEK-SCHEDULE (ALL) SD_SM_HT ..
SW_OA%   =WEEK-SCHEDULE (MON) SD_OFF
          (TUE) SD_OFF
          (WED) SD_OFF
          (THU) SD_OA%
          (FRI) SD_OA%
          (SAT) SD_OA%
          (SUN) SD_OA%
          (HOL) SD_OA% ..

```

\$ FULL ON SYSTEM

```

S_ON    =SCHEDULE THRU DEC 31 SW_ON ..

```

## \$ FULL OFF SYSTEM

S\_OFF =SCHEDULE THRU DEC 31 SW\_OFF ..

## \$ HEATING SEASON

S\_HE-SCHED =SCHEDULE THRU MAY 15 SW\_ON  
THRU OCT 1 SW\_OFF  
THRU DEC 31 SW\_ON ..

## \$ COOLING SEASON

S\_CL\_SCHED =SCHEDULE THRU MAY 15 SW\_OFF  
THRU OCT 1 SW\_ON  
THRU DEC 31 SW\_OFF ..

## \$ HEATING SET TEMP

S\_HT\_SET\_F =SCHEDULE THRU MAY 15 SW\_WT\_HT  
THRU OCT 1 SW\_SM\_HT  
THRU DEC 31 SW\_WT\_HT ..

## \$ COOLING SET TEMP

S\_CL\_SET\_F =SCHEDULE THRU MAY 15 SW\_WT\_CL  
THRU OCT 1 SW\_SM\_CL  
THRU DEC 31 SW\_WT\_CL ..S\_HRLY\_RPT =SCHEDULE THRU JAN 9 SW\_OFF  
THRU JAN 10 SW\_ON  
THRU JAN 22 SW\_OFF  
THRU JAN 23 SW\_ON  
THRU JUL 18 SW\_OFF  
THRU JUL 19 SW\_ON  
THRU JUL 22 SW\_OFF  
THRU JUL 23 SW\_ON  
THRU DEC 31 SW\_OFF ..

S\_OA% =SCHEDULE THRU DEC 31 SW\_OA% ..

## \$ ZONE DESCRIPTION

THEATER =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..LOBBY =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..PROJ-ROOM =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

## \$ SYSTEM DESCRIPTION

AHU-1 =SYSTEM SYSTEM-TYPE = SZRH  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_HE-SCHED  
 COOLING-SCHEDULE = S\_CL\_SCHED HEAT-SET-T = 55.0  
 PREHEAT-T = 0.0 OA-CONTROL = FIXED  
 SUPPLY-CFM = 14500. RATED-CFM = 14500.  
 MIN-AIR-SCH = S\_OA% MAX-OA-FRACTION = 0.17  
 SUPPLY-DELTA-T = 2.4 SUPPLY-KW = 0.00078  
 FAN-PLACEMENT = BLOW-THROUGH  
 NIGHT-CYCLE-CTRL = STAY-OFF NIGHT-VENT-DT = 0.0  
 MIN-CFM-RATIO = 1.0 REHEAT-DELTA-T = 27.8  
 COOLING-CAPACITY = 453656. COOL-SH-CAP = 380832.  
 HEATING-CAPACITY = -417300.  
 SIZING-OPTION = COINCIDENT RETURN-AIR-PATH = DUCT  
 ZONE-NAMES = (THEATER, LOBBY) ..

AHU-2 =SYSTEM SYSTEM-TYPE = SZRH  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_ON COOLING-SCHEDULE = S\_ON  
 HEAT-SET-T = 55.0 PREHEAT-T = 0.0  
 OA-CONTROL = FIXED SUPPLY-CFM = 1800.  
 RATED-CFM = 1800. MIN-AIR-SCH = S\_OA%  
 MAX-OA-FRACTION = 0.17 SUPPLY-DELTA-T = 2.4  
 SUPPLY-KW = 0.00078 FAN-PLACEMENT = BLOW-THROUGH  
 NIGHT-CYCLE-CTRL = STAY-OFF NIGHT-VENT-DT = 0.0  
 MIN-CFM-RATIO = 1.0 REHEAT-DELTA-T = 17.  
 COOLING-CAPACITY = 48900. COOL-SH-CAP = 48900.  
 HEATING-CAPACITY = -30709.3  
 ZONE-HEAT-SOURCE = ELECTRIC  
 SIZING-OPTION = COINCIDENT RETURN-AIR-PATH = DUCT  
 ZONE-NAMES = (PROJ-ROOM) ..

## \$ HOURLY REPORT DESCRIPTION

THEAT-BLK =REPORT-BLOCK VARIABLE-TYPE = THEATER  
 VARIABLE-LIST = (17,18,7,6) ..  
 LOBBY-BLK =REPORT-BLOCK VARIABLE-TYPE = LOBBY  
 VARIABLE-LIST = (17,18,7,6) ..  
 PROJ-BLK =REPORT-BLOCK VARIABLE-TYPE = PROJ-ROOM  
 VARIABLE-LIST = (17,18,7,6) ..  
 AHU-1-BLK =REPORT-BLOCK VARIABLE-TYPE = AHU-1  
 VARIABLE-LIST = (3,5,6,17,39) ..  
 AHU-2-BLK =REPORT-BLOCK VARIABLE-TYPE = AHU-2  
 VARIABLE-LIST = (3,5,6,17,39) ..  
 ZONES-HRLY = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY\_RPT  
 REPORT-BLOCK = (THEAT-BLK, LOBBY-BLK, PROJ-BLK)  
 ..  
 AHU-HRLY = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY\_RPT  
 REPORT-BLOCK = (AHU-1-BLK, AHU-2-BLK)  
 ..  
 END ..



EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/19/1995 10: 0:13 SDL RUN 1  
 DENVER, CO 80227 RUN #4 NIGHT INFILTRATION OR BLDG. #7866 THEATER W/DRESS RM  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR AHU-1 TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-82.340	14 17	0. F	-2. F	10128.	-333.010	29.492
FEB	0.00000				-59.052	3 17	24. F	21. F	9218.	-221.883	29.492
MAR	0.00000				-41.592	3 22	20. F	17. F	10032.	-180.491	29.492
APR	0.00000				-7.715	5 8	34. F	30. F	9856.	-78.961	29.492
MAY	29.63481	16 2	62. F	59. F	-0.549	5 8	46. F	41. F	10128.	-26.960	29.492
JUN	66.87326	19 19	86. F	75. F	0.000				9761.	0.000	29.492
JUL	88.13656	17 19	88. F	80. F	0.000				10318.	0.000	29.492
AUG	81.26391	21 19	95. F	76. F	0.000				9937.	0.000	29.492
SEP	45.40338	5 19	87. F	76. F	0.000				9951.	0.000	29.492
OCT	0.98839	1 19	81. F	66. F	-5.214	20 9	29. F	29. F	10223.	-88.741	29.492
NOV	0.00000				-32.729	3 7	19. F	17. F	9666.	-125.058	29.492
DEC	0.00000				-71.032	9 17	20. F	16. F	10318.	-240.587	29.492
TOTAL MAX	312.300				-300.222				119543.	-333.010	29.492

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/19/1995 10: 0:13 SDL RUN 1  
 DENVER, CO 80227 RUN #4 NIGHT INFILTRATION OR BLDG. #7866 THEATER W/DRESS RM  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR AHU-1 TOPEKA, KS

MONTH	HOURS				HOURS				HOURS				HOURS			
	COOLING LOAD	HEATING LOAD	COINCIDENT COOL-HEAT LOAD	FLOATING	HEATING AVAIL.	COOLING AVAIL.	FANS ON	FANS ON CYCLE	NIGHT VENTING	FLOATING WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)		
JAN	0	744	0	0	744	0	744	0	0	0	-72.280	11.310	-72.280	11.310		
FEB	0	672	0	0	672	0	672	0	0	0	-74.548	11.310	-74.548	11.310		
MAR	0	710	0	34	744	0	744	0	0	34	-76.707	29.492	-76.707	29.492		
APR	0	488	0	232	720	0	720	0	0	232	0.000	11.310	0.000	11.310		
MAY	378	198	0	168	360	378	744	0	0	168	0.000	11.310	0.000	11.310		
JUN	717	0	0	3	717	0	720	0	0	3	0.000	23.505	0.000	23.505		
JUL	744	0	0	0	744	0	744	0	0	0	0.000	23.505	0.000	23.505		
AUG	744	0	0	0	744	0	744	0	0	0	0.000	23.505	0.000	23.505		
SEP	643	0	0	77	643	8	720	0	0	77	0.000	23.505	0.000	23.505		
OCT	8	479	0	257	8	0	744	0	0	257	0.000	23.505	0.000	23.505		
NOV	0	642	0	78	0	0	720	0	0	78	-93.619	11.310	-93.619	11.310		
DEC	0	744	0	0	744	0	744	0	0	0	-127.187	29.492	-127.187	29.492		
ANNUAL	3234	4677	0	849	5424	3234	8760	0	0	849						

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/19/1995 10: 0:13 SDL RUN 1  
 DENVER, CO 80227 RUN #4 NIGHT INFILTRATION OR BLDG. #7866THEATER W/DRESS RM  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR AHU-2 TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C			
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC- TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.01514	22 24	40.F	38.F	2.353	-5.409	14 17	0.F	-2.F	-25.736	1890.	7.278
FEB	0.09288	26 18	52.F	41.F	5.939	-3.530	3 9	3.F	1.F	-13.960	1742.	7.278
MAR	0.73383	24 18	65.F	64.F	13.383	-2.425	3 24	17.F	14.F	-10.489	1843.	7.278
APR	2.77139	28 19	71.F	68.F	24.846	-0.373	5 8	34.F	30.F	-5.940	1857.	7.278
MAY	5.82925	30 23	78.F	74.F	37.663	-0.023	5 8	46.F	41.F	-2.356	1890.	7.278
JUN	8.11590	19 20	84.F	75.F	39.400	0.000				0.000	1810.	7.278
JUL	10.31944	17 19	88.F	80.F	47.165	0.000				0.000	1984.	7.278
AUG	9.32853	21 20	92.F	76.F	42.534	0.000				0.000	1796.	7.278
SEP	6.26517	5 18	90.F	77.F	39.235	-0.003	29 9	50.F	45.F	-0.470	1904.	7.278
OCT	3.31353	1 18	83.F	68.F	25.433	-0.266	20 9	29.F	29.F	-7.191	1937.	7.278
NOV	0.72217	6 24	59.F	55.F	13.283	-1.723	3 7	19.F	17.F	-10.292	1763.	7.278
DEC	0.14442	3 23	49.F	42.F	6.546	-4.369	8 18	14.F	11.F	-15.197	1984.	7.278
TOTAL	47.652					-18.122				-25.736	22402.	7.278
MAX					47.165							

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/19/1995 10: 0:13 SDL RUN 1  
 DENVER, CO 80227 RUN #4 NIGHT INFILTRATION OR BLDG. #7866THEATER W/DRESS RM  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR AHU-2 TOPEKA, KS

MONTH	H O U R S				H O U R S				C O I N C I D E N T		C O I N C I D E N T	
	HOURS COOLING LOAD	HOURS HEATING LOAD	HOURS COOL-HEAT LOAD	HOURS COINCIDENT LOAD	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.	HOURS FANS ON	HOURS FANS ON	HOURS HEATING AT COOLING PEAK (KBTU/HR)	HOURS ELECTRIC LOAD AT COOLING PEAK (KW)	HOURS HEATING AT COOLING PEAK (KBTU/HR)	HOURS ELECTRIC LOAD AT COOLING PEAK (KW)
JAN	17	727	0	0	744	744	744	0	0	0.000	0.000	7.278
FEB	38	634	0	0	672	672	672	0	0	0.000	0.000	7.278
MAR	176	568	0	0	744	744	744	0	0	0.000	0.000	7.278
APR	552	168	0	0	720	720	720	0	0	0.000	0.000	7.278
MAY	723	21	0	0	744	744	744	0	0	0.000	0.000	7.278
JUN	720	0	0	0	720	720	720	0	0	0.000	0.000	7.278
JUL	744	0	0	0	744	744	744	0	0	0.000	0.000	7.278
AUG	744	0	0	0	744	744	744	0	0	0.000	0.000	7.278
SEP	706	0	0	0	720	720	720	0	0	0.000	0.000	7.278
OCT	600	144	0	0	744	744	744	0	0	0.000	0.000	7.278
NOV	251	469	0	0	720	720	720	0	0	0.000	0.000	7.278
DEC	72	672	0	0	744	744	744	0	0	0.000	0.000	7.278
ANNUAL	5343	3417	0	0	8760	8760	8760	0	0	0.000	0.000	7.278

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/19/1995 10: 0:13 PDL RUN 1  
 DENVER, CO 80227 RUN #4 NIGHT INFILTRATION OR BLDG. #7866THEATER W/DRESS RM  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY 47.031 139.273 9/17	NATURAL-GAS 134.263 452.293 14/17
JAN	TOTAL (MBTU) PEAK (KBTU) DY/HR	47.031 139.273 9/17	134.263 452.293 14/17
FEB	TOTAL (MBTU) PEAK (KBTU) DY/HR	42.812 139.228 20/17	101.019 318.749 3/17
MAR	TOTAL (MBTU) PEAK (KBTU) DY/HR	45.762 138.675 24/17	73.317 268.117 3/22
APR	TOTAL (MBTU) PEAK (KBTU) DY/HR	45.061 140.539 28/17	15.696 143.786 5/ 8
MAY	TOTAL (MBTU) PEAK (KBTU) DY/HR	59.251 229.308 30/24	1.935 52.954 5/ 8
JUN	TOTAL (MBTU) PEAK (KBTU) DY/HR	73.841 234.722 19/17	0.000 0.000 30/ 1
JUL	TOTAL (MBTU) PEAK (KBTU) DY/HR	85.000 263.897 23/17	0.000 0.000 31/ 1
AUG	TOTAL (MBTU) PEAK (KBTU) DY/HR	82.440 254.129 21/17	0.000 0.000 31/ 1
SEP	TOTAL (MBTU) PEAK (KBTU) DY/HR	65.455 237.329 5/17	0.076 5.815 29/ 9
OCT	TOTAL (MBTU) PEAK (KBTU) DY/HR	47.228 185.917 1/24	11.411 158.045 20/ 9
NOV	TOTAL (MBTU) PEAK (KBTU) DY/HR	43.967 139.318 5/17	58.696 204.593 3/ 7
DEC	TOTAL (MBTU) PEAK (KBTU) DY/HR	48.017 139.360 2/17	118.387 341.199 9/17
	ONE YEAR USE/PEAK	685.868 263.897	514.799 452.293

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/19/1995 10: 0:13 PDL RUN 1  
 DENVER, CO 80227 RUN #4 NIGHT INFILTRATION OR BLDG. #78666THEATER W/DRESS RM  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
SPACE HEAT	23.71	514.80
SPACE COOL	163.72	0.00
HVAC AUX	394.07	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	62.50	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	41.86	0.00
TOTAL	685.85	514.80

TOTAL SITE ENERGY 1200.67 MBTU 142.1 KBTU/SQFT-YR GROSS-AREA 142.1 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 2574.46 MBTU 304.7 KBTU/SQFT-YR GROSS-AREA 304.7 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 0.7  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.



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$ E Z - D O E   S Y S T E M S   I N P U T $
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\$ GENERAL PROJECT DATA

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TITLE  LINE-1 *      EMC      ENGINEERS      INC.      *
        LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
        LINE-3 *      DENVER,      CO      80227      *
        LINE-4 *RUN #5 DAY INFILTRATION OR BLDG. #7866 *
        LINE-5 *THEATER W/DRESS RM      * ..

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ABORT      ERRORS      ..
DIAGNOSTIC  WARNINGS ..
SYSTEMS-REPORT  VERIFICATION=(SV-A)
              SUMMARY=(SS-A,SS-C,SS-K,SS-O)
              HOURLY-DATA-SAVE = YES ..

```

\$ SCHEDULES

```

SD_ON      =DAY-SCHEDULE (1,24) (1.) ..
SD_OFF     =DAY-SCHEDULE (1,24) (0.) ..
SD_WT_HT   =DAY-SCHEDULE (1,24) (74.) ..
SD_SM_CL   =DAY-SCHEDULE (1,24) (72.) ..
SD_WT_CL   =DAY-SCHEDULE (1,24) (74.2) ..
SD_SM_HT   =DAY-SCHEDULE (1,24) (71.8) ..
SD_OA%     =DAY-SCHEDULE (1,16) (0.17) ..
              (17,24) (0.) ..
SD_OA%_END =DAY-SCHEDULE (1,24) (0.17) ..

SW_ON      =WEEK-SCHEDULE (ALL) SD_ON ..
SW_OFF     =WEEK-SCHEDULE (ALL) SD_OFF ..
SW_WT_HT   =WEEK-SCHEDULE (ALL) SD_WT_HT ..
SW_SM_CL   =WEEK-SCHEDULE (ALL) SD_SM_CL ..
SW_WT_CL   =WEEK-SCHEDULE (ALL) SD_WT_CL ..
SW_SM_HT   =WEEK-SCHEDULE (ALL) SD_SM_HT ..
SW_OA%     =WEEK-SCHEDULE (MON) SD_OA%_END
              (TUE) SD_OA%_END
              (WED) SD_OA%_END
              (THU) SD_OA%
              (FRI) SD_OA%
              (SAT) SD_OA%
              (SUN) SD_OA%
              (HOL) SD_OA% ..

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\$ FULL ON SYSTEM

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S_ON      =SCHEDULE THRU DEC 31 SW_ON ..

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\$ FULL OFF SYSTEM

S\_OFF =SCHEDULE THRU DEC 31 SW\_OFF ..

\$ HEATING SEASON

S\_HE-SCHED =SCHEDULE THRU MAY 15 SW\_ON  
THRU OCT 1 SW\_OFF  
THRU DEC 31 SW\_ON ..

\$ COOLING SEASON

S\_CL\_SCHED =SCHEDULE THRU MAY 15 SW\_OFF  
THRU OCT 1 SW\_ON  
THRU DEC 31 SW\_OFF ..

\$ HEATING SET TEMP

S\_HT\_SET\_F =SCHEDULE THRU MAY 15 SW\_WT\_HT  
THRU OCT 1 SW\_SM\_HT  
THRU DEC 31 SW\_WT\_HT ..

\$ COOLING SET TEMP

S\_CL\_SET\_F =SCHEDULE THRU MAY 15 SW\_WT\_CL  
THRU OCT 1 SW\_SM\_CL  
THRU DEC 31 SW\_WT\_CL ..

S\_HRLY\_RPT =SCHEDULE THRU JAN 9 SW\_OFF

THRU JAN 10 SW\_ON  
THRU JAN 22 SW\_OFF  
THRU JAN 23 SW\_ON  
THRU JUL 18 SW\_OFF  
THRU JUL 19 SW\_ON  
THRU JUL 22 SW\_OFF  
THRU JUL 23 SW\_ON  
THRU DEC 31 SW\_OFF ..

S\_OA% =SCHEDULE THRU DEC 31 SW\_OA% ..

\$ ZONE DESCRIPTION

THEATER =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

LOBBY =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

PROJ-ROOM =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2

SIZING-OPTION = FROM-LOADS ..

## \$ SYSTEM DESCRIPTION

AHU-1 =SYSTEM SYSTEM-TYPE = SZRH  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_HE-SCHED  
 COOLING-SCHEDULE = S\_CL\_SCHED HEAT-SET-T = 55.0  
 PREHEAT-T = 0.0 OA-CONTROL = FIXED  
 SUPPLY-CFM = 14500. RATED-CFM = 14500.  
MIN-AIR-SCH = S OA% MAX-OA-FRACTION = 0.17 ←  
 SUPPLY-DELTA-T = 2.4 SUPPLY-KW = 0.00078  
 FAN-PLACEMENT = BLOW-THROUGH  
 NIGHT-CYCLE-CTRL = STAY-OFF NIGHT-VENT-DT = 0.0  
 MIN-CFM-RATIO = 1.0 REHEAT-DELTA-T = 27.8  
 COOLING-CAPACITY = 453656. COOL-SH-CAP = 380832.  
 HEATING-CAPACITY = -417300.  
 SIZING-OPTION = COINCIDENT RETURN-AIR-PATH = DUCT  
 ZONE-NAMES = (THEATER, LOBBY) ..

AHU-2 =SYSTEM SYSTEM-TYPE = SZRH  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_ON COOLING-SCHEDULE = S\_ON  
 HEAT-SET-T = 55.0 PREHEAT-T = 0.0  
 OA-CONTROL = FIXED SUPPLY-CFM = 1800.  
 RATED-CFM = 1800. MIN-AIR-SCH = S OA% ←  
 MAX-OA-FRACTION = 0.17 SUPPLY-DELTA-T = 2.4  
 SUPPLY-KW = 0.00078 FAN-PLACEMENT = BLOW-THROUGH  
 NIGHT-CYCLE-CTRL = STAY-OFF NIGHT-VENT-DT = 0.0  
 MIN-CFM-RATIO = 1.0 REHEAT-DELTA-T = 17.  
 COOLING-CAPACITY = 48900. COOL-SH-CAP = 48900.  
 HEATING-CAPACITY = -30709.3  
 ZONE-HEAT-SOURCE = ELECTRIC  
 SIZING-OPTION = COINCIDENT RETURN-AIR-PATH = DUCT  
 ZONE-NAMES = (PROJ-ROOM) ..

## \$ HOURLY REPORT DESCRIPTION

THEAT-BLK =REPORT-BLOCK VARIABLE-TYPE = THEATER  
 VARIABLE-LIST = (17,18,7,6) ..  
 LOBBY-BLK =REPORT-BLOCK VARIABLE-TYPE = LOBBY  
 VARIABLE-LIST = (17,18,7,6) ..  
 PROJ-BLK =REPORT-BLOCK VARIABLE-TYPE = PROJ-ROOM  
 VARIABLE-LIST = (17,18,7,6) ..  
 AHU-1-BLK =REPORT-BLOCK VARIABLE-TYPE = AHU-1  
 VARIABLE-LIST = (3,5,6,17,39) ..  
 AHU-2-BLK =REPORT-BLOCK VARIABLE-TYPE = AHU-2  
 VARIABLE-LIST = (3,5,6,17,39) ..  
 ZONES-HRLY = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY\_RPT  
 REPORT-BLOCK = (THEAT-BLK, LOBBY-BLK, PROJ-BLK)  
 ..  
 AHU-HRLY = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY\_RPT  
 REPORT-BLOCK = (AHU-1-BLK, AHU-2-BLK)  
 ..



EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/19/1995 10: 5:39 SDL RUN 1  
DENVER, CO 80227 RUN #5 DAY INFILTRATION OR BLDG. #7866 THEATER W/DRESS RM  
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR AHU-1 TOPEKA, KS

MONTH	COOLING ENERGY (MBTU)		TIME OF MAX DY HR		DRY- BULB TEMP		WET- BULB TEMP		HEATING ENERGY (MBTU)		TIME OF MAX DY HR		DRY- BULB TEMP		WET- BULB TEMP		HEATING LOAD (KBTU/HR)		ELEC- TRICAL ENERGY (KWH)		MAXIMUM HEATING LOAD (KBTU/HR)		ELEC- TRICAL ENERGY (KWH)		MAXIMUM ELEC LOAD (KW)	
	COOLING ENERGY (MBTU)	MAXIMUM COOLING LOAD (KBTU/HR)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	HEATING ENERGY (MBTU)	MAXIMUM HEATING LOAD (KBTU/HR)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	HEATING ENERGY (MBTU)	MAXIMUM HEATING LOAD (KBTU/HR)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	HEATING LOAD (KBTU/HR)	ELEC- TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)								
JAN	0.00000	0.000				-142.652	0.000	15	7	-7.F	-8.F	7	-7.F	-8.F	-412.533	10128.	29.492									
FEB	0.00000	0.000				-106.767	0.000	3	7	-5.F	-6.F	3	-5.F	-6.F	-380.777	9218.	29.492									
MAR	0.00000	0.000				-88.288	0.000	3	8	15.F	12.F	3	15.F	12.F	-285.406	10032.	29.492									
APR	0.00000	0.000				-25.427	0.000	5	7	30.F	27.F	5	30.F	27.F	-196.683	9856.	29.492									
MAY	28.55549	296.117	16	2	62.F	59.F	296.117	5	7	44.F	40.F	5	44.F	40.F	-118.566	10128.	29.492									
JUN	80.37951	239.835	30	21	78.F	72.F	239.835								0.000	9761.	29.492									
JUL	111.55617	265.692	23	16	98.F	79.F	265.692								0.000	10318.	29.492									
AUG	107.28452	252.240	11	21	90.F	68.F	252.240								0.000	9937.	29.492									
SEP	49.98956	226.611	8	21	81.F	70.F	226.611								0.000	9951.	29.492									
OCT	0.72743	136.159	1	21	67.F	62.F	136.159	20	8	23.F	22.F	8	23.F	22.F	-226.712	10223.	29.492									
NOV	0.00000	0.000				-70.917	0.000	3	6	13.F	12.F	3	13.F	12.F	-288.266	9666.	29.492									
DEC	0.00000	0.000				-125.518	0.000	13	8	0.F	-1.F	8	0.F	-1.F	-368.423	10318.	29.492									
TOTAL	378.493	296.117				-587.514	296.117								-412.533	119543.	29.492									
MAX																										

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/19/1995 10: 5:39 SDL RUN 1  
DENVER, CO 80227 RUN #5 DAY INFILTRATION OR BLDG. #7866 THEATER W/DRESS RM  
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR AHU-1 TOPEKA, KS

MONTH	COOLING LOAD		HEATING LOAD		COINCIDENT COOL-HEAT LOAD		HOURS COINCIDENT COOL-HEAT LOAD		HOURS HEATING AVAIL.		HOURS COOLING AVAIL.		HOURS FANS ON CYCLE ON		HOURS NIGHT VENTING		HOURS FLOATING WHEN FANS ON		HEATING LOAD AT COOLING PEAK (KBTU/HR)		ELECTRIC LOAD AT COOLING PEAK (KW)	
	COOLING LOAD	HEATING LOAD	COINCIDENT COOL-HEAT LOAD	HOURS COINCIDENT COOL-HEAT LOAD	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.	HOURS FANS ON CYCLE ON	HOURS NIGHT VENTING	HOURS FLOATING WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)											
JAN	0	710	0	34	744	0	744	0	744	0	34	-186.243	11.310									
FEB	0	614	0	58	672	0	672	0	672	0	58	-191.005	11.310									
MAR	0	651	0	93	744	0	744	0	744	0	93	0.000	29.492									
APR	0	513	0	207	720	0	720	0	720	0	207	-39.314	11.310									
MAY	314	218	0	212	360	314	744	0	744	0	212	0.000	11.310									
JUN	676	0	0	44	0	676	720	0	720	0	44	0.000	23.505									
JUL	744	0	0	0	0	744	744	0	744	0	0	0.000	11.310									
AUG	735	0	0	9	0	735	744	0	744	0	9	0.000	23.505									
SEP	486	0	0	234	0	486	744	0	744	0	234	0.000	23.505									
OCT	6	493	0	245	720	6	744	0	744	0	245	0.000	23.505									
NOV	0	617	0	103	720	0	720	0	720	0	103	-224.668	11.310									
DEC	0	687	0	57	744	0	744	0	744	0	57	-3.481	29.492									
ANNUAL	2961	4503	0	1296	5424	2961	8760	0	8760	0	1296											

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/19/1995 10: 5:39 SDL RUN 1  
 DENVER, CO 80227 RUN #5 DAY INFILTRATION OR BLDG. #7866 THEATER W/DRESS RM  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR AHU-2 TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	MAXIMUM ELEC LOAD (KW)
JAN	1.07572	22	24	40.F	38.F	15	1	-6.F	-7.F	-34.682	1890.
FEB	1.39176	26	24	43.F	37.F	2	23	1.F	0.F	-31.827	1742.
MAR	1.78635	27	24	46.F	41.F	3	7	14.F	12.F	-29.962	1843.
APR	2.87264	28	24	65.F	64.F	5	7	30.F	27.F	-20.560	1857.
MAY	5.45895	30	24	80.F	72.F	5	7	44.F	40.F	-12.274	1890.
JUN	9.57069	30	22	77.F	73.F	2	7	50.F	49.F	-6.846	1810.
JUL	12.90110	23	16	98.F	79.F	0	0	0.000	0.000	0.000	1984.
AUG	12.29024	11	24	85.F	68.F	4	7	54.F	53.F	-3.031	1796.
SEP	7.00205	8	24	78.F	69.F	11	7	40.F	40.F	-9.512	1904.
OCT	3.20798	1	24	64.F	60.F	20	8	23.F	22.F	-24.282	1937.
NOV	1.72658	6	24	59.F	55.F	3	6	13.F	12.F	-30.542	1763.
DEC	1.58083	3	24	46.F	42.F	13	6	2.F	1.F	-31.361	1984.
TOTAL MAX	60.865									-59.999	22402.
										-34.682	7.278

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/19/1995 10: 5:39 SDL RUN 1  
 DENVER, CO 80227 RUN #5 DAY INFILTRATION OR BLDG. #7866 THEATER W/DRESS RM  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR AHU-2 TOPEKA, KS

MONTH	N U M B E R O F H O U R S				C O I N C I D E N T L O A D S						
	HOURS COOLING LOAD	HOURS HEATING LOAD	HOURS COOL-HEAT LOAD	HOURS FLOATING	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.	HOURS FANS ON CYCLE	HOURS NIGHT VENTING	HOURS FLOATING WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)
JAN	123	621	0	0	744	744	744	0	0	0.000	7.278
FEB	135	537	0	0	672	672	672	0	0	0.000	7.278
MAR	136	608	0	0	744	744	744	0	0	0.000	7.278
APR	279	441	0	0	720	720	720	0	0	0.000	7.278
MAY	529	215	0	0	744	744	744	0	0	0.000	7.278
JUN	689	31	0	0	720	720	720	0	0	0.000	7.278
JUL	744	0	0	0	744	744	744	0	0	0.000	1.404
AUG	735	9	0	0	744	744	744	0	0	0.000	7.278
SEP	555	165	0	0	720	720	720	0	0	0.000	7.278
OCT	301	443	0	0	744	744	744	0	0	0.000	7.278
NOV	154	566	0	0	720	720	720	0	0	0.000	7.278
DEC	160	584	0	0	744	744	744	0	0	0.000	7.278
ANNUAL	4540	4220	0	0	8760	8760	8760	0	0	0.000	7.278

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/19/1995 10: 5:39 PDL RUN 1  
 DENVER, CO 80227 RUN #5 DAY INFILTRATION OR BLDG. #7866 THEATER W/DRESS RM  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY TOTAL (MBTU) PEAK (KBTU) DY/HR	NATURAL-GAS TOTAL (MBTU) PEAK (KBTU) DY/HR
JAN	48.711 138.393 16/17	48.711 138.393 16/17	217.718 559.457 15/ 7
FEB	44.298 137.685 5/17	44.298 137.685 5/17	168.248 526.478 3/ 7
MAR	47.739 137.348 3/17	47.739 137.348 3/17	145.856 421.266 3/ 8
APR	44.880 138.180 28/24	44.880 138.180 28/24	47.851 310.813 5/ 7
MAY	56.203 197.894 30/24	56.203 197.894 30/24	12.055 209.971 5/ 7
JUN	73.579 200.408 19/24	73.579 200.408 19/24	0.302 17.430 2/ 7
JUL	86.900 211.818 23/17	86.900 211.818 23/17	0.000 0.000 31/ 1
AUG	84.750 211.528 12/24	84.750 211.528 12/24	0.078 11.196 4/ 7
SEP	63.386 200.896 5/24	63.386 200.896 5/24	2.207 21.787 11/ 7
OCT	46.689 177.243 1/24	46.689 177.243 1/24	43.115 349.305 20/ 8
NOV	45.341 136.810 6/24	45.341 136.810 6/24	118.730 425.118 3/ 6
DEC	49.675 139.125 9/17	49.675 139.125 9/17	194.997 512.947 13/ 8
	ONE YEAR USE/PEAK	692.151 211.818	951.158 559.457

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/19/1995 10: 5:39 PDL RUN 1  
 DENVER, CO 80227 RUN #5 DAY INFILTRATION OR BLDG. #7866 THEATER W/DRESS RM  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

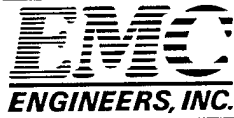
ENERGY TYPE	ELECTRICITY	NATURAL-GAS
IN SITE MBTU -		
CATEGORY OF USE		
SPACE HEAT	33.08	951.16
SPACE COOL	164.72	0.00
HVAC AUX	389.96	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	62.50	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	41.86	0.00
TOTAL	692.12	951.16

TOTAL SITE ENERGY 1643.31 MBTU 194.5 KBTU/SQFT-YR GROSS-AREA 194.5 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 3029.69 MBTU 358.5 KBTU/SQFT-YR GROSS-AREA 358.6 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 4.2  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.



**COMPUTER ENERGY SIMULATIONS**

**BLDG. 7656  
TRAINING BUILDINGS**



DENVER - ATLANTA

PROJECT: FEASIBILITY STUDY FOR  
 INSTALLATION OF UMCS  
 LOCATION: FORT RILEY, KANSAS

EMC NO: 1406-001  
 CALC. BY: AJN  
 CHECKED BY: CEL  
 DATE: 05-Jul-95

BUILDING NO.: 7656  
 BLDG. TYPE: GEN INSTR BUILDING

**ENERGY CONSTANT CALCULATIONS**

	BASERUN	RUN1	RUN2	RUN3	RUN4	RUN5
HEATING (MBtu)	240.4	183.8	181.2	459.8	83.2	148.2
COOLING (KWH)	240,275	223,844	235,391	219,678	240,275	235,573

SUPPLY AIR FAN	14,560 CFM
FLOOR AREA	11,308 FT <sup>2</sup>
CFM/	1456 CFM
UA	1852 BTU/HR. °F
BLDG CONSTR.	2 (1 FOR LIGHT ) (2 FOR HEAVY)

EZDOE COMPUTER RUN DEFINITION:	
BASERUN	EXISTING OPERATION
RUN1	NIGHT SETBACK
RUN2	DDC CONTROL
RUN3	ECONOMIZER
RUN4	NIGHTTIME INFILTRATION (OA)
RUN5	DAYTIME INFILTRATION (OA)

HOURS OF OCCUPANCY			ANNUAL HEATING & COOLING HOURS	
M-F	700	2100	70 HR	HR. ON HEATING 2270 HR/YR
SAT.	0	0	0 HR	HR. ON COOLING 1380 HR/YR
SUN.	0	0	0 HR	HR. OFF HEATING 3178 HR/YR
	TOTAL OCCUPY HR.		70 HR/WK	HR. OFF COOLING 1932 HR/YR
	TOTAL UNOCC. HR.		98 HR/WK	
	ANNUAL OCCUPY HR.		3650 HR/YR	
	ANNUAL UNOCC. HR.		5110 HR/YR	

PRESENT HR. OF OPERATION FOR SYS. WITH HEATING AND COOLING 8760 HR/YR  
 PRESENT HR. OF OPERATION FOR SYS. WITH HEATING ONLY 5448 HR/YR  
 PRESENT HR. OF OPERATION FOR SYS. WITH COOLING ONLY 3312 HR/YR  
 HRS SAVED (HTG ONLY) 5448 - 2270 = 3178 HR/YR  
 HRS SAVED (CLG ONLY) 3312 - 1380 = 1932 HR/YR

HOAUHC	240.35 MBtu	-	83.17 MBtu	=	2.11E+01 Btu/CFM-HR	
	1456 CFM	x	5110 HR/YR			
HOAUH	240.35 MBtu	-	83.17 MBtu	=	3.40E+01 Btu/CFM-HR	
	1456 CFM	x	3178 HR/YR			
COAUHC	240,275.4 kWH	-	240,275.4 kWH	=	0.00E+00 kWH/CFM-HR	
	1456 CFM	x	5110 HR/YR			
COAUC	240,275.4 kWH	-	240,275.4 kWH	=	0.00E+00 kWH/CFM-HR	
	1456 CFM	x	1932 HR/YR			
HOAOHC	240.35 MBtu	-	148.17 MBtu	=	1.73E+01 Btu/CFM-HR	
	1456 CFM	x	3650 HR/YR			
HOAOH	240.35 MBtu	-	148.17 MBtu	=	2.79E+01 Btu/CFM-HR	
	1456 CFM	x	2270 HR/YR			
COAOHC	240,275.4 kWH	-	235,572.8 kWH	=	8.85E-04 kWH/CFM-HR	
	1456 CFM	x	3650 HR/YR			
COAOC	240,275.4 kWH	-	235,572.8 kWH	=	2.34E-03 kWH/CFM-HR	
	1456 CFM	x	1380 HR/YR			
DC DUTY	1 / 6 (10 MINUTES PER HOUR)			=	0.17	
DC DEMAND	1 / 6 (10 MINUTES PER HOUR)			=	0.17	
ECC	223,844.1 kWH	-	219,677.7 kWH	=	2.07E-04 kWH/CFM-HR	
	14560 CFM	x	1380 HR/YR			
ECHC	223,844.1 kWH	-	219,677.7 kWH	=	7.84E-05 kWH/CFM-HR	
	14560 CFM	x	3650 HR/YR			
NSUCHC	240,275.4 kWH	-	223,844.1 kWH	=	2.21E-04 kWH/CFM-HR	
	14560 CFM	x	5110 HR/YR			
NSUCC	240,275.4 kWH	-	223,844.1 kWH	=	5.84E-04 kWH/CFM-HR	
	14560 CFM	x	1932 HR/YR			
DDCCHC	240,275.4 kWH	-	235,391.2 kWH	=	9.19E-05 kWH/CFM-HR	
	14560 CFM	x	3650 HR/YR			
DDCCC	240,275.4 kWH	-	235,391.2 kWH	=	2.43E-04 kWH/CFM-HR	
	14560 CFM	x	1380 HR/YR			
NSC	240.35 MBtu	-	183.8 MBtu	=	3.05E+04 Btu/UA	
	1852.0192 UA					
DDCH	240.35 MBtu	-	181.18 MBtu	=	3.19E+04 Btu/UA	
	1852.0192 UA					
OPT	( 2 HR/DAY X 240 DAY/YR )		-	175 HR/YR	=	305 HR/YR
CHWR	(1.10 kW X 0.012 Eff. X 664 HRS X 2 Degrees of Reset)			=	17.5 kWH/TON	
OAR	567 HR/YR	x	0.01	=	5.67 HR/YR	





INPUT LOADS ..

\$-----\$  
\$ E Z - D O E L O A D S I N P U T \$  
\$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
LINE-3 \* DENVER, CO 80227 \*  
  
LINE-4 \*BASELINE SIMULATION FOR BLDG.# 7656 \*  
LINE-5 \*GEN INST BLDG \* ..

ABORT ERRORS ..  
DIAGNOSTIC WARNINGS ..  
LOADS-REPORT VERIFICATION=(LV-D)  
SUMMARY=(LS-C,LS-D)  
HOURLY-DATA-SAVE = YES ..  
BUILDING-LOCATION LATITUDE = 39.0  
LONGITUDE = 96.5  
ALTITUDE = 1065.  
TIME-ZONE = 6  
GROSS-AREA = 11313.5  
SHIELDING-COEF = 0.29  
X-REF = 0.0  
Y-REF = 0.0 ..  
RUN-PERIOD JAN 1 1994 THRU DEC 31 1994 ..

\$ SCHEDULES

LD\_ON =DAY-SCHEDULE (1,24) (1.) ..  
LD\_OFF =DAY-SCHEDULE (1,24) (0.) ..  
LD\_M-TH/LT =DAY-SCHEDULE (1,6) (0.)  
(7) (0.5)  
(8,22) (1.)  
(23,24) (0.) ..  
LD\_FRI/LIT =DAY-SCHEDULE (1,6) (0.)  
(7) (0.5)  
(8,14) (1.)  
(15) (0.5)  
(16,24) (0.) ..  
LD\_M-TR/PE =DAY-SCHEDULE (1,6) (0.)  
(7) (0.35)  
(8,15) (0.7)  
(16) (0.85)  
(17,22) (1.)  
(23,24) (0.) ..

```
LD_FRI/PEO =DAY-SCHEDULE (1,6) (0.)
                (7) (0.35)
                (8,14) (0.7)
                (15) (0.35)
                (16,24) (0.) ..
```

```
LW_ON =WEEK-SCHEDULE (ALL) LD_ON ..
```

```
LW_OFF =WEEK-SCHEDULE (ALL) LD_OFF ..
```

```
LW_LIT/EQU =WEEK-SCHEDULE (MON) LD_M-TH/LT
                (TUE) LD_M-TH/LT
                (WED) LD_M-TH/LT
                (THU) LD_M-TH/LT
                (FRI) LD_FRI/LIT
                (SAT) LD_OFF
                (SUN) LD_OFF
                (HOL) LD_OFF ..
```

```
LW_PEOPLE =WEEK-SCHEDULE (MON) LD_M-TR/PE
                (TUE) LD_M-TR/PE
                (WED) LD_M-TR/PE
                (THU) LD_M-TR/PE
                (FRI) LD_FRI/PEO
                (SAT) LD_OFF
                (SUN) LD_OFF
                (HOL) LD_OFF ..
```

```
L_FULL_ON =SCHEDULE THRU DEC 31 LW_ON ..
```

```
L_FULL_OFF =SCHEDULE THRU DEC 31 LW_OFF ..
```

```
$ LIGHTING AND EQUIP SCHE
```

```
L_LITS/EQU =SCHEDULE THRU DEC 31 LW_LIT/EQU ..
```

```
$ PEOPLE SCHEDULE
```

```
L_PEOPLE =SCHEDULE THRU DEC 31 LW_PEOPLE ..
```

#### \$ CONSTRUCTION TYPES

```
$ BUILT-UP ROOF IN MEZZIN AREA
```

```
ROF-MEZZ =LAYERS MATERIAL=(HF-E2,IN03,HF-E4,HF-C14,HF-E4,AC01)
                THICKNESS=(0.042,0.511,0.000,0.333,0.000,0.031) ..
R-MEZZIN =CONSTRUCTION LAYERS = ROF-MEZZ
                ABSORPTANCE = 0.800
                ROUGHNESS = 1 ..
```

```
$ BUILT-UP ROOF OVER OLD DIN AREA
```

DIN-ROOF =LAYERS MATERIAL=(HF-E2, HF-E4, IN03, GP04, HF-E4, AC01)  
 THICKNESS=(0.042, 0.000, 0.511, 0.063, 0.000, 0.031) ..  
 ROOF-DIN =CONSTRUCTION LAYERS = DIN-ROOF  
 ABSORPTANCE = 0.800  
 ROUGHNESS = 1 ..

## \$ EXTERIOR WALL BRICK, INSL, BRICK

WALL-1 =LAYERS MATERIAL=(BK01, AL11, IN23, CB06, GP01) I-F-R= 0.6100  
 THICKNESS=(0.333, 0.000, 0.167, 0.500, 0.042) ..  
 EXWALL-1 =CONSTRUCTION LAYERS = WALL-1  
 ABSORPTANCE = 0.880  
 ROUGHNESS = 2 ..

## \$ SLAB FLOOR

FLOOR =CONSTRUCTION U-VALUE = 0.020  
 ABSORPTANCE = 0.610  
 ROUGHNESS = 5 ..

## \$ STANDARD METAL DOOR

METAL-DR =LAYERS MATERIAL=(HF-A3, IN34, HF-A3)  
 THICKNESS=(0.005, 0.104, 0.005) ..  
 DOOR-MET =CONSTRUCTION LAYERS = METAL-DR  
 ABSORPTANCE = 0.860  
 ROUGHNESS = 5 ..

2\_PN\_STD =GLASS-TYPE GLASS-TYPE-CODE = 2  
 PANES = 2 ..

## \$ SPACE DESCRIPTION

S-PER\_ZONE =SPACE AREA = 1620.0 VOLUME = 22275.0  
 TEMPERATURE = (73.) ZONE-TYPE = CONDITIONED  
 PEOPLE-SCHEDULE = L\_PEOPLE AREA/PERSON = 225.0  
 PEOPLE-HG-LAT = 625.0 PEOPLE-HG-SENS = 375.0  
 LIGHTING-TYPE = SUS-FLUOR LIGHTING-W/SQFT = 1.5  
 LIGHT-TO-SPACE = 1.0 LIGHTING-SCHEDULE = L\_LITS/EQU  
 EQUIP-SCHEDULE = L\_LITS/EQU EQUIPMENT-W/SQFT = 0.37  
 FURN-FRACTION = 0.3 FURN-WEIGHT = 1.  
 INF-METHOD = NONE ..

E-W HEIGHT = 18.0 WIDTH = 39.0 CONS = EXWALL-1  
 AZIMUTH = 180 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 4.0 WIDTH = 5.3 G-T = 2\_PN\_STD  
 MULTIPLIER = 2.0 SETBACK = 0.3  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

U-W HEIGHT = 15.0 WIDTH = 108.0 CONS = FLOOR ..

ROOF HEIGHT = 15.0 WIDTH = 31.5 CONS = R-MEZZIN  
 TILT = 0 SKY-FORM-FACTOR = 1.0 ..

E-W HEIGHT = 12.0 WIDTH = 84.0 CONS = EXWALL-1  
 AZIMUTH = 180 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 8.0 WIDTH = 4.0 G-T = 2\_PN\_STD  
 MULTIPLIER = 18.0 SETBACK = 0.3  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

DOOR HEIGHT = 7.5 WIDTH = 3.5 CONS = DOOR-MET  
 SETBACK = 0.3 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

ROOF HEIGHT = 15.0 WIDTH = 76.5 CONS = ROOF-DIN  
 TILT = 0 SKY-FORM-FACTOR = 1.0 ..

W-PER\_ZONE =SPACE AREA = 1069.5 VOLUME = 19251.0  
 TEMPERATURE = (73.) ZONE-TYPE = CONDITIONED  
 PEOPLE-SCHEDULE = L\_PEOPLE AREA/PERSON = 225.0  
 PEOPLE-HG-LAT = 625.0 PEOPLE-HG-SENS = 375.0  
 LIGHTING-TYPE = SUS-FLUOR LIGHTING-W/SQFT = 1.5  
 LIGHT-TO-SPACE = 1.0 LIGHTING-SCHEDULE = L\_LITS/EQU  
 EQUIP-SCHEDULE = L\_LITS/EQU EQUIPMENT-W/SQFT = 0.37  
 FURN-FRACTION = 0.3 FURN-WEIGHT = 1.  
 INF-METHOD = NONE ..

E-W HEIGHT = 18.0 WIDTH = 86.3 CONS = EXWALL-1  
 AZIMUTH = 270 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 4.8 WIDTH = 6.0 G-T = 2\_PN\_STD  
 MULTIPLIER = 4.0 SETBACK = 0.3  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

DOOR HEIGHT = 7.5 WIDTH = 3.5 CONS = DOOR-MET  
 SETBACK = 0.3 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 OVERHANG-A = 5.  
 OVERHANG-B = 3. OVERHANG-W = 15. OVERHANG-D = 5. ..

U-W HEIGHT = 15.0 WIDTH = 71.3 CONS = FLOOR ..

ROOF HEIGHT = 15.0 WIDTH = 71.3 CONS = R-MEZZIN  
 TILT = 0 SKY-FORM-FACTOR = 1.0 ..

E-PER\_ZONE =SPACE AREA = 1762.4 VOLUME = 21149.0  
 TEMPERATURE = (73.) ZONE-TYPE = CONDITIONED  
 PEOPLE-SCHEDULE = L\_PEOPLE AREA/PERSON = 225.0  
 PEOPLE-HG-LAT = 625.0 PEOPLE-HG-SENS = 375.0  
 LIGHTING-TYPE = SUS-FLUOR LIGHTING-W/SQFT = 1.5  
 LIGHT-TO-SPACE = 1.0 LIGHTING-SCHEDULE = L\_LITS/EQU  
 EQUIP-SCHEDULE = L\_LITS/EQU EQUIPMENT-W/SQFT = 0.37  
 FURN-FRACTION = 0.3 FURN-WEIGHT = 1.  
 INF-METHOD = NONE ..

E-W HEIGHT = 12.0 WIDTH = 86.3 CONS = EXWALL-1

AZIMUTH = 90 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 8.0 WIDTH = 4.0 G-T = 2\_PN\_STD  
MULTIPLIER = 6.0 SETBACK = 0.3  
SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 12.0 WIDTH = 13.0 CONS = EXWALL-1  
AZIMUTH = 180 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

DOOR HEIGHT = 7.5 WIDTH = 3.5 CONS = DOOR-MET  
MULTIPLIER = 2.0 SETBACK = 0.3  
SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5  
OVERHANG-A = 1. OVERHANG-B = 2. OVERHANG-W = 10.  
OVERHANG-D = 10. ..

E-W HEIGHT = 12.0 WIDTH = 13.0 CONS = EXWALL-1  
AZIMUTH = 0 SKY-FORM-FACTOR = 0.5  
GND-FORM-FACTOR = 0.5 ..

DOOR HEIGHT = 7.5 WIDTH = 3.5 CONS = DOOR-MET  
MULTIPLIER = 2.0 SETBACK = 0.3  
SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5  
OVERHANG-A = 1. OVERHANG-B = 2. OVERHANG-W = 10.  
OVERHANG-D = 10. ..

U-W HEIGHT = 20.5 WIDTH = 86.0 CONS = FLOOR ..

ROOF HEIGHT = 20.5 WIDTH = 86.0 CONS = ROOF-DIN  
TILT = 0 SKY-FORM-FACTOR = 1.0 ..

CORE\_ZONE =SPACE AREA = 5236.0 VOLUME = 70938.0  
TEMPERATURE = (73.) ZONE-TYPE = CONDITIONED  
PEOPLE-SCHEDULE = L\_PEOPLE AREA/PERSON = 225.0  
PEOPLE-HG-LAT = 625.0 PEOPLE-HG-SENS = 375.0  
LIGHTING-TYPE = SUS-FLUOR LIGHTING-W/SQFT = 1.5  
LIGHT-TO-SPACE = 1.0 LIGHTING-SCHEDULE = L\_LITS/EQU  
EQUIP-SCHEDULE = L\_LITS/EQU EQUIPMENT-W/SQFT = 0.37  
FURN-FRACTION = 0.3 FURN-WEIGHT = 1.  
INF-METHOD = NONE ..

ROOF HEIGHT = 24.0 WIDTH = 56.3 CONS = R-MEZZIN  
TILT = 0 SKY-FORM-FACTOR = 1.0 ..

ROOF HEIGHT = 56.3 WIDTH = 69.0 CONS = ROOF-DIN  
TILT = 0 SKY-FORM-FACTOR = 1.0 ..

U-W HEIGHT = 56.3 WIDTH = 93.0 CONS = FLOOR ..

N-PER\_ZONE =SPACE AREA = 1620.0 VOLUME = 22275.0  
TEMPERATURE = (73.) ZONE-TYPE = CONDITIONED  
PEOPLE-SCHEDULE = L\_PEOPLE AREA/PERSON = 225.0  
PEOPLE-HG-LAT = 625.0 PEOPLE-HG-SENS = 375.0

LIGHTING-TYPE = SUS-FLUOR LIGHTING-W/SQFT = 1.5  
 LIGHT-TO-SPACE = 1.0 LIGHTING-SCHEDULE = L\_LITS/EQU  
 EQUIP-SCHEDULE = L\_LITS/EQU EQUIPMENT-W/SQFT = 0.37  
 FURN-FRACTION = 0.3 FURN-WEIGHT = 1.  
 INF-METHOD = NONE ..

E-W HEIGHT = 18.0 WIDTH = 39.0 CONS = EXWALL-1  
 AZIMUTH = 0 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 4.0 WIDTH = 4.0 G-T = 2\_PN\_STD  
 SETBACK = 0.3 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 12.0 WIDTH = 84.0 CONS = EXWALL-1  
 AZIMUTH = 0 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 8.0 WIDTH = 4.0 G-T = 2\_PN\_STD  
 MULTIPLIER = 18.0 SETBACK = 0.3  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

DOOR HEIGHT = 7.5 WIDTH = 3.5 CONS = DOOR-MET  
 SETBACK = 0.3 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

U-W HEIGHT = 15.0 WIDTH = 108.0 CONS = FLOOR ..

ROOF HEIGHT = 15.0 WIDTH = 31.5 CONS = R-MEZZIN  
 TILT = 0 SKY-FORM-FACTOR = 1.0 ..

ROOF HEIGHT = 15.0 WIDTH = 76.5 CONS = ROOF-DIN  
 TILT = 0 SKY-FORM-FACTOR = 1.0 ..

END ..  
 COMPUTE LOADS ..  
 INPUT SYSTEMS ..

\$-----\$  
 \$ E Z - D O E S Y S T E M S I N P U T \$  
 \$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
 LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
 LINE-3 \* DENVER, CO 80227 \*  
 LINE-4 \*BASELINE SIMULATION FOR BLDG.# 7656 \*  
 LINE-5 \*GEN INST BLDG \* ..  
 ABORT ERRORS ..  
 DIAGNOSTIC WARNINGS ..  
 SYSTEMS-REPORT VERIFICATION=(SV-A)

SUMMARY=(SS-A,SS-B,SS-C,SS-K,SS-O)  
 HOURLY-DATA-SAVE = YES ..

## \$ SCHEDULES

SD\_ON =DAY-SCHEDULE (1,24) (1.) ..  
 SD\_SM\_CL =DAY-SCHEDULE (1,24) (72.) ..  
 SD\_WT\_HT =DAY-SCHEDULE (1,24) (74.) ..  
 SD\_OFF =DAY-SCHEDULE (1,24) (0.) ..  
 SD\_SM\_HT =DAY-SCHEDULE (1,24) (71.8) ..  
 SD\_WT\_CL =DAY-SCHEDULE (1,13) (74.2)  
 (14) (74.27)  
 (15,24) (74.2) ..  
 SD\_OA% =DAY-SCHEDULE (1,24) (0.1) ..  
 SW\_ON =WEEK-SCHEDULE (ALL) SD\_ON ..  
 SW\_OFF =WEEK-SCHEDULE (ALL) SD\_OFF ..  
 SW\_WT\_HT =WEEK-SCHEDULE (ALL) SD\_WT\_HT ..  
 SW\_SM\_CL =WEEK-SCHEDULE (ALL) SD\_SM\_CL ..  
 SW\_SM\_HT =WEEK-SCHEDULE (ALL) SD\_SM\_HT ..  
 SW\_WT\_CL =WEEK-SCHEDULE (ALL) SD\_WT\_CL ..  
 SW\_OA% =WEEK-SCHEDULE (ALL) SD\_OA% ..  
 S\_FULL\_ON =SCHEDULE THRU DEC 31 SW\_ON ..  
 S\_FULL\_OFF =SCHEDULE THRU DEC 31 SW\_OFF ..  
 \$ HEATING SEASON  
 S\_HE\_SCHED =SCHEDULE THRU MAY 15 SW\_ON  
 THRU OCT 1 SW\_OFF  
 THRU DEC 31 SW\_ON ..  
 \$ COOLING SEASON  
 S\_CL\_SCHED =SCHEDULE THRU MAY 15 SW\_OFF  
 THRU OCT 1 SW\_ON  
 THRU DEC 31 SW\_OFF ..  
 \$ HEATING SET TEMP  
 S\_HT\_SET\_F =SCHEDULE THRU MAY 15 SW\_WT\_HT  
 THRU OCT 1 SW\_SM\_HT  
 THRU DEC 31 SW\_WT\_HT ..  
 \$ COOLING SET TEMP  
 S\_CL\_SET\_F =SCHEDULE THRU MAY 15 SW\_WT\_CL  
 THRU OCT 1 SW\_SM\_CL  
 THRU DEC 31 SW\_WT\_CL ..  
 S\_OA% =SCHEDULE THRU DEC 31 SW\_OA% ..

S\_HRLY-RPT =SCHEDULE THRU JAN 14 SW\_OFF  
 THRU JAN 15 SW\_ON  
 THRU AUG 22 SW\_OFF  
 THRU AUG 23 SW\_ON  
 THRU DEC 31 SW\_OFF ..

## \$ ZONE DESCRIPTION

S-PER\_ZONE =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
 SIZING-OPTION = FROM-LOADS ..

W-PER\_ZONE =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
 SIZING-OPTION = FROM-LOADS ..

E-PER\_ZONE =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
 SIZING-OPTION = FROM-LOADS ..

CORE\_ZONE =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
 SIZING-OPTION = FROM-LOADS ..

N-PER\_ZONE =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
 HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
 ZONE-TYPE = CONDITIONED  
 THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
 SIZING-OPTION = FROM-LOADS ..

## \$ SYSTEM DESCRIPTION

MZ-SYSTEM =SYSTEM SYSTEM-TYPE = MZS  
 MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
 HEATING-SCHEDULE = S\_HE\_SCHED  
 COOLING-SCHEDULE = S\_CL\_SCHED PREHEAT-T = 0.0  
 OA-CONTROL = FIXED SUPPLY-CFM = 14000.  
 RATED-CFM = 14000. MIN-OUTSIDE-AIR = 0.1  
 MIN-AIR-SCH = S\_OA% MAX-OA-FRACTION = 0.1  
 SUPPLY-DELTA-T = 2.7 SUPPLY-KW = 0.00088  
 MOTOR-PLACEMENT = OUTSIDE-AIRFLOW  
 NIGHT-CYCLE-CTRL = STAY-OFF NIGHT-VENT-DT = 0.0  
 MIN-CFM-RATIO = 1.0 COOLING-CAPACITY = 402500.  
 COOL-SH-CAP = 362250. HEATING-CAPACITY = -1225000.  
 SIZING-OPTION = COINCIDENT RETURN-AIR-PATH = DUCT



ZONE-NAMES = (S-PER\_ZONE, N-PER\_ZONE, W-PER\_ZONE,  
E-PER\_ZONE, CORE\_ZONE) ..

\$ HOURLY REPORT DESCRIPTION

AHU-BLOCK =REPORT-BLOCK VARIABLE-TYPE = MZ-SYSTEM  
VARIABLE-LIST = (3,5,6,18,18,17) ..  
ZONE-N-BLK =REPORT-BLOCK VARIABLE-TYPE = N-PER\_ZONE  
VARIABLE-LIST = (17,18,7,31) ..  
ZONE-S-BLK =REPORT-BLOCK VARIABLE-TYPE = S-PER\_ZONE  
VARIABLE-LIST = (17,18,7,31) ..  
HRLY-ZN-N = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
REPORT-BLOCK = (ZONE-N-BLK)  
..  
HRLY-ZN-S = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
REPORT-BLOCK = (ZONE-S-BLK)  
..  
HRLY-AHU = HOURLY-REPORT REPORT-SCHEDULE = S\_HRLY-RPT  
REPORT-BLOCK = (AHU-BLOCK)  
..  
END ..  
COMPUTE SYSTEMS ..  
  
INPUT PLANT ..

\$-----\$  
\$ E Z - D O E P L A N T S I N P U T \$  
\$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
LINE-3 \* DENVER, CO 80227 \*  
  
LINE-4 \*BASELINE SIMULATION FOR BLDG.# 7656 \*  
LINE-5 \*GEN INST BLDG \* ..

ABORT ERRORS ..  
DIAGNOSTIC WARNINGS ..  
PLANT-REPORT VERIFICATION=(PV-A)  
SUMMARY=(PS-B,BEPS)  
HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

PD\_ON =DAY-SCHEDULE (1,24) (1.) ..  
  
PD\_OFF =DAY-SCHEDULE (1,24) (0.) ..  
  
PW\_ON =WEEK-SCHEDULE (ALL) PD\_ON ..  
  
PW\_OFF =WEEK-SCHEDULE (ALL) PD\_OFF ..

## \$ HEATING SEASON

P\_HEAT =SCHEDULE THRU MAY 15 PW\_ON  
THRU OCT 1 PW\_OFF  
THRU DEC 31 PW\_ON ..

## \$ COOLING SEASON

P\_COOL =SCHEDULE THRU MAY 15 PW\_OFF  
THRU OCT 1 PW\_ON  
THRU DEC 31 PW\_OFF ..

## \$ EQUIPMENT DESCRIPTION

BOILER-HW =PLANT-EQUIPMENT TYPE = HW-BOILER  
SIZE = -999. ..

CHILLER-RC =PLANT-EQUIPMENT TYPE = HERM-REC-CHLR  
SIZE = -999. INSTALLED-NUMBER = 2  
MAX-NUMBER-AVAIL = 2 ..

PLANT-PARAMETERS BOILER-FUEL = NATURAL-GAS STM-BOILER-HIR = 1.33  
HERM-CENT-COND-TYPE = AIR HERM-REC-COND-TYPE = AIR  
HCIRC-HEAD = 30.0 ..

PART-LOAD-RATIO TYPE = ELEC-STM-BOILER  
MIN-RATIO = 0.0099 MAX-RATIO = 1.0000  
OPERATING-RATIO = 1.0000 ELEC-INPUT-RATIO = 1.0000 ..

ENERGY-RESOURCE RESOURCE = ELECTRICITY ..  
ENERGY-RESOURCE RESOURCE = NATURAL-GAS ..

HEAT-SCH =LOAD-ASSIGNMENT TYPE = HEATING  
OPERATION-MODE = RUN-NEEDED  
  
LOAD-RANGE = 0.000  
PLANT-EQUIPMENT = BOILER-HW  
NUMBER = 1 ..

COOL-SCH =LOAD-ASSIGNMENT TYPE = COOLING  
OPERATION-MODE = RUN-NEEDED  
  
LOAD-RANGE = 0.000  
PLANT-EQUIPMENT = CHILLER-RC  
NUMBER = 2 ..

END ..  
COMPUTE PLANT ..  
STOP ..

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 8/1995 14:23:31 LDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG.# 7656 GEN INST BLDG TOPEKA, KS  
 REPORT- LV-D DETAILS OF EXTERIOR SURFACES IN THE PROJECT

NUMBER OF EXTERIOR SURFACES 16 RECTANGULAR 16 OTHER 0  
 (U-VALUE INCLUDES INSIDE AIR FILM PLUS OUTSIDE AIR FILM AT 7.5 MPH WINDSPEED )

SURFACE	SPACE	U-VALUE (BTU/HR-SQFT-F)	AREA (SQFT)	U-VALUE (BTU/HR-SQFT-F)	W A L L + G L A S S - U-VALUE (BTU/HR-SQFT-F)	AREA (SQFT)	U-VALUE (BTU/HR-SQFT-F)	GLASS AREA (SQFT)	OPAQUE AREA (SQFT)	GLASS+OPAQUE AREA (SQFT)	AZIMUTH
E-PER_ZONE		0.000	0.00	0.092		156.00	0.092			156.00	NORTH
N-PER_ZONE		0.490	16.00	0.092		686.00	0.101			702.00	NORTH
N-PER_ZONE		0.490	576.00	0.092		432.00	0.320			1008.00	NORTH
E-PER_ZONE		0.490	192.00	0.092		843.60	0.166			1035.60	EAST
S-PER_ZONE		0.490	576.00	0.092		432.00	0.320			1008.00	SOUTH
S-PER_ZONE		0.490	42.40	0.092		659.60	0.116			702.00	SOUTH
E-PER_ZONE		0.000	0.00	0.092		156.00	0.092			156.00	SOUTH
W-PER_ZONE		0.490	115.20	0.092		1438.20	0.122			1553.40	WEST
W-PER_ZONE		0.000	0.00	0.036		1069.50	0.036			1069.50	ROOF
E-PER_ZONE		0.000	0.00	0.040		1763.00	0.040			1763.00	ROOF
E-PER_ZONE		0.000	0.00	0.036		1351.20	0.036			1351.20	ROOF
CORE_ZONE		0.000	0.00	0.040		3884.70	0.040			3884.70	ROOF
CORE_ZONE		0.000	0.00	0.040		1147.50	0.040			1147.50	ROOF
S-PER_ZONE		0.000	0.00	0.036		472.50	0.036			472.50	ROOF
S-PER_ZONE		0.000	0.00	0.036		472.50	0.036			472.50	ROOF
N-PER_ZONE		0.000	0.00	0.040		1147.50	0.040			1147.50	ROOF
N-PER_ZONE		0.000	0.00	0.020		1620.00	0.020			1620.00	UNDERGRND
S-PER_ZONE		0.000	0.00	0.020		1069.50	0.020			1069.50	UNDERGRND
W-PER_ZONE		0.000	0.00	0.020		1763.00	0.020			1763.00	UNDERGRND
E-PER_ZONE		0.000	0.00	0.020		5235.90	0.020			5235.90	UNDERGRND
CORE_ZONE		0.000	0.00	0.020		1620.00	0.020			1620.00	UNDERGRND
N-PER_ZONE		0.000	0.00	0.020							UNDERGRND

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 8/1995 14:23:31 LDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG.# 7656 GEN INST BLDG TOPEKA, KS  
 REPORT- LV-D DETAILS OF EXTERIOR SURFACES IN THE PROJECT

NORTH	EAST	SOUTH	WEST	ROOF	ALL WALLS	WALLS+ROOFS	UNDERGRND	BUILDING
0.490	0.490	0.490	0.490	0.000	0.490	0.000	0.000	0.490
0.092	0.092	0.092	0.092	0.039	0.092	0.055	0.020	0.041
0.218	0.166	0.224	0.122	0.039	0.188	0.092	0.020	0.064
592.00	192.00	618.40	115.20	0.00	1517.60	1517.60	0.00	1517.60
1274.00	843.60	1247.60	1438.20	11308.40	4803.40	16111.80	11308.40	27420.20
1866.00	1035.60	1866.00	1553.40	11308.40	6321.00	17629.40	11308.40	28937.80

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 8/1995 14:23:31 LDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG.# 7656 GEN INST BLDG TOPEKA, KS  
 REPORT- LS-C BUILDING PEAK LOAD COMPONENTS

\*\*\* BUILDING \*\*\*

FLOOR AREA 11308 SQFT 1051 SQMT  
 VOLUME 155888 CUFT 4415 CUMT

COOLING LOAD  
 AUG 11 5PM  
 98F 37C  
 71F 22C

HEATING LOAD  
 JAN 15 8AM  
 -6F -21C  
 -7F -22C

	SENSIBLE (KBTU/H)	( KW )	LATENT (KBTU/H)	( KW )	SENSIBLE (KBTU/H)	( KW )	SENSIBLE (KBTU/H)	( KW )
WALLS	5.256	1.539	0.000	0.000	-31.361	-9.185	-31.361	-9.185
ROOFS	19.070	5.585	0.000	0.000	-37.338	-10.935	-37.338	-10.935
GLASS CONDUCTION	17.334	5.077	0.000	0.000	-58.329	-17.083	-58.329	-17.083
GLASS SOLAR	54.360	15.921	0.000	0.000	2.663	0.780	2.663	0.780
DOOR	0.905	0.265	0.000	0.000	-2.437	-0.714	-2.437	-0.714
INTERNAL SURFACES	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
UNDERGROUND SURFACES	-1.070	-0.313	0.000	0.000	-6.494	-1.902	-6.494	-1.902
OCCUPANTS TO SPACE	16.442	4.815	31.411	9.199	0.335	0.098	0.335	0.098
LIGHT TO SPACE	52.660	15.423	0.000	0.000	2.093	0.613	2.093	0.613
EQUIPMENT TO SPACE	13.404	3.926	0.000	0.000	0.350	0.103	0.350	0.103
PROCESS TO SPACE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
INFILTRATION	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TOTAL	178.361	52.238	31.411	9.199	-130.516	-38.225	-130.516	-38.225
TOTAL LOAD	209.772	KBTU/H	61.437	KW	-130.516	KBTU/H	-38.225	KW
TOTAL LOAD / AREA	18.55	BTU/H.SQFT	58.482	W /SQMT	11.542	BTU/H.SQFT	36.386	W /SQMT

\*\*\*\*\*  
 \* NOTE 1) THE ABOVE LOADS EXCLUDE OUTSIDE VENTILATION AIR \*  
 \* LOADS \*  
 \* 2) TIMES GIVEN IN STANDARD TIME FOR THE LOCATION \*  
 \* IN CONSIDERATION \*  
 \*\*\*\*\*

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 8/1995 14:23:31 SDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG.# 7656 GEN INST BLDG TOPEKA, KS  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR MZ-SYSTEM

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC LOAD (KW)
JAN	0.00000				-49.079	15	-6.F	-7.F	15412.	-215.482	33.457
FEB	0.00000				-29.981	3	-1.F	-2.F	13870.	-168.064	33.457
MAR	0.00000				-15.453	14	15.F	13.F	16067.	-139.597	33.457
APR	0.00000				-1.707	5	31.F	28.F	14958.	-40.777	33.457
MAY	47.26222	16	62.F	59.F	-0.692	10	60.F	56.F	15412.	-13.394	33.457
JUN	106.15520	27	89.F	77.F	0.000				15444.	0.000	33.457
JUL	122.71164	13	89.F	79.F	0.000				14926.	0.000	33.457
AUG	125.71970	24	95.F	77.F	0.000				16067.	0.000	33.457
SEP	79.92394	7	92.F	75.F	0.000				14958.	0.000	33.457
OCT	1.18942	1	85.F	68.F	-11.917	2	64.F	59.F	15084.	-42.585	33.457
NOV	0.00000				-11.673	13	25.F	24.F	14947.	-102.334	33.457
DEC	0.00000				-41.107	12	3.F	2.F	15254.	-180.300	33.457
TOTAL	482.962				-151.608				182382.	-215.482	33.457
MAX					406.262						

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 8/1995 14:23:31 SDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG.# 7656 GEN INST BLDG TOPEKA, KS  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR MZ-SYSTEM

MONTH	HOURS				HOURS				HOURS				HOURS			
	COOLING LOAD	HEATING LOAD	COINCIDENT COOL-HEAT LOAD	FLOATING	HEATING AVAIL.	COOLING AVAIL.	FANS ON	FANS ON	FANS ON	FANS ON	VENTING	FLOATING WHEN	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)		
JAN	0	744	0	0	744	0	744	0	0	0	0	-15.191	12.320			
FEB	0	672	0	0	672	0	672	0	0	0	0	-11.925	12.320			
MAR	0	744	0	0	744	0	744	0	0	0	0	-10.757	12.320			
APR	0	720	0	0	720	0	720	0	0	0	0	-5.331	12.320			
MAY	384	360	0	0	384	384	744	0	0	0	0	0.000	12.320			
JUN	720	0	0	0	720	720	744	0	0	0	0	0.000	33.457			
JUL	744	0	0	0	744	744	744	0	0	0	0	0.000	33.457			
AUG	744	0	0	0	744	744	744	0	0	0	0	0.000	33.457			
SEP	678	0	0	0	720	24	744	0	0	0	42	0.000	33.457			
OCT	16	720	0	8	720	0	744	0	0	0	8	0.000	12.320			
NOV	0	720	0	0	720	0	744	0	0	0	0	-36.541	12.320			
DEC	0	744	0	0	744	0	744	0	0	0	0	-112.955	12.320			
ANNUAL	3286	5424	0	50	5424	3336	8760	0	0	0	50					

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY 55.507 119.416 31/ 8 49.597 119.416 28/ 9 56.300 119.416 30/ 8 51.624 116.191 5/ 8 71.011 227.276 31/18 92.810 227.888 28/17 97.191 233.983 13/17 103.481 238.285 23/16 82.744 233.372 7/16 52.643 115.260 26/19 52.309 119.416 10/ 8 54.843 119.416 30/14	NATURAL-GAS 72.409 271.597 15/ 8 46.912 220.897 3/ 6 25.685 189.474 14/ 6 4.901 69.569 5/ 6 2.186 24.822 10/23 0.000 0.000 30/ 1 0.000 0.000 31/ 1 0.000 0.000 31/ 1 0.000 0.000 30/ 1 5.244 72.523 2/ 2 20.388 147.223 13/ 6 62.624 234.177 12/ 6
JAN	TOTAL (MBTU) PEAK (KBTU) DY/HR	55.507 119.416 31/ 8	72.409 271.597 15/ 8
FEB	TOTAL (MBTU) PEAK (KBTU) DY/HR	49.597 119.416 28/ 9	46.912 220.897 3/ 6
MAR	TOTAL (MBTU) PEAK (KBTU) DY/HR	56.300 119.416 30/ 8	25.685 189.474 14/ 6
APR	TOTAL (MBTU) PEAK (KBTU) DY/HR	51.624 116.191 5/ 8	4.901 69.569 5/ 6
MAY	TOTAL (MBTU) PEAK (KBTU) DY/HR	71.011 227.276 31/18	2.186 24.822 10/23
JUN	TOTAL (MBTU) PEAK (KBTU) DY/HR	92.810 227.888 28/17	0.000 0.000 30/ 1
JUL	TOTAL (MBTU) PEAK (KBTU) DY/HR	97.191 233.983 13/17	0.000 0.000 31/ 1
AUG	TOTAL (MBTU) PEAK (KBTU) DY/HR	103.481 238.285 23/16	0.000 0.000 31/ 1
SEP	TOTAL (MBTU) PEAK (KBTU) DY/HR	82.744 233.372 7/16	0.000 0.000 30/ 1
OCT	TOTAL (MBTU) PEAK (KBTU) DY/HR	52.643 115.260 26/19	5.244 72.523 2/ 2
NOV	TOTAL (MBTU) PEAK (KBTU) DY/HR	52.309 119.416 10/ 8	20.388 147.223 13/ 6
DEC	TOTAL (MBTU) PEAK (KBTU) DY/HR	54.843 119.416 30/14	62.624 234.177 12/ 6
	ONE YEAR USE/PEAK	820.059 238.285	240.351 271.597

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 8/1995 14:23:31 PDL RUN 1  
 DENVER, CO 80227 BASELINE SIMULATION FOR BLDG.# 7656 GEN INST BLDG  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE	ELECTRICITY	NATURAL-GAS
IN SITE MBTU -		
CATEGORY OF USE		
SPACE HEAT	9.81	240.35
SPACE COOL	170.44	0.00
HVAC AUX	385.52	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	203.97	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	50.32	0.00
TOTAL	820.06	240.35

TOTAL SITE ENERGY 1060.41 MBTU 93.7 KBTU/SQFT-YR GROSS-AREA 93.8 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 2702.99 MBTU 238.9 KBTU/SQFT-YR GROSS-AREA 239.0 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 1.3  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.





LIGHTING-TYPE = SUS-FLUOR LIGHTING-W/SQFT = 1.5  
 LIGHT-TO-SPACE = 1.0 LIGHTING-SCHEDULE = L\_LITS/EQU  
 EQUIP-SCHEDULE = L\_LITS/EQU EQUIPMENT-W/SQFT = 0.37  
 FURN-FRACTION = 0.3 FURN-WEIGHT = 1.  
 INF-METHOD = NONE ..

E-W HEIGHT = 18.0 WIDTH = 39.0 CONS = EXWALL-1  
 AZIMUTH = 0 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 4.0 WIDTH = 4.0 G-T = 2\_PN\_STD  
 SETBACK = 0.3 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 12.0 WIDTH = 84.0 CONS = EXWALL-1  
 AZIMUTH = 0 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 8.0 WIDTH = 4.0 G-T = 2\_PN\_STD  
 MULTIPLIER = 18.0 SETBACK = 0.3  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

DOOR HEIGHT = 7.5 WIDTH = 3.5 CONS = DOOR-MET  
 SETBACK = 0.3 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

U-W HEIGHT = 15.0 WIDTH = 108.0 CONS = FLOOR ..

ROOF HEIGHT = 15.0 WIDTH = 31.5 CONS = R-MEZZIN  
 TILT = 0 SKY-FORM-FACTOR = 1.0 ..

ROOF HEIGHT = 15.0 WIDTH = 76.5 CONS = ROOF-DIN  
 TILT = 0 SKY-FORM-FACTOR = 1.0 ..

END ..  
 COMPUTE LOADS ..  
 INPUT SYSTEMS ..

\$-----\$  
 \$ E Z - D O E S Y S T E M S I N P U T \$  
 \$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
 LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
 LINE-3 \* DENVER, CO 80227 \*  
 LINE-4 \*RUN #1 NIGHT SET BACK FOR BLDG.# 7656 \*  
 LINE-5 \*GEN INST BLDG \* ..  
 ABORT ERRORS ..  
 DIAGNOSTIC WARNINGS ..  
 SYSTEMS-REPORT VERIFICATION=(SV-A)

SUMMARY=(SS-A,SS-B,SS-C,SS-K,SS-O)  
HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

```
SD_ON      =DAY-SCHEDULE (1,24) (1.) ..
SD_SM_CL_W =DAY-SCHEDULE (1,6) (85.)
              (7,22) (72.)
              (23,24) (85.) ..
SD_WT_HT_W =DAY-SCHEDULE (1,6) (55.)
              (7,22) (74.)
              (23,24) (55.) ..
SD_OFF     =DAY-SCHEDULE (1,24) (0.) ..
SD_SM_HT_W =DAY-SCHEDULE (1,6) (83.)
              (7,22) (70.)
              (23,24) (83.) ..
SD_WT_CL_W =DAY-SCHEDULE (1,6) (57.)
              (7,22) (76.)
              (23,24) (57.) ..
SD_OA%    =DAY-SCHEDULE (1,24) (0.1) ..
SD_WT_HT_F =DAY-SCHEDULE (1,6) (55.)
              (7,15) (74.)
              (16,24) (55.) ..
SD_SM_CL_F =DAY-SCHEDULE (1,6) (85.)
              (7,15) (72.)
              (16,24) (85.) ..
SD_SM_HT_F =DAY-SCHEDULE (1,6) (83.)
              (7,15) (70.)
              (16,24) (83.) ..
SD_WT_CL_F =DAY-SCHEDULE (1,6) (57.)
              (7,15) (76.)
              (16,24) (57.) ..
SD_SM_HT_D =DAY-SCHEDULE (1,24) (83.) ..
SD_WT_CL_D =DAY-SCHEDULE (1,24) (57.) ..
SD_WT_HT_D =DAY-SCHEDULE (1,24) (55.) ..
SD_SM_CL_D =DAY-SCHEDULE (1,24) (85.) ..
SD_FAN_W   =DAY-SCHEDULE (1,6) (0.)
              (7,22) (1.)
              (23,24) (0.) ..
SD_FAN_F   =DAY-SCHEDULE (1,6) (0.)
              (7,15) (1.)
              (16,24) (0.) ..
SD_FAN_D   =DAY-SCHEDULE (1,24) (0.) ..

SW_ON      =WEEK-SCHEDULE (ALL) SD_ON ..
SW_OFF     =WEEK-SCHEDULE (ALL) SD_OFF ..

SW_WT_HT   =WEEK-SCHEDULE (MON) SD_WT_HT_W
              (TUE) SD_WT_HT_W
              (WED) SD_WT_HT_W
              (THU) SD_WT_HT_W
              (FRI) SD_WT_HT_F
              (SAT) SD_WT_HT_D
              (SUN) SD_WT_HT_D
              (HOL) SD_WT_HT_D ..
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SW_SM_CL =WEEK-SCHEDULE (MON) SD_SM_CL_W
(TUE) SD_SM_CL_W
(WED) SD_SM_CL_W
(THU) SD_SM_CL_W
(FRI) SD_SM_CL_F
(SAT) SD_SM_CL_D
(SUN) SD_SM_CL_D
(HOL) SD_SM_CL_D ..

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SW_SM_HT =WEEK-SCHEDULE (MON) SD_SM_HT_W
(TUE) SD_SM_HT_W
(WED) SD_SM_HT_W
(THU) SD_SM_HT_W
(FRI) SD_SM_HT_F
(SAT) SD_SM_HT_D
(SUN) SD_SM_HT_D
(HOL) SD_SM_HT_D ..

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```

SW_WT_CL =WEEK-SCHEDULE (MON) SD_WT_CL_W
(TUE) SD_WT_CL_W
(WED) SD_WT_CL_W
(THU) SD_WT_CL_W
(FRI) SD_WT_CL_F
(SAT) SD_WT_CL_D
(SUN) SD_WT_CL_D
(HOL) SD_WT_CL_D ..

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SW_OA% =WEEK-SCHEDULE (ALL) SD_OA% ..

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SW_FAN =WEEK-SCHEDULE (MON) SD_FAN_W
(TUE) SD_FAN_W
(WED) SD_FAN_W
(THU) SD_FAN_W
(FRI) SD_FAN_F
(SAT) SD_FAN_D
(SUN) SD_FAN_D
(HOL) SD_FAN_D ..

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S_FULL_ON =SCHEDULE THRU DEC 31 SW_ON ..

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S_FULL_OFF =SCHEDULE THRU DEC 31 SW_OFF ..

```

\$ HEATING SEASON

```

S_HE_SCHED =SCHEDULE THRU MAY 15 SW_ON
THRU OCT 1 SW_OFF
THRU DEC 31 SW_ON ..

```

\$ COOLING SEASON

```

S_CL_SCHED =SCHEDULE THRU MAY 15 SW_OFF
THRU OCT 1 SW_ON
THRU DEC 31 SW_OFF ..

```

\$ HEATING SET TEMP

```

S_HT_SET_F =SCHEDULE THRU MAY 15 SW_WT_HT

```

THRU OCT 1 SW\_SM\_HT  
THRU DEC 31 SW\_WT\_HT ..

\$ COOLING SET TEMP

S\_CL\_SET\_F =SCHEDULE THRU MAY 15 SW\_WT\_CL  
THRU OCT 1 SW\_SM\_CL  
THRU DEC 31 SW\_WT\_CL ..

S\_OA% =SCHEDULE THRU DEC 31 SW\_OA% ..

S\_HRLY-RPT =SCHEDULE THRU JAN 12 SW\_OFF  
THRU JAN 15 SW\_ON  
THRU AUG 18 SW\_OFF  
THRU AUG 20 SW\_ON  
THRU AUG 22 SW\_OFF  
THRU AUG 23 SW\_ON  
THRU DEC 31 SW\_OFF ..

S\_FAN\_CYC =SCHEDULE THRU DEC 31 SW\_FAN ..

\$ ZONE DESCRIPTION

S-PER\_ZONE =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL  
SIZING-OPTION = FROM-LOADS ..

W-PER\_ZONE =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL  
SIZING-OPTION = FROM-LOADS ..

E-PER\_ZONE =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL  
SIZING-OPTION = FROM-LOADS ..

CORE\_ZONE =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL  
SIZING-OPTION = FROM-LOADS ..

N-PER\_ZONE =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL  
SIZING-OPTION = FROM-LOADS ..

\$ SYSTEM DESCRIPTION

```

MZ-SYSTEM =SYSTEM      SYSTEM-TYPE = MZS
                        MAX-SUPPLY-T = 120.0  MIN-SUPPLY-T = 55.0
                        HEATING-SCHEDULE = S_HE_SCHED
                        COOLING-SCHEDULE = S_CL_SCHED  PREHEAT-T = 0.0
                        HEAT-CONTROL = COLDEST  COOL-CONTROL = WARMEST
                        OA-CONTROL = FIXED  SUPPLY-CFM = 14000.
                        RATED-CFM = 14000.  MIN-OUTSIDE-AIR = 0.1
                        MIN-AIR-SCH = S_OA%  MAX-OA-FRACTION = 0.1 ←
                        FAN-SCHEDULE = S_FAN_CYC  SUPPLY-DELTA-T = 2.7
                        SUPPLY-KW = 0.00088
                        MOTOR-PLACEMENT = OUTSIDE-AIRFLOW
                        NIGHT-CYCLE-CTRL = CYCLE-ON-ANY  NIGHT-VENT-DT = 0.0
                        MIN-CFM-RATIO = 1.0  COOLING-CAPACITY = 402500.
                        COOL-SH-CAP = 362250.  HEATING-CAPACITY = -1225000.
                        SIZING-OPTION = COINCIDENT  RETURN-AIR-PATH = DUCT
                        ZONE-NAMES = (S-PER_ZONE, N-PER_ZONE, W-PER_ZONE,
                                      E-PER_ZONE, CORE_ZONE) ..

```

## \$ HOURLY REPORT DESCRIPTION

```

AHU-BLOCK =REPORT-BLOCK VARIABLE-TYPE = MZ-SYSTEM
                        VARIABLE-LIST = (3,5,6,18,18,17) ..
ZONE-N-BLK =REPORT-BLOCK VARIABLE-TYPE = N-PER_ZONE
                        VARIABLE-LIST = (17,18,7,31) ..
ZONE-S-BLK =REPORT-BLOCK VARIABLE-TYPE = S-PER_ZONE
                        VARIABLE-LIST = (17,18,7,31) ..
HRLY-ZN-N = HOURLY-REPORT  REPORT-SCHEDULE = S_HRLY-RPT
                        REPORT-BLOCK = (ZONE-N-BLK)
..
HRLY-ZN-S = HOURLY-REPORT  REPORT-SCHEDULE = S_HRLY-RPT
                        REPORT-BLOCK = (ZONE-S-BLK)
..
HRLY-AHU = HOURLY-REPORT  REPORT-SCHEDULE = S_HRLY-RPT
                        REPORT-BLOCK = (AHU-BLOCK)
..
END ..
COMPUTE SYSTEMS ..

INPUT PLANT ..

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$-----$
$ E Z - D O E   P L A N T S   I N P U T $
$-----$

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## \$ GENERAL PROJECT DATA

```

TITLE  LINE-1 *      EMC      ENGINEERS      INC.      *
        LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
        LINE-3 *      DENVER,      CO      80227      *

        LINE-4 *RUN #1 NIGHT SET BACK FOR BLDG.# 7656 *
        LINE-5 *GEN INST BLDG                          * ..

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EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC. DOE-2.1D 5/ 8/1995 15:32:42 SDL RUN 1												
DENVER, CO 80227 RUN #1 NIGHT SET BACK FOR BLDG.# 7656 GEN INST BLDG TOPEKA, KS												
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR MZ-SYSTEM												
----- C O O L I N G ----- H E A T I N G ----- E L E C -----												
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				0.000	-33.258	17	27.F	24.F	-490.213	14870.	33.457
FEB	0.00000				0.000	-18.680	7	26.F	25.F	-457.155	13821.	33.457
MAR	0.00000				0.000	-9.303	7	28.F	27.F	-317.449	16067.	33.457
APR	0.00000				0.000	-1.561	5	30.F	27.F	-45.837	14958.	33.457
MAY	39.55154	16	62.F	59.F	395.356	-0.682	10	60.F	56.F	-13.373	15190.	33.457
JUN	87.87987	20	75.F	71.F	386.367	0.000				0.000	14877.	33.457
JUL	92.35793	18	76.F	72.F	394.740	0.000				0.000	13583.	33.457
AUG	104.54575	22	76.F	72.F	406.187	0.000				0.000	15008.	33.457
SEP	68.13030	6	75.F	71.F	390.646	0.000				0.000	14687.	33.457
OCT	0.04687	1	85.F	68.F	16.017	-1.580	31	43.F	39.F	-29.221	15084.	33.457
NOV	0.00000				0.000	-5.390	14	32.F	32.F	-257.420	14947.	33.457
DEC	0.00000				0.000	-25.837	12	2.F	1.F	-591.607	15081.	33.457
TOTAL	392.513				406.187	-96.291				-591.607	178157.	33.457

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC. DOE-2.1D 5/ 8/1995 15:32:42 SDL RUN 1												
DENVER, CO 80227 RUN #1 NIGHT SET BACK FOR BLDG.# 7656 GEN INST BLDG TOPEKA, KS												
REPORT- SS-C SYSTEM MONTHLY LOADS SUMMARY FOR MZ-SYSTEM												
----- N U M B E R O F H O U R S -----												
MONTH	HOURS COOLING LOAD	HOURS HEATING LOAD	HOURS COOL-HEAT LOAD	HOURS COINCIDENT COOL-HEAT LOAD	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.	HOURS FANS ON	HOURS FANS ON CYCLE	HOURS NIGHT VENTING	HOURS FLOATING WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)
JAN	0	661	0	0	744	0	700	392	0	39	-8.581	12.320
FEB	0	602	0	0	672	0	668	392	0	66	-6.860	12.320
MAR	0	564	0	0	744	0	744	404	0	180	-6.380	12.320
APR	0	388	0	0	720	0	720	419	0	332	-5.298	12.320
MAY	245	189	0	0	360	384	726	418	0	292	0.000	12.320
JUN	480	0	0	0	0	720	674	350	0	194	0.000	22.888
JUL	492	0	0	0	0	744	635	350	0	143	0.000	22.888
AUG	510	0	0	0	0	744	658	318	0	148	0.000	22.888
SEP	378	0	0	0	720	720	698	397	0	320	0.000	22.888
OCT	7	421	0	0	720	24	744	452	0	316	0.000	12.320
NOV	0	537	0	0	720	0	720	421	0	183	-7.504	12.320
DEC	0	671	0	0	744	0	730	429	0	59	-16.195	12.320
ANNUAL	2112	4033	0	0	5424	3336	8417	4742	0	2272		

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 8/1995 15:32:42 PDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SET BACK FOR BLDG.# 7656 GEN INST BLDG TOPEKA, KS  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY 54.208 128.457 31/11 49.527 128.457 28/10 56.480 128.457 21/ 8 51.804 118.055 5/ 8 66.087 237.860 31/18 82.098 238.865 27/17 80.207 237.721 13/17 89.976 251.666 22/16 74.445 245.989 6/16 52.371 117.020 31/ 8 52.319 128.457 14/ 8 54.455 128.457 27/11	NATURAL-GAS 57.021 637.745 17/ 7 34.176 601.818 7/ 7 19.423 445.976 7/ 7 5.676 82.959 5/ 7 2.637 29.907 10/23 0.000 0.000 30/ 1 0.000 0.000 31/ 1 0.000 0.000 31/ 1 0.000 0.000 30/ 1 5.973 55.805 31/ 7 13.065 377.019 14/ 7 45.825 745.670 12/ 7
JAN	TOTAL (MBTU) PEAK (KBTU) DY/HR	54.208 128.457 31/11	57.021 637.745 17/ 7
FEB	TOTAL (MBTU) PEAK (KBTU) DY/HR	49.527 128.457 28/10	34.176 601.818 7/ 7
MAR	TOTAL (MBTU) PEAK (KBTU) DY/HR	56.480 128.457 21/ 8	19.423 445.976 7/ 7
APR	TOTAL (MBTU) PEAK (KBTU) DY/HR	51.804 118.055 5/ 8	5.676 82.959 5/ 7
MAY	TOTAL (MBTU) PEAK (KBTU) DY/HR	66.087 237.860 31/18	2.637 29.907 10/23
JUN	TOTAL (MBTU) PEAK (KBTU) DY/HR	82.098 238.865 27/17	0.000 0.000 30/ 1
JUL	TOTAL (MBTU) PEAK (KBTU) DY/HR	80.207 237.721 13/17	0.000 0.000 31/ 1
AUG	TOTAL (MBTU) PEAK (KBTU) DY/HR	89.976 251.666 22/16	0.000 0.000 31/ 1
SEP	TOTAL (MBTU) PEAK (KBTU) DY/HR	74.445 245.989 6/16	0.000 0.000 30/ 1
OCT	TOTAL (MBTU) PEAK (KBTU) DY/HR	52.371 117.020 31/ 8	5.973 55.805 31/ 7
NOV	TOTAL (MBTU) PEAK (KBTU) DY/HR	52.319 128.457 14/ 8	13.065 377.019 14/ 7
DEC	TOTAL (MBTU) PEAK (KBTU) DY/HR	54.455 128.457 27/11	45.825 745.670 12/ 7
	ONE YEAR USE/PEAK	763.978 251.666	183.796 745.670

EMC ENGINEERS INC. E2DOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 8/1995 15:32:42 PDL RUN 1  
 DENVER, CO 80227 RUN #1 NIGHT SET BACK FOR BLDG.# 7656 GEN INST BLDG  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE	ELECTRICITY	NATURAL-GAS
IN SITE MBTU -		
CATEGORY OF USE		
SPACE HEAT	9.08	183.80
SPACE COOL	132.57	0.00
HVAC AUX	368.04	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	203.97	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	50.32	0.00
TOTAL	763.98	183.80

TOTAL SITE ENERGY 947.77 MBTU 83.8 KBTU/SQFT-YR GROSS-AREA 83.8 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 2478.02 MBTU 219.0 KBTU/SQFT-YR GROSS-AREA 219.1 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 14.8  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.



LIGHTING-TYPE = SUS-FLUOR LIGHTING-W/SQFT = 1.5  
 LIGHT-TO-SPACE = 1.0 LIGHTING-SCHEDULE = L\_LITS/EQU  
 EQUIP-SCHEDULE = L\_LITS/EQU EQUIPMENT-W/SQFT = 0.37  
 FURN-FRACTION = 0.3 FURN-WEIGHT = 1.  
 INF-METHOD = NONE ..

E-W HEIGHT = 18.0 WIDTH = 39.0 CONS = EXWALL-1  
 AZIMUTH = 0 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 4.0 WIDTH = 4.0 G-T = 2\_PN\_STD  
 SETBACK = 0.3 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 12.0 WIDTH = 84.0 CONS = EXWALL-1  
 AZIMUTH = 0 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 8.0 WIDTH = 4.0 G-T = 2\_PN\_STD  
 MULTIPLIER = 18.0 SETBACK = 0.3  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

DOOR HEIGHT = 7.5 WIDTH = 3.5 CONS = DOOR-MET  
 SETBACK = 0.3 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

U-W HEIGHT = 15.0 WIDTH = 108.0 CONS = FLOOR ..

ROOF HEIGHT = 15.0 WIDTH = 31.5 CONS = R-MEZZIN  
 TILT = 0 SKY-FORM-FACTOR = 1.0 ..

ROOF HEIGHT = 15.0 WIDTH = 76.5 CONS = ROOF-DIN  
 TILT = 0 SKY-FORM-FACTOR = 1.0 ..

END ..

COMPUTE LOADS ..

INPUT SYSTEMS ..

\$-----\$  
 \$ E Z - D O E S Y S T E M S I N P U T \$  
 \$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
 LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
 LINE-3 \* DENVER, CO 80227 \*  
 LINE-4 \*RUN #2 DDC CONTROL FOR BLDG.# 7656 \*  
 LINE-5 \*GEN INST BLDG \* ..  
 ABORT ERRORS ..  
 DIAGNOSTIC WARNINGS ..  
 SYSTEMS-REPORT VERIFICATION=(SV-A)

SUMMARY=(SS-A,SS-B,SS-C,SS-K,SS-O)  
HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

```

SD_ON      =DAY-SCHEDULE (1,24) (1.) ..
SD_SM_CL_W =DAY-SCHEDULE (1,24) (76.) ..
SD_WT_HT_W =DAY-SCHEDULE (1,24) (70.) ..
SD_OFF     =DAY-SCHEDULE (1,24) (0.) ..
SD_SM_HT_W =DAY-SCHEDULE (1,24) (75.8) ..
SD_WT_CL_W =DAY-SCHEDULE (1,24) (70.2) ..
SD_OA%     =DAY-SCHEDULE (1,24) (0.1) ..
SD_WT_HT_F =DAY-SCHEDULE (1,24) (74.) ..
SD_SM_CL_F =DAY-SCHEDULE (1,24) (72.) ..
SD_SM_HT_F =DAY-SCHEDULE (1,24) (71.8) ..
SD_WT_CL_F =DAY-SCHEDULE (1,13) (74.2)
              (14) (74.27)
              (15,24) (74.2) ..
SD_SM_HT_D =DAY-SCHEDULE (1,24) (71.8) ..
SD_WT_CL_D =DAY-SCHEDULE (1,13) (74.2)
              (14) (74.27)
              (15,24) (74.2) ..
SD_WT_HT_D =DAY-SCHEDULE (1,24) (74.) ..
SD_SM_CL_D =DAY-SCHEDULE (1,24) (72.) ..

SW_ON      =WEEK-SCHEDULE (ALL) SD_ON ..

SW_OFF     =WEEK-SCHEDULE (ALL) SD_OFF ..

SW_WT_HT   =WEEK-SCHEDULE (ALL) SD_WT_HT_W ..

SW_SM_CL   =WEEK-SCHEDULE (ALL) SD_SM_CL_W ..

SW_SM_HT   =WEEK-SCHEDULE (ALL) SD_SM_HT_W ..

SW_WT_CL   =WEEK-SCHEDULE (ALL) SD_WT_CL_W ..

SW_OA%     =WEEK-SCHEDULE (ALL) SD_OA% ..

S_FULL_ON  =SCHEDULE THRU DEC 31 SW_ON ..

S_FULL_OFF =SCHEDULE THRU DEC 31 SW_OFF ..

$ HEATING SEASON
S_HE_SCHED =SCHEDULE THRU MAY 15 SW_ON
              THRU OCT 1 SW_OFF
              THRU DEC 31 SW_ON ..

$ COOLING SEASON
S_CL_SCHED =SCHEDULE THRU MAY 15 SW_OFF
              THRU OCT 1 SW_ON
              THRU DEC 31 SW_OFF ..

$ HEATING SET TEMP
S_HT_SET_F =SCHEDULE THRU MAY 15 SW_WT_HT

```

THRU OCT 1 SW\_SM\_HT  
THRU DEC 31 SW\_WT\_HT ..

## \$ COOLING SET TEMP

S\_CL\_SET\_F =SCHEDULE THRU MAY 15 SW\_WT\_CL  
THRU OCT 1 SW\_SM\_CL  
THRU DEC 31 SW\_WT\_CL ..

S\_OA% =SCHEDULE THRU DEC 31 SW\_OA% ..

S\_HRLY-RPT =SCHEDULE THRU JAN 14 SW\_OFF  
THRU JAN 15 SW\_ON  
THRU AUG 22 SW\_OFF  
THRU AUG 23 SW\_ON  
THRU DEC 31 SW\_OFF ..

## \$ ZONE DESCRIPTION

S-PER\_ZONE =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

W-PER\_ZONE =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

E-PER\_ZONE =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

CORE\_ZONE =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

N-PER\_ZONE =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

## \$ SYSTEM DESCRIPTION

MZ-SYSTEM =SYSTEM SYSTEM-TYPE = MZS  
MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0  
HEATING-SCHEDULE = S\_HE\_SCHED

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COOLING-SCHEDULE = S_CL_SCHED  PREHEAT-T = 0.0
HEAT-CONTROL = COLDEST  COOL-CONTROL = WARMEST
OA-CONTROL = FIXED  SUPPLY-CFM = 14000.
RATED-CFM = 14000.  MIN-OUTSIDE-AIR = 0.1
MIN-AIR-SCH = S_OA%  MAX-OA-FRACTION = 0.1
SUPPLY-DELTA-T = 2.7  SUPPLY-KW = 0.00088
MOTOR-PLACEMENT = OUTSIDE-AIRFLOW
NIGHT-CYCLE-CTRL = STAY-OFF  NIGHT-VENT-DT = 0.0
MIN-CFM-RATIO = 1.0  COOLING-CAPACITY = 402500.
COOL-SH-CAP = 362250.  HEATING-CAPACITY = -1225000.
SIZING-OPTION = COINCIDENT  RETURN-AIR-PATH = DUCT
ZONE-NAMES = (S-PER_ZONE, N-PER_ZONE, W-PER_ZONE,
              E-PER_ZONE, CORE_ZONE) ..

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\$ HOURLY REPORT DESCRIPTION

```

AHU-BLOCK =REPORT-BLOCK VARIABLE-TYPE = MZ-SYSTEM
              VARIABLE-LIST = (3,5,6,18,18,17) ..
ZONE-N-BLK =REPORT-BLOCK VARIABLE-TYPE = N-PER_ZONE
              VARIABLE-LIST = (17,18,7,31) ..
ZONE-S-BLK =REPORT-BLOCK VARIABLE-TYPE = S-PER_ZONE
              VARIABLE-LIST = (17,18,7,31) ..
HRLY-ZN-N  = HOURLY-REPORT  REPORT-SCHEDULE = S_HRLY-RPT
              REPORT-BLOCK = (ZONE-N-BLK)
..
HRLY-ZN-S  = HOURLY-REPORT  REPORT-SCHEDULE = S_HRLY-RPT
              REPORT-BLOCK = (ZONE-S-BLK)
..
HRLY-AHU   = HOURLY-REPORT  REPORT-SCHEDULE = S_HRLY-RPT
              REPORT-BLOCK = (AHU-BLOCK)
..
END ..
COMPUTE SYSTEMS ..

INPUT PLANT ..

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$-----$
$ E Z - D O E  P L A N T S  I N P U T $
$-----$

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\$ GENERAL PROJECT DATA

```

TITLE  LINE-1 *   EMC      ENGINEERS      INC.      *
        LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
        LINE-3 *   DENVER,      CO      80227      *

        LINE-4 *RUN #2 DDC CONTROL FOR BLDG.# 7656      *
        LINE-5 *GEN INST BLDG                          * ..

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ABORT      ERRORS ..
DIAGNOSTIC WARNINGS ..
PLANT-REPORT VERIFICATION=(PV-A)
              SUMMARY=(PS-B,BEPS)
              HOURLY-DATA-SAVE = YES ..

```

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 8/1995 14:26:51 SDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG.# 7656 GEN INST BLDG  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR MZ-SYSTEM TOPEKA, KS

MONTH	C O O L I N G				H E A T I N G				E L E C				
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	HEATING LOAD (KBTU/HR)	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC LOAD (KW)
JAN	0.00000				-40.297	15	8	-6.F	-7.F	0.000	-201.276	0.000	15412.
FEB	0.00000				-22.106	3	6	-1.F	-2.F	0.000	-151.352	0.000	13870.
MAR	0.00000				-9.938	14	6	15.F	13.F	0.000	-117.613	0.000	16067.
APR	0.00000				-1.381	5	23	37.F	32.F	0.000	-14.791	0.000	14958.
MAY	41.12622	16	2	62.F	59.F	10	23	60.F	56.F	0.000	-13.373	0.000	15412.
JUN	94.90955	27	17	89.F	77.F	291.687				0.000	0.000	0.000	15444.
JUL	110.49636	13	19	89.F	79.F	312.273				0.000	0.000	0.000	14926.
AUG	114.16965	24	17	95.F	77.F	312.009				0.000	0.000	0.000	16067.
SEP	69.53050	7	17	92.F	75.F	303.175				0.000	0.000	0.000	14958.
OCT	0.83652	1	17	85.F	68.F	103.625				-1.521	-14.921	-14.921	15084.
NOV	0.00000				-6.626	13	6	25.F	24.F	-6.626	-86.719	-86.719	14947.
DEC	0.00000				-32.000	12	6	3.F	2.F	-32.000	-167.004	-167.004	15254.
TOTAL	431.069				-114.551					-114.551	-201.276	-201.276	182382.
MAX										416.303			33.457

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 8/1995 14:26:51 SDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG.# 7656 GEN INST BLDG  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR MZ-SYSTEM TOPEKA, KS

MONTH	HOURS				HOURS				HOURS				HOURS			
	COOLING LOAD	HEATING LOAD	COINCIDENT COOL-HEAT LOAD	FLOATING	HEATING AVAIL.	COOLING AVAIL.	FANS ON	FANS ON CYCLE	FANS ON NIGHT	FLOATING WHEN	HEATING LOAD AT COOLING PEAK	ELECTRIC LOAD AT COOLING PEAK	HEATING LOAD AT COOLING PEAK	ELECTRIC LOAD AT COOLING PEAK		
JAN	0	678	0	66	744	0	744	0	0	0	66	-7.188	12.320			
FEB	0	597	0	75	672	0	672	0	0	0	75	-6.182	12.320			
MAR	0	516	0	228	744	0	744	0	0	0	228	-6.226	12.320			
APR	0	374	0	346	720	0	720	0	0	0	346	-5.298	12.320			
MAY	382	189	0	173	360	384	744	0	0	0	173	0.000	12.320			
JUN	711	0	0	9	0	720	720	0	0	0	9	0.000	33.457			
JUL	744	0	0	0	0	744	744	0	0	0	0	0.000	33.457			
AUG	744	0	0	0	0	744	744	0	0	0	0	0.000	33.457			
SEP	635	0	0	85	720	24	720	0	0	0	85	0.000	33.457			
OCT	15	417	0	312	720	0	720	0	0	0	312	0.000	12.320			
NOV	0	509	0	211	720	0	720	0	0	0	211	-15.541	12.320			
DEC	0	670	0	74	744	0	744	0	0	0	74	-99.199	12.320			
ANNUAL	3231	3950	0	1579	5424	3336	8760	0	0	0	1579					

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 8/1995 14:26:51 PDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG.# 7656 GEN INST BLDG  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY 55.058 119.074 28/11	NATURAL-GAS 59.809 253.691 15/ 8
JAN	TOTAL (MBTU) PEAK (KBTU) DY/HR	49.087 119.074 28/ 8	35.007 200.174 3/ 6
FEB	TOTAL (MBTU) PEAK (KBTU) DY/HR	55.815 119.074 14/ 8	16.675 162.628 14/ 6
MAR	TOTAL (MBTU) PEAK (KBTU) DY/HR	51.389 115.073 5/22	3.281 26.910 5/23
APR	TOTAL (MBTU) PEAK (KBTU) DY/HR	69.257 225.344 31/18	1.632 24.593 10/23
MAY	TOTAL (MBTU) PEAK (KBTU) DY/HR	89.919 225.660 28/17	0.000 0.000 30/ 1
JUN	TOTAL (MBTU) PEAK (KBTU) DY/HR	94.144 231.947 13/17	0.000 0.000 31/ 1
JUL	TOTAL (MBTU) PEAK (KBTU) DY/HR	100.745 236.560 24/17	0.000 0.000 31/ 1
AUG	TOTAL (MBTU) PEAK (KBTU) DY/HR	79.510 231.542 7/16	0.000 0.000 30/ 1
SEP	TOTAL (MBTU) PEAK (KBTU) DY/HR	52.319 115.221 26/19	3.628 27.123 19/23
OCT	TOTAL (MBTU) PEAK (KBTU) DY/HR	51.841 117.540 3/ 8	12.000 127.272 13/ 6
NOV	TOTAL (MBTU) PEAK (KBTU) DY/HR	54.306 119.074 30/ 8	49.151 217.215 12/ 6
DEC	TOTAL (MBTU) PEAK (KBTU) DY/HR	803.390 236.560	181.183 253.691

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 8/1995 14:26:51 PDL RUN 1  
 DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG.# 7656 GEN INST BLDG  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
SPACE HEAT	7.50	181.18
SPACE COOL	156.66	0.00
HVAC AUX	384.94	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	203.97	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	50.32	0.00
TOTAL	803.39	181.18

TOTAL SITE ENERGY 984.57 MBTU 87.0 KBTU/SQFT-YR GROSS-AREA 87.1 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 2593.77 MBTU 229.3 KBTU/SQFT-YR GROSS-AREA 229.4 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 2.4  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.





LIGHTING-TYPE = SUS-FLUOR LIGHTING-W/SQFT = 1.5  
 LIGHT-TO-SPACE = 1.0 LIGHTING-SCHEDULE = L\_LITS/EQU  
 EQUIP-SCHEDULE = L\_LITS/EQU EQUIPMENT-W/SQFT = 0.37  
 FURN-FRACTION = 0.3 FURN-WEIGHT = 1.  
 INF-METHOD = NONE ..

E-W HEIGHT = 18.0 WIDTH = 39.0 CONS = EXWALL-1  
 AZIMUTH = 0 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 4.0 WIDTH = 4.0 G-T = 2\_PN\_STD  
 SETBACK = 0.3 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 12.0 WIDTH = 84.0 CONS = EXWALL-1  
 AZIMUTH = 0 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 8.0 WIDTH = 4.0 G-T = 2\_PN\_STD  
 MULTIPLIER = 18.0 SETBACK = 0.3  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

DOOR HEIGHT = 7.5 WIDTH = 3.5 CONS = DOOR-MET  
 SETBACK = 0.3 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

U-W HEIGHT = 15.0 WIDTH = 108.0 CONS = FLOOR ..

ROOF HEIGHT = 15.0 WIDTH = 31.5 CONS = R-MEZZIN  
 TILT = 0 SKY-FORM-FACTOR = 1.0 ..

ROOF HEIGHT = 15.0 WIDTH = 76.5 CONS = ROOF-DIN  
 TILT = 0 SKY-FORM-FACTOR = 1.0 ..

END ..  
 COMPUTE LOADS ..  
 INPUT SYSTEMS ..

\$-----\$  
 \$ E Z - D O E S Y S T E M S I N P U T \$  
 \$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
 LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
 LINE-3 \* DENVER, CO 80227 \*  
 LINE-4 \*RUN #3 ECONOMIZER FOR BLDG.# 7656 \*  
 LINE-5 \*GEN INST BLDG \* ..  
 ABORT ERRORS ..  
 DIAGNOSTIC WARNINGS ..  
 SYSTEMS-REPORT VERIFICATION=(SV-A)

SUMMARY=(SS-A,SS-B,SS-C,SS-K,SS-O)

HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

```

SD_ON      =DAY-SCHEDULE (1,24) (1.) ..
SD_SM_CL_W =DAY-SCHEDULE (1,6) (85.)
              (7,22) (72.)
              (23,24) (85.) ..
SD_WT_HT_W =DAY-SCHEDULE (1,6) (55.)
              (7,22) (74.)
              (23,24) (55.) ..
SD_OFF     =DAY-SCHEDULE (1,24) (0.) ..
SD_SM_HT_W =DAY-SCHEDULE (1,6) (83.)
              (7,22) (70.)
              (23,24) (83.) ..
SD_WT_CL_W =DAY-SCHEDULE (1,6) (57.)
              (7,22) (76.)
              (23,24) (57.) ..
SD_OR%    =DAY-SCHEDULE (1,24) (0.1) ..
SD_WT_HT_F =DAY-SCHEDULE (1,6) (55.)
              (7,15) (74.)
              (16,24) (55.) ..
SD_SM_CL_F =DAY-SCHEDULE (1,6) (85.)
              (7,15) (72.)
              (16,24) (85.) ..
SD_SM_HT_F =DAY-SCHEDULE (1,6) (83.)
              (7,15) (70.)
              (16,24) (83.) ..
SD_WT_CL_F =DAY-SCHEDULE (1,6) (57.)
              (7,15) (76.)
              (16,24) (57.) ..
SD_SM_HT_D =DAY-SCHEDULE (1,24) (83.) ..
SD_WT_CL_D =DAY-SCHEDULE (1,24) (57.) ..
SD_WT_HT_D =DAY-SCHEDULE (1,24) (55.) ..
SD_SM_CL_D =DAY-SCHEDULE (1,24) (85.) ..
SD_FAN_W   =DAY-SCHEDULE (1,6) (0.)
              (7,22) (1.)
              (23,24) (0.) ..
SD_FAN_F   =DAY-SCHEDULE (1,6) (0.)
              (7,15) (1.)
              (16,24) (0.) ..
SD_FAN_D   =DAY-SCHEDULE (1,24) (0.) ..

SW_ON      =WEEK-SCHEDULE (ALL) SD_ON ..

SW_OFF     =WEEK-SCHEDULE (ALL) SD_OFF ..

SW_WT_HT   =WEEK-SCHEDULE (MON) SD_WT_HT_W
              (TUE) SD_WT_HT_W
              (WED) SD_WT_HT_W
              (THU) SD_WT_HT_W
              (FRI) SD_WT_HT_F
              (SAT) SD_WT_HT_D
              (SUN) SD_WT_HT_D
              (HOL) SD_WT_HT_D ..

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SW_SM_CL =WEEK-SCHEDULE (MON) SD_SM_CL_W
                    (TUE) SD_SM_CL_W
                    (WED) SD_SM_CL_W
                    (THU) SD_SM_CL_W
                    (FRI) SD_SM_CL_F
                    (SAT) SD_SM_CL_D
                    (SUN) SD_SM_CL_D
                    (HOL) SD_SM_CL_D ..

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SW_SM_HT =WEEK-SCHEDULE (MON) SD_SM_HT_W
                    (TUE) SD_SM_HT_W
                    (WED) SD_SM_HT_W
                    (THU) SD_SM_HT_W
                    (FRI) SD_SM_HT_F
                    (SAT) SD_SM_HT_D
                    (SUN) SD_SM_HT_D
                    (HOL) SD_SM_HT_D ..

```

```

SW_WT_CL =WEEK-SCHEDULE (MON) SD_WT_CL_W
                    (TUE) SD_WT_CL_W
                    (WED) SD_WT_CL_W
                    (THU) SD_WT_CL_W
                    (FRI) SD_WT_CL_F
                    (SAT) SD_WT_CL_D
                    (SUN) SD_WT_CL_D
                    (HOL) SD_WT_CL_D ..

```

```

SW_OA% =WEEK-SCHEDULE (ALL) SD_OA% ..

```

```

SW_FAN =WEEK-SCHEDULE (MON) SD_FAN_W
                    (TUE) SD_FAN_W
                    (WED) SD_FAN_W
                    (THU) SD_FAN_W
                    (FRI) SD_FAN_F
                    (SAT) SD_FAN_D
                    (SUN) SD_FAN_D
                    (HOL) SD_FAN_D ..

```

```

S_FULL_ON =SCHEDULE THRU DEC 31 SW_ON ..

```

```

S_FULL_OFF =SCHEDULE THRU DEC 31 SW_OFF ..

```

```

$ HEATING SEASON

```

```

S_HE_SCHED =SCHEDULE THRU MAY 15 SW_ON
                    THRU OCT 1 SW_OFF
                    THRU DEC 31 SW_ON ..

```

```

$ COOLING SEASON

```

```

S_CL_SCHED =SCHEDULE THRU MAY 15 SW_OFF
                    THRU OCT 1 SW_ON
                    THRU DEC 31 SW_OFF ..

```

```

$ HEATING SET TEMP

```

```

S_HT_SET_F =SCHEDULE THRU MAY 15 SW_WT_HT

```

THRU OCT 1 SW\_SM\_HT  
THRU DEC 31 SW\_WT\_HT ..

\$ COOLING SET TEMP

S\_CL\_SET\_F =SCHEDULE THRU MAY 15 SW\_WT\_CL  
THRU OCT 1 SW\_SM\_CL  
THRU DEC 31 SW\_WT\_CL ..

S\_OA% =SCHEDULE THRU DEC 31 SW\_OA% ..

S\_HRLY-RPT =SCHEDULE THRU JAN 12 SW\_OFF  
THRU JAN 15 SW\_ON  
THRU AUG 18 SW\_OFF  
THRU AUG 20 SW\_ON  
THRU AUG 22 SW\_OFF  
THRU AUG 23 SW\_ON  
THRU DEC 31 SW\_OFF ..

S\_FAN\_CYC =SCHEDULE THRU DEC 31 SW\_FAN ..

\$ ZONE DESCRIPTION

S-PER\_ZONE =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL  
SIZING-OPTION = FROM-LOADS ..

W-PER\_ZONE =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL  
SIZING-OPTION = FROM-LOADS ..

E-PER\_ZONE =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL  
SIZING-OPTION = FROM-LOADS ..

CORE\_ZONE =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL  
SIZING-OPTION = FROM-LOADS ..

N-PER\_ZONE =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL  
SIZING-OPTION = FROM-LOADS ..

\$ SYSTEM DESCRIPTION

```

MZ-SYSTEM =SYSTEM      SYSTEM-TYPE = MZS
MAX-SUPPLY-T = 120.0  MIN-SUPPLY-T = 55.0
HEATING-SCHEDULE = S_HE_SCHED
COOLING-SCHEDULE = S_CL_SCHED  PREHEAT-T = 0.0
ECONO-LIMIT-T = 70.0  HEAT-CONTROL = COLDEST ←
COOL-CONTROL = WARMEST  SUPPLY-CFM = 14000.
RATED-CFM = 14000.  MIN-OUTSIDE-AIR = 0.1
FAN-SCHEDULE = S_FAN_CYC  SUPPLY-DELTA-T = 2.7
SUPPLY-KW = 0.00088
MOTOR-PLACEMENT = OUTSIDE-AIRFLOW
NIGHT-CYCLE-CTRL = CYCLE-ON-ANY  NIGHT-VENT-DT = 0.0
MIN-CFM-RATIO = 1.0  COOLING-CAPACITY = 402500.
COOL-SH-CAP = 362250.  HEATING-CAPACITY = -1225000.
SIZING-OPTION = COINCIDENT  RETURN-AIR-PATH = DUCT
ZONE-NAMES = (S-PER_ZONE, N-PER_ZONE, W-PER_ZONE,
              E-PER_ZONE, CORE_ZONE) ..

```

\$ HOURLY REPORT DESCRIPTION

```

AHU-BLOCK =REPORT-BLOCK VARIABLE-TYPE = MZ-SYSTEM
              VARIABLE-LIST = (3,5,6,18,18,17) ..
ZONE-N-BLK =REPORT-BLOCK VARIABLE-TYPE = N-PER_ZONE
              VARIABLE-LIST = (17,18,7,31) ..
ZONE-S-BLK =REPORT-BLOCK VARIABLE-TYPE = S-PER_ZONE
              VARIABLE-LIST = (17,18,7,31) ..
HRLY-ZN-N = HOURLY-REPORT REPORT-SCHEDULE = S_HRLY-RPT
              REPORT-BLOCK = (ZONE-N-BLK)
..
HRLY-ZN-S = HOURLY-REPORT REPORT-SCHEDULE = S_HRLY-RPT
              REPORT-BLOCK = (ZONE-S-BLK)
..
HRLY-AHU = HOURLY-REPORT REPORT-SCHEDULE = S_HRLY-RPT
              REPORT-BLOCK = (AHU-BLOCK)
..
END ..
COMPUTE SYSTEMS ..

INPUT PLANT ..

```

```

$-----$
$ E Z - D O E   P L A N T S   I N P U T $
$-----$

```

\$ GENERAL PROJECT DATA

```

TITLE  LINE-1 *      EMC      ENGINEERS      INC.      *
      LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
      LINE-3 *      DENVER,      CO      80227      *

      LINE-4 *RUN #3 ECONOMIZER FOR BLDG.# 7656      *
      LINE-5 *GEN INST BLDG      * ..

```

ABORT ERRORS ..

EMC ENGINEERS INC. DOE-2.1D 5/ 8/1995 15:42:13 SDL RUN 1  
 DENVER, CO 80227 EZDOE - ELITE SOFTWARE DEVELOPMENT INC GEN INST BLDG  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR RUN #3 ECONOMIZER FOR BLDG.# 7656 TOPEKA, KS  
 MZ-SYSTEM

MONTH	C O O L I N G				H E A T I N G				E L E C					
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	TRICAL ENERGY (KWH)	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC- TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)		
JAN	0.00000				-60.628	17	7	27.F	24.F	-590.278	13687.	33.457		
FEB	0.00000				-46.420	28	7	14.F	12.F	-656.385	12428.	33.457		
MAR	0.00000				-39.813	14	7	16.F	14.F	-603.191	14934.	33.457		
APR	0.00000				-16.760	4	7	32.F	30.F	-446.584	14699.	33.457		
MAY	28.36173	31	7	75.F	69.F	9	7	43.F	43.F	-408.656	15129.	33.457		
JUN	78.24092	20	7	75.F	71.F			0.000	0.000	0.000	14840.	33.457		
JUL	88.67802	25	7	69.F	66.F			0.000	0.000	0.000	13534.	33.457		
AUG	99.48522	15	7	68.F	67.F			0.000	0.000	0.000	15008.	33.457		
SEP	56.37944	6	7	75.F	71.F			0.000	0.000	0.000	14675.	33.457		
OCT	0.05201	1	17	85.F	68.F			-15.255	31	7	43.F	39.F	14813.	33.457
NOV	0.00000				-33.655	28	7	28.F	26.F	-536.266	13851.	33.457		
DEC	0.00000				-57.997	12	7	2.F	1.F	-670.260	13677.	33.457		
TOTAL	351.197				-274.992					-670.260	171260.	33.457		
MAX														

EMC ENGINEERS INC. DOE-2.1D 5/ 8/1995 15:42:13 SDL RUN 1  
 DENVER, CO 80227 EZDOE - ELITE SOFTWARE DEVELOPMENT INC GEN INST BLDG  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR RUN #3 ECONOMIZER FOR BLDG.# 7656 TOPEKA, KS  
 MZ-SYSTEM

MONTH	H O U R S				H O U R S				H O U R S				C O I N C I D E N T	
	COOLING LOAD	HEATING LOAD	COOL-HEAT LOAD	FLOATING	HEATING AVAIL.	COOLING AVAIL.	FANS ON	FANS ON	FANS ON	FANS ON	FANS ON	FANS ON	HEATING LOAD AT PEAK (KBTU/HR)	ELECTRIC LOAD AT PEAK (KW)
JAN	0	572	0	172	744	0	604	296	0	0	32	0.000	12.320	
FEB	0	512	0	160	672	0	555	279	0	0	43	0.000	12.320	
MAR	0	533	0	211	744	0	652	312	0	0	119	0.000	12.320	
APR	0	304	0	416	720	0	699	398	0	0	395	0.000	12.320	
MAY	212	126	0	406	360	384	721	413	0	0	217	0.000	22.888	
JUN	454	0	0	266	0	720	671	347	0	0	158	0.000	22.888	
JUL	473	0	0	271	0	744	631	346	0	0	152	0.000	22.888	
AUG	506	0	0	238	0	744	658	318	0	0	367	0.000	22.888	
SEP	330	0	0	390	0	720	697	396	0	0	424	0.000	22.888	
OCT	5	293	0	446	720	24	722	430	0	0	144	0.000	12.320	
NOV	0	487	0	233	720	0	631	332	0	0	30	0.000	12.320	
DEC	0	586	0	158	744	0	616	315	0	0	-62.559	12.320		
ANNUAL 1980		3413	0	3367	5424	3336	7857	4182	0	0	2464			

BMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 8/1995 15:42:13 PDL RUN 1  
 DENVER, CO 80227 RUN #3 ECONOMIZER FOR BLDG.# 7656 GEN INST BLDG  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY 52.131 130.348 31/11	NATURAL-GAS 99.344 760.081 17/ 7
JAN	TOTAL (MBTU) PEAK (KBTU) DY/HR	46.713 130.348 28/11	76.815 830.242 28/ 7
FEB	TOTAL (MBTU) PEAK (KBTU) DY/HR	54.853 130.348 31/ 8	66.918 773.887 14/ 7
MAR	TOTAL (MBTU) PEAK (KBTU) DY/HR	52.006 130.348 25/ 8	29.193 603.149 4/ 7
APR	TOTAL (MBTU) PEAK (KBTU) DY/HR	63.498 249.095 31/18	8.197 560.717 9/ 7
MAY	TOTAL (MBTU) PEAK (KBTU) DY/HR	81.345 250.101 27/17	0.000 0.000 30/ 1
JUN	TOTAL (MBTU) PEAK (KBTU) DY/HR	80.890 247.989 13/17	0.000 0.000 31/ 1
JUL	TOTAL (MBTU) PEAK (KBTU) DY/HR	91.527 264.051 22/16	0.000 0.000 31/ 1
AUG	TOTAL (MBTU) PEAK (KBTU) DY/HR	71.837 258.145 6/16	0.000 0.000 30/ 1
SEP	TOTAL (MBTU) PEAK (KBTU) DY/HR	52.331 130.348 31/10	26.653 644.574 31/ 7
OCT	TOTAL (MBTU) PEAK (KBTU) DY/HR	50.676 130.348 30/ 9	57.200 701.804 28/ 7
NOV	TOTAL (MBTU) PEAK (KBTU) DY/HR	51.941 130.348 30/10	95.454 844.805 12/ 7
DEC	TOTAL (MBTU) PEAK (KBTU) DY/HR		
	ONE YEAR USE/PEAK	749.748 264.051	459.774 844.805

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 8/1995 15:42:13 PDL RUN 1  
 DENVER, CO 80227 RUN #3 ECONOMIZER FOR BLDG.# 7656 GEN INST BLDG  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
SPACE HEAT	21.97	459.77
SPACE COOL	127.11	0.00
HVAC AUX	346.39	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	203.97	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	50.32	0.00
TOTAL	749.76	459.77

TOTAL SITE ENERGY 1209.52 MBTU 106.9 KBTU/SQFT-YR GROSS-AREA 107.0 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 2711.27 MBTU 239.6 KBTU/SQFT-YR GROSS-AREA 239.8 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 15.7  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.



LIGHTING-TYPE = SUS-FLUOR LIGHTING-W/SQFT = 1.5  
 LIGHT-TO-SPACE = 1.0 LIGHTING-SCHEDULE = L\_LITS/EQU  
 EQUIP-SCHEDULE = L\_LITS/EQU EQUIPMENT-W/SQFT = 0.37  
 FURN-FRACTION = 0.3 FURN-WEIGHT = 1.  
 INF-METHOD = NONE ..

E-W HEIGHT = 18.0 WIDTH = 39.0 CONS = EXWALL-1  
 AZIMUTH = 0 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 4.0 WIDTH = 4.0 G-T = 2\_PN\_STD  
 SETBACK = 0.3 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 12.0 WIDTH = 84.0 CONS = EXWALL-1  
 AZIMUTH = 0 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 8.0 WIDTH = 4.0 G-T = 2\_PN\_STD  
 MULTIPLIER = 18.0 SETBACK = 0.3  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

DOOR HEIGHT = 7.5 WIDTH = 3.5 CONS = DOOR-MET  
 SETBACK = 0.3 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

U-W HEIGHT = 15.0 WIDTH = 108.0 CONS = FLOOR ..

ROOF HEIGHT = 15.0 WIDTH = 31.5 CONS = R-MEZZIN  
 TILT = 0 SKY-FORM-FACTOR = 1.0 ..

ROOF HEIGHT = 15.0 WIDTH = 76.5 CONS = ROOF-DIN  
 TILT = 0 SKY-FORM-FACTOR = 1.0 ..

END ..  
 COMPUTE LOADS ..  
 INPUT SYSTEMS ..

\$-----\$  
 \$ E Z - D O E S Y S T E M S I N P U T \$  
 \$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
 LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
 LINE-3 \* DENVER, CO 80227 \*  
 LINE-4 \*RUN #4 NIGHT INFILTRATION BLDG.# 7656 \*  
 LINE-5 \*GEN INST BLDG \* ..  
 ABORT ERRORS ..  
 DIAGNOSTIC WARNINGS ..  
 SYSTEMS-REPORT VERIFICATION=(SV-A)

SUMMARY=(SS-A,SS-B,SS-C,SS-K,SS-O)

HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

SD\_ON =DAY-SCHEDULE (1,24) (1.) ..  
SD\_SM\_CL =DAY-SCHEDULE (1,24) (72.) ..  
SD\_WT\_HT =DAY-SCHEDULE (1,24) (74.) ..  
SD\_OFF =DAY-SCHEDULE (1,24) (0.) ..  
SD\_SM\_HT =DAY-SCHEDULE (1,24) (71.8) ..  
SD\_WT\_CL =DAY-SCHEDULE (1,13) (74.2)  
(14) (74.27)  
(15,24) (74.2) ..

SD\_OA%\_W =DAY-SCHEDULE (1,6) (0.)  
(7,22) (0.1)  
(23,24) (0.) ..  
SD\_OA%\_F =DAY-SCHEDULE (1,6) (0.)  
(7,15) (0.1)  
(16,24) (0.) ..  
SD\_OA%\_D =DAY-SCHEDULE (1,24) (0.) ..



SW\_ON =WEEK-SCHEDULE (ALL) SD\_ON ..  
SW\_OFF =WEEK-SCHEDULE (ALL) SD\_OFF ..  
SW\_WT\_HT =WEEK-SCHEDULE (ALL) SD\_WT\_HT ..  
SW\_SM\_CL =WEEK-SCHEDULE (ALL) SD\_SM\_CL ..  
SW\_SM\_HT =WEEK-SCHEDULE (ALL) SD\_SM\_HT ..  
SW\_WT\_CL =WEEK-SCHEDULE (ALL) SD\_WT\_CL ..  
SW\_OA% =WEEK-SCHEDULE (MON) SD\_OA%\_W  
(TUE) SD\_OA%\_W  
(WED) SD\_OA%\_W  
(THU) SD\_OA%\_W  
(FRI) SD\_OA%\_F  
(SAT) SD\_OA%\_D  
(SUN) SD\_OA%\_D  
(HOL) SD\_OA%\_D ..

S\_FULL\_ON =SCHEDULE THRU DEC 31 SW\_ON ..

S\_FULL\_OFF =SCHEDULE THRU DEC 31 SW\_OFF ..

\$ HEATING SEASON

S\_HE\_SCHED =SCHEDULE THRU MAY 15 SW\_ON  
THRU OCT 1 SW\_OFF  
THRU DEC 31 SW\_ON ..

\$ COOLING SEASON

S\_CL\_SCHED =SCHEDULE THRU MAY 15 SW\_OFF  
THRU OCT 1 SW\_ON  
THRU DEC 31 SW\_OFF ..

## \$ HEATING SET TEMP

S\_HT\_SET\_F =SCHEDULE THRU MAY 15 SW\_WT\_HT  
THRU OCT 1 SW\_SM\_HT  
THRU DEC 31 SW\_WT\_HT ..

## \$ COOLING SET TEMP

S\_CL\_SET\_F =SCHEDULE THRU MAY 15 SW\_WT\_CL  
THRU OCT 1 SW\_SM\_CL  
THRU DEC 31 SW\_WT\_CL ..

S\_OA‡ =SCHEDULE THRU DEC 31 SW\_OA‡ ..

S\_HRLY-RPT =SCHEDULE THRU JAN 14 SW\_OFF  
THRU JAN 15 SW\_ON  
THRU AUG 22 SW\_OFF  
THRU AUG 23 SW\_ON  
THRU DEC 31 SW\_OFF ..

## \$ ZONE DESCRIPTION

S-PER\_ZONE =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

W-PER\_ZONE =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

E-PER\_ZONE =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

CORE\_ZONE =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

N-PER\_ZONE =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

## \$ SYSTEM DESCRIPTION

```

MZ-SYSTEM =SYSTEM SYSTEM-TYPE = MZS
MAX-SUPPLY-T = 120.0 MIN-SUPPLY-T = 55.0
HEATING-SCHEDULE = S_HE_SCHD
COOLING-SCHEDULE = S_CL_SCHD PREHEAT-T = 0.0
OA-CONTROL = FIXED SUPPLY-CFM = 14000.
RATED-CFM = 14000. MIN-AIR-SCH = S_OA% ←
MAX-OA-FRACTION = 0.1 SUPPLY-DELTA-T = 2.7
SUPPLY-KW = 0.00088
MOTOR-PLACEMENT = OUTSIDE-AIRFLOW
NIGHT-CYCLE-CTRL = STAY-OFF NIGHT-VENT-DT = 0.0
MIN-CFM-RATIO = 1.0 COOLING-CAPACITY = 402500.
COOL-SH-CAP = 362250. HEATING-CAPACITY = -1225000.
SIZING-OPTION = COINCIDENT RETURN-AIR-PATH = DUCT
ZONE-NAMES = (S-PER_ZONE, N-PER_ZONE, W-PER_ZONE,
              E-PER_ZONE, CORE_ZONE) ..

```

\$ HOURLY REPORT DESCRIPTION

```

AHU-BLOCK =REPORT-BLOCK VARIABLE-TYPE = MZ-SYSTEM
          VARIABLE-LIST = (3,5,6,18,18,17) ..
ZONE-N-BLK =REPORT-BLOCK VARIABLE-TYPE = N-PER_ZONE
          VARIABLE-LIST = (17,18,7,31) ..
ZONE-S-BLK =REPORT-BLOCK VARIABLE-TYPE = S-PER_ZONE
          VARIABLE-LIST = (17,18,7,31) ..
HRLY-ZN-N = HOURLY-REPORT REPORT-SCHEDULE = S_HRLY-RPT
          REPORT-BLOCK = (ZONE-N-BLK)
..
HRLY-ZN-S = HOURLY-REPORT REPORT-SCHEDULE = S_HRLY-RPT
          REPORT-BLOCK = (ZONE-S-BLK)
..
HRLY-AHU = HOURLY-REPORT REPORT-SCHEDULE = S_HRLY-RPT
          REPORT-BLOCK = (AHU-BLOCK)
..
END ..
COMPUTE SYSTEMS ..

INPUT PLANT ..

```

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$-----$
$ E Z - D O E P L A N T S I N P U T $
$-----$

```

\$ GENERAL PROJECT DATA

```

TITLE LINE-1 * EMC ENGINEERS INC. *
LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
LINE-3 * DENVER, CO 80227 *

LINE-4 *RUN #4 NIGHT INFILTRATION BLDG.# 7656 *
LINE-5 *GEN INST BLDG * ..

```

```

ABORT ERRORS ..
DIAGNOSTIC WARNINGS ..
PLANT-REPORT VERIFICATION=(PV-A)

```

EMC ENGINEERS INC. DOE-2.1D 5/ 8/1995 16: 7:20 SDL RUN 1  
 DENVER, CO 80227 EZDOE - ELITE SOFTWARE DEVELOPMENT INC  
 RUN #4 NIGHT INFILTRATION BLDG.# 7656 GEN INST BLDG  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR TOPEKA, KS  
 MZ-SYSTEM

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC-TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-18.525	28	-1.1 F	-3.1 F	-147.161	15412.	33.457
FEB	0.00000				-7.299	3	-5.1 F	-6.1 F	-133.682	13870.	33.457
MAR	0.00000				-2.156	3	15.1 F	12.1 F	-58.935	16067.	33.457
APR	0.00000				-1.068	15	30.1 F	28.1 F	-21.242	14958.	33.457
MAY	48.76165	16	62.1 F	59.1 F	-0.535	11	50.1 F	49.1 F	-17.334	15412.	33.457
JUN	97.44159	27	89.1 F	77.1 F	0.000				0.000	15444.	33.457
JUL	105.17020	13	95.1 F	79.1 F	0.000				0.000	14926.	33.457
AUG	112.84464	24	95.1 F	77.1 F	0.000				0.000	16067.	33.457
SEP	79.91335	7	92.1 F	75.1 F	0.000				0.000	14958.	33.457
OCT	1.29022	1	85.1 F	68.1 F	-1.288	2	64.1 F	59.1 F	-32.181	15084.	33.457
NOV	0.00000				-1.320	2	19.1 F	17.1 F	-22.443	14947.	33.457
DEC	0.00000				-14.232	12	2.1 F	1.1 F	-157.929	15254.	33.457
TOTAL	445.422				-46.424				-157.929	182382.	33.457
MAX									535.740		

EMC ENGINEERS INC. DOE-2.1D 5/ 8/1995 16: 7:20 SDL RUN 1  
 DENVER, CO 80227 EZDOE - ELITE SOFTWARE DEVELOPMENT INC  
 RUN #4 NIGHT INFILTRATION BLDG.# 7656 GEN INST BLDG  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR TOPEKA, KS  
 MZ-SYSTEM

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING LOAD	HEATING LOAD	COINCIDENT COOL-HEAT LOAD	FLOATING HOURS	HOURS COOLING AVAIL.	HOURS HEATING AVAIL.	HOURS COOLING AVAIL.	HOURS HEATING AVAIL.	HOURS FANS ON CYCLE	HOURS NIGHT VENTING	HOURS FLOATING WHEN FANS ON
JAN	0	744	0	0	0	744	0	0	0	0	0
FEB	0	672	0	0	0	672	0	0	0	0	0
MAR	0	744	0	0	0	744	0	0	0	0	0
APR	0	720	0	0	0	720	0	0	0	0	0
MAY	384	358	0	2	384	744	0	0	0	2	0
JUN	720	0	0	0	720	744	0	0	0	0	0
JUL	744	0	0	0	744	744	0	0	0	0	0
AUG	744	0	0	0	744	744	0	0	0	0	0
SEP	716	0	0	4	720	744	0	0	0	4	0
OCT	24	720	0	0	24	744	0	0	0	0	0
NOV	0	720	0	0	0	720	0	0	0	0	0
DEC	0	744	0	0	0	744	0	0	0	0	0
ANNUAL	3332	5422	0	6	3336	8760	0	0	0	6	6

EMC ENGINEERS INC. 80227 EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 8/1995 16: 7:20 PDL RUN 1  
 DENVER, CO MONTHLY PEAK AND TOTAL ENERGY USE RUN #4 NIGHT INFILTRATION BLDG.# 7656 GEN INST BLDG TOPEKA, KS  
 REPORT- PS-B

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY 54.114 118.032 31/ 8 48.189 118.032 28/ 8 55.349 118.032 4/ 8 51.461 115.030 5/22 73.272 241.117 16/16 94.318 241.723 28/17 95.939 248.509 13/17 104.101 253.222 24/17 86.596 247.773 7/16 52.706 115.179 26/20 51.447 115.521 10/ 8 53.352 118.032 30/14	NATURAL-GAS 29.518 187.704 28/ 7 12.920 173.290 3/ 7 5.097 89.249 3/ 8 3.293 36.862 15/ 7 1.644 30.477 11/ 7 0.000 0.000 30/ 1 0.000 0.000 31/ 1 0.000 0.000 31/ 1 0.000 0.000 30/ 1 3.653 54.739 2/ 2 3.706 38.824 2/ 7 23.342 199.056 12/ 7
JAN	TOTAL (MBTU) PEAK (KBTU) DY/HR	54.114 118.032 31/ 8	29.518 187.704 28/ 7
FEB	TOTAL (MBTU) PEAK (KBTU) DY/HR	48.189 118.032 28/ 8	12.920 173.290 3/ 7
MAR	TOTAL (MBTU) PEAK (KBTU) DY/HR	55.349 118.032 4/ 8	5.097 89.249 3/ 8
APR	TOTAL (MBTU) PEAK (KBTU) DY/HR	51.461 115.030 5/22	3.293 36.862 15/ 7
MAY	TOTAL (MBTU) PEAK (KBTU) DY/HR	73.272 241.117 16/16	1.644 30.477 11/ 7
JUN	TOTAL (MBTU) PEAK (KBTU) DY/HR	94.318 241.723 28/17	0.000 0.000 30/ 1
JUL	TOTAL (MBTU) PEAK (KBTU) DY/HR	95.939 248.509 13/17	0.000 0.000 31/ 1
AUG	TOTAL (MBTU) PEAK (KBTU) DY/HR	104.101 253.222 24/17	0.000 0.000 31/ 1
SEP	TOTAL (MBTU) PEAK (KBTU) DY/HR	86.596 247.773 7/16	0.000 0.000 30/ 1
OCT	TOTAL (MBTU) PEAK (KBTU) DY/HR	52.706 115.179 26/20	3.653 54.739 2/ 2
NOV	TOTAL (MBTU) PEAK (KBTU) DY/HR	51.447 115.521 10/ 8	3.706 38.824 2/ 7
DEC	TOTAL (MBTU) PEAK (KBTU) DY/HR	53.352 118.032 30/14	23.342 199.056 12/ 7
	ONE YEAR USE/PEAK	820.844 253.222	83.173 199.056

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 8/1995 16: 7:20 PDL RUN 1  
 DENVER, CO 80227 RUN #4 NIGHT INFILTRATION BLDG.# 7656 GEN INST BLDG TOPEKA, KS  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
SPACE HEAT	3.89	83.17
SPACE COOL	172.72	0.00
HVAC AUX	389.95	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	203.97	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	50.32	0.00
TOTAL	820.85	83.17

TOTAL SITE ENERGY 904.02 MBTU 79.9 KBTU/SQFT-YR GROSS-AREA 79.9 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 2548.17 MBTU 225.2 KBTU/SQFT-YR GROSS-AREA 225.3 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 0.4  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.





LIGHTING-TYPE = SUS-FLUOR LIGHTING-W/SQFT = 1.5  
 LIGHT-TO-SPACE = 1.0 LIGHTING-SCHEDULE = L\_LITS/EQU  
 EQUIP-SCHEDULE = L\_LITS/EQU EQUIPMENT-W/SQFT = 0.37  
 FURN-FRACTION = 0.3 FURN-WEIGHT = 1.  
 INF-METHOD = NONE ..

E-W HEIGHT = 18.0 WIDTH = 39.0 CONS = EXWALL-1  
 AZIMUTH = 0 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 4.0 WIDTH = 4.0 G-T = 2\_PN\_STD  
 SETBACK = 0.3 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

E-W HEIGHT = 12.0 WIDTH = 84.0 CONS = EXWALL-1  
 AZIMUTH = 0 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

WINDOW HEIGHT = 8.0 WIDTH = 4.0 G-T = 2\_PN\_STD  
 MULTIPLIER = 18.0 SETBACK = 0.3  
 SKY-FORM-FACTOR = 0.5 GND-FORM-FACTOR = 0.5 ..

DOOR HEIGHT = 7.5 WIDTH = 3.5 CONS = DOOR-MET  
 SETBACK = 0.3 SKY-FORM-FACTOR = 0.5  
 GND-FORM-FACTOR = 0.5 ..

U-W HEIGHT = 15.0 WIDTH = 108.0 CONS = FLOOR ..

ROOF HEIGHT = 15.0 WIDTH = 31.5 CONS = R-MEZZIN  
 TILT = 0 SKY-FORM-FACTOR = 1.0 ..

ROOF HEIGHT = 15.0 WIDTH = 76.5 CONS = ROOF-DIN  
 TILT = 0 SKY-FORM-FACTOR = 1.0 ..

END ..

COMPUTE LOADS ..

INPUT SYSTEMS ..

\$-----\$  
 \$ E Z - D O E S Y S T E M S I N P U T \$  
 \$-----\$

\$ GENERAL PROJECT DATA

TITLE LINE-1 \* EMC ENGINEERS INC. \*  
 LINE-2 \*EZDOE - ELITE SOFTWARE DEVELOPMENT INC\*  
 LINE-3 \* DENVER, CO 80227 \*

LINE-4 \*RUN #5 DAY INFILTRATION FOR BLDG.# 7656 \*

LINE-5 \*GEN INST BLDG \* ..

ABORT ERRORS ..  
 DIAGNOSTIC WARNINGS ..  
 SYSTEMS-REPORT VERIFICATION=(SV-A)

SUMMARY=(SS-A,SS-B,SS-C,SS-K,SS-O)  
HOURLY-DATA-SAVE = YES ..

\$ SCHEDULES

```

SD_ON      =DAY-SCHEDULE (1,24) (1.) ..
SD_SM_CL   =DAY-SCHEDULE (1,24) (72.) ..
SD_WT_HT   =DAY-SCHEDULE (1,24) (74.) ..
SD_OFF     =DAY-SCHEDULE (1,24) (0.) ..
SD_SM_HT   =DAY-SCHEDULE (1,24) (71.8) ..
SD_WT_CL   =DAY-SCHEDULE (1,13) (74.2)
            (14) (74.27)
            (15,24) (74.2) ..
SD_OA%_W   =DAY-SCHEDULE (1,6) (0.1)
            (7,22) (0.)
            (23,24) (0.1) ..
SD_OA%_F   =DAY-SCHEDULE (1,6) (0.1)
            (7,15) (0.)
            (16,24) (0.1) ..
SD_OA%_D   =DAY-SCHEDULE (1,24) (0.1) ..

SW_ON      =WEEK-SCHEDULE (ALL) SD_ON ..
SW_OFF     =WEEK-SCHEDULE (ALL) SD_OFF ..
SW_WT_HT   =WEEK-SCHEDULE (ALL) SD_WT_HT ..
SW_SM_CL   =WEEK-SCHEDULE (ALL) SD_SM_CL ..
SW_SM_HT   =WEEK-SCHEDULE (ALL) SD_SM_HT ..
SW_WT_CL   =WEEK-SCHEDULE (ALL) SD_WT_CL ..

SW_OA%     =WEEK-SCHEDULE (MON) SD_OA%_W
            (TUE) SD_OA%_W
            (WED) SD_OA%_W
            (THU) SD_OA%_W
            (FRI) SD_OA%_F
            (SAT) SD_OA%_D
            (SUN) SD_OA%_D
            (HOL) SD_OA%_D ..

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S_FULL_ON  =SCHEDULE THRU DEC 31 SW_ON ..
S_FULL_OFF =SCHEDULE THRU DEC 31 SW_OFF ..

```

\$ HEATING SEASON

```

S_HE_SCHED =SCHEDULE THRU MAY 15 SW_ON
            THRU OCT 1 SW_OFF
            THRU DEC 31 SW_ON ..

```

\$ COOLING SEASON

```

S_CL_SCHED =SCHEDULE THRU MAY 15 SW_OFF
            THRU OCT 1 SW_ON
            THRU DEC 31 SW_OFF ..

```

## \$ HEATING SET TEMP

S\_HT\_SET\_F =SCHEDULE THRU MAY 15 SW\_WT\_HT  
THRU OCT 1 SW\_SM\_HT  
THRU DEC 31 SW\_WT\_HT ..

## \$ COOLING SET TEMP

S\_CL\_SET\_F =SCHEDULE THRU MAY 15 SW\_WT\_CL  
THRU OCT 1 SW\_SM\_CL  
THRU DEC 31 SW\_WT\_CL ..

S\_OA% =SCHEDULE THRU DEC 31 SW\_OA% ..

S\_HRLY-RPT =SCHEDULE THRU JAN 14 SW\_OFF  
THRU JAN 15 SW\_ON  
THRU AUG 22 SW\_OFF  
THRU AUG 23 SW\_ON  
THRU DEC 31 SW\_OFF ..

## \$ ZONE DESCRIPTION

S-PER\_ZONE =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

W-PER\_ZONE =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

E-PER\_ZONE =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

CORE\_ZONE =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

N-PER\_ZONE =ZONE DESIGN-HEAT-T = 74.0 DESIGN-COOL-T = 72.0  
HEAT-TEMP-SCH = S\_HT\_SET\_F COOL-TEMP-SCH = S\_CL\_SET\_F  
ZONE-TYPE = CONDITIONED  
THERMOSTAT-TYPE = PROPORTIONAL THROTTLING-RANGE = 0.2  
SIZING-OPTION = FROM-LOADS ..

## \$ SYSTEM DESCRIPTION

```

MZ-SYSTEM =SYSTEM      SYSTEM-TYPE = MZS
                        MAX-SUPPLY-T = 120.0  MIN-SUPPLY-T = 55.0
                        HEATING-SCHEDULE = S_HE_SCHED
                        COOLING-SCHEDULE = S_CL_SCHED  PREHEAT-T = 0.0
                        OA-CONTROL = FIXED  SUPPLY-CFM = 14000.
                        RATED-CFM = 14000.  MIN-AIR-SCH = S OA ←
                        MAX-OA-FRACTION = 0.1  SUPPLY-DELTA-T = 2.7
                        SUPPLY-KW = 0.00088
                        MOTOR-PLACEMENT = OUTSIDE-AIRFLOW
                        NIGHT-CYCLE-CTRL = STAY-OFF  NIGHT-VENT-DT = 0.0
                        MIN-CFM-RATIO = 1.0  COOLING-CAPACITY = 402500.
                        COOL-SH-CAP = 362250.  HEATING-CAPACITY = -1225000.
                        SIZING-OPTION = COINCIDENT  RETURN-AIR-PATH = DUCT
                        ZONE-NAMES = (S-PER_ZONE, N-PER_ZONE, W-PER_ZONE,
                                      E-PER_ZONE, CORE_ZONE) ..

```

\$ HOURLY REPORT DESCRIPTION

```

AHU-BLOCK =REPORT-BLOCK VARIABLE-TYPE = MZ-SYSTEM
            VARIABLE-LIST = (3,5,6,18,18,17) ..
ZONE-N-BLK =REPORT-BLOCK VARIABLE-TYPE = N-PER_ZONE
            VARIABLE-LIST = (17,18,7,31) ..
ZONE-S-BLK =REPORT-BLOCK VARIABLE-TYPE = S-PER_ZONE
            VARIABLE-LIST = (17,18,7,31) ..
HRLY-ZN-N  = HOURLY-REPORT REPORT-SCHEDULE = S_HRLY-RPT
            REPORT-BLOCK = (ZONE-N-BLK)
..
HRLY-ZN-S  = HOURLY-REPORT REPORT-SCHEDULE = S_HRLY-RPT
            REPORT-BLOCK = (ZONE-S-BLK)
..
HRLY-AHU   = HOURLY-REPORT REPORT-SCHEDULE = S_HRLY-RPT
            REPORT-BLOCK = (AHU-BLOCK)
..
END ..
COMPUTE SYSTEMS ..

```

INPUT PLANT ..

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$-----$
$ E Z - D O E   P L A N T S   I N P U T $
$-----$

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\$ GENERAL PROJECT DATA

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TITLE  LINE-1 *   EMC      ENGINEERS      INC.      *
        LINE-2 *EZDOE - ELITE SOFTWARE DEVELOPMENT INC*
        LINE-3 *   DENVER,      CO      80227      *

        LINE-4 *RUN #5 DAY INFILTRATION FOR BLDG.# 7656 *
        LINE-5 *GEN INST BLDG                               * ..

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ABORT      ERRORS ..
DIAGNOSTIC WARNINGS ..
PLANT-REPORT VERIFICATION=(PV-A)

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EMC ENGINEERS INC. EZZOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 8/1995 16:15: 2 SDL RUN 1  
 DENVER, CO 80227 RUN #5 DAY INFILTRATION FOR BLDG.# 7656 GEN INST BLDG  
 REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR TOPEKA, KS  
 MZ-SYSTEM

MONTH	C O O L I N G				H E A T I N G				E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC-TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000				-31.318	15	9	-5.F	-6.F	15412.	33.457
FEB	0.00000				-16.950	28	6	12.F	11.F	13870.	33.457
MAR	0.00000				-7.857	6	7	19.F	18.F	16067.	33.457
APR	0.00000				-1.946	14	23	41.F	35.F	14958.	33.457
MAY	46.30294	16	2	62.F	59.F	4	23	49.F	47.F	15412.	33.457
JUN	97.04712	28	18	89.F	76.F					15444.	33.457
JUL	109.95313	13	18	90.F	78.F					14926.	33.457
AUG	112.14284	11	17	98.F	71.F					16067.	33.457
SEP	75.37170	17	17	92.F	75.F					14958.	33.457
OCT	1.19131	1	17	85.F	68.F	2	2	64.F	59.F	15084.	33.457
NOV	0.00000				-5.824	13	6	25.F	24.F	14947.	33.457
DEC	0.00000				-23.534	12	6	3.F	2.F	15254.	33.457
TOTAL	442.008				-90.643					182382.	33.457
MAX									-195.836		

EMC ENGINEERS INC. EZZOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 8/1995 16:15: 2 SDL RUN 1  
 DENVER, CO 80227 RUN #5 DAY INFILTRATION FOR BLDG.# 7656 GEN INST BLDG  
 REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR TOPEKA, KS  
 MZ-SYSTEM

MONTH	HOURS				HOURS				HOURS				HOURS			
	COOLING LOAD	HEATING LOAD	COINCIDENT COOL-HEAT LOAD	FLOATING	HEATING AVAIL.	COOLING AVAIL.	FANS ON	FANS ON CYCLE	FANS ON	NIGHT VENTING	FLOATING WHEN FANS ON	HEATING COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)	HEATING COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)	
JAN	0	0	0	0	744	0	744	0	0	0	0	-11.934	12.320	-11.934	12.320	
FEB	0	0	0	0	672	0	672	0	0	0	0	-10.760	12.320	-10.760	12.320	
MAR	0	0	0	0	744	0	744	0	0	0	0	-11.299	12.320	-11.299	12.320	
APR	0	0	0	0	720	0	720	0	0	0	0	-5.838	12.320	-5.838	12.320	
MAY	384	351	0	9	360	384	744	0	0	9	0	0.000	12.320	0.000	12.320	
JUN	720	0	0	0	0	720	744	0	0	0	0	0.000	33.457	0.000	33.457	
JUL	744	0	0	0	0	744	744	0	0	0	0	0.000	33.457	0.000	33.457	
AUG	744	0	0	0	0	744	744	0	0	0	0	0.000	33.457	0.000	33.457	
SEP	684	0	0	36	720	720	744	0	0	36	0	0.000	12.320	0.000	12.320	
OCT	16	720	0	8	720	24	744	0	0	8	0	0.000	12.320	0.000	12.320	
NOV	0	720	0	0	720	0	744	0	0	0	0	-12.346	12.320	-12.346	12.320	
DEC	0	744	0	0	744	0	744	0	0	0	0	-109.211	12.320	-109.211	12.320	
ANNUAL	3292	5415	0	53	5424	3336	8760	0	0	53						

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 8/1995 16:15: 2 PDL RUN 1  
 DENVER, CO 80227 RUN #5 DAY INFILTRATION FOR BLDG.# 7656 GEN INST BLDG  
 REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY- TOTAL (MBTU) PEAK (KBTU) DY/HR	ELECTRICITY 54.503 117.563 28/ 8	NATURAL-GAS 46.379 246.834 15/ 9
JAN	TOTAL (MBTU) PEAK (KBTU) DY/HR	48.735 116.255 28/ 8	27.101 198.996 28/ 6
FEB	TOTAL (MBTU) PEAK (KBTU) DY/HR	55.781 115.598 14/ 8	14.046 172.109 6/ 7
MAR	TOTAL (MBTU) PEAK (KBTU) DY/HR	51.609 114.746 4/ 8	5.100 57.816 14/23
APR	TOTAL (MBTU) PEAK (KBTU) DY/HR	70.676 218.005 16/16	2.477 53.410 4/23
MAY	TOTAL (MBTU) PEAK (KBTU) DY/HR	90.046 213.734 28/17	0.000 0.000 30/ 1
JUN	TOTAL (MBTU) PEAK (KBTU) DY/HR	93.167 217.082 13/17	0.000 0.000 31/ 1
JUL	TOTAL (MBTU) PEAK (KBTU) DY/HR	99.799 226.848 11/16	0.000 0.000 31/ 1
AUG	TOTAL (MBTU) PEAK (KBTU) DY/HR	81.437 219.574 6/17	0.000 0.000 30/ 1
SEP	TOTAL (MBTU) PEAK (KBTU) DY/HR	52.650 114.854 26/20	5.633 72.205 2/ 2
OCT	TOTAL (MBTU) PEAK (KBTU) DY/HR	51.867 114.952 28/ 8	11.198 136.490 13/ 6
NOV	TOTAL (MBTU) PEAK (KBTU) DY/HR	53.741 118.069 12/ 8	36.238 230.413 12/ 6
DEC	TOTAL (MBTU) PEAK (KBTU) DY/HR	804.011 226.848	148.171 246.834

EMC ENGINEERS INC. EDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 8/1995 16:15: 2 PDL RUN 1  
 DENVER, CO 80227 RUN #5 DAY INFILTRATION FOR BLDG.# 7656 GEN INST BLDG  
 REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
SPACE HEAT	6.06	148.17
SPACE COOL	157.65	0.00
HVAC AUX	386.01	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	203.97	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	50.32	0.00
TOTAL	804.01	148.17

TOTAL SITE ENERGY 952.18 MBTU 84.2 KBTU/SQFT-YR GROSS-AREA 84.2 KBTU/SQFT-YR NET-AREA  
 TOTAL SOURCE ENERGY 2562.62 MBTU 226.5 KBTU/SQFT-YR GROSS-AREA 226.6 KBTU/SQFT-YR NET-AREA  
 PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 1.2  
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0  
 NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED  
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.





UA CALCULATIONS

**REPRESENTATIVE BUILDINGS FOR UA CALCULATIONS**

GRP LTR	BLDG NO.	BLDG NAME	SQ FT	USE	UA CALCS
A	5000	FIRE STATION	8,400	24 hours	
B	313	CIV PERS BLDG	6,222	Admin	X
B	804	RGT HQ BUILD	10,241	Admin	
B	7036	REGIMENTAL HQ BLDG	10,010	Admin	X
B	7178	MOTOR POOL ADMIN	2,480	Admin	
B	7450	REGIMENTAL HQ BLDG	9,850	Admin	
B	7636	REGIMENTAL HQ BLDG	9,850	Admin	
B	7834	REGIMENTAL HQ BLDG	9,904	Admin	X
B	8010	DET DAY ROOM	2,100	Admin	X
B	8020	DET DAY ROOM	2,100	Admin	
B	8046	DET DAY ROOM	2,100	Admin	
B	8056	DET DAY ROOM	2,100	Admin	
B	8071	RGT HQ BUILD	9,963	Admin	X
C	751	AC PTS & TOE ST	9,834	Admin & Supp	X
C	810	ADMIN & SUPPLY BLDG	15,152	Admin & Supp	X
C	812	ADMIN & SUPPLY BLDG	23,559	Admin & Supp	
C	835	MAF OPS BLDG	19,470	Admin & Supp	X
C	7212	CO HQ BLDG	19,320	Admin & Supp	X
C	7220	CO HQ BLDG	18,870	Admin & Supp	X
C	7243	ADMIN & SUPPLY BLDG	17,829	Admin & Supp	
C	7432	ADMIN & SUPPLY BLDG	13,500	Admin & Supp	
C	7602	ADMIN & SUPPLY BLDG	13,520	Admin & Supp	
C	7608	ADMIN & SUPPLY BLDG	13,520	Admin & Supp	
C	7652	ADMIN & SUPPLY BLDG	13,520	Admin & Supp	
C	7658	ADMIN & SUPPLY BLDG	13,520	Admin & Supp	
C	7802	ADMIN & SUPPLY BLDG	13,280	Admin & Supp	X
C	7808	ADMIN & SUPPLY BLDG	13,280	Admin & Supp	
C	7852	ADMIN & SUPPLY BLDG	13,280	Admin & Supp	
C	7858	ADMIN & SUPPLY BLDG	13,280	Admin & Supp	
C	8021	ADMIN & SUPPLY BLDG	23,676	Admin & Supp	X
C	8023	ADMIN & SUPPLY BLDG	23,676	Admin & Supp	
C	8057	ADMIN & SUPPLY BLDG	23,676	Admin & Supp	
C	8059	ADMIN & SUPPLY BLDG	23,676	Admin & Supp	
D	29	RED CROSS BLDG	3,000	Admin - block	X
D	200	ADMIN GENERAL PURP	60,690	Admin - block	
D	203	CAVALRY MUSEUM	5,800	Admin - block	X
D	205	CAVALRY MUSEUM	16,496	Admin - block	X
D	207	CAVALRY MUSEUM	8,278	Admin - block	
D	210	MILIT PERS BLDG	58,448	Admin - block	
D	211	ADMIN	41,062	Admin - block	X
D	222	ADMIN GEN PURP	18,854	Admin - block	
D	301	FINANCE ADMIN	32,947	Admin - block	
D	302	FINANCE ADMIN	16,138	Admin - block	X
D	330	DEH ADMIN	14,913	Admin - block	X
D	364	UEMCS HQ	744	Admin - block	X
D	403	ADMIN GENERAL PURP	18,151	Admin - block	
D	405	ADMIN GEN PURP	10,778	Admin - block	X
D	406	CID BLDG	10,390	Admin - block	X
D	500	POST HQ BLDG	65,453	Admin - block	
D	509	ADM GEN PURPOSE	10,108	Admin - block	
E	610	ENL BARRACKS W/AS	29,004	Barracks	X
E	620	OFF QTRS MILIT	12,640	Barracks	X
E	621	OFF QTRS TRANS	10,723	Barracks	
E	5309	GUEST HOUSE	23,784	Barracks	X
E	7050	ENL BARRACKS W/AS	39,675	Barracks & Din	X
E	7053	ENL BARRACKS W/AS	39,675	Barracks & Din	
E	7404	ENL BARRACKS W/O DIN	50,967	Barracks	X
E	7424	ENL BARRACKS W/O DIN	50,967	Barracks	X
E	7610	ENL BARRACKS W/AS	41,892	Barracks	X
E	7612	ENL BARRACKS W/AS	41,892	Barracks	
E	7614	ENL BARRACKS W/AS	41,892	Barracks	
E	7616	ENL BARRACKS W/AS	41,892	Barracks	
E	7618	ENL BARRACKS W/O DIN	41,892	Barracks	X
E	7642	ENL BARRACKS W/O DIN	41,892	Barracks	
E	7644	ENL BARRACKS W/O DIN	41,892	Barracks	
E	7646	ENL BARRACKS W/O DIN	41,892	Barracks	
E	7648	ENL BARRACKS W/O DIN	41,892	Barracks	
E	7650	ENL BARRACKS W/O DIN	41,892	Barracks	
E	7810	ENL BARRACKS W/O DIN	41,843	Barracks	
E	7812	ENL BARRACKS W/O DIN	41,843	Barracks	
E	7814	ENL BARRACKS W/O DIN	41,843	Barracks	
E	7816	ENL BARRACKS W/O DIN	41,843	Barracks	
E	7818	ENL BARRACKS W/O DIN	41,843	Barracks	
E	7842	ENL BARRACKS W/AS	41,843	Barracks	
E	7844	ENL BARRACKS W/O DIN	41,843	Barracks	
E	7846	ENL BARRACKS W/AS	41,843	Barracks	

**REPRESENTATIVE BUILDINGS FOR UA CALCULATIONS**

GRP LTR	BLDG NO.	BLDG NAME	SQ FT	USE	UA CALCS
E	7848	ENL BARRACKS W/O DIN	41,843	Barracks	
E	7850	ENL BARRACKS W/AS	41,843	Barracks	
E	8002	ENL BARRACKS W/O DIN	22,700	Barracks	X
E	8006	ENL BARRACKS W/O DIN	22,700	Barracks	
E	8008	ENL BARRACKS W/O DIN	11,549	Barracks	X
E	8012	ENL BARRACKS W/O DIN	22,700	Barracks	
E	8014	ENL BARRACKS W/O DIN	11,549	Barracks	
E	8038	ENL BARRACKS W/O DIN	22,700	Barracks	
E	8040	ENL BARRACKS W/O DIN	11,549	Barracks	
E	8042	ENL BARRACKS W/O DIN	22,700	Barracks	X
E	8048	ENL BARRACKS W/O DIN	11,549	Barracks	
E	8050	ENL BARRACKS W/O DIN	11,549	Barracks	
E	8052	SR ENL QTRS	22,700	Barracks	
E	8054	ENL BARRACKS W/O DIN	11,549	Barracks	
H	27	OFF QTRS MILIT	38,146	Barracks - block	
H	214	ENL BARRACKS W/AS	35,821	Barracks - block	X
H	223	ENL BARRACKS W/DAS	47,794	Barracks - block	X
H	227	ENL BARRACKS W/AS	32,303	Barracks - block	
H	402	ENL BARRACKS W/AS	35,718	Barracks - block	
H	404	ENL BARRACKS W/DAS	35,718	Barracks - block	
H	409	ENL BARRACKS W/AS	32,883	Barracks - block	
H	410	ENL BARRACKS W/AS	32,883	Barracks - block	
H	411	ENL BARRACKS W/AS	32,883	Barracks - block	
H	512	SR ENL QTRS	13,619	Barracks - block	
H	540	OFF QTRS MILIT	14,528	Barracks - block	X
H	541	OFF QTRS MILIT	18,083	Barracks - block	X
H	542	OFF QTRS MILIT	14,528	Barracks - block	
I	760	BN HQ BLDG	7,364	Battalion	
I	802	BN ADMIN & CLRM	12,526	Battalion	
I	808	BN ADMIN & CLRM	12,526	Battalion	
I	7017	BN HQ BLDG	2,604	Battalion	X
I	7028	BN CLASSROOMS	3,733	Battalion	X
I	7046	BN CLASSROOMS	3,733	Battalion	
I	7031	BN HQ BLDG	3,733	Battalion	X
I	7033	BN HQ BLDG	4,083	Battalion	X
I	7047	BN HQ BLDG	3,733	Battalion	
I	7048	BN HQ BLDG	2,604	Battalion	
I	7108	BN ADMIN & CLRM	12,527	Battalion	
I	7109	BN ADMIN & CLRM	13,535	Battalion	X
I	7215	BN HQ BLDG	2,604	Battalion	
I	7218	BN HQ BLDG	12,625	Battalion	
I	7270	BN HQ BLDG	6,130	Battalion	
I	7410	BN ADMIN & CLRM	12,599	Battalion	
I	7620	BN ADMIN & CLRM	6,340	Battalion	X
I	7622	BN ADMIN & CLRM	12,380	Battalion	
I	7624	BN ADMIN & CLRM	6,158	Battalion	
I	7630	BN ADMIN & CLRM	6,158	Battalion	
I	7638	BN ADMIN & CLRM	6,158	Battalion	
I	7806	BN HQ BLDG	13,493	Battalion	
I	7820	BN ADMIN & CLRM	6,673	Battalion	X
I	7824	BN ADMIN & CLRM	12,246	Battalion	
I	7836	BN ADMIN & CLRM	12,246	Battalion	
I	7854	BN HQ BLDG	13,493	Battalion	
I	8025	BN ADMIN & CLRM	12,000	Battalion	
I	8037	BN ADMIN & CLRM	12,000	Battalion	
I	5302	POST OFFICE	12,240	Post Office	X
K	5315	MORRIS HILL CHAPEL	19,748	Church	X
K	7086	UNIT CHAPEL	8,696	Church	
K	7865	UNIT CHAPEL	8,718	Church	X
L	3	POST CHAPEL	8,828	Church - block	X
L	6	POST CHAPEL	6,230	Church - block	
M	253	DRUG ABUSE CTR	11,122	Clinic	
M	602	DENTAL CLINIC	11,557	Clinic	X
M	814	MEDICAL FAC - NEW	9,220	Clinic	X
M	4010	DENTAL CLINIC	15,587	Clinic	X
M	7034	CLINIC W/O BEDS	3,842	Clinic	
M	7626	CLINIC W/O BEDS	3,604	Clinic	
M	7665	DENTAL CLINIC	11,076	Clinic	
M	7670	DENTAL CLINIC	14,960	Clinic	
M	7826	CLINIC W/O BEDS	3,841	Clinic	
M	8065	CLINIC W/O BEDS	3,848	Clinic	X
N	650	COLD STOR FAC	22,331	Cold Storage	
N	652	COLD STOR FAC	8,167	Cold Storage	
O	7245	ENL PERS DIN	13,998	Dining	
O	7606	ENL PERS DIN	13,493	Dining	
O	7654	ENL PERS DIN	13,493	Dining	

**REPRESENTATIVE BUILDINGS FOR UA CALCULATIONS**

GRP LTR	BLDG NO	BLDG NAME	SQ FT	USE	UA CALCS
O	7804	ENL PERS DIN	13,493	Dining	
O	7856	ENL PERS DIN	13,493	Dining	
O	8063	ENL PERS DIN	18,313	Dining	X
P	723	MNT HANGAR COMB	21,640	Hangar	X
P	727	MNT HANGAR COMB	36,152	Hangar	X
P	741	MNT HANGAR COMB	38,898	Hangar	
P	817	MNT HANGAR AVUM	40,061	Hangar	X
P	833	AIRCRAFT HANGAR	52,080	Hangar	X
P	853	MNT HANGAR AVUM	48,112	Hangar	
P	710	TAC EQUIP SHOP	2,173	Maintenance	X
P	820	TAC EQUIP SHOP	20,564	Maintenance	
P	840	VEHICLE MNT SHOP ORG	9,152	Maintenance	X
P	1470	AR VEH MNT SHOP	21,667	Maintenance	
P	7176	MOTOR POOL MNT SHOP	4,880	Maintenance	
P	7350	VEH MNT SHOP ORG	21,345	Maintenance	X
P	7500	VEH MNT SHOP ORG	22,325	Maintenance	
P	7520	VEH MNT SHOP ORG	27,112	Maintenance	
P	7760	VEH MNT SHOP ORG	17,163	Maintenance	X
P	7720	VEH MNT SHOP ORG	22,325	Maintenance	
P	7780	VEH MNT SHOP ORG	17,163	Maintenance	
P	7900	VEH MNT SHOP ORG	20,943	Maintenance	
P	7920	VEH MNT SHOP DS	124,553	Maintenance	X
P	7940	VEH MNT SHOP ORG	22,405	Maintenance	X
P	7960	VEH MNT SHOP ORG	20,245	Maintenance	
P	8100	CONSOLIDATED MNT	224,927	Maintenance	
P	8300	VEH MNT SHOP ORG	20,240	Maintenance	
P	8320	VEH MNT SHOP ORG	20,240	Maintenance	
P	8330	VEH MNT SHOP ORG	39,256	Maintenance	
P	8340	VEH MNT SHOP ORG	20,240	Maintenance	
P	8360	VEH MNT SHOP ORG	39,428	Maintenance	X
P	8370	VEH MNT SHOP ORG	26,876	Maintenance	
P	8380	VEH MNT SHOP ORG	73,400	Maintenance	X
P	8390	TAC EQUIP SHOP	24,755	Maintenance	
P	8410	VEH MNT SHOP ORG	73,233	Maintenance	X
R	806	COMB AC-HTG PLANT	1,000	Mechanical	
R	7210	CH CHILLER PLANT	4,320	Mechanical	
R	8073	CH ENERGY PLANT	4,070	Mechanical	
S	202	PHYS FITNESS CTR	51,307	Gym - block	X
S	5800	YOUTH CTR	21,560	Youth Center	X
S	6940	INDOOR SWIM POOL	23,347	Swimming Pool	
S	7024	GYMNASIUM	20,619	Recreation	
S	7632	GYMNASIUM	20,694	Recreation	
S	7832	GYMNASIUM	20,694	Recreation	
S	8069	IN SW POOL/GYM	25,620	Swimming Pool	
T	6910	EXC SP ST FAC	2,525	Retail	X
T	6914	EXC MAIN RETL	63,930	Retail	
T	7285	CLOTHING SALES	17,042	Retail	X
U	720	AF OPS BLDG	3,705	Simulator	X
U	722	FLIGHT SIMULATOR	7,000	Simulator	X
U	724	FLIGHT SIMULATOR	13,188	Simulator	
U	7739	MOVING TARGET SIM BLDG	4,074	Simulator	X
V	7485	BOWLING ALLEY	36,966	Recreation	X
W	7866	THEATER W/DRESS RM	11,098	Theater	
W	206	THEATER W/O DRESS RM	10,754	Theater	
X	319	GEN INSTRUCTION BLDG	9,690	Training	X
X	6620	COMMUN ACT CTR	31,740	Training	X
X	6918	SKILL DEV CTR	11,507	Training	X
X	7264	LIBRARY MAIN	31,240	Training	
X	7305	APP INSTR BLDG	9,872	Training	X
X	7604	GEN INST BLDG	13,493	Training	X
X	7656	GEN INST BLDG	13,493	Training	X
X	8044	APP INSTR BLDG	2,470	Training	X
<b>TOTAL NUMBER OF BUILDINGS FOR UA CALCULATIONS</b>					<b>80</b>



**UA VALUES EXTRAPOLATED TO SIMILAR BUILDINGS**

GRP LTR	BLDG NO.	BLDG NAME	SQ FT	USE	UA VALUE
A	5000	FIRE STATION	8,400	24 hours	2,186
B	313	CIV PERS BLDG	6,222	Admin	1,941
B	804	RGT HQ BLDG	10,241	Admin	2,665
B	7036	REGIMENTAL HQ BLDG	10,010	Admin	2,605
B	7178	MOTOR POOL ADMIN	2,480	Admin	645
B	7450	REGIMENTAL HQ BLDG	9,850	Admin	2,563
B	7636	REGIMENTAL HQ BLDG	9,850	Admin	2,563
B	7834	REGIMENTAL HQ BLDG	9,904	Admin	2,577
B	8010	DET DAY ROOM	2,100	Admin	665
B	8020	DET DAY ROOM	2,100	Admin	665
B	8046	DET DAY ROOM	2,100	Admin	665
B	8056	DET DAY ROOM	2,100	Admin	665
B	8071	RGT HQ BLDG	9,963	Admin	2,545
C	751	AC PTS & TOE ST	9,834	Admin & Supp	3,641
C	810	ADMIN & SUPPLY BLDG	15,152	Admin & Supp	4,538
C	812	ADMIN & SUPPLY BLDG	23,559	Admin & Supp	7,056
C	835	MAF OPS BLDG	19,470	Admin & Supp	4,060
C	7212	CO HQ BLDG	19,320	Admin & Supp	7,306
C	7220	CO HQ BLDG	18,870	Admin & Supp	4,949
C	7243	ADMIN & SUPPLY BLDG	17,829	Admin & Supp	4,676
C	7432	ADMIN & SUPPLY BLDG	13,500	Admin & Supp	4,746
C	7602	ADMIN & SUPPLY BLDG	13,520	Admin & Supp	4,753
C	7608	ADMIN & SUPPLY BLDG	13,520	Admin & Supp	4,753
C	7652	ADMIN & SUPPLY BLDG	13,520	Admin & Supp	4,753
C	7658	ADMIN & SUPPLY BLDG	13,520	Admin & Supp	4,753
C	7802	ADMIN & SUPPLY BLDG	13,280	Admin & Supp	4,669
C	7808	ADMIN & SUPPLY BLDG	13,280	Admin & Supp	4,669
C	7852	ADMIN & SUPPLY BLDG	13,280	Admin & Supp	4,669
C	7858	ADMIN & SUPPLY BLDG	13,280	Admin & Supp	4,669
C	8021	ADMIN & SUPPLY BLDG	23,676	Admin & Supp	5,496
C	8023	ADMIN & SUPPLY BLDG	23,676	Admin & Supp	5,496
C	8057	ADMIN & SUPPLY BLDG	23,676	Admin & Supp	5,496
C	8059	ADMIN & SUPPLY BLDG	23,676	Admin & Supp	5,496
D	29	RED CROSS BLDG	3,000	Admin - block	2,004
D	200	ADMIN GENERAL PURP	60,690	Admin - block	16,960
D	203	CAVALRY MUSEUM	5,800	Admin - block	2,265
D	205	CAVALRY MUSEUM	16,496	Admin - block	5,291
D	207	CAVALRY MUSEUM	8,278	Admin - block	2,655
D	210	MILIT PERS BLDG	58,448	Admin - block	10,220
D	211	ADMIN	41,062	Admin - block	7,180
D	222	ADMIN GEN PURP	18,854	Admin - block	3,297
D	301	FINANCE ADMIN	32,947	Admin - block	7,152
D	302	FINANCE ADMIN	16,138	Admin - block	3,503
D	330	DEH ADMIN	14,913	Admin - block	3,515
D	364	UEMCS HQ	744	Admin - block	676
D	403	ADMIN GENERAL PURP	18,151	Admin - block	5,072
D	405	ADMIN GEN PURP	10,778	Admin - block	3,012
D	406	CID BLDG	10,390	Admin - block	3,389
D	500	POST HQ BLDG	65,453	Admin - block	18,291
D	509	ADM GEN PURPOSE	10,108	Admin - block	2,825
E	610	ENL BARRACKS W/AS	29,004	Barracks	8,369
E	620	OFF QTRS MILIT	12,640	Barracks	4,410
E	621	OFF QTRS TRANS	10,723	Barracks	3,741
E	5309	GUEST HOUSE	23,784	Barracks	6,555
E	7050	ENL BARRACKS W/AS	39,675	Barracks & Din	7,027
E	7053	ENL BARRACKS W/AS	39,675	Barracks & Din	7,027
E	7404	ENL BARRACKS W/O DIN	50,967	Barracks	18,554
E	7424	ENL BARRACKS W/O DIN	50,967	Barracks	15,693
E	7610	ENL BARRACKS W/AS	41,892	Barracks	15,201
E	7612	ENL BARRACKS W/AS	41,892	Barracks	15,201
E	7614	ENL BARRACKS W/AS	41,892	Barracks	15,201
E	7616	ENL BARRACKS W/AS	41,892	Barracks	15,201
E	7618	ENL BARRACKS W/O DIN	41,892	Barracks	15,201
E	7642	ENL BARRACKS W/O DIN	41,892	Barracks	15,201
E	7644	ENL BARRACKS W/O DIN	41,892	Barracks	15,201
E	7646	ENL BARRACKS W/O DIN	41,892	Barracks	15,201
E	7648	ENL BARRACKS W/O DIN	41,892	Barracks	15,201
E	7650	ENL BARRACKS W/O DIN	41,892	Barracks	15,201
E	7810	ENL BARRACKS W/O DIN	41,843	Barracks	15,183
E	7812	ENL BARRACKS W/O DIN	41,843	Barracks	15,183
E	7814	ENL BARRACKS W/O DIN	41,843	Barracks	15,183
E	7816	ENL BARRACKS W/O DIN	41,843	Barracks	15,183
E	7818	ENL BARRACKS W/O DIN	41,843	Barracks	15,183
E	7842	ENL BARRACKS W/AS	41,843	Barracks	15,183
E	7844	ENL BARRACKS W/O DIN	41,843	Barracks	15,183

**UA VALUES EXTRAPOLATED TO SIMILAR BUILDINGS**

GRP LTR	BLDG NO.	BLDG NAME	SQ FT	USE	UA VALUE
E	7846	ENL BARRACKS W/AS	41,843	Barracks	15,183
E	7848	ENL BARRACKS W/O DIN	41,843	Barracks	15,183
E	7850	ENL BARRACKS W/AS	41,843	Barracks	15,183
E	8002	ENL BARRACKS W/O DIN	22,700	Barracks	5,777
E	8006	ENL BARRACKS W/O DIN	22,700	Barracks	5,777
E	8008	ENL BARRACKS W/O DIN	11,549	Barracks	2,899
E	8012	ENL BARRACKS W/O DIN	22,700	Barracks	5,777
E	8014	ENL BARRACKS W/O DIN	11,549	Barracks	2,899
E	8038	ENL BARRACKS W/O DIN	22,700	Barracks	5,777
E	8040	ENL BARRACKS W/O DIN	11,549	Barracks	2,899
E	8042	ENL BARRACKS W/O DIN	22,700	Barracks	5,777
E	8048	ENL BARRACKS W/O DIN	11,549	Barracks	2,899
E	8050	ENL BARRACKS W/O DIN	11,549	Barracks	2,899
E	8052	SR ENL QTRS	22,700	Barracks	5,777
E	8054	ENL BARRACKS W/O DIN	11,549	Barracks	2,899
H	27	OFF QTRS MILIT	38,146	Barracks - block	6,395
H	214	ENL BARRACKS W/AS	35,821	Barracks - block	6,005
H	223	ENL BARRACKS W/DAS	47,794	Barracks - block	7,623
H	227	ENL BARRACKS W/AS	32,303	Barracks - block	5,152
H	402	ENL BARRACKS W/AS	35,718	Barracks - block	5,697
H	404	ENL BARRACKS W/DAS	35,718	Barracks - block	5,697
H	409	ENL BARRACKS W/AS	32,883	Barracks - block	5,245
H	410	ENL BARRACKS W/AS	32,883	Barracks - block	5,245
H	411	ENL BARRACKS W/AS	32,883	Barracks - block	5,245
H	512	SR ENL QTRS	13,619	Barracks - block	2,172
H	540	OFF QTRS MILIT	14,528	Barracks - block	3,238
H	541	OFF QTRS MILIT	18,083	Barracks - block	3,933
H	542	OFF QTRS MILIT	14,528	Barracks - block	3,238
I	760	BN HQ BLDG	7,364	Battalion	3,399
I	802	BN ADMIN & CLRM	12,526	Battalion	5,781
I	808	BN ADMIN & CLRM	12,526	Battalion	5,781
I	7017	BN HQ BLDG	2,604	Battalion	1,162
I	7028	BN CLASSROOMS	3,733	Battalion	1,723
I	7046	BN CLASSROOMS	3,733	Battalion	1,723
I	7031	BN HQ BLDG	3,733	Battalion	1,723
I	7033	BN HQ BLDG	4,083	Battalion	1,960
I	7047	BN HQ BLDG	3,733	Battalion	1,723
I	7048	BN HQ BLDG	2,604	Battalion	1,202
I	7108	BN ADMIN & CLRM	12,527	Battalion	2,984
I	7109	BN ADMIN & CLRM	13,535	Battalion	3,224
I	7215	BN HQ BLDG	2,604	Battalion	1,202
I	7218	BN HQ BLDG	12,625	Battalion	3,007
I	7270	BN HQ BLDG	6,130	Battalion	2,347
I	7410	BN ADMIN & CLRM	12,599	Battalion	3,001
I	7620	BN ADMIN & CLRM	6,340	Battalion	2,427
I	7622	BN ADMIN & CLRM	12,380	Battalion	2,949
I	7624	BN ADMIN & CLRM	6,158	Battalion	1,467
I	7630	BN ADMIN & CLRM	6,158	Battalion	1,467
I	7638	BN ADMIN & CLRM	6,158	Battalion	1,467
I	7806	BN HQ BLDG	13,493	Battalion	3,214
I	7820	BN ADMIN & CLRM	6,673	Battalion	2,512
I	7824	BN ADMIN & CLRM	12,246	Battalion	2,917
I	7836	BN ADMIN & CLRM	12,246	Battalion	2,917
I	7854	BN HQ BLDG	13,493	Battalion	3,214
I	8025	BN ADMIN & CLRM	12,000	Battalion	2,858
I	8037	BN ADMIN & CLRM	12,000	Battalion	2,858
I	5302	POST OFFICE	12,240	Post Office	2,645
K	5315	MORRIS HILL CHAPEL	19,748	Church	6,485
K	7086	UNIT CHAPEL	8,696	Church	2,856
K	7865	UNIT CHAPEL	8,718	Church	2,526
L	3	POST CHAPEL	8,828	Church - block	2,020
L	6	POST CHAPEL	6,230	Church - block	1,426
M	253	DRUG ABUSE CTR	11,122	Clinic	2,414
M	602	DENTAL CLINIC	11,557	Clinic	1,060
M	814	MEDICAL FAC - NEW	9,220	Clinic	1,449
M	4010	DENTAL CLINIC	15,587	Clinic	2,715
M	7034	CLINIC W/O BEDS	3,842	Clinic	1,595
M	7626	CLINIC W/O BEDS	3,604	Clinic	1,496
M	7665	DENTAL CLINIC	11,076	Clinic	4,597
M	7670	DENTAL CLINIC	14,960	Clinic	6,209
M	7826	CLINIC W/O BEDS	3,841	Clinic	1,594
M	8065	CLINIC W/O BEDS	3,848	Clinic	1,597
N	650	COLD STOR FAC	22,331	Cold Storage	0
N	652	COLD STOR FAC	8,167	Cold Storage	0

**UA VALUES EXTRAPOLATED TO SIMILAR BUILDINGS**

GRP LTR	BLDG NO.	BLDG NAME	SQ FT	USE	UA VALUE
O	7245	ENL PERS DIN	13,998	Dining	2,545
O	7606	ENL PERS DIN	13,493	Dining	2,454
O	7654	ENL PERS DIN	13,493	Dining	2,454
O	7804	ENL PERS DIN	13,493	Dining	2,454
O	7856	ENL PERS DIN	13,493	Dining	2,454
O	8063	ENL PERS DIN	18,313	Dining	3,330
P	723	MNT HANGAR COMB	21,640	Hangar	9,771
P	727	MNT HANGAR COMB	36,152	Hangar	13,826
P	741	MNT HANGAR COMB	38,898	Hangar	14,876
P	817	MNT HANGAR AVUM	40,061	Hangar	9,255
P	833	AIRCRAFT HANGAR	52,080	Hangar	10,102
P	853	MNT HANGAR AVUM	48,112	Hangar	9,332
P	710	TAC EQUIP SHOP	2,173	Maintenance	1,462
P	820	TAC EQUIP SHOP	20,564	Maintenance	8,561
P	840	VEHICLE MNT SHOP ORG	9,152	Maintenance	3,810
P	1470	AR VEH MNT SHOP	21,667	Maintenance	9,020
P	7176	MOTOR POOL MNT SHOP	4,880	Maintenance	2,032
P	7350	VEH MNT SHOP ORG	21,345	Maintenance	9,281
P	7500	VEH MNT SHOP ORG	22,325	Maintenance	9,707
P	7520	VEH MNT SHOP ORG	27,112	Maintenance	11,789
P	7760	VEH MNT SHOP ORG	17,163	Maintenance	8,285
P	7720	VEH MNT SHOP ORG	22,325	Maintenance	9,707
P	7780	VEH MNT SHOP ORG	17,163	Maintenance	7,463
P	7900	VEH MNT SHOP ORG	20,943	Maintenance	9,106
P	7920	VEH MNT SHOP DS	124,553	Maintenance	43,349
P	7940	VEH MNT SHOP ORG	22,405	Maintenance	9,609
P	7960	VEH MNT SHOP ORG	20,245	Maintenance	8,683
P	8100	CONSOLIDATED MNT	224,927	Maintenance	78,283
P	8300	VEH MNT SHOP ORG	20,240	Maintenance	8,801
P	8320	VEH MNT SHOP ORG	20,240	Maintenance	8,801
P	8330	VEH MNT SHOP ORG	39,256	Maintenance	17,069
P	8340	VEH MNT SHOP ORG	20,240	Maintenance	8,801
P	8360	VEH MNT SHOP ORG	39,428	Maintenance	17,691
P	8370	VEH MNT SHOP ORG	26,876	Maintenance	11,686
P	8380	VEH MNT SHOP ORG	73,400	Maintenance	15,834
P	8390	TAC EQUIP SHOP	24,755	Maintenance	10,764
P	8410	VEH MNT SHOP ORG	73,233	Maintenance	15,834
R	806	COMB AC-HTG PLANT	1,000	Mechanical	0
R	7210	CH CHILLER PLANT	4,320	Mechanical	0
R	8073	CH ENERGY PLANT	4,070	Mechanical	0
S	202	PHYS FITNESS CTR	51,307	Gym - block	6,674
S	5800	YOUTH CTR	21,560	Youth Center	2,572
S	6940	INDOOR SWIM POOL	23,347	Swimming Pool	3,037
S	7024	GYMNASIUM	20,619	Recreation	2,682
S	7632	GYMNASIUM	20,694	Recreation	2,692
S	7832	GYMNASIUM	20,694	Recreation	2,692
S	8069	IN SW POOL/GYM	25,620	Swimming Pool	3,333
T	6910	EXC SP ST FAC	2,525	Retail	789
T	6914	EXC MAIN RETL	63,930	Retail	18,359
T	7285	CLOTHING SALES	17,042	Retail	4,894
U	720	AF OPS BLDG	3,705	Simulator	1,587
U	722	FLIGHT SIMULATOR	7,000	Simulator	1,718
U	724	FLIGHT SIMULATOR	13,188	Simulator	3,237
U	7739	MOVING TARGET SIM BLDG	4,074	Simulator	1,901
V	7485	BOWLING ALLEY	36,966	Recreation	6,305
W	7866	THEATER W/DRESS RM	11,098	Theater	3,187
W	206	THEATER W/O DRESS RM	10,754	Theater	3,088
X	319	GEN INSTRUCTION BLDG	9,690	Training	2,244
X	6620	COMMUN ACT CTR	31,740	Training	4,433
X	6918	SKILL DEV CTR	11,507	Training	3,864
X	7264	LIBRARY MAIN	31,240	Training	4,363
X	7305	APP INSTR BLDG	9,872	Training	3,353
X	7604	GEN INST BLDG	13,493	Training	3,640
X	7656	GEN INST BLDG	13,493	Training	3,640
X	8044	APP INSTR BLDG	2,470	Training	839





E M C ENGINEERS, INC.  
 PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 12-Jun-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	3	BLDG NAME:	POST CHAPEL
BLDG FUNCTION:	CHAPEL		
FLOOR AREA: (SQ. FT)	4,340	# FLOORS:	1
SLAB PERIMETER: (FT)	299		

**I. AREAS: ( [ ] FIELD VERIFIED ELEVATION PLANS)**

		NORTH	SOUTH	EAST	WEST	TOTAL
WALLS, GROSS	(SQ. FT)	1,841	1,841	737	737	5,156
GLASS	(SQ. FT)	130	130	0	30	290
PERSONNEL DOOR	(SQ. FT)	21	21	60	0	102
OVERHEAD DOOR	(SQ. FT)	0	0	0	0	0
WALLS, NET	(SQ. FT)	1,690	1,690	677	707	4,764
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)	(SQ. FT)					2,150
OVERHEAD DOOR	(SQ. FT)	0	PERSONNEL DOOR	(SQ. FT)	102	
BASEMENT WALLS	(SQ. FT)					0

**II. CONSTRUCTION: ( [ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES)**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE	
	1. OUTSIDE AIR FILM	0.17	
	2. 18" SANDSTONE	1.44	
	3. AIR SPACE	1.00	
	4. 3/16" GYPSUM BD.	0.45	
	5.		
	6.		
	7. INSIDE AIR FILM	0.68	
	TOTAL R-WALL =	3.74	
	U=1/R	0.267	
ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE	
	1. OUTSIDE AIR FILM	0.17	
	2. ASPHALT SHINGLES	0.44	
	3. 1/2" PLYWOOD	0.62	
	4. 2" RIGID INSULATION	5.56	
	5. AIR SPACE	1.00	
	6. .625 GYPSUM PLASTER	0.39	
	7. INSIDE AIR FILM	0.68	
	TOTAL R-ROOF =	8.86	
	U=1/R	0.113	
GLASS TYPE:	DOUBLE PANE	R-GLASS	1.75
SLAB TYPE FLOOR:	CONCRETE	SLF	0.68
BASEMENT TYPE:	NONE	R-BASEM.	0.00
OVERHEAD DOOR TYPE:	NONE	R-ODOOR	0.00
PERSONNEL DOOR TYPE:	WOOD	R-PDOOR	1.88

**III. INFILTRATION:**

WINDOWS (LF of Crack)	105 X 0.27 Sq.In./LF=	Sq.In.	28	X CFM/Sq.In.	1.530	=	43
PERSONNEL DOORS (SF)	102 X 0.16 Sq.In./SF=	Sq.In.	16	X CFM/Sq.In.	1.530	=	25
DOOR OPENINGS / HR - SINGLE DOOR	2	X CFM /OPENING /HR	1.600	=	3		
DOOR OPENINGS / HR - DOUBLE DOORS	4	X CFM /OPENING /HR	1.385	=	6		
<b>TOTAL INFILTRATION (CFM)</b>							<b>77</b>

UA ODOOR	=	ODOOR AREA	0	X DOOR "U"	0.000	=	0
UA PDOOR	=	PDOOR AREA	102	X DOOR "U"	0.532	=	54
UA WALL	=	WALL AREA	4,764	X WALL "U"	0.267	=	1,274
UA ROOF	=	ROOF AREA	2,150	X ROOF "U"	0.113	=	243
UA GLASS	=	GLASS AREA	290	X GLASS "U"	0.571	=	166
UA SLAB	=	SLAB PERIM.	299	X SLF	0.680	=	203
UA BASEM.	=	B-WALL AREA	0	X BASE. "U"	0.000	=	0
INFILTRATION	=	CFM	77	X A. T. F.	1.037	=	80
<b>TOTAL UA (BTU/HR°F)</b>							<b>2,020</b>

E M C ENGINEERS, INC.  
 PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 12-Jun-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	29	BLDG NAME:	RED CROSS BLDG
BLDG FUNCTION:			
FLOOR AREA: (SQ. FT)	2,994	# FLOORS:	2
SLAB PERIMETER: (FT)	222		

**I. AREAS: ([ ] FIELD VERIFIED ELEVATION PLANS)**

		NORTH	SOUTH	EAST	WEST	TOTAL
WALLS, GROSS	(SQ. FT)	1,455	1,452	780	912	4,599
GLASS	(SQ. FT)	248	212	114	91	664
PERSONNEL DOOR	(SQ. FT)	20	31	0	0	51
OVERHEAD DOOR	(SQ. FT)	0	0	0	0	0
WALLS, NET	(SQ. FT)	1,187	1,209	666	821	3,883
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)						(SQ. FT) 2,994
OVERHEAD DOOR	(SQ. FT)	0 PERSONNEL DOOR		(SQ. FT)		51
BASEMENT WALLS	(SQ. FT)					0

**II. CONSTRUCTION: ([ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES)**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE	
	1. OUTSIDE AIR FILM	0.17	
	2. 18" SANDSTONE BLOCK	1.44	
	3. AIR SPACE	1.00	
	4. 1/2" GYPSUM BOARD	0.45	
	5.		
	6.		
	7. INSIDE AIR FILM	0.68	
	TOTAL R-WALL =	3.74	
	U=1/R	0.267	
ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE	
	1. OUTSIDE AIR FILM	0.17	
	2. ASPHALT SHINGLES	0.44	
	3. 3/4" WOOD	0.83	
	4. AIR SPACE	1.00	
	5. 3" BATT INSUL.	11.00	
	6. 0.625" PLASTER	0.39	
	ACOUSTIC TILE	1.79	
	7. INSIDE AIR FILM	0.68	
	TOTAL R-ROOF =	16.30	
	U=1/R	0.061	
GLASS TYPE:	SINGLE PANE IN ALUM. FRAMES W/STORM WINDOWS	R-GLASS	1.60
SLAB TYPE FLOOR:	CONCRETE	SLF	0.68
BASEMENT TYPE:	CONCRETE	R-BASEM.	10.00
OVERHEAD DOOR TYPE:	NONE	R-ODOOR	0.00
PERSONNEL DOOR TYPE:	WOOD	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	324 X 0.33 Sq.In./LF=	Sq.In.	107	X CFM/Sq.In.	1.530	=	164
PERSONNEL DOORS (SF)	56 X 0.16 Sq.In./SF=	Sq.In.	9	X CFM/Sq.In.	1.530	=	14
DOOR OPENINGS / HR - SINGLE DOOR		1	X CFM / OPENING / HR	1.600	=	2	
DOOR OPENINGS / HR - DOUBLE DOORS		2	X CFM / OPENING / HR	1.385	=	2	
TOTAL INFILTRATION (CFM)						=	181

UA ODOOR	=	ODOOR AREA	0	X DOOR "U"	0.000	=	0
UA PDOOR	=	PDOOR AREA	51	X DOOR "U"	0.552	=	28
UA WALL	=	WALL AREA	3,883	X WALL "U"	0.267	=	1,038
UA ROOF	=	ROOF AREA	2,994	X ROOF "U"	0.061	=	184
UA GLASS	=	GLASS AREA	664	X GLASS "U"	0.625	=	415
UA SLAB	=	SLAB PERIM.	222	X SLF	0.680	=	151
UA BASEM.	=	B-WALL AREA	0	X BASE. "U"	0.100	=	0
INFILTRATION	=	CFM	181	X A. T. F.	1.037	=	188
TOTAL UA (BTU/HR°F)						=	2,004

E M C ENGINEERS, INC.  
 PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 12-Jun-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	202	BLDG NAME:	GYMNASIUM
BLDG FUNCTION:	GYM		
FLOOR AREA: (SQ. FT)	51,321	# FLOORS:	2
SLAB PERIMETER: (FT)	813		

**I. AREAS: ( [ ] FIELD VERIFIED ELEVATION PLANS)**

		NORTH	SOUTH	EAST	WEST	TOTAL
WALLS, GROSS	(SQ. FT)	3,682	3,682	6,677	6,677	20,719
GLASS	(SQ. FT)	324	324	156	164	968
PERSONNEL DOOR	(SQ. FT)	42	42	42	168	294
OVERHEAD DOOR	(SQ. FT)	0	0	0	0	0
WALLS, NET	(SQ. FT)	3,316	3,316	6,479	6,345	19,457
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)	(SQ. FT)					31,296
OVERHEAD DOOR	(SQ. FT)	0	PERSONNEL DOOR		(SQ. FT)	294
BASEMENT WALLS	(SQ. FT)					0

**II. CONSTRUCTION: ( [ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES)**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. 18" SANDSTONE	1.44
	3. AIR SPACE	1.00
	4. 1" INSULATION	4.00
	5. 1/2" GYP BD	0.45
	6.	
	7. INSIDE AIR FILM	0.68
	TOTAL R-WALL =	7.74
	U=1/R	0.129

ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. SHINGLES	0.44
	3. 3/4" WOOD	0.83
	4. AIR SPACE	1.00
	5. INSUL	11.93
	6. 1/2" GYP BD	0.45
	7. INSIDE AIR FILM	0.68
	TOTAL R-ROOF =	15.50
	U=1/R	0.065

GLASS TYPE:	SINGLE PANE	R-GLASS	0.90
SLAB TYPE FLOOR:	CONCRETE	SLF	0.68
BASEMENT TYPE:	NONE	R-BASEM.	0.00
OVERHEAD DOOR TYPE:	NONE	R-ODOOR	0.00
PERSONNEL DOOR TYPE:	WOOD	R-PDOOR	1.88

**III. INFILTRATION:**

WINDOWS (LF of Crack)	482 X 0.33 Sq.In./LF=	Sq.In.	159	X CFM/Sq.In.	1.530	=	243
PERSONNEL DOORS (SF)	294 X 0.16 Sq.In./SF=	Sq.In.	47	X CFM/Sq.In.	1.530	=	72
DOOR OPENINGS / HR - SINGLE DOOR				X CFM / OPENING / HR	1.600	=	0
DOOR OPENINGS / HR - DOUBLE DOORS			20	X CFM / OPENING / HR	1.385	=	28
TOTAL INFILTRATION (CFM)							343

UA ODOOR	=	ODOOR AREA	0	X DOOR "U"	0.000	=	0
UA PDOOR	=	PDOOR AREA	294	X DOOR "U"	0.532	=	156
UA WALL	=	WALL AREA	19,457	X WALL "U"	0.129	=	2,514
UA ROOF	=	ROOF AREA	31,296	X ROOF "U"	0.065	=	2,020
UA GLASS	=	GLASS AREA	968	X GLASS "U"	1.111	=	1,076
UA SLAB	=	SLAB PERIM.	813	X SLF	0.680	=	553
UA BASEM.	=	B-WALL AREA	0	X BASE. "U"	0.000	=	0
INFILTRATION	=	CFM	343	X A. T. F.	1.037	=	356
TOTAL UA (BTU/HR°F)							6,674

E M C ENGINEERS, INC.  
 PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 18-Jul-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	203	BLDG NAME:	CAVALRY MUSEUM
BLDG FUNCTION:	MUSEUM		
FLOOR AREA: (SQ. FT)	4,186	# FLOORS:	1
SLAB PERIMETER: (FT)	MECH ROOM		

**I. AREAS: ( [ ] FIELD VERIFIED ELEVATION PLANS)**

		NORTH	SOUTH	EAST	WEST	TOTAL
WALLS, GROSS	(SQ. FT)	541	541	1,150	1,150	3,383
GLASS	(SQ. FT)	39	39	215	215	507
PERSONNEL DOOR	(SQ. FT)	0	0	0	84	84
OVERHEAD DOOR	(SQ. FT)	0	0	0	0	0
WALLS, NET	(SQ. FT)	502	502	936	852	2,792
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)	(SQ. FT)					5,454
OVERHEAD DOOR	(SQ. FT)	0	PERSONNEL DOOR		(SQ. FT)	84
BASEMENT WALLS	(SQ. FT)					0

**II. CONSTRUCTION: ( [ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES)**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE	
	1. OUTSIDE AIR FILM	0.17	
	2. 16" SANDSTONE BLOCK	1.28	
	3. 3/16" GYPSUM BOARD	0.45	
	4.		
	5.		
	6.		
	7. INSIDE AIR FILM	0.68	
	TOTAL R-WALL =	2.58	
	U=1/R	0.388	
ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE	
	1. OUTSIDE AIR FILM	0.17	
	2. ASPHALT SHINGLES	0.44	
	3. 60# ROLL ROOFING	1.47	
	4. ASPHALT FELT	0.12	
	5. AIR SPACE	1.00	
	6. 3/8" PLYWOOD	0.46	
	7. INSIDE AIR FILM	0.68	
	TOTAL R-ROOF =	4.34	
	U=1/R	0.230	
GLASS TYPE:	SINGLE PANE WITH STORMS	R-GLASS	1.60
SLAB TYPE FLOOR:	CONCRETE	SLF	0.68
BASEMENT TYPE:	NONE	R-BASEM.	0.00
OVERHEAD DOOR TYPE:	NONE	R-ODOOR	0.00
PERSONNEL DOOR TYPE:	HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	234 X 0.33 Sq.In./LF=	Sq.In.	77	X CFM/Sq.In.	1.530	=	118
PERSONNEL DOORS (SF)	84 X 0.16 Sq.In./SF=	Sq.In.	13	X CFM/Sq.In.	1.530	=	21
DOOR OPENINGS / HR - SINGLE DOOR		X CFM / OPENING / HR	1.600	=	0		
DOOR OPENINGS / HR - DOUBLE DOORS		X CFM / OPENING / HR	1.385	=	0		
				TOTAL INFILTRATION (CFM)		=	139

UA ODOOR	=	ODOOR AREA	0	X DOOR "U"	0.000	=	0
UA PDOOR	=	PDOOR AREA	84	X DOOR "U"	0.552	=	46
UA WALL	=	WALL AREA	2,792	X WALL "U"	0.388	=	1,082
UA ROOF	=	ROOF AREA	5,454	X ROOF "U"	0.230	=	1,257
UA GLASS	=	GLASS AREA	507	X GLASS "U"	0.625	=	317
UA SLAB	=	SLAB PERIM. MECH ROOM		X SLF	0.680	=	0
UA BASEM.	=	B-WALL AREA	0	X BASE. "U"	0.000	=	0
INFILTRATION	=	CFM	139	X A. T. F.	0.852	=	118
						TOTAL UA (BTU/HR°F)	2,820

E M C ENGINEERS, INC.  
 PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 18-Jul-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	205	BLDG NAME:	CALVARY MUSEUM
BLDG FUNCTION:	MUSEUM		
FLOOR AREA: (SQ. FT)	19,533	# FLOORS:	3
SLAB PERIMETER: (FT)	CRAWL SPACE		

**I. AREAS: ( [ ] FIELD VERIFIED ELEVATION PLANS)**

		NORTH	SOUTH	EAST	WEST	TOTAL
WALLS, GROSS	(SQ. FT)	2,686	2,686	3,868	4,420	13,660
GLASS	(SQ. FT)	288	216	540	621	1,665
PERSONNEL DOOR	(SQ. FT)	21	21	42	21	105
OVERHEAD DOOR	(SQ. FT)	0	0	0	0	0
WALLS, NET	(SQ. FT)	2,377	2,449	3,286	3,778	11,890
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)	(SQ. FT)					19,533
OVERHEAD DOOR	(SQ. FT)	0	PERSONNEL DOOR		(SQ. FT)	105
BASEMENT WALLS	(SQ. FT)					0

**II. CONSTRUCTION: ( [ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES)**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE	
	1. OUTSIDE AIR FILM	0.17	
	2. 18" SANDSTONE BLOCK	1.44	
	3. AIR SPACE	1.00	
	4. 2" RIGID INSULATION	5.56	
	5. 1/2" GYPSUM BOARD	0.45	
	6.		
	7. INSIDE AIR FILM	0.68	
	TOTAL R-WALL =	9.30	
	U=1/R	0.108	
ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE	
	1. OUTSIDE AIR FILM	0.17	
	2. ASPHALT SHINGLES	0.44	
	3. 3/4" WOOD	0.83	
	4. AIR SPACE	1.00	
	5. 1" RIGID INSULATION	2.78	
	6.		
	7. INSIDE AIR FILM	0.68	
	TOTAL R-ROOF =	5.90	
	U=1/R	0.170	
GLASS TYPE:	SINGLE PANE W/STORM WINDOWS	R-GLASS	1.60
SLAB TYPE FLOOR:	CONCRETE	SLF	0.68
BASEMENT TYPE:	NONE	R-BASEM.	0.00
OVERHEAD DOOR TYPE:	NONE	R-ODOOR	0.00
PERSONNEL DOOR TYPE:	WOOD	R-PDOOR	1.88

**III. INFILTRATION:**

WINDOWS (LF of Crack)	927 X 0.33 Sq.In./LF=	Sq.In.	306	X CFM/Sq.In.	1.530	=	468
PERSONNEL DOORS (SF)	105 X 0.16 Sq.In./SF=	Sq.In.	17	X CFM/Sq.In.	1.530	=	26
DOOR OPENINGS / HR - SINGLE DOOR			X CFM /OPENING /HR	1.600	=	0	
DOOR OPENINGS / HR - DOUBLE DOORS			X CFM /OPENING /HR	1.385	=	0	
				TOTAL INFILTRATION (CFM)		=	494

UA ODOOR	=	ODOOR AREA	0	X DOOR "U"	0.000	=	0
UA PDOOR	=	PDOOR AREA	105	X DOOR "U"	0.532	=	56
UA WALL	=	WALL AREA	11,890	X WALL "U"	0.108	=	1,278
UA ROOF	=	ROOF AREA	19,533	X ROOF "U"	0.170	=	3,313
UA GLASS	=	GLASS AREA	1,665	X GLASS "U"	0.625	=	1,041
UA SLAB	=	SLAB PERIM. CRAWL SPACE		X SLF	0.680	=	0
UA BASEM.	=	B-WALL AREA	0	X BASE. "U"	0.000	=	0
INFILTRATION	=	CFM	494	X A. T. F.	0.852	=	421
						<b>TOTAL UA (BTU/HR°F)</b>	<b>6,109</b>

E M C ENGINEERS, INC.  
 PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 12-Jun-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	211	BLDG NAME:	ADMIN
BLDG FUNCTION:	ADMIN		
FLOOR AREA: (SQ. FT)	38,754	# FLOORS:	3
SLAB PERIMETER: (FT)	726		

**I. AREAS: ([ ] FIELD VERIFIED ELEVATION PLANS)**

		NORTH-E	NORTH-W	SOUTH-E	SOUTH-W	TOTAL	
WALLS, GROSS	(SQ. FT)	2,432	4,465	4,465	2,432	13,794	
GLASS	(SQ. FT)	608	1,040	1,152	608	3,408	
PERSONNEL DOOR	(SQ. FT)	42	84	42	42	210	
OVERHEAD DOOR	(SQ. FT)					0	
WALLS, NET	(SQ. FT)	1,782	3,341	3,271	1,782	10,176	
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)						(SQ. FT)	18,392
OVERHEAD DOOR	(SQ. FT)	0	PERSONNEL DOOR		(SQ. FT)	210	
BASEMENT WALLS	(SQ. FT)	1,043	1,323	1,323	1,043	4,732	

**II. CONSTRUCTION: ([ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES)**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. 18" SANDSTONE	1.44
	3. 1/2" GYPSUM BOARD	0.45
	4. 3/4" WOOD	0.83
	5.	
	6.	
	7. INSIDE AIR FILM	0.68
	TOTAL R-WALL =	3.57
	U=1/R	0.281

ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. SHINGLES	0.44
	3. 3/4" WOOD	0.83
	4. AIR SPACE	1.00
	5. 3" BATT INSULATION	11.00
	6. 1/2" GYPSUM BOARD	0.45
	7. INSIDE AIR FILM	0.68
	TOTAL R-ROOF =	14.57
	U=1/R	0.069

GLASS TYPE:	SINGLE PANE WITH STORMS	R-GLASS	1.60
SLAB TYPE FLOOR:	CONCRETE	SLF	0.68
BASEMENT TYPE:	NONE	R-BASEM.	0.00
OVERHEAD DOOR TYPE:	NONE	R-ODOOR	0.00
PERSONNEL DOOR TYPE:	HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	616 X 0.27 Sq.In./LF=	Sq.In.	166	X CFM/Sq.In.	1.530	=	254
PERSONNEL DOORS (SF)	210 X 0.16 Sq.In./SF=	Sq.In.	34	X CFM/Sq.In.	1.530	=	51
DOOR OPENINGS / HR - SINGLE DOOR		X CFM / OPENING / HR		1.600	=		0
DOOR OPENINGS / HR - DOUBLE DOORS	4	X CFM / OPENING / HR		1.385	=		6
<b>TOTAL INFILTRATION (CFM)</b>							<b>311</b>

UA ODOOR	=	ODOOR AREA	0	X DOOR "U"	0.000	=	0
UA PDOOR	=	PDOOR AREA	210	X DOOR "U"	0.552	=	116
UA WALL	=	WALL AREA	10,176	X WALL "U"	0.281	=	2,854
UA ROOF	=	ROOF AREA	18,392	X ROOF "U"	0.069	=	1,263
UA GLASS	=	GLASS AREA	3,408	X GLASS "U"	0.625	=	2,130
UA SLAB	=	SLAB PERIM.	726	X SLF	0.680	=	494
UA BASEM.	=	B-WALL AREA	4,732	X BASE. "U"	0.000	=	0
INFILTRATION	=	CFM	311	X A. T. F.	1.037	=	323
<b>TOTAL UA (BTU/HR°F)</b>							<b>7,180</b>

E M C ENGINEERS, INC.  
 PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 12-Jun-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	214	BLDG NAME:	ENL BARRACKS W/AS
BLDG FUNCTION:			
FLOOR AREA: (SQ. FT)	31,662	# FLOORS:	2
SLAB PERIMETER: (FT)			

**I. AREAS: ([ ] FIELD VERIFIED ELEVATION PLANS)**

		NORTH	SOUTH	EAST	WEST	TOTAL
WALLS, GROSS	(SQ. FT)	4,380	4,380	3,015	3,015	14,790
GLASS	(SQ. FT)	733	555	746	746	2,779
PERSONNEL DOOR	(SQ. FT)	168	210	42	42	462
OVERHEAD DOOR	(SQ. FT)	0	0	0	0	0
WALLS, NET	(SQ. FT)	3,479	3,616	4,815	4,815	11,550
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)						(SQ. FT) 10,554
OVERHEAD DOOR	(SQ. FT)	0	PERSONNEL DOOR		(SQ. FT)	462
BASEMENT WALLS	(SQ. FT)	1,314	1,314	1,445	1,445	5,518

**II. CONSTRUCTION: ([ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES)**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. 18" SANDSTONE	1.44
	3. 1/2" GYPSUM BOARD	0.45
	4. 1" AIR SPACE	1.00
	5.	
	6.	
	7. INSIDE AIR FILM	0.68
	TOTAL R-WALL =	3.74
	U=1/R	0.267

ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. SHINGLES	0.44
	3. 1/2" GYPSUM BOARD	0.45
	4. AIR SPACE	1.00
	5. 3/4" WOOD	0.83
	6. 6" BATT INSULATION	19.00
	7. INSIDE AIR FILM	0.68
	TOTAL R-ROOF =	22.57
	U=1/R	0.044

GLASS TYPE:	DOUBLE HUNG W/STORMS	R-GLASS	1.60
SLAB TYPE FLOOR:	CONCRETE	SLF	0.68
BASEMENT TYPE:	NONE	R-BASEM.	0.00
OVERHEAD DOOR TYPE:	NONE	R-ODOOR	0.00
PERSONNEL DOOR TYPE:	HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	756 X 0.27 Sq.In./LF=	Sq.In.	204	X CFM/Sq.In.	1.530	=	312	
PERSONNEL DOORS (SF)	462 X 0.16 Sq.In./SF=	Sq.In.	74	X CFM/Sq.In.	1.530	=	113	
DOOR OPENINGS / HR - SINGLE DOOR		8	X CFM /OPENING /HR	1.600	=		13	
DOOR OPENINGS / HR - DOUBLE DOORS		2	X CFM /OPENING /HR	1.385	=		3	
TOTAL INFILTRATION (CFM)							=	441

UA ODOOR	=	ODOOR AREA	0	X DOOR "U"	0.000	=	0	
UA PDOOR	=	PDOOR AREA	462	X DOOR "U"	0.552	=	255	
UA WALL	=	WALL AREA	11,550	X WALL "U"	0.267	=	3,088	
UA ROOF	=	ROOF AREA	10,554	X ROOF "U"	0.044	=	468	
UA GLASS	=	GLASS AREA	2,779	X GLASS "U"	0.625	=	1,737	
UA SLAB	=	SLAB PERIM.	0	X SLF	0.680	=	0	
UA BASEM.	=	B-WALL AREA	5,518	X BASE. "U"	0.000	=	0	
INFILTRATION	=	CFM	441	X A. T. F.	1.037	=	457	
TOTAL UA (BTU/HR°F)							=	6,005



E M C ENGINEERS, INC.  
 PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 12-Jun-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	223	BLDG NAME:	ENL BARRACKS W/DAS
BLDG FUNCTION:			
FLOOR AREA: (SQ. FT)	37,428	# FLOORS:	2
SLAB PERIMETER: (FT)			

**I. AREAS: ( [ ] FIELD VERIFIED ELEVATION PLANS)**

		NORTH	SOUTH	EAST	WEST	TOTAL	
WALLS, GROSS	(SQ. FT)	5,712	5,712	3,504	3,504	18,432	
GLASS	(SQ. FT)	1,227	1,029	240	249	2,745	
PERSONNEL DOOR	(SQ. FT)	84	147	189	189	609	
OVERHEAD DOOR	(SQ. FT)	0	0	0	0	0	
WALLS, NET	(SQ. FT)	4,401	4,536	3,075	3,066	15,078	
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)						(SQ. FT)	12,476
OVERHEAD DOOR	(SQ. FT)	0	PERSONNEL DOOR		(SQ. FT)	609	
BASEMENT WALLS	(SQ. FT)	2,142	2,142	1,314	1,314	6,912	

**II. CONSTRUCTION: ( [ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES)**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE	
	1. OUTSIDE AIR FILM	0.17	
	2. 16" SANDSTONE	1.28	
	3. AIR SPACE	1.00	
	4. 1/2" GYPSUM BOARD	0.45	
	5.		
	6.		
	7. INSIDE AIR FILM	0.68	
	TOTAL R-WALL =	3.58	
	U=1/R	0.279	
ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE	
	1. OUTSIDE AIR FILM	0.17	
	2. SHINGLES	0.44	
	3. 3/4" WOOD	0.83	
	4. AIR SPACE	1.00	
	5. 6" BATT INSULATION	19.00	
	6. 1/2" GYPSUM BOARD	0.45	
	7. INSIDE AIR FILM	0.68	
	TOTAL R-ROOF =	22.57	
	U=1/R	0.044	
GLASS TYPE:	SINGLE PANE W/STORMS	R-GLASS	1.60
SLAB TYPE FLOOR:	CONCRETE	SLF	0.68
BASEMENT TYPE:	NONE	R-BASEM.	0.00
OVERHEAD DOOR TYPE:	NONE	R-ODOOR	0.00
PERSONNEL DOOR TYPE:	HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	1209 X 0.33 Sq.In./LF=	Sq.In.	399	X CFM/Sq.In.	1.530	=	610
PERSONNEL DOORS (SF)	609 X 0.16 Sq.In./SF=	Sq.In.	97	X CFM/Sq.In.	1.530	=	149
DOOR OPENINGS / HR - SINGLE DOOR	8	X CFM / OPENING / HR	1.600	=	13		
DOOR OPENINGS / HR - DOUBLE DOORS	4	X CFM / OPENING / HR	1.385	=	6		
TOTAL INFILTRATION (CFM)							778

UA ODOOR	=	ODOOR AREA	0	X DOOR "U"	0.000	=	0
UA PDOOR	=	PDOOR AREA	609	X DOOR "U"	0.552	=	336
UA WALL	=	WALL AREA	15,078	X WALL "U"	0.279	=	4,212
UA ROOF	=	ROOF AREA	12,476	X ROOF "U"	0.044	=	553
UA GLASS	=	GLASS AREA	2,745	X GLASS "U"	0.625	=	1,716
UA SLAB	=	SLAB PERIM.	0	X SLF	0.680	=	0
UA BASEM.	=	B-WALL AREA	6,912	X BASE. "U"	0.000	=	0
INFILTRATION	=	CFM	778	X A. T. F.	1.037	=	807
TOTAL UA (BTU/HR*F)							7,623

E M C ENGINEERS, INC.  
 PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 12-Jun-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	302	BLDG NAME:	ADM & FINANCE
BLDG FUNCTION:			
FLOOR AREA: (SQ. FT)	16,500	# FLOORS:	3
SLAB PERIMETER: (FT)			

**I. AREAS: ([ ] FIELD VERIFIED ELEVATION PLANS)**

		NORTH	SOUTH	EAST	WEST	TOTAL	
WALLS, GROSS	(SQ. FT)	1,116	1,116	2,625	2,625	7,482	
GLASS	(SQ. FT)	156	96	240	72	564	
PERSONNEL DOOR	(SQ. FT)	0	0	105	105	210	
OVERHEAD DOOR	(SQ. FT)	0	0	0	0	0	
WALLS, NET	(SQ. FT)	960	1,020	2,280	2,448	6,708	
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)						(SQ. FT)	9,500
OVERHEAD DOOR	(SQ. FT)	0	PERSONNEL DOOR		(SQ. FT)	210	
BASEMENT WALLS	(SQ. FT)	500	500	176	176	1,352	

**II. CONSTRUCTION: ([ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES)**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. 18" SANDSTONE BLOCK	1.44
	3. AIR SPACE	1.00
	4. 1" RIGID INSULATION	2.78
	5. 1/2" GYPSUM BOARD	0.45
	6.	
	7. INSIDE AIR FILM	0.68
	TOTAL R-WALL =	6.52
	U=1/R	0.153

ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. ASPHALT SHINGLES	0.44
	3. 3/4" WOOD	0.83
	4. 1" RIGID INSULATION	2.78
	5. 1/2" GYPSUM BOARD	0.45
	6.	
	7. INSIDE AIR FILM	0.68
	TOTAL R-ROOF =	5.35
	U=1/R	0.187

GLASS TYPE:	SINGLE PANE W/STORMS	R-GLASS	1.60
SLAB TYPE FLOOR:	CONCRETE	SLF	0.68
BASEMENT TYPE:	NONE	R-BASEM.	0.00
OVERHEAD DOOR TYPE:	NONE	R-ODOOR	0.00
PERSONNEL DOOR TYPE:	HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	322 X 0.33 Sq.In./LF=	Sq.In.	106	X CFM/Sq.In.	1.530	=	163
PERSONNEL DOORS (SF)	210 X 0.16 Sq.In./SF=	Sq.In.	34	X CFM/Sq.In.	1.530	=	51
DOOR OPENINGS / HR - SINGLE DOOR							
	4	X CFM / OPENING / HR		1.600	=		6
DOOR OPENINGS / HR - DOUBLE DOORS							
		X CFM / OPENING / HR		1.385	=		0
						TOTAL INFILTRATION (CFM)	220

UA ODOOR	=	ODOOR AREA	0	X DOOR "U"	0.000	=	0
UA PDOOR	=	PDOOR AREA	210	X DOOR "U"	0.552	=	116
UA WALL	=	WALL AREA	6,708	X WALL "U"	0.153	=	1,029
UA ROOF	=	ROOF AREA	9,500	X ROOF "U"	0.187	=	1,777
UA GLASS	=	GLASS AREA	564	X GLASS "U"	0.625	=	353
UA SLAB	=	SLAB PERIM.	0	X SLF	0.680	=	0
UA BASEM.	=	B-WALL AREA	1,352	X BASE. "U"	0.000	=	0
INFILTRATION	=	CFM	220	X A. T. F.	1.037	=	229
						TOTAL UA (BTU/HR°F)	3,503

E M C ENGINEERS, INC.  
 PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 12-Jun-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	313	BLDG NAME:	CIV PERS BLDG
BLDG FUNCTION:			
FLOOR AREA: (SQ. FT)	6,000	# FLOORS:	1
SLAB PERIMETER: (FT)	380		

**I. AREAS: ([ ] FIELD VERIFIED ELEVATION PLANS)**

		NORTH-W	NORTH-E	SOUTH-W	SOUTH-E	TOTAL
WALLS, GROSS	(SQ. FT)	1,500	400	1,500	400	3,800
GLASS	(SQ. FT)	180	30	30	195	435
PERSONNEL DOOR	(SQ. FT)	0	21	21	42	84
OVERHEAD DOOR	(SQ. FT)	0	0	0	0	0
WALLS, NET	(SQ. FT)	1,320	349	1,449	163	3,281
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)	(SQ. FT)					6,000
OVERHEAD DOOR	(SQ. FT)		0	PERSONNEL DOOR	(SQ. FT)	84
BASEMENT WALLS	(SQ. FT)					0

**II. CONSTRUCTION: ([ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES)**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. 4" BRICK	1.20
	3. 1" AIR SPACE	1.00
	4. 8" CMU	1.11
	5.	
	6.	
	7. INSIDE AIR FILM	0.68
	TOTAL R-WALL =	4.16
	U=1/R	0.240

ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. ASPHALT SHINGLES	0.44
	3. WOOD BASE	0.56
	4. AIR SPACE	1.00
	5. 3" BATT INSUL	11.00
	6.	
	7. INSIDE AIR FILM	0.68
	TOTAL R-ROOF =	13.85
	U=1/R	0.072

GLASS TYPE:	SINGLE PANE W/STORMS	R-GLASS	1.60
SLAB TYPE FLOOR:	CONCRETE	SLF	0.68
BASEMENT TYPE:	NONE	R-BASEM.	0.00
OVERHEAD DOOR TYPE:	NONE	R-ODOOR	0.00
PERSONNEL DOOR TYPE:	HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	232 X 0.33 Sq.In./LF=	Sq.In.	77	X CFM/Sq.In.	1.530	=	117
PERSONNEL DOORS (SF)	84 X 0.16 Sq.In./SF=	Sq.In.	13	X CFM/Sq.In.	1.530	=	21
DOOR OPENINGS / HR - SINGLE DOOR		X CFM /OPENING /HR		1.600	=	0	
DOOR OPENINGS / HR - DOUBLE DOORS		X CFM /OPENING /HR		1.385	=	0	
				TOTAL INFILTRATION (CFM)		=	138

UA ODOOR	=	ODOOR AREA	0	X DOOR "U"	0.000	=	0
UA PDOOR	=	PDOOR AREA	84	X DOOR "U"	0.552	=	46
UA WALL	=	WALL AREA	3,281	X WALL "U"	0.240	=	789
UA ROOF	=	ROOF AREA	6,000	X ROOF "U"	0.072	=	433
UA GLASS	=	GLASS AREA	435	X GLASS "U"	0.625	=	272
UA SLAB	=	SLAB PERIM.	380	X SLF	0.680	=	258
UA BASEM.	=	B-WALL AREA	0	X BASE "U"	0.000	=	0
INFILTRATION	=	CFM	138	X A. T. F.	1.037	=	143
				TOTAL UA (BTU/HR°F)			1,941

E M C ENGINEERS, INC.  
 PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 18-Jul-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	319	BLDG NAME:	GEN INSTRUCTION BLDG
BLDG FUNCTION:			
FLOOR AREA: (SQ. FT)	9,600	# FLOORS:	1
SLAB PERIMETER: (FT)	440		

**I. AREAS: ([ ] FIELD VERIFIED ELEVATION PLANS)**

		NORTH-W	NORTH-E	SOUTH-W	SOUTH-E	TOTAL
WALLS, GROSS	(SQ. FT)	1,920	720	720	1,920	5,280
GLASS	(SQ. FT)	245	77	80	220	622
PERSONNEL DOOR	(SQ. FT)	0	42	42	21	105
OVERHEAD DOOR	(SQ. FT)	0	0	0	0	0
WALLS, NET	(SQ. FT)	1,675	601	598	1,679	4,554
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)	(SQ. FT)					9,600
OVERHEAD DOOR	(SQ. FT)	0	PERSONNEL DOOR		(SQ. FT)	105
BASEMENT WALLS	(SQ. FT)					0

**II. CONSTRUCTION: ([ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES)**

WALLS: (SKETCH CROSS SECTION OF WALL)		COMPONENTS	R-VALUE
		1. OUTSIDE AIR FILM	0.17
		2. 4" BRICK	1.20
		3. AIR SPACE	1.00
		4. 1/2" GYPSUM BOARD	0.45
		5.	
		6.	
		7. INSIDE AIR FILM	0.68
		TOTAL R-WALL =	3.50
		U=1/R	0.286
ROOF: (SKETCH CROSS SECTION OF ROOF)		COMPONENTS	R-VALUE
		1. OUTSIDE AIR FILM	0.17
		2. STEEL DECK	0.00
		3. AIR SPACE	1.00
		4. 12" FIBERGLASS	38.00
		5. PLASTER CEILING	0.63
		6.	
		7. INSIDE AIR FILM	0.68
		TOTAL R-ROOF =	40.48
		U=1/R	0.025
GLASS TYPE:	SINGLE PANE	R-GLASS	0.90
SLAB TYPE FLOOR:	CONCRETE	SLF	0.68
BASEMENT TYPE:	NONE	R-BASEM.	0.00
OVERHEAD DOOR TYPE:	NONE	R-ODOOR	0.00
PERSONNEL DOOR TYPE:	HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	220 X 0.33 Sq.In./LF=	Sq.In.	73	X CFM/Sq.In.	1.530	=	111
PERSONNEL DOORS (SF)	105 X 0.16 Sq.In./SF=	Sq.In.	17	X CFM/Sq.In.	1.530	=	26
DOOR OPENINGS / HR - SINGLE DOOR							
				X CFM / OPENING / HR	1.600	=	0
DOOR OPENINGS / HR - DOUBLE DOORS							
				X CFM / OPENING / HR	1.385	=	0
				TOTAL INFILTRATION (CFM)		=	137

UA ODOOR	=	ODOOR AREA	0	X DOOR "U"	0.000	=	0	
UA PDOOR	=	PDOOR AREA	105	X DOOR "U"	0.552	=	58	
UA WALL	=	WALL AREA	4,554	X WALL "U"	0.286	=	1,301	
UA ROOF	=	ROOF AREA	9,600	X ROOF "U"	0.025	=	237	
UA GLASS	=	GLASS AREA	622	X GLASS "U"	1.111	=	691	
UA SLAB	=	SLAB PERIM.	440	X SLF	0.680	=	299	
UA BASEM.	=	B-WALL AREA	0	X BASE "U"	0.000	=	0	
INFILTRATION	=	CFM	137	X A. T. F.	0.852	=	117	
							TOTAL UA (BTU/HR°F)	2,702

E M C ENGINEERS, INC.  
 PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 12-Jun-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	330	BLDG NAME:	DEH ADMIN
BLDG FUNCTION:			
FLOOR AREA: (SQ. FT)	14,126	# FLOORS:	3
SLAB PERIMETER: (FT)			

**I. AREAS: ([ ] FIELD VERIFIED ELEVATION PLANS)**

		NORTH-W	NORTH-E	SOUTH-W	SOUTH-E	TOTAL	
WALLS, GROSS	(SQ. FT)	989	2,519	2,519	989	7,015	
GLASS	(SQ. FT)	82	267	297	82	728	
PERSONNEL DOOR	(SQ. FT)	0	42	63	0	105	
OVERHEAD DOOR	(SQ. FT)	0	0	0	0	0	
WALLS, NET	(SQ. FT)	907	2,210	2,159	907	6,182	
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)						(SQ. FT)	14,126
OVERHEAD DOOR	(SQ. FT)	0	PERSONNEL DOOR		(SQ. FT)	105	
BASEMENT WALLS	(SQ. FT)	172	438	438	172	1,220	

**II. CONSTRUCTION: ([ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES)**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE	
	1. OUTSIDE AIR FILM	0.17	
	2. 18" SANDSTONE	1.44	
	3. AIR SPACE	1.00	
	4. 1/2" GYPSUM BOARD	0.45	
	5.		
	6.		
	7. INSIDE AIR FILM	0.68	
	TOTAL R-WALL =	3.74	
	U=1/R	0.267	
ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE	
	1. OUTSIDE AIR FILM	0.17	
	2. SHINGLES	0.44	
	3. 3/4" WOOD	0.83	
	4. AIR SPACE	1.00	
	5. 6" BLANKET INSUL	9.00	
	6. 1/2" GYPUSM BOARD	0.45	
	7. INSIDE AIR FILM	0.68	
	TOTAL R-ROOF =	12.57	
	U=1/R	0.080	
GLASS TYPE:	SINGLE PANE W/STORMS	R-GLASS	1.60
SLAB TYPE FLOOR:	CONCRETE	SLF	0.68
BASEMENT TYPE:	NONE	R-BASEM.	0.00
OVERHEAD DOOR TYPE:	NONE	R-ODOOR	0.00
PERSONNEL DOOR TYPE:	HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	369 X 0.33 Sq.In./LF=	Sq.In.	122	X CFM/Sq.In.	1.530	=	186
PERSONNEL DOORS (SF)	105 X 0.16 Sq.In./SF=	Sq.In.	17	X CFM/Sq.In.	1.530	=	26
DOOR OPENINGS / HR - SINGLE DOOR		X CFM /OPENING /HR		1.600	=	0	
DOOR OPENINGS / HR - DOUBLE DOORS	4	X CFM /OPENING /HR		1.385	=	6	
<b>TOTAL INFILTRATION (CFM)</b>						=	<b>217</b>

UA ODOOR	=	ODOOR AREA	0	X DOOR "U"	0.000	=	0
UA PDOOR	=	PDOOR AREA	105	X DOOR "U"	0.552	=	58
UA WALL	=	WALL AREA	6,182	X WALL "U"	0.267	=	1,653
UA ROOF	=	ROOF AREA	14,126	X ROOF "U"	0.080	=	1,124
UA GLASS	=	GLASS AREA	728	X GLASS "U"	0.625	=	455
UA SLAB	=	SLAB PERIM.	0	X SLF	0.680	=	0
UA BASEM.	=	B-WALL AREA	1,220	X BASE. "U"	0.000	=	0
INFILTRATION	=	CFM	217	X A. T. F.	1.037	=	225
<b>TOTAL UA (BTU/HR°F)</b>						=	<b>3,515</b>

E M C ENGINEERS, INC.  
 PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 12-Jun-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	364	BLDG NAME:	UEMCS HQ
BLDG FUNCTION:			
FLOOR AREA: (SQ. FT)	760	# FLOORS:	1
SLAB PERIMETER: (FT)	118		

**I. AREAS: ([ ] FIELD VERIFIED ELEVATION PLANS)**

		NORTH	SOUTH	EAST	WEST	TOTAL	
WALLS, GROSS	(SQ. FT)	360	360	171	171	1,062	
GLASS	(SQ. FT)	50	37	0	0	87	
PERSONNEL DOOR	(SQ. FT)	21	0	0	0	21	
OVERHEAD DOOR	(SQ. FT)	0	0	0	0	0	
WALLS, NET	(SQ. FT)	289	323	171	171	954	
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)						(SQ. FT)	760
OVERHEAD DOOR	(SQ. FT)	0	PERSONNEL DOOR		(SQ. FT)	21	
BASEMENT WALLS	(SQ. FT)					0	

**II. CONSTRUCTION: ([ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES)**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE	
	1. OUTSIDE AIR FILM	0.17	
	2. 18" SANDSTONE BLOCK	1.44	
	3. AIR SPACE	1.00	
	4. 1/2" GYPSUM BOARD	0.45	
	5.		
	6.		
	7. INSIDE AIR FILM	0.68	
	TOTAL R-WALL =	3.74	
	U=1/R	0.267	
ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE	
	1. OUTSIDE AIR FILM	0.17	
	2. SHINGLES	0.44	
	3. 3/4" WOOD	0.83	
	4. AIR SPACE	1.00	
	5. 1/2" GYPSUM BOARD	0.45	
	6.		
	7. INSIDE AIR FILM	0.68	
	TOTAL R-ROOF =	3.57	
	U=1/R	0.281	
GLASS TYPE:	SINGLE PANE W/STORMS	R-GLASS	1.60
SLAB TYPE FLOOR:	CONCRETE	SLF	0.68
BASEMENT TYPE:	NONE	R-BASEM.	0.00
OVERHEAD DOOR TYPE:	NONE	R-ODOOR	0.00
PERSONNEL DOOR TYPE:	HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	105 X 0.33 Sq.In./LF=	Sq.In.	35	X CFM/Sq.In.	1.530	=	53
PERSONNEL DOORS (SF)	21 X 0.16 Sq.In./SF=	Sq.In.	3	X CFM/Sq.In.	1.530	=	5
DOOR OPENINGS / HR - SINGLE DOOR				X CFM /OPENING /HR	1.600	=	0
DOOR OPENINGS / HR - DOUBLE DOORS				1 X CFM /OPENING /HR	1.385	=	1
TOTAL INFILTRATION (CFM)						=	60

UA ODOOR	=	ODOOR AREA	0	X DOOR "U"	0.000	=	0
UA PDOOR	=	PDOOR AREA	21	X DOOR "U"	0.552	=	12
UA WALL	=	WALL AREA	954	X WALL "U"	0.267	=	255
UA ROOF	=	ROOF AREA	760	X ROOF "U"	0.281	=	213
UA GLASS	=	GLASS AREA	87	X GLASS "U"	0.625	=	54
UA SLAB	=	SLAB PERIM.	118	X SLF	0.680	=	80
UA BASEM.	=	B-WALL AREA	0	X BASE. "U"	0.000	=	0
INFILTRATION	=	CFM	60	X A. T. F.	1.037	=	62
TOTAL UA (BTU/HR°F)						=	676

E M C ENGINEERS, INC.  
 PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 12-Jun-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	405	BLDG NAME:	ADMIN GEN PURP
BLDG FUNCTION:			
FLOOR AREA: (SQ. FT)	11,104	# FLOORS:	2
SLAB PERIMETER: (FT)			

**I. AREAS: ( [ ] FIELD VERIFIED ELEVATION PLANS )**

		NORTH-W	NORTH-E	SOUTH-W	SOUTH-E	TOTAL
WALLS, GROSS	(SQ. FT)	2,340	1,430	1,430	2,700	7,900
GLASS	(SQ. FT)	156	90	180	360	786
PERSONNEL DOOR	(SQ. FT)	42	42	21	63	168
OVERHEAD DOOR	(SQ. FT)	0	0	0	0	0
WALLS, NET	(SQ. FT)	2,142	1,298	1,229	2,277	6,946
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)						(SQ. FT) 4,950
OVERHEAD DOOR	(SQ. FT)	0	PERSONNEL DOOR		(SQ. FT)	168
BASEMENT WALLS	(SQ. FT)	450	275	275	450	1,450

**II. CONSTRUCTION: ( [ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES )**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. 18" SANDSTONE BLOCK	1.44
	3. AIR SPACE	1.00
	4. 1/2" GYPSUM BOARD	0.45
	5.	
	6.	
	7. INSIDE AIR FILM	0.68
	TOTAL R-WALL =	3.74
	U=1/R	0.267

ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. SHINGLES	0.44
	3. 3/4" WOOD	0.83
	4. AIR SPACE	1.00
	5. 3" BATT INSULATION	11.00
	6. 1/2" GYPSUM BOARD	0.45
	7. INSIDE AIR FILM	0.68
	TOTAL R-ROOF =	14.57
	U=1/R	0.069

GLASS TYPE:	SINGLE PANE W/ STORMS	R-GLASS	1.60
SLAB TYPE FLOOR:	CONCRETE	SLF	0.68
BASEMENT TYPE:	NONE	R-BASEM.	0.00
OVERHEAD DOOR TYPE:	NONE	R-ODOOR	0.00
PERSONNEL DOOR TYPE:	HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	337 X 0.33 Sq.In./LF=	Sq.In.	111	X CFM/Sq.In.	1.530	=	170
PERSONNEL DOORS (SF)	168 X 0.16 Sq.In./SF=	Sq.In.	27	X CFM/Sq.In.	1.530	=	41
DOOR OPENINGS / HR - SINGLE DOOR		2	X CFM /OPENING /HR	1.600	=	3	
DOOR OPENINGS / HR - DOUBLE DOORS		6	X CFM /OPENING /HR	1.385	=	8	
TOTAL INFILTRATION (CFM)						=	223

UA ODOOR	=	ODOOR AREA	0	X DOOR "U"	0.000	=	0
UA PDOOR	=	PDOOR AREA	168	X DOOR "U"	0.552	=	93
UA WALL	=	WALL AREA	6,946	X WALL "U"	0.267	=	1,857
UA ROOF	=	ROOF AREA	4,950	X ROOF "U"	0.069	=	340
UA GLASS	=	GLASS AREA	786	X GLASS "U"	0.625	=	491
UA SLAB	=	SLAB PERIM.	0	X SLF	0.680	=	0
UA BASEM.	=	B-WALL AREA	1,450	X BASE. "U"	0.000	=	0
INFILTRATION	=	CFM	223	X A. T. F.	1.037	=	231
TOTAL UA (BTU/HR°F)						=	3,012

E M C ENGINEERS, INC.  
 PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 12-Jun-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	406	BLDG NAME:	CID BLDG
BLDG FUNCTION:			
FLOOR AREA: (SQ. FT)	10,219	# FLOORS:	3
SLAB PERIMETER: (FT)	0		

**I. AREAS: ([ ] FIELD VERIFIED ELEVATION PLANS)**

		NORTH-W	NORTH-E	SOUTH-W	SOUTH-E	TOTAL
WALLS, GROSS	(SQ. FT)	2,520	1,218	1,218	2,520	7,476
GLASS	(SQ. FT)	132	72	72	180	456
PERSONNEL DOOR	(SQ. FT)	42	21	21	42	126
OVERHEAD DOOR	(SQ. FT)	0	0	0	0	0
WALLS, NET	(SQ. FT)	2,346	1,125	1,125	2,298	6,894
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)					(SQ. FT)	2,703
OVERHEAD DOOR	(SQ. FT)	0	PERSONNEL DOOR		(SQ. FT)	126
BASEMENT WALLS	(SQ. FT)					8,195

**II. CONSTRUCTION: ([ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES)**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. 18" SANDSTONE BLOCK	1.44
	3. 1" AIR SPACE	1.00
	4. 1/2" GYPSUM BOARD	0.45
	5.	
	6.	
	7. INSIDE AIR FILM	0.68
	TOTAL R-WALL =	3.74
	U=1/R	0.267

ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. ASPHALT SHINGLES	0.44
	3. 3/4" WOOD	0.83
	4. AIR SPACE	1.00
	5. 3" BATT INSULATION	11.00
	6. 0.625" PLASTER	0.39
	7. ACOUSTIC TILE	1.79
	INSIDE AIR FILM	0.68
	TOTAL R-ROOF =	16.30
	U=1/R	0.061

GLASS TYPE:	SINGLE PANE IN ALUM. FRAMES W/STORM WINDOWS	R-GLASS	1.60
SLAB TYPE FLOOR:	CONCRETE	SLF	0.68
BASEMENT TYPE:	CONCRETE	R-BASEM.	10.00
OVERHEAD DOOR TYPE:	NONE	R-ODOOR	0.00
PERSONNEL DOOR TYPE:	HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	396 X 0.27 Sq.In./LF=	Sq.In.	107	X CFM/Sq.In.	1.530	=	164
PERSONNEL DOORS (SF)	126 X 0.16 Sq.In./SF=	Sq.In.	20	X CFM/Sq.In.	1.530	=	31
DOOR OPENINGS / HR - SINGLE DOOR							
			1	X CFM / OPENING / HR	1.600	=	2
DOOR OPENINGS / HR - DOUBLE DOORS							
			2	X CFM / OPENING / HR	1.385	=	3
TOTAL INFILTRATION (CFM)							199

UA ODOOR	=	ODOOR AREA	0	X DOOR "U"	0.000	=	0
UA PDOOR	=	PDOOR AREA	126	X DOOR "U"	0.552	=	70
UA WALL	=	WALL AREA	6,894	X WALL "U"	0.267	=	1,843
UA ROOF	=	ROOF AREA	2,703	X ROOF "U"	0.061	=	166
UA GLASS	=	GLASS AREA	456	X GLASS "U"	0.625	=	285
UA SLAB	=	SLAB PERIM.	0	X SLF	0.680	=	0
UA BASEM.	=	B-WALL AREA	8,195	X BASE. "U"	0.100	=	820
INFILTRATION	=	CFM	199	X A. T. F.	1.037	=	206
TOTAL UA (BTU/HR°F)							3,389



E M C ENGINEERS, INC.  
 PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 12-Jun-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	540	BLDG NAME:	OFF QTRS MILIT
BLDG FUNCTION:			
FLOOR AREA: (SQ. FT)	14,186	# FLOORS:	2
SLAB PERIMETER: (FT)	435		

**I. AREAS: ([ ] FIELD VERIFIED ELEVATION PLANS)**

		NORTH	SOUTH	EAST	WEST	TOTAL
WALLS, GROSS	(SQ. FT)	686	686	3,043	3,043	7,459
GLASS	(SQ. FT)	96	96	1,200	1,344	2,736
PERSONNEL DOOR	(SQ. FT)	0	0	84	0	84
OVERHEAD DOOR	(SQ. FT)	0	0	0	0	0
WALLS, NET	(SQ. FT)	590	590	1,759	1,699	4,639
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)						(SQ. FT) 7,093
OVERHEAD DOOR	(SQ. FT)	0	PERSONNEL DOOR		(SQ. FT)	84
BASEMENT WALLS	(SQ. FT)					0

**II. CONSTRUCTION: ([ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES)**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE	
COMPOSITE: 4" BRICK = 1.2 PLYWOOD SHEATHING = .62	1. OUTSIDE AIR FILM	0.17	
	2. COMPOSITE	1.00	
	3. AIR SPACE	1.00	
	4. 1/4" GYPSUM BOARD	0.45	
	5. 2" RIGID INSULATION	8.00	
	6.		
	7. INSIDE AIR FILM	0.68	
	TOTAL R-WALL =	11.30	
	U=1/R	0.088	
ROOF: (SKETCH CROSS SECTION OF ROOF)			
	COMPONENTS	R-VALUE	
	1. OUTSIDE AIR FILM	0.17	
	2. COMPOSITION SHINGLES	0.00	
	3. 55# FELT	0.06	
	4. PLYWOOD SHEATHING	0.62	
	5. AIR SPACE	1.00	
	6. 6" BATT INSULATION	19.00	
	7. INSIDE AIR FILM	0.68	
	TOTAL R-ROOF =	21.53	
	U=1/R	0.046	
GLASS TYPE:	SINGLE PANE W/STORM WINDOWS	R-GLASS	1.60
SLAB TYPE FLOOR:	CONCRETE	SLF	0.68
BASEMENT TYPE:	NONE	R-BASEM.	0.00
OVERHEAD DOOR TYPE:	NONE	R-ODOOR	0.00
PERSONNEL DOOR TYPE:	HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	798 X 0.33 Sq.In./LF=	Sq.In.	263	X CFM/Sq.In.	1.530	=	403
PERSONNEL DOORS (SF)	84 X 0.16 Sq.In./SF=	Sq.In.	13	X CFM/Sq.In.	1.530	=	21
DOOR OPENINGS / HR - SINGLE DOOR		4	X CFM / OPENING / HR	1.600	=	6	
DOOR OPENINGS / HR - DOUBLE DOORS			X CFM / OPENING / HR	1.385	=	0	
TOTAL INFILTRATION (CFM)						=	430

UA ODOOR	=	ODOOR AREA	0	X DOOR "U"	0.000	=	0
UA PDOOR	=	PDOOR AREA	84	X DOOR "U"	0.552	=	46
UA WALL	=	WALL AREA	4,639	X WALL "U"	0.088	=	411
UA ROOF	=	ROOF AREA	7,093	X ROOF "U"	0.046	=	329
UA GLASS	=	GLASS AREA	2,736	X GLASS "U"	0.625	=	1,710
UA SLAB	=	SLAB PERIM.	435	X SLF	0.680	=	296
UA BASEM.	=	B-WALL AREA	0	X BASE "U"	0.000	=	0
INFILTRATION	=	CFM	430	X A. T. F.	1.037	=	446
TOTAL UA (BTU/HR°F)						=	3,238

E M C ENGINEERS, INC.  
 PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 12-Jun-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	541	BLDG NAME:	OFF QTRS MILIT
BLDG FUNCTION:			
FLOOR AREA: (SQ. FT)	18,000	# FLOORS:	2
SLAB PERIMETER: (FT)	530		

**I. AREAS: ([ ] FIELD VERIFIED ELEVATION PLANS)**

		NORTH	SOUTH	EAST	WEST	TOTAL
WALLS, GROSS	(SQ. FT)	686	686	3,861	3,861	9,095
GLASS	(SQ. FT)	96	96	1,536	1,584	3,312
PERSONNEL DOOR	(SQ. FT)	0	0	0	84	84
OVERHEAD DOOR	(SQ. FT)	0	0	0	0	0
WALLS, NET	(SQ. FT)	590	590	2,325	2,193	5,699
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)	(SQ. FT)					9,000
OVERHEAD DOOR	(SQ. FT)	0	PERSONNEL DOOR		(SQ. FT)	84
BASEMENT WALLS	(SQ. FT)	0	0	0	0	0

**II. CONSTRUCTION: ([ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES)**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE
COMPOSITE: 4" BRICK = 1.2 PLYWOOD SHEATHING = .62	1. OUTSIDE AIR FILM	0.17
	2. COMPOSITE	1.00
	3. AIR SPACE	1.00
	4. 1/4" GYPSUM BOARD	0.45
	5. 2" RIGID INSULATION	8.00
	6.	
	7. INSIDE AIR FILM	0.68
	TOTAL R-WALL =	11.30
	U=1/R	0.088
ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. COMPOSITION SHINGLES	0.00
	3. 55# FELT	0.06
	4. PLYWOOD SHEATHING	0.62
	5. AIR SPACE	1.00
	6. 6" BATT INSULATION	19.00
	7. INSIDE AIR FILM	0.68
	TOTAL R-ROOF =	21.53
	U=1/R	0.046
GLASS TYPE: SINGLE PANE W/STORMS	R-GLASS	1.60
SLAB TYPE FLOOR: CONCRETE	SLF	0.68
BASEMENT TYPE: NONE	R-BASEM.	0.00
OVERHEAD DOOR TYPE: NONE	R-ODOOR	0.00
PERSONNEL DOOR TYPE: HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	966 X 0.33 Sq.In./LF=	Sq.In.	319	X CFM/Sq.In.	1.530	=	488
PERSONNEL DOORS (SF)	84 X 0.16 Sq.In./SF=	Sq.In.	13	X CFM/Sq.In.	1.530	=	21
DOOR OPENINGS / HR - SINGLE DOOR	4	X CFM / OPENING / HR	1.600	=	6		
DOOR OPENINGS / HR - DOUBLE DOORS		X CFM / OPENING / HR	1.385	=	0		
TOTAL INFILTRATION (CFM)						=	515

UA ODOOR	=	ODOOR AREA	0	X DOOR "U"	0.000	=	0
UA PDOOR	=	PDOOR AREA	84	X DOOR "U"	0.552	=	46
UA WALL	=	WALL AREA	5,699	X WALL "U"	0.088	=	504
UA ROOF	=	ROOF AREA	9,000	X ROOF "U"	0.046	=	418
UA GLASS	=	GLASS AREA	3,312	X GLASS "U"	0.625	=	2,070
UA SLAB	=	SLAB PERIM.	530	X SLF	0.680	=	360
UA BASEM.	=	B-WALL AREA	0	X BASE. "U"	0.000	=	0
INFILTRATION	=	CFM	515	X A. T. F.	1.037	=	534
TOTAL UA (BTU/HR°F)							3,933

E M C ENGINEERS, INC.  
 PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 12-Jun-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	602	BLDG NAME:	DENTAL CLINIC
BLDG FUNCTION:	CLINIC		
FLOOR AREA (SQ. FT)	11,044	# FLOORS:	1
SLAB PERIMETER (FT)	CRAWL SPACE		

**I. AREAS: ( [ ] FIELD VERIFIED ELEVATION PLANS )**

		NORTH	SOUTH	EAST	WEST	TOTAL
WALLS, GROSS	(SQ. FT)	948	948	1,148	1,148	4,191
GLASS	(SQ. FT)	80	174	96	90	440
PERSONNEL DOOR	(SQ. FT)	0	42	42	42	126
OVERHEAD DOOR	(SQ. FT)	0	0	0	0	0
WALLS, NET	(SQ. FT)	868	732	1,010	1,016	3,625
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)						(SQ. FT) 11,044
OVERHEAD DOOR	(SQ. FT)	0 PERSONNEL DOOR		(SQ. FT)	126	
BASEMENT WALLS	(SQ. FT)					0

**II. CONSTRUCTION: ( [ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES )**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE	
COMPOSITE: 10" ARCH. CONCRETE = 1.39 INSULATED GLASS = 1.75	1. OUTSIDE AIR FILM	0.17	
	2. COMPOSITE	1.57	
	3. 6" BATT INSUL.	19.00	
	4. 5/8" GYPSUM BD.	0.56	
	5.		
	6.		
	7. INSIDE AIR FILM	0.68	
	TOTAL R-WALL =	21.98	
	U=1/R	0.045	
ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE	
	1. OUTSIDE AIR FILM	0.17	
	2. METAL ROOF	0.00	
	3. 6" BATT INSUL.	19.00	
	4. 2 LAYERS FELT	0.12	
	5. 1/2" PLYWOOD	0.62	
	6.		
	7. INSIDE AIR FILM	0.68	
	TOTAL R-ROOF =	20.59	
	U=1/R	0.049	
GLASS TYPE:	DOUBLE PANE	R-GLASS	1.75
SLAB TYPE FLOOR:	CONCRETE	SLF	0.68
BASEMENT TYPE:	NONE	R-BASEM.	0.00
OVERHEAD DOOR TYPE:	NONE	R-ODOOR	0.00
PERSONNEL DOOR TYPE:	HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	0 X 0.27 Sq.In./LF=	Sq.In.	0	X CFM/Sq.In.	1.530	=	0
PERSONNEL DOORS (SF)	126 X 0.16 Sq.In./SF=	Sq.In.	20	X CFM/Sq.In.	1.530	=	31
DOOR OPENINGS / HR - SINGLE DOOR							
				X CFM /OPENING /HR	1.600	=	0
DOOR OPENINGS / HR - DOUBLE DOORS							
				X CFM /OPENING /HR	1.385	=	6
TOTAL INFILTRATION (CFM)						=	36

UA ODOOR	=	ODOOR AREA	0	X DOOR "U"	0.000	=	0
UA PDOOR	=	PDOOR AREA	126	X DOOR "U"	0.552	=	70
UA WALL	=	WALL AREA	3,625	X WALL "U"	0.045	=	165
UA ROOF	=	ROOF AREA	11,044	X ROOF "U"	0.049	=	536
UA GLASS	=	GLASS AREA	440	X GLASS "U"	0.571	=	251
UA SLAB	=	SLAB PERIM. CRAWL SPACE		X SLF	0.660	=	0
UA BASEM.	=	B-WALL AREA	0	X BASE "U"	0.000	=	0
INFILTRATION	=	CFM	36	X A. T. F.	1.037	=	38
TOTAL UA (BTU/HR°F)							1,060

E M C ENGINEERS, INC.  
 PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 12-Jun-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	610	BLDG NAME:	ENL BARRACKS W/AS
BLDG FUNCTION:	BARRACKS		
FLOOR AREA: (SQ. FT)	28,804	# FLOORS:	4
SLAB PERIMETER: (FT)			

**I. AREAS: ( [ ] FIELD VERIFIED ELEVATION PLANS)**

		NORTH	SOUTH	EAST	WEST	TOTAL
WALLS, GROSS	(SQ. FT)	1,248	1,248	7,595	7,595	17,686
GLASS	(SQ. FT)	0	0	2,445	2,430	4,875
PERSONNEL DOOR	(SQ. FT)	105	0	126	42	273
OVERHEAD DOOR	(SQ. FT)	0	0	0	0	0
WALLS, NET	(SQ. FT)	1,143	1,248	5,024	5,123	12,538
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)	(SQ. FT)					8,639
OVERHEAD DOOR	(SQ. FT)	0	PERSONNEL DOOR	(SQ. FT)	273	
BASEMENT WALLS	(SQ. FT)	390	390	740	740	2,260

**II. CONSTRUCTION: ( [ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES)**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. 4" BRICK	1.20
	3. AIR SPACE	1.00
	4. 6" CMU	0.92
	5. AIR SPACE	1.00
	6. 1/4" GYPSUM BOARD	0.45
	7. INSIDE AIR FILM	0.68
	TOTAL R-WALL =	5.42
	U=1/R	0.185

ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. BUR	0.33
	3. 2" RIGID INSUL.	5.56
	4. 2" LIGHTWEIGHT CONCRETE	0.52
	5.	
	6.	
	7. INSIDE AIR FILM	0.68
	TOTAL R-ROOF =	7.26
	U=1/R	0.138

GLASS TYPE:	SINGLE PANE W/STORM WINDOWS	R-GLASS	1.60
SLAB TYPE FLOOR:	CONCRETE	SLF	0.68
BASEMENT TYPE:	NONE	R-BASEM.	10.00
OVERHEAD DOOR TYPE:	NONE	R-ODOOR	0.00
PERSONNEL DOOR TYPE:	HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	2600 X 0.33 Sq.In./LF=	Sq.In.	858	X CFM/Sq.In.	1.530	=	1313
PERSONNEL DOORS (SF)	273 X 0.16 Sq.In./SF=	Sq.In.	44	X CFM/Sq.In.	1.530	=	67
DOOR OPENINGS / HR - SINGLE DOOR				X CFM /OPENING /HR	1.600	=	0
DOOR OPENINGS / HR - DOUBLE DOORS	8			X CFM /OPENING /HR	1.385	=	11
				TOTAL INFILTRATION (CFM)			1391

UA ODOOR	=	ODOOR AREA	0	X DOOR "U"	0.000	=	0	
UA PDOOR	=	PDOOR AREA	273	X DOOR "U"	0.552	=	151	
UA WALL	=	WALL AREA	12,538	X WALL "U"	0.185	=	2,313	
UA ROOF	=	ROOF AREA	8,639	X ROOF "U"	0.138	=	1,190	
UA GLASS	=	GLASS AREA	4,875	X GLASS "U"	0.625	=	3,047	
UA SLAB	=	SLAB PERIM.	0	X SLF	0.680	=	0	
UA BASEM.	=	B-WALL AREA	2,260	X BASE. "U"	0.100	=	226	
INFILTRATION	=	CFM	1391	X A. T. F.	1.037	=	1,442	
							TOTAL UA (BTU/HR*F)	8,369

E M C ENGINEERS, INC.  
 PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 12-Jun-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	620	BLDG NAME:	OFF QTRS MILIT
BLDG FUNCTION:			
FLOOR AREA: (SQ. FT)	11,359	# FLOORS:	2
SLAB PERIMETER: (FT)	493		

**I. AREAS: ([ ] FIELD VERIFIED ELEVATION PLANS)**

		NORTH	SOUTH	EAST	WEST	TOTAL	
WALLS, GROSS	(SQ. FT)	3,741	3,741	437	437	8,355	
GLASS	(SQ. FT)	784	728	0	28	1,540	
PERSONNEL DOOR	(SQ. FT)	84	0	0	0	84	
OVERHEAD DOOR	(SQ. FT)	0	0	0	0	0	
WALLS, NET	(SQ. FT)	2,873	3,013	437	409	6,731	
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)						(SQ. FT)	7,499
OVERHEAD DOOR	(SQ. FT)	0	PERSONNEL DOOR		(SQ. FT)	84	
BASEMENT WALLS	(SQ. FT)					0	

**II. CONSTRUCTION: ([ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES)**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE	
COMPOSITES VERTICAL WOOD SIDING W/BATTENS = 1.17 4" BRICK = 1.2	1. OUTSIDE AIR FILM	0.17	
	2. COMPOSITE WALL	1.18	
	3. AIR SPACE	1.00	
	4. 1" INSULATION	4.00	
	5. 1/2" GYPSUM BOARD	0.45	
	6.		
	7. INSIDE AIR FILM	0.68	
	TOTAL R-WALL =	7.48	
	U=1/R	0.134	
ROOF: (SKETCH CROSS SECTION OF ROOF)			
	COMPONENTS	R-VALUE	
	1. OUTSIDE AIR FILM	0.17	
	2. SHINGLES	0.83	
	3. 2" INSULATION	5.56	
	4. AIR SPACE	1.00	
	5.		
	6.		
	7. INSIDE AIR FILM	0.68	
	TOTAL R-ROOF =	8.24	
	U=1/R	0.121	
GLASS TYPE:	SINGLE PANE	R-GLASS	0.90
SLAB TYPE FLOOR:	CONCRETE	SLF	0.68
BASEMENT TYPE:	NONE	R-BASEM	0.00
OVERHEAD DOOR TYPE:	NONE	R-ODOOR	0.00
PERSONNEL DOOR TYPE:	HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	915 X 0.33 Sq.In./LF=	Sq.In.	302	X CFM/Sq.In.	1.530	=	462
PERSONNEL DOORS (SF)	84 X 0.16 Sq.In./SF=	Sq.In.	13	X CFM/Sq.In.	1.530	=	21
DOOR OPENINGS / HR - SINGLE DOOR		4	X CFM /OPENING /HR	1.600	=	6	
DOOR OPENINGS / HR - DOUBLE DOORS			X CFM /OPENING /HR	1.385	=	0	
<b>TOTAL INFILTRATION (CFM)</b>							<b>489</b>

UA ODOOR	=	ODOOR AREA	0	X DOOR "U"	0.000	=	0
UA PDOOR	=	PDOOR AREA	84	X DOOR "U"	0.552	=	46
UA WALL	=	WALL AREA	6,731	X WALL "U"	0.134	=	900
UA ROOF	=	ROOF AREA	7,499	X ROOF "U"	0.121	=	911
UA GLASS	=	GLASS AREA	1,540	X GLASS "U"	1.111	=	1,711
UA SLAB	=	SLAB PERIM.	493	X SLF	0.680	=	335
UA BASEM.	=	B-WALL AREA	0	X BASE. "U"	0.000	=	0
INFILTRATION	=	CFM	489	X A. T. F.	1.037	=	507
<b>TOTAL UA (BTU/HR°F)</b>							<b>4,410</b>

E M C ENGINEERS, INC.  
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 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
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 LOCATION: FT. RILEY, KANSAS

DATE: 12-Jun-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	710	BLDG NAME:	TAC EQUIP SHOP
BLDG FUNCTION:			
FLOOR AREA: (SQ. FT)	2,125	# FLOORS:	1
SLAB PERIMETER: (FT)	199		

**I. AREAS: ( [ ] FIELD VERIFIED ELEVATION PLANS)**

		NORTH-W	NORTH-E	SOUTH-W	SOUTH-E	TOTAL
WALLS, GROSS	(SQ. FT)	944	1,195	1,195	944	4,276
GLASS	(SQ. FT)	63	181	145	0	389
PERSONNEL DOOR	(SQ. FT)	0	21	42	21	84
OVERHEAD DOOR	(SQ. FT)	0	420	420	0	840
WALLS, NET	(SQ. FT)	881	573	588	923	2,963
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)					(SQ. FT)	2,125
OVERHEAD DOOR	(SQ. FT)	840	PERSONNEL DOOR		(SQ. FT)	84
BASEMENT WALLS	(SQ. FT)					0

**II. CONSTRUCTION: ( [ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES)**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE	
	1. OUTSIDE AIR FILM	0.17	
	2. 2" INS METAL PANELS	7.33	
	3. 2" AIR SPACE	1.00	
	4. 8" CMU	1.11	
	5.		
	6.		
	7. INSIDE AIR FILM	0.68	
TOTAL R-WALL =		10.29	
U=1/R		0.097	
ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE	
	1. OUTSIDE AIR FILM	0.17	
	2. INS METAL PANELS	7.33	
	3. 2" RIGID INSUL	5.56	
	4. METAL DECK		
	5.		
	6.		
	7. INSIDE AIR FILM	0.68	
TOTAL R-ROOF =		13.74	
U=1/R		0.073	
GLASS TYPE:	SINGLE PANE	R-GLASS	0.90
SLAB TYPE FLOOR:	CONCRETE	SLF	0.68
BASEMENT TYPE:	NONE	R-BASEM.	0.00
OVERHEAD DOOR TYPE:	INSULATED METAL	R-ODOOR	7.33
PERSONNEL DOOR TYPE:	HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	112 X 0.33 Sq.In./LF=	Sq.In.	37	X CFM/Sq.In.	1.530	=	57	
PERSONNEL DOORS (SF)	84 X 0.16 Sq.In./SF=	Sq.In.	13	X CFM/Sq.In.	1.530	=	21	
OVERHEAD DOORS (SF)			840	X CFM/Sq.Ft.	0.228	=	192	
DOOR OPENINGS / HR - SINGLE DOOR			4	X CFM / OPENING /HR	1.600	=	6	
DOOR OPENINGS / HR - DOUBLE DOORS			4	X CFM / OPENING /HR	1.385	=	6	
TOTAL INFILTRATION (CFM)							=	281

UA ODOOR	=	ODOOR AREA	840	X DOOR "U"	0.136	=	115	
UA PDOOR	=	PDOOR AREA	84	X DOOR "U"	0.552	=	46	
UA WALL	=	WALL AREA	2,963	X WALL "U"	0.097	=	288	
UA ROOF	=	ROOF AREA	2,125	X ROOF "U"	0.073	=	155	
UA GLASS	=	GLASS AREA	389	X GLASS "U"	1.111	=	432	
UA SLAB	=	SLAB PERIM.	199	X SLF	0.680	=	135	
UA BASEM.	=	B-WALL AREA	0	X BASE. "U"	0.000	=	0	
INFILTRATION	=	CFM	281	X A. T. F.	1.037	=	291	
TOTAL UA (BTU/HR°F)							=	1,462

E M C ENGINEERS, INC.  
 PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 12-Jun-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	720	BLDG NAME:	AF OPS BLDG
BLDG FUNCTION:			
FLOOR AREA: (SQ. FT)	3,714	# FLOORS:	1
SLAB PERIMETER: (FT)	248		

**I. AREAS: ([ ] FIELD VERIFIED ELEVATION PLANS)**

		NORTH-W	NORTH-E	SOUTH-W	SOUTH-E	TOTAL	
WALLS, GROSS	(SQ. FT)	712	1,022	1,022	712	3,469	
GLASS	(SQ. FT)	75	0	113	0	188	
PERSONNEL DOOR	(SQ. FT)	35	0	0	77	112	
OVERHEAD DOOR	(SQ. FT)	0	0	0	0	0	
WALLS, NET	(SQ. FT)	602	1,022	910	636	3,170	
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)						(SQ. FT)	3,714
OVERHEAD DOOR	(SQ. FT)	0		PERSONNEL DOOR	(SQ. FT)	112	
BASEMENT WALLS	(SQ. FT)					0	

**II. CONSTRUCTION: ([ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES)**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. 4" BRICK	1.20
	3. 2" AIR SPACE	1.00
	4. 8" MASONRY UNITS	1.29
	5. AIR SPACE	1.00
	6. 1/4" GYPSUM BOARD	0.45
	7. INSIDE AIR FILM	0.68
	TOTAL R-WALL =	5.79
	U=1/R	0.173

ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. 5 PLY BUR	0.33
	3. 2" RIGID INSULATION	5.56
	4. 1/5" SHEET METAL ROOF	0.00
	5.	
	6.	
	7. INSIDE AIR FILM	0.68
	TOTAL R-ROOF =	6.74
	U=1/R	0.148

GLASS TYPE:	SINGLE PANE	R-GLASS	0.90
SLAB TYPE FLOOR:	CONCRETE	SLF	0.68
BASEMENT TYPE:	NONE	R-BASEM.	0.00
OVERHEAD DOOR TYPE:	NONE	R-ODOOR	0.00
PERSONNEL DOOR TYPE:	HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	36 X 0.33 Sq.In./LF=	Sq.In.	12	X CFM/Sq.In.	1.530	=	18
PERSONNEL DOORS (SF)	112 X 0.16 Sq.In./SF=	Sq.In.	18	X CFM/Sq.In.	1.530	=	27
DOOR OPENINGS / HR - SINGLE DOOR		1	X CFM /OPENING /HR	1.600	=	2	
DOOR OPENINGS / HR - DOUBLE DOORS		1	X CFM /OPENING /HR	1.385	=	1	
TOTAL INFILTRATION (CFM)						=	49

UA ODOOR	=	ODOOR AREA	0	X DOOR "U"	0.000	=	0
UA PDOOR	=	PDOOR AREA	112	X DOOR "U"	0.552	=	62
UA WALL	=	WALL AREA	3,170	X WALL "U"	0.173	=	547
UA ROOF	=	ROOF AREA	3,714	X ROOF "U"	0.148	=	551
UA GLASS	=	GLASS AREA	188	X GLASS "U"	1.111	=	208
UA SLAB	=	SLAB PERIM.	248	X SLF	0.680	=	168
UA BASEM.	=	B-WALL AREA	0	X BASE. "U"	0.000	=	0
INFILTRATION	=	CFM	49	X A. T. F.	1.037	=	50
TOTAL UA (BTU/HR°F)						=	1,587

E M C ENGINEERS, INC.  
 PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 18-Jul-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	722	BLDG NAME:	FLIGHT SIMULATOR
BLDG FUNCTION:			
FLOOR AREA: (SQ. FT)	6,400	# FLOORS:	1
SLAB PERIMETER: (FT)	320		

**I. AREAS: ( [ ] FIELD VERIFIED ELEVATION PLANS )**

		NORTH-W	NORTH-E	SOUTH-W	SOUTH-E	TOTAL
WALLS, GROSS	(SQ. FT)	2,160	1,812	1,812	2,160	7,944
GLASS	(SQ. FT)	150	22	0	0	172
PERSONNEL DOOR	(SQ. FT)	42	63	42	0	147
OVERHEAD DOOR	(SQ. FT)					0
WALLS, NET	(SQ. FT)	1,968	1,728	1,770	2,160	7,626
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)						(SQ. FT)
OVERHEAD DOOR	(SQ. FT)	0	PERSONNEL DOOR		(SQ. FT)	147
BASEMENT WALLS	(SQ. FT)					0

**II. CONSTRUCTION: ( [ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES )**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. 8" CONCRETE BLOCK	1.11
	3. 3" BATT INSUL.	11.00
	4. 1/2" G.W.B.	0.45
	5.	
	6.	
	7. INSIDE AIR FILM	0.68
	TOTAL R-WALL =	13.41
	U=1/R	0.075

ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. BUR	0.33
	3. 2" RIGID INSULATION	5.56
	4. METAL DECK	0.00
	5.	
	6.	
	7. INSIDE AIR FILM	0.68
	TOTAL R-ROOF =	6.74
	U=1/R	0.148

GLASS TYPE:	DOUBLE PANE	R-GLASS	1.75
SLAB TYPE FLOOR:	CONCRETE	SLF	0.68
BASEMENT TYPE:	NONE	R-BASEM.	0.00
OVERHEAD DOOR TYPE:	NONE	R-ODOOR	0.00
PERSONNEL DOOR TYPE:	HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	X 0.27 Sq.In./LF=	Sq.In.	0	X CFM/Sq.In.	1.530	=	0
PERSONNEL DOORS (SF)	147 X 0.16 Sq.In./SF=	Sq.In.	24	X CFM/Sq.In.	1.530	=	36
DOOR OPENINGS / HR - SINGLE DOOR				X CFM / OPENING / HR	1.600	=	0
DOOR OPENINGS / HR - DOUBLE DOORS				X CFM / OPENING / HR	1.385	=	0
<b>TOTAL INFILTRATION (CFM)</b>						<b>=</b>	<b>36</b>

UA ODOOR	=	ODOOR AREA	0	X DOOR "U"	0.000	=	0
UA PDOOR	=	PDOOR AREA	147	X DOOR "U"	0.552	=	81
UA WALL	=	WALL AREA	7,626	X WALL "U"	0.075	=	569
UA ROOF	=	ROOF AREA	0	X ROOF "U"	0.148	=	0
UA GLASS	=	GLASS AREA	172	X GLASS "U"	0.571	=	98
UA SLAB	=	SLAB PERIM.	320	X SLF	0.680	=	218
UA BASEM	=	B-WALL AREA	0	X BASE. "U"	0.000	=	0
INFILTRATION	=	CFM	36	X A. T. F.	0.852	=	31
<b>TOTAL UA (BTU/HR°F)</b>						<b>=</b>	<b>996</b>



E M C ENGINEERS, INC.  
 PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 12-Jun-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	723	BLDG NAME:	MAINT. HANGER
BLDG FUNCTION:	MAINT		
FLOOR AREA: (SQ. FT)	21,355	# FLOORS:	1 & 2
SLAB PERIMETER: (FT)	521		

**I. AREAS: ([ ] FIELD VERIFIED ELEVATION PLANS)**

		NORTH-W	NORTH-E	SOUTH-W	SOUTH-E	TOTAL
WALLS, GROSS	(SQ. FT)	4,115	3,522	3,522	4,115	15,274
GLASS	(SQ. FT)	0	557	691	0	1,248
PERSONNEL DOOR	(SQ. FT)	0	187	68	0	254
OVERHEAD DOOR	(SQ. FT)	1,960	0	0	1,960	3,920
WALLS, NET	(SQ. FT)	2,155	2,778	2,763	2,155	9,852
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)						(SQ. FT) 17,030
OVERHEAD DOOR	(SQ. FT)	3,920	PERSONNEL DOOR		(SQ. FT)	254
BASEMENT WALLS	(SQ. FT)					0

**II. CONSTRUCTION: ([ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES)**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPOSITES	R-VALUE
COMPONENTS: 8" MASONRY UNITS = 1.11 1" INSULATION = 4.0 METAL SIDING = 0 CORRUGATED SIDING = 4.85 IA FILM = .68 OA FILM = .17	1. NE WALL	2.59
	2. SW WALL	2.59
	3. NW WALL	4.85
	4. SE WALL	4.85
	5.	
	6.	
	7.	
	COMP. R-WALL =	3.58
	U=1/R	0.279
ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPOSITES	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. ROOF DECK	0.00
	3. INSULATION	4.00
	4. 5 PLY BUR	0.33
	5.	
	6.	
	7. INSIDE AIR FILM	0.68
	TOTAL R-ROOF =	5.18
U=1/R	0.193	
GLASS TYPE: SINGLE PANE	R-GLASS	0.90
SLAB TYPE FLOOR: CONCRETE	SLF	0.68
BASEMENT TYPE: NONE	R-BASEM.	0.00
OVERHEAD DOOR TYPE: INSULATED METAL	R-ODOOR	7.33
PERSONNEL DOOR TYPE: HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	590 X 0.33 Sq.In./LF=	Sq.In.	195	X CFM/Sq.In.	1.530	=	298	
PERSONNEL DOORS (SF)	254 X 0.16 Sq.In./SF=	Sq.In.	41	X CFM/Sq.In.	1.530	=	62	
OVERHEAD DOOR (SF)			3920	X CFM/Sq.Ft.	0.228	=	894	
DOOR OPENINGS / HR - SINGLE DOOR			5	X CFM /OPENING /HR	1.600	=	8	
DOOR OPENINGS / HR - DOUBLE DOORS			5	X CFM /OPENING /HR	1.385	=	7	
<b>TOTAL INFILTRATION (CFM)</b>							<b>=</b>	<b>1269</b>

UA ODOOR	=	ODOOR AREA	3,920	X DOOR "U"	0.136	=	535	
UA PDOOR	=	PDOOR AREA	254	X DOOR "U"	0.552	=	141	
UA WALL	=	WALL AREA	9,852	X WALL "U"	0.279	=	2,752	
UA ROOF	=	ROOF AREA	17,030	X ROOF "U"	0.193	=	3,288	
UA GLASS	=	GLASS AREA	1,248	X GLASS "U"	1.111	=	1,387	
UA SLAB	=	SLAB PERIM.	521	X SLF	0.680	=	354	
UA BASEM.	=	B-WALL AREA	0	X BASE. "U"	0.000	=	0	
INFILTRATION	=	CFM	1269	X A. T. F.	1.037	=	1,316	
<b>TOTAL UA (BTU/HR°F)</b>							<b>=</b>	<b>9,771</b>



E M C ENGINEERS, INC.  
 PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 12-Jun-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	751	BLDG NAME:	AC PTS & TOE ST
BLDG FUNCTION:			
FLOOR AREA: (SQ. FT)	9,809	# FLOORS:	1
SLAB PERIMETER: (FT)	422		

**I. AREAS: ( [ ] FIELD VERIFIED ELEVATION PLANS )**

		NORTH	SOUTH	EAST	WEST	TOTAL	
WALLS, GROSS	(SQ. FT)	1,988	1,988	967	967	5,910	
GLASS	(SQ. FT)	192	288	192	144	816	
PERSONNEL DOOR	(SQ. FT)	63	42	42	0	147	
OVERHEAD DOOR	(SQ. FT)	0	0	0	0	0	
WALLS, NET	(SQ. FT)	1,733	1,658	733	823	4,947	
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)						(SQ. FT)	9,809
OVERHEAD DOOR	(SQ. FT)	0	PERSONNEL DOOR		(SQ. FT)	147	
BASEMENT WALLS	(SQ. FT)					0	

**II. CONSTRUCTION: ( [ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES )**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE	
	1. OUTSIDE AIR FILM	0.17	
	2. 18" SANDSTONE	1.28	
	3. AIR SPACE	1.00	
	4. 1/2" GYPSUM BOARD	0.45	
	5.		
	6.		
	7. INSIDE AIR FILM	0.68	
	TOTAL R-WALL =	3.58	
	U=1/R	0.279	
ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE	
	1. OUTSIDE AIR FILM	0.17	
	2. SHINGLES	0.44	
	3. 3/4" WOOD	0.83	
	4. 3" BATT INSULATION	11.00	
	5.		
	6.		
	7. INSIDE AIR FILM	0.68	
	TOTAL R-ROOF =	13.12	
	U=1/R	0.076	
GLASS TYPE:	SINGLE PANE	R-GLASS	0.90
SLAB TYPE FLOOR:	CONCRETE	SLF	0.68
BASEMENT TYPE:	NONE	R-BASEM.	0.00
OVERHEAD DOOR TYPE:	NONE	R-ODOOR	0.00
PERSONNEL DOOR TYPE:	HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	374 X 0.33 Sq.In./LF=	Sq.In.	123	X CFM/Sq.In.	1.530	=	189
PERSONNEL DOORS (SF)	147 X 0.16 Sq.In./SF=	Sq.In.	24	X CFM/Sq.In.	1.530	=	36
DOOR OPENINGS / HR - SINGLE DOOR							
				X CFM / OPENING / HR	1.600	=	3
DOOR OPENINGS / HR - DOUBLE DOORS							
				X CFM / OPENING / HR	1.385	=	0
TOTAL INFILTRATION (CFM)						=	228

UA ODOOR	=	ODOOR AREA	0	X DOOR "U"	0.000	=	0
UA PDOOR	=	PDOOR AREA	147	X DOOR "U"	0.552	=	81
UA WALL	=	WALL AREA	4,947	X WALL "U"	0.279	=	1,382
UA ROOF	=	ROOF AREA	9,809	X ROOF "U"	0.076	=	748
UA GLASS	=	GLASS AREA	816	X GLASS "U"	1.111	=	907
UA SLAB	=	SLAB PERIM.	422	X SLF	0.680	=	287
UA BASEM.	=	B-WALL AREA	0	X BASE. "U"	0.000	=	0
INFILTRATION	=	CFM	228	X A. T. F.	1.037	=	236
TOTAL UA (BTU/HR°F)							3,641

E M C ENGINEERS, INC.  
 PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 12-Jun-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	810	BLDG NAME:	ADM & SUPPORT BLDG
BLDG FUNCTION:			
FLOOR AREA: (SQ. FT)	15,150	# FLOORS:	1
SLAB PERIMETER: (FT)	580		

**I. AREAS: ([ ] FIELD VERIFIED ELEVATION PLANS)**

		NORTH	SOUTH	EAST	WEST	TOTAL
WALLS, GROSS	(SQ. FT)	1,414	1,882	2,513	2,513	8,322
GLASS	(SQ. FT)	0	0	0	328	328
PERSONNEL DOOR	(SQ. FT)	0	0	378	84	462
OVERHEAD DOOR	(SQ. FT)	0	0	0	0	0
WALLS, NET	(SQ. FT)	1,414	1,882	2,135	2,101	7,532
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)					(SQ. FT)	20,297
OVERHEAD DOOR	(SQ. FT)	0	PERSONNEL DOOR		(SQ. FT)	462
BASEMENT WALLS	(SQ. FT)					0

**II. CONSTRUCTION: ([ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES)**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE	
	1. OUTSIDE AIR FILM	0.17	
	2. 6" JUMBO BRICK	1.80	
	3. 2" INSULATION	8.00	
	4. 6" CMU	1.29	
	5.		
	6.		
	7. INSIDE AIR FILM	0.68	
	TOTAL R-WALL =	11.94	
	U=1/R	0.084	
ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE	
	1. OUTSIDE AIR FILM	0.17	
	2. SHINGLES	0.44	
	3. FELT UNDERLAYMENT	0.06	
	4. 1/2" PLYWOOD SHEATHI	0.62	
	5. METAL DECK	0.00	
	6. 2" INSULATION	5.56	
	7. INSIDE AIR FILM	0.68	
	TOTAL R-ROOF =	7.53	
	U=1/R	0.133	
GLASS TYPE:	SINGLE PANE	R-GLASS	0.90
SLAB TYPE FLOOR:	CONCRETE	SLF	0.68
BASEMENT TYPE:	NONE	R-BASEM.	0.00
OVERHEAD DOOR TYPE:	NONE	R-ODOOR	0.00
PERSONNEL DOOR TYPE:	HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	120 X 0.33 Sq.In./LF=	Sq.In.	40	X CFM/Sq.In.	1.530	=	61
PERSONNEL DOORS (SF)	462 X 0.16 Sq.In./SF=	Sq.In.	74	X CFM/Sq.In.	1.530	=	113
DOOR OPENINGS / HR - SINGLE DOOR	4	X CFM /OPENING /HR	1.600	=	6		
DOOR OPENINGS / HR - DOUBLE DOORS	8	X CFM /OPENING /HR	1.385	=	11		
<b>TOTAL INFILTRATION (CFM)</b>							<b>191</b>

UA ODOOR	=	ODOOR AREA	0	X DOOR "U"	0.000	=	0
UA PDOOR	=	PDOOR AREA	462	X DOOR "U"	0.552	=	255
UA WALL	=	WALL AREA	7,532	X WALL "U"	0.084	=	631
UA ROOF	=	ROOF AREA	20,297	X ROOF "U"	0.133	=	2,695
UA GLASS	=	GLASS AREA	328	X GLASS "U"	1.111	=	364
UA SLAB	=	SLAB PERIM.	580	X SLF	0.680	=	394
UA BASEM.	=	B-WALL AREA	0	X BASE. "U"	0.000	=	0
INFILTRATION	=	CFM	191	X A. T. F.	1.037	=	198
<b>TOTAL UA (BTU/HR*F)</b>							<b>4,538</b>

E M C ENGINEERS, INC.  
 PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 12-Jun-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	814	BLDG NAME:	MEDICAL FAC - NEW
BLDG FUNCTION:			
FLOOR AREA: (SQ. FT)	9,216	# FLOORS:	1
SLAB PERIMETER: (FT)	384		

**I. AREAS: ( [ ] FIELD VERIFIED ELEVATION PLANS )**

		NORTH	SOUTH	EAST	WEST	TOTAL
WALLS, GROSS	(SQ. FT)	1,056	1,056	1,056	1,056	4,224
GLASS	(SQ. FT)	0	80	160	96	336
PERSONNEL DOOR	(SQ. FT)	84	0	42	0	126
OVERHEAD DOOR	(SQ. FT)	0	0	0	0	0
WALLS, NET	(SQ. FT)	972	976	854	960	3,762
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)						(SQ. FT) 16,128
OVERHEAD DOOR	(SQ. FT)	0	PERSONNEL DOOR		(SQ. FT)	126
BASEMENT WALLS	(SQ. FT)					0

**II. CONSTRUCTION: ( [ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES )**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE	
	1. OUTSIDE AIR FILM	0.17	
	2. 6" JUMBO BRICK	1.80	
	3. 1" AIR SPACE	1.00	
	4. 2" RIGID INSUL	5.56	
	5. 8' CMU	1.11	
	6.		
	7. INSIDE AIR FILM	0.68	
	TOTAL R-WALL =	10.32	
	U=1/R	0.097	
ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE	
	1. OUTSIDE AIR FILM	0.17	
	2. METAL ROOF	0.00	
	3. 5/8" COMPOSITE BOARD	0.39	
	4. 1/2" COMPOSITE BOARD	0.62	
	5. 3.6" PHENOLIC INSUL	32.25	
	6. METAL DECK		
	7. INSIDE AIR FILM	0.68	
	TOTAL R-ROOF =	34.11	
	U=1/R	0.029	
GLASS TYPE:	DOUBLE PANE	R-GLASS	1.75
SLAB TYPE FLOOR:	CONCRETE	SLF	0.68
BASEMENT TYPE:	NONE	R-BASEM.	0.00
OVERHEAD DOOR TYPE:	NONE	R-ODOOR	0.00
PERSONNEL DOOR TYPE:	HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	98 X 0.33 Sq.In./LF=	Sq.In.	32	X CFM/Sq.In.	1.530	=	49	
PERSONNEL DOORS (SF)	126 X 0.16 Sq.In./SF=	Sq.In.	20	X CFM/Sq.In.	1.530	=	31	
DOOR OPENINGS / HR - SINGLE DOOR		X CFM / OPENING / HR	1.600	=	0			
DOOR OPENINGS / HR - DOUBLE DOORS	4	X CFM / OPENING / HR	1.385	=	6			
TOTAL INFILTRATION (CFM)							=	86

UA ODOOR	=	ODOOR AREA	0	X DOOR "U"	0.000	=	0	
UA PDOOR	=	PDOOR AREA	126	X DOOR "U"	0.552	=	70	
UA WALL	=	WALL AREA	3,762	X WALL "U"	0.097	=	365	
UA ROOF	=	ROOF AREA	16,128	X ROOF "U"	0.029	=	473	
UA GLASS	=	GLASS AREA	336	X GLASS "U"	0.571	=	192	
UA SLAB	=	SLAB PERIM.	384	X SLF	0.680	=	261	
UA BASEM.	=	B-WALL AREA	0	X BASE. "U"	0.000	=	0	
INFILTRATION	=	CFM	86	X A. T. F.	1.037	=	89	
TOTAL UA (BTU/HR°F)							=	1,449



E M C ENGINEERS, INC.  
 PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 12-Jun-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	833	BLDG NAME:	MNT HANGAR AVUM
BLDG FUNCTION:			
FLOOR AREA: (SQ. FT)	50,127	# FLOORS:	1
SLAB PERIMETER: (FT)	1,013		

**I. AREAS: ([ ] FIELD VERIFIED ELEVATION PLANS)**

		NORTH-W	NORTH-E	SOUTH-W	SOUTH-E	TOTAL
WALLS, GROSS	(SQ. FT)	14,880	5,025	18,124	5,025	43,054
GLASS	(SQ. FT)	135	744	0	135	1,014
PERSONNEL DOOR	(SQ. FT)	27	386	0	27	440
OVERHEAD DOOR	(SQ. FT)	0	0	8,640	0	8,640
WALLS, NET	(SQ. FT)	14,718	3,895	9,484	4,863	32,960
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)						(SQ. FT) 50,320
OVERHEAD DOOR	(SQ. FT)	8,640	PERSONNEL DOOR	(SQ. FT)		440
BASEMENT WALLS	(SQ. FT)					0

**II. CONSTRUCTION: ([ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES)**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPOSITES	R-VALUE	
COMPONENTS	1. SE WALL	10.71	
4" FLUTED CMU = 1.17	2. NW WALL	10.71	
1" AIR SPACE = 1.0	3. SW WALL	11.85	
1" RIGID INSULATION = 4.0	4. NE WALL	5.96	
6" CMU = 1.29	5.		
3" RIBBED METAL PANELS W/3" BATT INSUL. = 11.0	6.		
IA FILM = .68	7.		
OA FILM = .17	TOTAL R-WALL =	10.34	
	U=1/R	0.097	
ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE	
	1. OUTSIDE AIR FILM	0.17	
	2. METAL DECK	0.00	
	3. 6" BLANKET INSUL.	19.00	
	4.		
	5.		
	6.		
	7. INSIDE AIR FILM	0.68	
	TOTAL R-ROOF =	19.85	
	U=1/R	0.050	
GLASS TYPE:	DOUBLE PANE	R-GLASS	1.75
SLAB TYPE FLOOR:	CONCRETE	SLF	0.68
BASEMENT TYPE:	NONE	R-BASEM.	0.00
OVERHEAD DOOR TYPE:	INSULATED METAL	R-ODOOR	7.33
PERSONNEL DOOR TYPE:	HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	1267 X 0.27 Sq.In./LF=	Sq.In.	342	X CFM/Sq.In.	1.530	=	523
PERSONNEL DOORS (SF)	440 X 0.16 Sq.In./SF=	Sq.In.	70	X CFM/Sq.In.	1.530	=	108
OVERHEAD DOORS (SF)			8640	X CFM/Sq.Ft.	0.114	=	985
DOOR OPENINGS / HR - SINGLE DOOR		4	X CFM /OPENING /HR	1.600	=	6	
DOOR OPENINGS / HR - DOUBLE DOORS		4	X CFM /OPENING /HR	1.385	=	6	
TOTAL INFILTRATION (CFM)							= 1628

UA ODOOR	=	ODOOR AREA	8,640	X DOOR "U"	0.136	=	1,179
UA PDOOR	=	PDOOR AREA	440	X DOOR "U"	0.552	=	243
UA WALL	=	WALL AREA	32,960	X WALL "U"	0.097	=	3,188
UA ROOF	=	ROOF AREA	50,320	X ROOF "U"	0.050	=	2,535
UA GLASS	=	GLASS AREA	1,014	X GLASS "U"	0.571	=	579
UA SLAB	=	SLAB PERIM.	1,013	X SLF	0.680	=	689
UA BASEM.	=	B-WALL AREA	0	X BASE. "U"	0.000	=	0
INFILTRATION	=	CFM	1628	X A. T. F.	1.037	=	1,688
TOTAL UA (BTU/HR°F)							10,102

E M C ENGINEERS, INC.  
 PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 12-Jun-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	835	BLDG NAME:	MAF OPS BLDG
BLDG FUNCTION:			
FLOOR AREA: (SQ. FT)	19,448	# FLOORS:	1
SLAB PERIMETER: (FT)	582		

**I. AREAS: ( [ ] FIELD VERIFIED ELEVATION PLANS )**

		NORTH	SOUTH	EAST	WEST	TOTAL
WALLS, GROSS	(SQ. FT)	2,132	2,132	2,618	2,618	9,500
GLASS	(SQ. FT)	0	0	0	328	328
PERSONNEL DOOR	(SQ. FT)	0	0	378	84	462
OVERHEAD DOOR	(SQ. FT)	0	0	0	0	0
WALLS, NET	(SQ. FT)	2,132	2,132	2,240	2,206	8,710
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)						(SQ. FT) 22,248
OVERHEAD DOOR	(SQ. FT)	0	PERSONNEL DOOR		(SQ. FT)	462
BASEMENT WALLS	(SQ. FT)					0

**II. CONSTRUCTION: ( [ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES )**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE	
	1. OUTSIDE AIR FILM	0.17	
	2. 6" JUMBO BRICK	1.80	
	3. 2" INSULATION	8.00	
	4. 6" CMU	1.29	
	5.		
	6.		
	7. INSIDE AIR FILM	0.68	
	TOTAL R-WALL =	11.94	
	U=1/R	0.084	
ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE	
	1. OUTSIDE AIR FILM	0.17	
	2. SHINGLES	0.44	
	3. 2" RIGID INSULATION	5.56	
	4. 1/2" PLYWOOD SHEATHI	0.62	
	5. AIR SPACE	1.00	
	6. ACU CEILING	1.25	
	7. INSIDE AIR FILM	0.68	
	TOTAL R-ROOF =	9.72	
	U=1/R	0.103	
GLASS TYPE:	DOUBLE PANE	R-GLASS	1.75
SLAB TYPE FLOOR:	CONCRETE	SLF	0.68
BASEMENT TYPE:	NONE	R-BASEM.	0.00
OVERHEAD DOOR TYPE:	NONE	R-ODOOR	0.00
PERSONNEL DOOR TYPE:	HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	160 X 0.27 Sq.In./LF=	Sq.In.	43	X CFM/Sq.In.	1.530	=	66	
PERSONNEL DOORS (SF)	462 X 0.16 Sq.In./SF=	Sq.In.	74	X CFM/Sq.In.	1.530	=	113	
DOOR OPENINGS / HR - SINGLE DOOR								
				X CFM /OPENING /HR	1.600	=	0	
DOOR OPENINGS / HR - DOUBLE DOORS								
		12		X CFM /OPENING /HR	1.385	=	17	
TOTAL INFILTRATION (CFM)							=	196

UA ODOOR	=	ODOOR AREA	0	X DOOR "U"	0.000	=	0
UA PDOOR	=	PDOOR AREA	462	X DOOR "U"	0.552	=	255
UA WALL	=	WALL AREA	8,710	X WALL "U"	0.084	=	729
UA ROOF	=	ROOF AREA	22,248	X ROOF "U"	0.103	=	2,289
UA GLASS	=	GLASS AREA	328	X GLASS "U"	0.571	=	187
UA SLAB	=	SLAB PERIM.	582	X SLF	0.680	=	396
UA BASEM.	=	B-WALL AREA	0	X BASE. "U"	0.000	=	0
INFILTRATION	=	CFM	196	X A. T. F.	1.037	=	203
TOTAL UA (BTU/HR*F)							4,060



E M C ENGINEERS, INC.  
 PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 12-Jun-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	840	BLDG NAME:	VEH MNT SHOP ORG
BLDG FUNCTION:			
FLOOR AREA: (SQ. FT)	9,545	# FLOORS:	1
SLAB PERIMETER: (FT)	396		

**I. AREAS: ( [ ] FIELD VERIFIED ELEVATION PLANS )**

		NORTH	SOUTH	EAST	WEST	TOTAL
WALLS, GROSS	(SQ. FT)	2,760	2,760	1,992	1,992	9,504
GLASS	(SQ. FT)	152	152	0	0	304
PERSONNEL DOOR	(SQ. FT)	84	84	84	0	252
OVERHEAD DOOR	(SQ. FT)	1,260	1,260	0	0	2,520
WALLS, NET	(SQ. FT)	1,264	1,264	1,908	1,992	6,428
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)						(SQ. FT) 9,545
OVERHEAD DOOR	(SQ. FT)	2,520	PERSONNEL DOOR		(SQ. FT)	252
BASEMENT WALLS	(SQ. FT)					0

**II. CONSTRUCTION: ( [ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES )**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. INSUL. METAL PANEL	8.34
	3.	
	4.	
	5.	
	6.	
	7. INSIDE AIR FILM	0.68
	TOTAL R-WALL =	9.19
	U=1/R	0.109

ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. BUR	0.33
	3. 2" RIGID INSUL.	5.56
	4.	
	5.	
	6.	
	7. INSIDE AIR FILM	0.68
	TOTAL R-ROOF =	6.74
	U=1/R	0.148

GLASS TYPE:	DOUBLE PANE	R-GLASS	1.75
SLAB TYPE FLOOR:	CONCRETE	SLF	0.68
BASEMENT TYPE:	NONE	R-BASEM.	0.00
OVERHEAD DOOR TYPE:	INSUL. METAL	R-ODOOR	7.33
PERSONNEL DOOR TYPE:	HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	224 X 0.27 Sq.In./LF=	Sq.In.	60	X CFM/Sq.In.	1.530	=	93
PERSONNEL DOORS (SF)	252 X 0.16 Sq.In./SF=	Sq.In.	40	X CFM/Sq.In.	1.530	=	62
OVERHEAD DOORS (SF)			2520	X CFM/Sq.Ft.	0.228	=	575
DOOR OPENINGS / HR - SINGLE DOOR			4	X CFM /OPENING /HR	1.600	=	6
DOOR OPENINGS / HR - DOUBLE DOORS			4	X CFM /OPENING /HR	1.385	=	6
<b>TOTAL INFILTRATION (CFM)</b>							<b>= 741</b>

UA ODOOR	=	ODOOR AREA	2,520	X DOOR "U"	0.136	=	344
UA PDOOR	=	PDOOR AREA	252	X DOOR "U"	0.552	=	139
UA WALL	=	WALL AREA	6,428	X WALL "U"	0.109	=	699
UA ROOF	=	ROOF AREA	9,545	X ROOF "U"	0.148	=	1,416
UA GLASS	=	GLASS AREA	304	X GLASS "U"	0.571	=	174
UA SLAB	=	SLAB PERIM.	396	X SLF	0.680	=	269
UA BASEM.	=	B-WALL AREA	0	X BASE. "U"	0.000	=	0
INFILTRATION	=	CFM	741	X A. T. F.	1.037	=	768
<b>TOTAL UA (BTU/HR°F)</b>							<b>3,810</b>

E M C ENGINEERS, INC.  
 PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 12-Jun-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	4010	BLDG NAME:	DENTAL CLINIC
BLDG FUNCTION:			
FLOOR AREA: (SQ. FT)	15,587	# FLOORS:	1
SLAB PERIMETER: (FT)	504		

**I. AREAS: ([ ] FIELD VERIFIED ELEVATION PLANS)**

		NORTH	SOUTH	EAST	WEST	TOTAL
WALLS, GROSS	(SQ. FT)	1,859	1,859	1,417	1,417	6,552
GLASS	(SQ. FT)	208	384	96	32	720
PERSONNEL DOOR	(SQ. FT)	0	42	42	98	182
OVERHEAD DOOR	(SQ. FT)					0
WALLS, NET	(SQ. FT)	1,651	1,433	1,279	1,287	5,650
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)	(SQ. FT)					15,587
OVERHEAD DOOR	(SQ. FT)	0				182
PERSONNEL DOOR	(SQ. FT)					182
BASEMENT WALLS	(SQ. FT)					0

**II. CONSTRUCTION: ([ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES)**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. 4" BRICK	1.20
	3. MTL FRAMING W/BATT	12.00
	4. 8" CMU	0.92
	5.	
	6.	
	7. INSIDE AIR FILM	0.68
	TOTAL R-WALL =	14.97
	U=1/R	0.067

ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. MTL ROOFING	0.00
	3. 4" RIGID INSUL	11.12
	4. FELT UNDERLAYMENT	0.06
	5. MTL. DECKING	0.00
	6.	
	7. INSIDE AIR FILM	0.68
	TOTAL R-ROOF =	12.03
	U=1/R	0.083

GLASS TYPE:	DOUBLE PANE	R-GLASS	1.75
SLAB TYPE FLOOR:	CONCRETE	SLF	0.68
BASEMENT TYPE:	NONE	R-BASEM.	0.00
OVERHEAD DOOR TYPE:	NONE	R-ODOOR	0.00
PERSONNEL DOOR TYPE:	HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	258 X 0.33 Sq.In./LF=	Sq.In.	85	X CFM/Sq.In.	1.530	=	130
PERSONNEL DOORS (SF)	182 X 0.16 Sq.In./SF=	Sq.In.	29	X CFM/Sq.In.	1.530	=	45
DOOR OPENINGS / HR - SINGLE DOOR				X CFM /OPENING /HR	1.600	=	0
DOOR OPENINGS / HR - DOUBLE DOORS			4	X CFM /OPENING /HR	1.385	=	6
				TOTAL INFILTRATION (CFM)		=	180

UA ODOOR	=	ODOOR AREA	0	X DOOR "U"	0.000	=	0
UA PDOOR	=	PDOOR AREA	182	X DOOR "U"	0.552	=	101
UA WALL	=	WALL AREA	5,650	X WALL "U"	0.067	=	377
UA ROOF	=	ROOF AREA	15,587	X ROOF "U"	0.083	=	1,296
UA GLASS	=	GLASS AREA	720	X GLASS "U"	0.571	=	411
UA SLAB	=	SLAB PERIM.	504	X SLF	0.680	=	343
UA BASEM.	=	B-WALL AREA	0	X BASE. "U"	0.000	=	0
INFILTRATION	=	CFM	180	X A. T. F.	1.037	=	187
				TOTAL UA (BTU/HR°F)		=	2,715

E M C ENGINEERS, INC.  
 PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 18-Jul-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	5302	BLDG NAME:	POST OFFICE
BLDG FUNCTION:			
FLOOR AREA (SQ. FT)	10,450	# FLOORS:	1
SLAB PERIMETER (FT)	410		

**I. AREAS: ([ ] FIELD VERIFIED ELEVATION PLANS)**

		NORTH	SOUTH	EAST	WEST	TOTAL
WALLS, GROSS	(SQ. FT)	1,630	1,630	1,888	1,888	7,036
GLASS	(SQ. FT)	0	0	0	198	198
PERSONNEL DOOR	(SQ. FT)	63	21	189	0	273
OVERHEAD DOOR	(SQ. FT)	0	0	0	0	0
WALLS, NET	(SQ. FT)	1,567	1,609	1,699	1,690	6,565
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)						(SQ. FT) 10,450
OVERHEAD DOOR	(SQ. FT)	0		PERSONNEL DOOR	(SQ. FT)	273
BASEMENT WALLS	(SQ. FT)					0

**II. CONSTRUCTION: ([ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES)**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE
COMPOSITE: 4" FACE BRICK = 1.2 4" PRE-CAST CONCRETE PANELS = .72	1. OUTSIDE AIR FILM	0.17
	2. COMPOSITE	1.05
	3. 2" AIR SPACE	1.00
	4. 2" RIGID INSUL.	5.56
	5. 8" CMU	1.11
	6.	
	7. INSIDE AIR FILM	0.68
	TOTAL R-WALL =	9.57
	U=1/R	0.104
ROOF: (SKETCH CROSS SECTION OF ROOF)		
	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. BUR	0.33
	3. GRAVEL	0.33
	4. 2" RIGID INSUL	5.56
	5.	
	6.	
	7. INSIDE AIR FILM	0.68
	TOTAL R-ROOF =	7.07
	U=1/R	0.141
GLASS TYPE:	SINGLE PANE	R-GLASS 0.90
SLAB TYPE FLOOR:	CONCRETE	SLF 0.68
BASEMENT TYPE:	NONE	R-BASEM. 0.00
OVERHEAD DOOR TYPE:	NONE	R-ODOOR 0.00
PERSONNEL DOOR TYPE:	HOLLOW METAL	R-PDOOR 1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	99 X 0.33 Sq.In./LF=	Sq.In.	33	X CFM/Sq.In.	1.530	=	50
PERSONNEL DOORS (SF)	273 X 0.16 Sq.In./SF=	Sq.In.	44	X CFM/Sq.In.	1.530	=	67
DOOR OPENINGS / HR - SINGLE DOOR							
				X CFM /OPENING /HR	1.600	=	0
DOOR OPENINGS / HR - DOUBLE DOORS							
				X CFM /OPENING /HR	1.385	=	0
TOTAL INFILTRATION (CFM)						=	117

UA ODOOR	=	ODOOR AREA	0	X DOOR "U"	0.000	=	0
UA PDOOR	=	PDOOR AREA	273	X DOOR "U"	0.552	=	151
UA WALL	=	WALL AREA	6,565	X WALL "U"	0.104	=	686
UA ROOF	=	ROOF AREA	10,450	X ROOF "U"	0.141	=	1,478
UA GLASS	=	GLASS AREA	198	X GLASS "U"	1.111	=	220
UA SLAB	=	SLAB PERIM.	410	X SLF	0.680	=	279
UA BASEM	=	B-WALL AREA	0	X BASE. "U"	0.000	=	0
INFILTRATION	=	CFM	117	X A. T. F.	0.852	=	100
TOTAL UA (BTU/HR°F)						=	2,913

E M C ENGINEERS, INC.  
 PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 12-Jun-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	5309	BLDG NAME:	GUEST HOUSE
BLDG FUNCTION:	QUARTERS		
FLOOR AREA: (SQ. FT)	21,067	# FLOORS:	3
SLAB PERIMETER: (FT)	392		

**I. AREAS: ([ ] FIELD VERIFIED ELEVATION PLANS)**

		NORTH	SOUTH	EAST	WEST	TOTAL
WALLS, GROSS	(SQ. FT)	5,199	5,199	1,073	1,073	12,544
GLASS	(SQ. FT)	1,166	1,156	74	24	2,419
PERSONNEL DOOR	(SQ. FT)	0	42	0	28	70
OVERHEAD DOOR	(SQ. FT)	0	0	0	0	0
WALLS, NET	(SQ. FT)	4,033	4,001	1,000	1,021	10,055
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)	(SQ. FT)					7,498
OVERHEAD DOOR	(SQ. FT)	0		PERSONNEL DOOR	(SQ. FT)	70
BASEMENT WALLS	(SQ. FT)					0

**II. CONSTRUCTION: ([ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES)**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. 4" BRICK	1.20
	3. 2" AIR SPACE	1.00
	4. 8" CMU	1.11
	5.	
	6.	
	7. INSIDE AIR FILM	0.68
	TOTAL R-WALL =	4.16
	U=1/R	0.240

ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. BUR	0.33
	3. 2.5" CONCRETE DECK	0.21
	4. 2.5" RIGID INSUL.	6.95
	5. AIR SPACE	1.00
	6. ACOUSTIC TILE CEILING	1.79
	7. INSIDE AIR FILM	0.61
	TOTAL R-ROOF =	11.06
	U=1/R	0.090

GLASS TYPE:	DOUBLE PANE IN METAL FRAMES	R-GLASS	1.00
SLAB TYPE FLOOR:	CONCRETE	SLF	0.83
BASEMENT TYPE:	CONCRETE	R-BASEM.	10.00
OVERHEAD DOOR TYPE:	NONE	R-ODOOR	0.00
PERSONNEL DOOR TYPE:	HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	1224 X 0.33 Sq.In./LF=	Sq.In.	404	X CFM/Sq.In.	1.530	=	618
PERSONNEL DOORS (SF)	70 X 0.16 Sq.In./SF=	Sq.In.	11	X CFM/Sq.In.	1.530	=	17
DOOR OPENINGS / HR - SINGLE DOOR		4	X CFM / OPENING / HR	1.600	=	6	
DOOR OPENINGS / HR - DOUBLE DOORS		8	X CFM / OPENING / HR	1.385	=	11	
			TOTAL INFILTRATION (CFM)		=	653	

UA ODOOR	=	ODOOR AREA	0	X DOOR "U"	0.000	=	0
UA PDOOR	=	PDOOR AREA	70	X DOOR "U"	0.552	=	39
UA WALL	=	WALL AREA	10,055	X WALL "U"	0.240	=	2,417
UA ROOF	=	ROOF AREA	7,498	X ROOF "U"	0.090	=	678
UA GLASS	=	GLASS AREA	2,419	X GLASS "U"	1.000	=	2,419
UA SLAB	=	SLAB PERIM.	392	X SLF	0.830	=	326
UA BASEM.	=	B-WALL AREA	0	X BASE. "U"	0.100	=	0
INFILTRATION	=	CFM	653	X A. T. F.	1.037	=	677
			<b>TOTAL UA (BTU/HR°F)</b>				<b>6,555</b>

E M C ENGINEERS, INC.  
 PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 12-Jun-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	5315	BLDG NAME:	MORRIS HILL CHAPEL
BLDG FUNCTION:	CHAPEL		
FLOOR AREA: (SQ. FT)	22,744	# FLOORS:	1
SLAB PERIMETER: (FT)	1,181		

**I. AREAS: ( [ ] FIELD VERIFIED ELEVATION PLANS )**

		NORTH-W	NORTH-E	SOUTH-W	SOUTH-E	TOTAL
WALLS, GROSS	(SQ. FT)	4,368	4,344	4,128	1,704	14,544
GLASS	(SQ. FT)	150	166	275	66	657
PERSONNEL DOOR	(SQ. FT)	0	84	126	84	294
OVERHEAD DOOR	(SQ. FT)	0	0	0	0	0
WALLS, NET	(SQ. FT)	4,218	4,094	3,727	1,554	13,593
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)						(SQ. FT) 25,782
OVERHEAD DOOR	(SQ. FT)	0	PERSONNEL DOOR		(SQ. FT)	294
BASEMENT WALLS	(SQ. FT)					0

**II. CONSTRUCTION: ( [ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES )**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. 4" BRICK	1.20
	3. 2" RIGID INSUL	5.56
	4. AIR SPACE	1.00
	5. 8" CMU	1.11
	6. 1/2" GYPSUM BD.	0.45
	7. INSIDE AIR FILM	0.68
	TOTAL R-WALL =	10.17
	U=1/R	0.098

ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. SHINGLES	0.44
	3. 2" RIGID INSUL	5.56
	4. 1/2" PLYWOOD SHEATHI	0.62
	5. 1/2" GYPSUM BOARD	0.45
	6.	
	7. INSIDE AIR FILM	0.68
	TOTAL R-ROOF =	7.92
	U=1/R	0.126

GLASS TYPE:	SINGLE PANE	R-GLASS	0.90
SLAB TYPE FLOOR:	CONCRETE	SLF	0.68
BASEMENT TYPE:	NONE	R-BASEM.	0.00
OVERHEAD DOOR TYPE:	NONE	R-ODOOR	0.00
PERSONNEL DOOR TYPE:	HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	230 X 0.33 Sq.In./LF=	Sq.In.	76	X CFM/Sq.In.	1.530	=	116	
PERSONNEL DOORS (SF)	294 X 0.16 Sq.In./SF=	Sq.In.	47	X CFM/Sq.In.	1.530	=	72	
DOOR OPENINGS / HR - SINGLE DOOR								
				X CFM /OPENING /HR	1.600	=	0	
DOOR OPENINGS / HR - DOUBLE DOORS								
			2	X CFM /OPENING /HR	1.385	=	3	
TOTAL INFILTRATION (CFM)							=	191

UA ODOOR	=	ODOOR AREA	0	X DOOR "U"	0.000	=	0
UA PDOOR	=	PDOOR AREA	294	X DOOR "U"	0.552	=	162
UA WALL	=	WALL AREA	13,593	X WALL "U"	0.098	=	1,337
UA ROOF	=	ROOF AREA	25,782	X ROOF "U"	0.126	=	3,255
UA GLASS	=	GLASS AREA	657	X GLASS "U"	1.111	=	730
UA SLAB	=	SLAB PERIM.	1,181	X SLF	0.680	=	803
UA BASEM.	=	B-WALL AREA	0	X BASE. "U"	0.000	=	0
INFILTRATION	=	CFM	191	X A. T. F.	1.037	=	198
TOTAL UA (BTU/HR°F)							6,485

E M C ENGINEERS, INC.  
 PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 18-Jul-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	5800	BLDG NAME:	YOUTH CENTER
BLDG FUNCTION:			
FLOOR AREA: (SQ. FT)	16,497	# FLOORS:	1
SLAB PERIMETER: (FT)	655		

**I. AREAS: ([ ] FIELD VERIFIED ELEVATION PLANS)**

		NORTH	SOUTH	EAST	WEST	TOTAL
WALLS, GROSS	(SQ. FT)	3,302	3,302	1,977	1,977	10,557
GLASS	(SQ. FT)	0	240	192	72	504
PERSONNEL DOOR	(SQ. FT)	105	42	42	42	231
OVERHEAD DOOR	(SQ. FT)	0	0	0	0	0
WALLS, NET	(SQ. FT)	3,197	3,020	1,743	1,863	9,822
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)						(SQ. FT) 18,922
OVERHEAD DOOR	(SQ. FT)	0	PERSONNEL DOOR		(SQ. FT)	231
BASEMENT WALLS	(SQ. FT)					0

**II. CONSTRUCTION: ([ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES)**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. 4" FACE BRICK	1.20
	3. AIR SPACE	1.00
	4. 2" RIGID INSUL.	5.56
	5. 8" CMU	1.11
	6.	
	7. INSIDE AIR FILM	0.68
	TOTAL R-WALL =	9.72
	U=1/R	0.103
ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. 12 GA PURLING	16.68
	3. METAL DECK	0.00
	4. 2" RIGID INSUL.	5.56
	5.	
	6.	
	7. INSIDE AIR FILM	0.68
	TOTAL R-ROOF =	23.09
	U=1/R	0.043
GLASS TYPE:	DOUBLE PANE	R-GLASS 1.75
SLAB TYPE FLOOR:	CONCRETE	SLF 0.68
BASEMENT TYPE:	NONE	R-BASEM. 0.00
OVERHEAD DOOR TYPE:	NONE	R-ODOOR 0.00
PERSONNEL DOOR TYPE:	HOLLOW METAL	R-PDOOR 1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	30 X 0.27 Sq.In./LF=	Sq.In.	8	X CFM/Sq.In.	1.530	=	12
PERSONNEL DOORS (SF)	231 X 0.16 Sq.In./SF=	Sq.In.	37	X CFM/Sq.In.	1.530	=	57
DOOR OPENINGS / HR - SINGLE DOOR							
				X CFM / OPENING / HR	1.600	=	0
DOOR OPENINGS / HR - DOUBLE DOORS							
				X CFM / OPENING / HR	1.385	=	0
TOTAL INFILTRATION (CFM)						=	69

UA ODOOR	=	ODOOR AREA	0	X DOOR "U"	0.000	=	0
UA PDOOR	=	PDOOR AREA	231	X DOOR "U"	0.552	=	128
UA WALL	=	WALL AREA	9,822	X WALL "U"	0.103	=	1,010
UA ROOF	=	ROOF AREA	18,922	X ROOF "U"	0.043	=	819
UA GLASS	=	GLASS AREA	504	X GLASS "U"	0.571	=	288
UA SLAB	=	SLAB PERIM.	655	X SLF	0.680	=	445
UA BASEM.	=	B-WALL AREA	0	X BASE. "U"	0.000	=	0
INFILTRATION	=	CFM	69	X A. T. F.	0.852	=	59
TOTAL UA (BTU/HR°F)							2,750

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 LOCATION: FT. RILEY, KANSAS

DATE: 18-Jul-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO.	6620	BLDG NAME:	OPEN MESS
BLDG FUNCTION:			
FLOOR AREA: (SQ. FT)	27,860	# FLOORS:	1
SLAB PERIMETER: (FT)	827		

**I. AREAS: ([ ] FIELD VERIFIED ELEVATION PLANS)**

		NORTH	SOUTH	EAST	WEST	TOTAL
WALLS, GROSS	(SQ. FT)	3,068	3,328	2,180	2,180	10,755
GLASS	(SQ. FT)	48	24	148	48	268
PERSONNEL DOOR	(SQ. FT)	168	84	168	168	588
OVERHEAD DOOR	(SQ. FT)	0	0	0	0	0
WALLS, NET	(SQ. FT)	2,852	3,220	1,864	1,964	9,899
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)						(SQ. FT) 27,860
OVERHEAD DOOR	(SQ. FT)	0 PERSONNEL DOOR		(SQ. FT)		588
BASEMENT WALLS	(SQ. FT)					0

**II. CONSTRUCTION: ([ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES)**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. 4" BRICK	1.20
	3. AIR SPACE	1.00
	4. 8" CONCRETE	1.11
	5. 1/2" GWB	0.45
	6.	
	7. INSIDE AIR FILM	0.68
	TOTAL R-WALL =	4.61
	U=1/R	0.217

ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. BUR	0.33
	3. GRAVEL	0.33
	4. URETHANE BD	16.29
	5. 3/4" WOOD	0.83
	6.	
	7. INSIDE AIR FILM	0.68
	TOTAL R-ROOF =	18.63
	U=1/R	0.054

GLASS TYPE:	DOUBLE PANE	R-GLASS	1.75
SLAB TYPE FLOOR:	CONCRETE	SLF	0.68
BASEMENT TYPE:	NONE	R-BASEM.	0.00
OVERHEAD DOOR TYPE:	NONE	R-ODOOR	0.00
PERSONNEL DOOR TYPE:	HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	180 X 0.27 Sq.In./LF=	Sq.In.	49	X CFM/Sq.In.	1.530	=	74
PERSONNEL DOORS (SF)	588 X 0.16 Sq.In./SF=	Sq.In.	94	X CFM/Sq.In.	1.530	=	144
DOOR OPENINGS / HR - SINGLE DOOR							
				X CFM /OPENING /HR	1.600	=	0
DOOR OPENINGS / HR - DOUBLE DOORS							
				X CFM /OPENING /HR	1.385	=	0
						TOTAL INFILTRATION (CFM)	218

UA ODOOR	=	ODOOR AREA	0	X DOOR "U"	0.000	=	0
UA PDOOR	=	PDOOR AREA	588	X DOOR "U"	0.552	=	325
UA WALL	=	WALL AREA	9,899	X WALL "U"	0.217	=	2,147
UA ROOF	=	ROOF AREA	27,860	X ROOF "U"	0.054	=	1,495
UA GLASS	=	GLASS AREA	268	X GLASS "U"	0.571	=	153
UA SLAB	=	SLAB PERIM.	827	X SLF	0.680	=	563
UA BASEM.	=	B-WALL AREA	0	X BASE. "U"	0.000	=	0
INFILTRATION	=	CFM	218	X A. T. F.	0.852	=	186
						TOTAL UA (BTU/HR°F)	4,869

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 LOCATION: FT. RILEY, KANSAS

DATE: 12-Jun-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	6910	BLDG NAME:	CLASS SIX
BLDG FUNCTION:	LIQUOR STORE		
FLOOR AREA: (SQ. FT)	2,226	# FLOORS:	1
SLAB PERIMETER: (FT)	190		

**I. AREAS: ([ ] FIELD VERIFIED ELEVATION PLANS)**

		NORTH	SOUTH	EAST	WEST	TOTAL
WALLS, GROSS	(SQ. FT)	689	689	546	546	2,470
GLASS	(SQ. FT)	54	32	0	96	182
PERSONNEL DOOR	(SQ. FT)	0	0	72	49	121
OVERHEAD DOOR	(SQ. FT)	0	0	0	0	0
WALLS, NET	(SQ. FT)	635	657	474	401	2,167
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)	(SQ. FT)					2,226
OVERHEAD DOOR	(SQ. FT)	0	PERSONNEL DOOR	(SQ. FT)		121
BASEMENT WALLS	(SQ. FT)					0

**II. CONSTRUCTION: ([ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES)**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. FACE BRICK & PANELS	1.19
	3. AIR SPACE	1.00
	4. URETHANE BRD INSUL	6.25
	5. 8" CMU	1.11
	6.	
	7. INSIDE AIR FILM	0.68
	TOTAL R-WALL =	10.40
	U=1/R	0.096

ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. BUR	0.33
	3. URETHANE BRD INSUL	16.29
	4. AIR SPACE	1.00
	5. ACOUSTIC TILE CLG	1.25
	6.	
	7. INSIDE AIR FILM	0.68
	TOTAL R-ROOF =	19.72
	U=1/R	0.051

GLASS TYPE:	SINGLE PANE	R-GLASS	0.90
SLAB TYPE FLOOR:	CONCRETE	SLF	0.68
BASEMENT TYPE:	NONE	R-BASEM.	0.00
OVERHEAD DOOR TYPE:	NONE	R-ODOOR	0.00
PERSONNEL DOOR TYPE:	HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	63 X 0.33 Sq.In./LF=	Sq.In.	21	X CFM/Sq.In.	1.530	=	32
PERSONNEL DOORS (SF)	121 X 0.16 Sq.In./SF=	Sq.In.	19	X CFM/Sq.In.	1.530	=	30
DOOR OPENINGS / HR - SINGLE DOOR				X CFM /OPENING /HR	1.600	=	0
DOOR OPENINGS / HR - DOUBLE DOORS			4	X CFM /OPENING /HR	1.385	=	6
<b>TOTAL INFILTRATION (CFM)</b>							<b>67</b>

UA ODOOR	=	ODOOR AREA	0	X DOOR "U"	0.000	=	0
UA PDOOR	=	PDOOR AREA	121	X DOOR "U"	0.552	=	67
UA WALL	=	WALL AREA	2,167	X WALL "U"	0.096	=	208
UA ROOF	=	ROOF AREA	2,226	X ROOF "U"	0.051	=	113
UA GLASS	=	GLASS AREA	182	X GLASS "U"	1.111	=	202
UA SLAB	=	SLAB PERIM.	190	X SLF	0.680	=	129
UA BASEM.	=	B-WALL AREA	0	X BASE. "U"	0.000	=	0
INFILTRATION	=	CFM	67	X A. T. F.	1.037	=	69
<b>TOTAL UA (BTU/HR*F)</b>							<b>789</b>



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 LOCATION: FT. RILEY, KANSAS

DATE: 18-Jul-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	6918	BLDG NAME:	SKILL DEVELOPMENT CENTER
BLDG FUNCTION:			
FLOOR AREA: (SQ. FT)	18,312	# FLOORS:	1
SLAB PERIMETER: (FT)	692		

**I. AREAS: ( [ ] FIELD VERIFIED ELEVATION PLANS )**

		NORTH	SOUTH	EAST	WEST	TOTAL
WALLS, GROSS	(SQ. FT)	2,130	2,545	3,190	3,233	11,098
GLASS	(SQ. FT)	0	131	144	116	391
PERSONNEL DOOR	(SQ. FT)	56	21	42	84	203
OVERHEAD DOOR	(SQ. FT)	0	0	0	56	56
WALLS, NET	(SQ. FT)	2,074	2,393	3,004	2,977	10,448
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)						(SQ. FT) 18,312
OVERHEAD DOOR	(SQ. FT)	56	PERSONNEL DOOR		(SQ. FT)	203
BASEMENT WALLS	(SQ. FT)					0

**II. CONSTRUCTION: ( [ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES )**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE	
	1. OUTSIDE AIR FILM	0.17	
	2. 4" FACE BRICK	1.20	
	3. 2" RIGID INSULATION	5.56	
	4. AIR SPACE	1.00	
	5. 8" CONCRETE BLOCK	1.11	
	6. 1/2" GYPSUM BOARD	0.45	
	7. INSIDE AIR FILM	0.68	
	TOTAL R-WALL =	10.17	
	U=1/R	0.098	
ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE	
	1. OUTSIDE AIR FILM	0.17	
	2. BUR	0.33	
	3. 2" RIGID INSULATION	5.56	
	4. 4" CONCRETE	0.33	
	5. 1/2" GYPSUM BOARD	0.45	
	6.		
	7. INSIDE AIR FILM	0.68	
	TOTAL R-ROOF =	7.52	
	U=1/R	0.133	
GLASS TYPE:	DOUBLE PANE	R-GLASS	1.75
SLAB TYPE FLOOR:	CONCRETE	SLF	0.68
BASEMENT TYPE:	NONE	R-BASEM.	0.00
OVERHEAD DOOR TYPE:	NONE	R-ODOOR	0.00
PERSONNEL DOOR TYPE:	HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	0 X 0.27 Sq.In./LF=	Sq.In.	0	X CFM/Sq.In.	1.530	=	0
PERSONNEL DOORS (SF)	203 X 0.16 Sq.In./SF=	Sq.In.	32	X CFM/Sq.In.	1.530	=	50
DOOR OPENINGS / HR - SINGLE DOOR		X CFM / OPENING / HR	1.600	=	0		
DOOR OPENINGS / HR - DOUBLE DOORS		X CFM / OPENING / HR	1.385	=	0		
		TOTAL INFILTRATION (CFM)		=	50		

UA ODOOR	=	ODOOR AREA	56	X DOOR "U"	0.000	=	0
UA PDOOR	=	PDOOR AREA	203	X DOOR "U"	0.552	=	112
UA WALL	=	WALL AREA	10,448	X WALL "U"	0.098	=	1,027
UA ROOF	=	ROOF AREA	18,312	X ROOF "U"	0.133	=	2,435
UA GLASS	=	GLASS AREA	391	X GLASS "U"	0.571	=	223
UA SLAB	=	SLAB PERIM.	692	X SLF	0.680	=	470
UA BASEM.	=	B-WALL AREA	0	X BASE. "U"	0.000	=	0
INFILTRATION	=	CFM	50	X A. T. F.	0.852	=	42
		TOTAL UA (BTU/HR°F)					4,311

E M C ENGINEERS, INC.  
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 LOCATION: FT. RILEY, KANSAS

DATE: 12-Jun-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	7017	BLDG NAME:	BN HQ BLDG
BLDG FUNCTION:			
FLOOR AREA: (SQ. FT)	2,578	# FLOORS:	1
SLAB PERIMETER: (FT)	211		

**I. AREAS: ( [ ] FIELD VERIFIED ELEVATION PLANS )**

		NORTH	SOUTH	EAST	WEST	TOTAL
WALLS, GROSS	(SQ. FT)	363	363	625	625	1,975
GLASS	(SQ. FT)	35	35	123	158	350
PERSONNEL DOOR	(SQ. FT)	0	21	42	0	63
OVERHEAD DOOR	(SQ. FT)					0
WALLS, NET	(SQ. FT)	328	307	461	468	1,562
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)						(SQ. FT) 2,578
OVERHEAD DOOR	(SQ. FT)	0	PERSONNEL DOOR		(SQ. FT)	63
BASEMENT WALLS	(SQ. FT)					0

**II. CONSTRUCTION: ( [ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES )**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE	
	1. OUTSIDE AIR FILM	0.17	
	2. 4" BRICK	1.20	
	3. AIR SPACE	1.00	
	4. 8" CMU	1.11	
	5.		
	6.		
	7. INSIDE AIR FILM	0.68	
	TOTAL R-WALL =	4.16	
	U=1/R	0.240	
ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE	
	1. OUTSIDE AIR FILM	0.17	
	2. BUR	0.33	
	3. 2" RIGID INSUL	5.56	
	4. AIR SPACE	1.00	
	5. ACOUSTIC TILE CEILING	1.25	
	6.		
	7. INSIDE AIR FILM	0.68	
	TOTAL R-ROOF =	8.99	
	U=1/R	0.111	
GLASS TYPE:	DOUBLE PANE	R-GLASS	1.75
SLAB TYPE FLOOR:	CONCRETE	SLF	0.68
BASEMENT TYPE:	NONE	R-BASEM.	0.00
OVERHEAD DOOR TYPE:	NONE	R-ODOOR	0.00
PERSONNEL DOOR TYPE:	HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	240 X 0.27 Sq.In./LF=	Sq.In.	65	X CFM/Sq.In.	1.530	=	99	
PERSONNEL DOORS (SF)	63 X 0.16 Sq.In./SF=	Sq.In.	10	X CFM/Sq.In.	1.530	=	15	
DOOR OPENINGS / HR - SINGLE DOOR								
			2	X CFM / OPENING / HR	1.600	=	3	
DOOR OPENINGS / HR - DOUBLE DOORS								
				X CFM / OPENING / HR	1.365	=	0	
TOTAL INFILTRATION (CFM)							=	118

UA ODOOR	=	ODOOR AREA	0	X DOOR "U"	0.000	=	0	
UA PDOOR	=	PDOOR AREA	63	X DOOR "U"	0.552	=	35	
UA WALL	=	WALL AREA	1,562	X WALL "U"	0.240	=	376	
UA ROOF	=	ROOF AREA	2,578	X ROOF "U"	0.111	=	287	
UA GLASS	=	GLASS AREA	350	X GLASS "U"	0.571	=	200	
UA SLAB	=	SLAB PERIM.	211	X SLF	0.680	=	143	
UA BASEM.	=	B-WALL AREA	0	X BASE. "U"	0.000	=	0	
INFILTRATION	=	CFM	118	X A. T. F.	1.037	=	122	
TOTAL UA (BTU/HR*F)							=	1,162

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 LOCATION: FT. RILEY, KANSAS

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 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	7028	BLDG NAME:	BN CLASSROOMS
BLDG FUNCTION:			
FLOOR AREA: (SQ. FT)	3,943	# FLOORS:	1
SLAB PERIMETER: (FT)	262		

**I. AREAS: ( [ ] FIELD VERIFIED ELEVATION PLANS )**

		NORTH	SOUTH	EAST	WEST	TOTAL
WALLS, GROSS	(SQ. FT)	986	986	836	836	3,644
GLASS	(SQ. FT)	100	124	205	205	634
PERSONNEL DOOR	(SQ. FT)	42	42	42	42	168
OVERHEAD DOOR	(SQ. FT)	0	0	0	0	0
WALLS, NET	(SQ. FT)	844	820	589	589	2,842
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)						(SQ. FT) 3,943
OVERHEAD DOOR	(SQ. FT)	0	PERSONNEL DOOR		(SQ. FT)	168
BASEMENT WALLS	(SQ. FT)					0

**II. CONSTRUCTION: ( [ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES )**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. 4" FACE BRICK	1.20
	3. 2" AIR SPACE	1.00
	4. 8" CMU	1.11
	5.	
	6.	
	7. INSIDE AIR FILM	0.68
	TOTAL R-WALL =	4.16
	U=1/R	0.240
ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. 2" POURED CONCRETE	0.52
	3. BUR	0.33
	4. 1" RIGID INSUL.	2.78
	5. 1" AIR SPACE	1.00
	6. 2" GYPSUM BD.	0.45
	7. INSIDE AIR FILM	0.68
	TOTAL R-ROOF =	5.93
	U=1/R	0.169
GLASS TYPE:	SINGLE PANE	R-GLASS 0.00
SLAB TYPE FLOOR:	CONCRETE	SLF 0.68
BASEMENT TYPE:	NONE	R-BASEM. 0.00
OVERHEAD DOOR TYPE:	NONE	R-ODOOR 0.00
PERSONNEL DOOR TYPE:	HOLLOW METAL	R-PDOOR 1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	112 X 0.33 Sq.In./LF=	Sq.In.	37	X CFM/Sq.In.	1.530	=	57
PERSONNEL DOORS (SF)	168 X 0.16 Sq.In./SF=	Sq.In.	27	X CFM/Sq.In.	1.530	=	41
DOOR OPENINGS / HR - SINGLE DOOR		X CFM / OPENING / HR		1.600	=	0	
DOOR OPENINGS / HR - DOUBLE DOORS	2	X CFM / OPENING / HR		1.385	=	3	
TOTAL INFILTRATION (CFM)							100

UA ODOOR	=	ODOOR AREA	0	X DOOR "U"	0.000	=	0
UA PDOOR	=	PDOOR AREA	168	X DOOR "U"	0.552	=	93
UA WALL	=	WALL AREA	2,842	X WALL "U"	0.240	=	683
UA ROOF	=	ROOF AREA	3,943	X ROOF "U"	0.169	=	665
UA GLASS	=	GLASS AREA	634	X GLASS "U"	0.000	=	0
UA SLAB	=	SLAB PERIM.	262	X SLF	0.680	=	178
UA BASEM.	=	B-WALL AREA	0	X BASE. "U"	0.000	=	0
INFILTRATION	=	CFM	100	X A. T. F.	1.037	=	104
TOTAL UA (BTU/HR*F)							1,723

E M C ENGINEERS, INC.  
 PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 12-Jun-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	7031	BLDG NAME:	BN HQ BLDG
BLDG FUNCTION:			
FLOOR AREA: (SQ. FT)	3,943	# FLOORS:	1
SLAB PERIMETER: (FT)	262		

**I. AREAS: ([ ] FIELD VERIFIED ELEVATION PLANS)**

		NORTH	SOUTH	EAST	WEST	TOTAL	
WALLS, GROSS	(SQ. FT)	986	986	836	836	3,644	
GLASS	(SQ. FT)	100	124	205	205	634	
PERSONNEL DOOR	(SQ. FT)	42	42	42	42	168	
OVERHEAD DOOR	(SQ. FT)	0	0	0	0	0	
WALLS, NET	(SQ. FT)	844	820	589	589	2,842	
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)						(SQ. FT)	3,943
OVERHEAD DOOR	(SQ. FT)	0		PERSONNEL DOOR		(SQ. FT)	168
BASEMENT WALLS	(SQ. FT)						0

**II. CONSTRUCTION: ([ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES)**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE	
	1. OUTSIDE AIR FILM	0.17	
	2. 4" FACE BRICK	1.20	
	3. 2" AIR SPACE	1.00	
	4. 8" CMU	1.11	
	5.		
	6.		
	7. INSIDE AIR FILM	0.68	
	TOTAL R-WALL =	4.16	
	U=1/R	0.240	
ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE	
	1. OUTSIDE AIR FILM	0.17	
	2. 2" POURED CONCRETE	0.52	
	3. BUR	0.33	
	4. 1" RIGID INSUL.	2.78	
	5. 1" AIR SPACE	1.00	
	6. 2" GYPSUM BD.	0.45	
	7. INSIDE AIR FILM	0.68	
	TOTAL R-ROOF =	5.93	
	U=1/R	0.169	
GLASS TYPE:	SINGLE PANE	R-GLASS	0.00
SLAB TYPE FLOOR:	CONCRETE	SLF	0.68
BASEMENT TYPE:	NONE	R-BASEM.	0.00
OVERHEAD DOOR TYPE:	NONE	R-ODOOR	0.00
PERSONNEL DOOR TYPE:	HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	112 X 0.33 Sq.In./LF=	Sq.In.	37	X CFM/Sq.In.	1.530	=	57
PERSONNEL DOORS (SF)	168 X 0.16 Sq.In./SF=	Sq.In.	27	X CFM/Sq.In.	1.530	=	41
DOOR OPENINGS / HR - SINGLE DOOR				X CFM / OPENING / HR	1.600	=	0
DOOR OPENINGS / HR - DOUBLE DOORS				2 X CFM / OPENING / HR	1.385	=	3
<b>TOTAL INFILTRATION (CFM)</b>							<b>100</b>

UA ODOOR	=	ODOOR AREA	0	X DOOR "U"	0.000	=	0
UA PDOOR	=	PDOOR AREA	168	X DOOR "U"	0.552	=	93
UA WALL	=	WALL AREA	2,842	X WALL "U"	0.240	=	683
UA ROOF	=	ROOF AREA	3,943	X ROOF "U"	0.169	=	665
UA GLASS	=	GLASS AREA	634	X GLASS "U"	0.000	=	0
UA SLAB	=	SLAB PERIM.	262	X SLF	0.680	=	178
UA BASEM.	=	B-WALL AREA	0	X BASE. "U"	0.000	=	0
INFILTRATION	=	CFM	100	X A. T. F.	1.037	=	104
<b>TOTAL UA (BTU/HR*F)</b>							<b>1,723</b>

E M C ENGINEERS, INC.  
 PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 18-Jul-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	7033	BLDG NAME:	BN HQ BLDG
BLDG FUNCTION:			
FLOOR AREA (SQ. FT)	3,870	# FLOORS:	1
SLAB PERIMETER (FT)	284		

**I. AREAS: ([ ] FIELD VERIFIED ELEVATION PLANS)**

		NORTH-W	SOUTH-W	NORTH-E	SOUTH-E	TOTAL	
WALLS, GROSS	(SQ. FT)	976	728	728	976	3,408	
GLASS	(SQ. FT)	48	0	60	156	264	
PERSONNEL DOOR	(SQ. FT)	105	105	0	42	252	
OVERHEAD DOOR	(SQ. FT)	0	0	0	0	0	
WALLS, NET	(SQ. FT)	823	623	668	778	2,892	
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)						(SQ. FT)	3,870
OVERHEAD DOOR	(SQ. FT)	0	PERSONNEL DOOR		(SQ. FT)	252	
BASEMENT WALLS	(SQ. FT)					0	

**II. CONSTRUCTION: ([ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES)**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. 4" FACE BRICK	1.20
	3. 2" AIR SPACE	1.00
	4. 8" CMU	1.11
	5.	
	6.	
	7. INSIDE AIR FILM	0.68
	TOTAL R-WALL =	4.16
	U=1/R	0.240

ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. BUR	0.33
	3. 2" RIGID INSUL.	5.56
	4. AIR SPACE	1.00
	5. GYP PLASTER CEILING	0.39
	6.	
	7. INSIDE AIR FILM	0.68
	TOTAL R-ROOF =	8.13
	U=1/R	0.123

GLASS TYPE:	SINGLE PANE	R-GLASS	0.90
SLAB TYPE FLOOR:	CONCRETE	SLF	0.68
BASEMENT TYPE:	NONE	R-BASEM.	0.00
OVERHEAD DOOR TYPE:	NONE	R-ODOOR	0.00
PERSONNEL DOOR TYPE:	HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	182 X 0.33 Sq.In./LF=	Sq.In.	60	X CFM/Sq.In.	1.530	=	92
PERSONNEL DOORS (SF)	252 X 0.16 Sq.In./SF=	Sq.In.	40	X CFM/Sq.In.	1.530	=	62
DOOR OPENINGS / HR - SINGLE DOOR		X CFM /OPENING /HR	1.600	=	0		
DOOR OPENINGS / HR - DOUBLE DOORS	3	X CFM /OPENING /HR	1.385	=	4		
<b>TOTAL INFILTRATION (CFM)</b>							<b>158</b>

UA ODOOR	=	ODOOR AREA	0	X DOOR "U"	0.000	=	0
UA PDOOR	=	PDOOR AREA	252	X DOOR "U"	0.552	=	139
UA WALL	=	WALL AREA	2,892	X WALL "U"	0.240	=	695
UA ROOF	=	ROOF AREA	3,870	X ROOF "U"	0.123	=	476
UA GLASS	=	GLASS AREA	264	X GLASS "U"	1.111	=	293
UA SLAB	=	SLAB PERIM.	284	X SLF	0.680	=	193
UA BASEM.	=	B-WALL AREA	0	X BASE. "U"	0.000	=	0
INFILTRATION	=	CFM	158	X A. T. F.	1.037	=	164
<b>TOTAL UA (BTU/HR°F)</b>							<b>1,960</b>

E M C ENGINEERS, INC.  
 PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 12-Jun-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	7036	BLDG NAME:	REGIMENTAL HQ BLDG
BLDG FUNCTION:			
FLOOR AREA: (SQ. FT)	9,390	# FLOORS:	3
SLAB PERIMETER: (FT)			

**I. AREAS: ([ ] FIELD VERIFIED ELEVATION PLANS)**

		NORTH	SOUTH	EAST	WEST	TOTAL	
WALLS, GROSS	(SQ. FT)	760	760	1,587	1,587	4,693	
GLASS	(SQ. FT)	192	153	595	652	1,592	
PERSONNEL DOOR	(SQ. FT)	64	21	42	21	148	
OVERHEAD DOOR	(SQ. FT)	0	0	0	0	0	
WALLS, NET	(SQ. FT)	504	586	950	914	2,953	
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)						(SQ. FT)	3,015
OVERHEAD DOOR	(SQ. FT)	0		PERSONNEL DOOR	(SQ. FT)	148	
BASEMENT WALLS	(SQ. FT)	552	447	1,014	1,014	3,027	

**II. CONSTRUCTION: ([ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES)**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE	
	1. OUTSIDE AIR FILM	0.17	
	2. 4" FACE BRICK	1.20	
	3. 2" AIR SPACE	1.00	
	4. 8" CMU	1.11	
	5.		
	6.		
	7. INSIDE AIR FILM	0.68	
	TOTAL R-WALL =	4.16	
	U=1/R	0.240	
ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE	
	1. OUTSIDE AIR FILM	0.17	
	2. 5 PLY BUR	0.33	
	3. 2" RIGID INSUL	5.56	
	4. 2" POURED FILL	0.52	
	5.		
	6.		
	7. INSIDE AIR FILM	0.68	
	TOTAL R-ROOF =	7.26	
	U=1/R	0.138	
GLASS TYPE:	SINGLE PANE W/STORMS	R-GLASS	1.60
SLAB TYPE FLOOR:	CONCRETE	SLF	0.68
BASEMENT TYPE:	NONE	R-BASEM.	0.00
OVERHEAD DOOR TYPE:	NONE	R-ODOOR	0.00
PERSONNEL DOOR TYPE:	HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	664 X 0.33 Sq.In./LF=	Sq.In.	219	X CFM/Sq.In.	1.530	=	335
PERSONNEL DOORS (SF)	148 X 0.16 Sq.In./SF=	Sq.In.	24	X CFM/Sq.In.	1.530	=	36
DOOR OPENINGS / HR - SINGLE DOOR	4	X CFM / OPENING /HR	1.600	=	6		
DOOR OPENINGS / HR - DOUBLE DOORS	8	X CFM / OPENING /HR	1.385	=	11		
<b>TOTAL INFILTRATION (CFM)</b>							<b>389</b>

UA ODOOR	=	ODOOR AREA	0	X DOOR "U"	0.000	=	0
UA PDOOR	=	PDOOR AREA	148	X DOOR "U"	0.552	=	82
UA WALL	=	WALL AREA	2,953	X WALL "U"	0.240	=	710
UA ROOF	=	ROOF AREA	3,015	X ROOF "U"	0.138	=	415
UA GLASS	=	GLASS AREA	1,592	X GLASS "U"	0.625	=	995
UA SLAB	=	SLAB PERIM.	0	X SLF	0.680	=	0
UA BASEM.	=	B-WALL AREA	3,027	X BASE. "U"	0.000	=	0
INFILTRATION	=	CFM	389	X A. T. F.	1.037	=	403
<b>TOTAL UA (BTU/HR°F)</b>							<b>2,605</b>

E M C ENGINEERS, INC.  
 PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 12-Jun-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	7050	BLDG NAME:	ENL BARRACKS W/AS
BLDG FUNCTION:			
FLOOR AREA: (SQ. FT)	33,888	# FLOORS:	3
SLAB PERIMETER: (FT)			

**I. AREAS: ([ ] FIELD VERIFIED ELEVATION PLANS)**

		NORTH-W	NORTH-E	SOUTH-W	SOUTH-E	TOTAL
WALLS, GROSS	(SQ. FT)	1,528	8,847	8,847	1,200	20,422
GLASS	(SQ. FT)	165	2,670	2,565	315	5,715
PERSONNEL DOOR	(SQ. FT)					0
OVERHEAD DOOR	(SQ. FT)					0
WALLS, NET	(SQ. FT)	1,363	6,177	6,282	885	14,707
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)					(SQ. FT)	10,146
OVERHEAD DOOR	(SQ. FT)	0	PERSONNEL DOOR		(SQ. FT)	0
BASEMENT WALLS	(SQ. FT)	304	2,592	2,416	960	6,272

**II. CONSTRUCTION: ([ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES)**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. 4" CMU	0.72
	3. AIR SPACE	1.00
	4. 8" CMU	1.11
	5.	
	6.	
	7. INSIDE AIR FILM	0.68
	TOTAL R-WALL =	3.68
	U=1/R	0.272

ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. BUR	0.33
	3. 2" RIGID INSUL	5.56
	4. 4" CONCRETE	0.33
	5.	
	6.	
	7. INSIDE AIR FILM	0.68
	TOTAL R-ROOF =	7.07
	U=1/R	0.141

GLASS TYPE:	SINGLE PANE	R-GLASS	0.00
SLAB TYPE FLOOR:	CONCRETE	SLF	0.68
BASEMENT TYPE:	NONE	R-BASEM.	0.00
OVERHEAD DOOR TYPE:	NONE	R-ODOOR	0.00
PERSONNEL DOOR TYPE:	HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	3048 X 0.33 Sq.In./LF=	Sq.In.	1006	X CFM/Sq.In.	1.530	=	1539
PERSONNEL DOORS (SF)	0 X 0.16 Sq.In./SF=	Sq.In.	0	X CFM/Sq.In.	1.530	=	0
DOOR OPENINGS / HR - SINGLE DOOR							
				X CFM /OPENING /HR	1.600	=	0
DOOR OPENINGS / HR - DOUBLE DOORS							
				X CFM /OPENING /HR	1.385	=	0
						TOTAL INFILTRATION (CFM)	= 1539

UA ODOOR	=	ODOOR AREA	0	X DOOR "U"	0.000	=	0
UA PDOOR	=	PDOOR AREA	0	X DOOR "U"	0.552	=	0
UA WALL	=	WALL AREA	14,707	X WALL "U"	0.272	=	3,996
UA ROOF	=	ROOF AREA	10,146	X ROOF "U"	0.141	=	1,435
UA GLASS	=	GLASS AREA	5,715	X GLASS "U"	0.000	=	0
UA SLAB	=	SLAB PERIM.	0	X SLF	0.680	=	0
UA BASEM.	=	B-WALL AREA	6,272	X BASE. "U"	0.000	=	0
INFILTRATION	=	CFM	1539	X A. T. F.	1.037	=	1,596
						TOTAL UA (BTU/HR°F)	7,027

E M C ENGINEERS, INC.  
 PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 18-Jul-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	7109	BLDG NAME:	BN ADMIN & CLRM
BLDG FUNCTION:			
FLOOR AREA: (SQ. FT)	14,271	# FLOORS:	1
SLAB PERIMETER: (FT)	532		

**I. AREAS: ( [ ] FIELD VERIFIED ELEVATION PLANS)**

		NORTH-W	NORTH-E	SOUTH-W	SOUTH-E	TOTAL
WALLS, GROSS	(SQ. FT)	2,300	482	482	2,300	5,564
GLASS	(SQ. FT)	56	0	0	248	304
PERSONNEL DOOR	(SQ. FT)	168	42	0	42	252
OVERHEAD DOOR	(SQ. FT)	0	0	0	0	0
WALLS, NET	(SQ. FT)	2,076	440	482	2,010	5,008
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)						(SQ. FT) 17,664
OVERHEAD DOOR	(SQ. FT)	0	PERSONNEL DOOR		(SQ. FT)	252
BASEMENT WALLS	(SQ. FT)					0

**II. CONSTRUCTION: ( [ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES)**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE	
	1. OUTSIDE AIR FILM	0.17	
	2. 6" FACE BRICK	1.80	
	3. 2" RIGID INSULATION	5.56	
	4. 6" CMU	0.92	
	5.		
	6.		
	7. INSIDE AIR FILM	0.68	
	TOTAL R-WALL =	9.13	
	U=1/R	0.110	
ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE	
	1. OUTSIDE AIR FILM	0.17	
	2. METAL DECK	0.00	
	3. 2" RIGID INSUL	5.56	
	4. 1/2" GYPSUM BOARD	0.45	
	5.		
	6.		
	7. INSIDE AIR FILM	0.68	
	TOTAL R-ROOF =	6.86	
	U=1/R	0.146	
GLASS TYPE:	SINGLE PANE	R-GLASS	0.90
SLAB TYPE FLOOR:	CONCRETE	SLF	0.68
BASEMENT TYPE:	NONE	R-BASEM.	0.00
OVERHEAD DOOR TYPE:	NONE	R-ODOOR	0.00
PERSONNEL DOOR TYPE:	HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	228 X 0.33 Sq.In./LF=	Sq.In.	75	X CFM/Sq.In.	1.530	=	115
PERSONNEL DOORS (SF)	252 X 0.16 Sq.In./SF=	Sq.In.	40	X CFM/Sq.In.	1.530	=	62
DOOR OPENINGS / HR - SINGLE DOOR				X CFM / OPENING / HR	1.600	=	0
DOOR OPENINGS / HR - DOUBLE DOORS				X CFM / OPENING / HR	1.385	=	0
TOTAL INFILTRATION (CFM)						=	177

UA ODOOR	=	ODOOR AREA	0	X DOOR "U"	0.000	=	0
UA PDOOR	=	PDOOR AREA	252	X DOOR "U"	0.552	=	139
UA WALL	=	WALL AREA	5,008	X WALL "U"	0.110	=	548
UA ROOF	=	ROOF AREA	17,664	X ROOF "U"	0.146	=	2,575
UA GLASS	=	GLASS AREA	304	X GLASS "U"	1.111	=	338
UA SLAB	=	SLAB PERIM.	532	X SLF	0.680	=	362
UA BASEM.	=	B-WALL AREA	0	X BASE. "U"	0.000	=	0
INFILTRATION	=	CFM	177	X A. T. F.	0.852	=	151
TOTAL UA (BTU/HR°F)							4,113



E M C ENGINEERS, INC.  
 PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 12-Jun-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	7212	BLDG NAME:	CO HQ BLDG
BLDG FUNCTION:			
FLOOR AREA: (SQ. FT)	21,424	# FLOORS:	1
SLAB PERIMETER: (FT)	620		

**I. AREAS: ([ ] FIELD VERIFIED ELEVATION PLANS)**

		NORTH	SOUTH	EAST	WEST	TOTAL
WALLS, GROSS	(SQ. FT)	2,132	2,132	2,884	2,884	10,032
GLASS	(SQ. FT)	0	0	0	328	328
PERSONNEL DOOR	(SQ. FT)	0	0	378	84	462
OVERHEAD DOOR	(SQ. FT)	0	0	0	0	0
WALLS, NET	(SQ. FT)	2,132	2,132	2,506	2,472	9,242
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)						(SQ. FT) 22,248
OVERHEAD DOOR	(SQ. FT)	0	PERSONNEL DOOR		(SQ. FT)	462
BASEMENT WALLS	(SQ. FT)					0

**II. CONSTRUCTION: ([ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES)**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE	
	1. OUTSIDE AIR FILM	0.17	
	2. 6" JUMBO BRICK	1.80	
	3. 2" INSULATION	8.00	
	4. 6" CMU	1.29	
	5.		
	6.		
	7. INSIDE AIR FILM	0.68	
	TOTAL R-WALL =	11.94	
	U=1/R	0.084	
ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE	
	1. OUTSIDE AIR FILM	0.17	
	2. SHINGLES	0.44	
	3. FELT UNDERLAYMENT	0.06	
	4. 1/2" PLYWOOD SHEATHI	0.62	
	5. AIR SPACE	1.00	
	6. ACU CEILING	1.25	
	7. INSIDE AIR FILM	0.68	
	TOTAL R-ROOF =	4.22	
	U=1/R	0.237	
GLASS TYPE:	SINGLE PANE	R-GLASS	0.90
SLAB TYPE FLOOR:	CONCRETE	SLF	0.68
BASEMENT TYPE:	NONE	R-BASEM.	0.00
OVERHEAD DOOR TYPE:	NONE	R-ODOOR	0.00
PERSONNEL DOOR TYPE:	HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	160 X 0.33 Sq.In./LF=	Sq.In.	53	X CFM/Sq.In.	1.530	=	81
PERSONNEL DOORS (SF)	462 X 0.16 Sq.In./SF=	Sq.In.	74	X CFM/Sq.In.	1.530	=	113
DOOR OPENINGS / HR - SINGLE DOOR		X CFM / OPENING / HR	1.600	=	0		
DOOR OPENINGS / HR - DOUBLE DOORS	12	X CFM / OPENING / HR	1.385	=	17		
<b>TOTAL INFILTRATION (CFM)</b>							<b>211</b>

UA ODOOR	=	ODOOR AREA	0	X DOOR "U"	0.000	=	0
UA PDOOR	=	PDOOR AREA	462	X DOOR "U"	0.552	=	255
UA WALL	=	WALL AREA	9,242	X WALL "U"	0.084	=	774
UA ROOF	=	ROOF AREA	22,248	X ROOF "U"	0.237	=	5,272
UA GLASS	=	GLASS AREA	328	X GLASS "U"	1.111	=	364
UA SLAB	=	SLAB PERIM.	620	X SLF	0.680	=	422
UA BASEM.	=	B-WALL AREA	0	X BASE. "U"	0.000	=	0
INFILTRATION	=	CFM	211	X A. T. F.	1.037	=	218
<b>TOTAL UA (BTU/HR°F)</b>							<b>7,306</b>

E M C ENGINEERS, INC.  
 PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 12-Jun-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	7220	BLDG NAME:	CO HQ BLDG
BLDG FUNCTION:			
FLOOR AREA: (SQ. FT)	18,624	# FLOORS:	1
SLAB PERIMETER: (FT)	578		

**I. AREAS: ([ ] FIELD VERIFIED ELEVATION PLANS)**

		NORTH	SOUTH	EAST	WEST	TOTAL
WALLS, GROSS	(SQ. FT)	1,989	1,989	2,688	2,688	9,353
GLASS	(SQ. FT)	0	0	0	328	328
PERSONNEL DOOR	(SQ. FT)	0	0	378	84	462
OVERHEAD DOOR	(SQ. FT)	0	0	0	0	0
WALLS, NET	(SQ. FT)	1,989	1,989	2,310	2,276	8,563
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)	(SQ. FT)					20,736
OVERHEAD DOOR	(SQ. FT)	0		PERSONNEL DOOR	(SQ. FT)	462
BASEMENT WALLS	(SQ. FT)					0

**II. CONSTRUCTION: ([ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES)**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE	
	1. OUTSIDE AIR FILM	0.17	
	2. 6" JUMBO BRICK	1.80	
	3. 2" INSULATION	8.00	
	4. 6" CMU	1.29	
	5.		
	6.		
	7. INSIDE AIR FILM	0.68	
	TOTAL R-WALL =	11.94	
	U=1/R	0.084	
ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE	
	1. OUTSIDE AIR FILM	0.17	
	2. SHINGLES	0.44	
	3. FELT UNDERLAYMENT	0.06	
	4. 2" INSULATION	5.56	
	5. METAL DECK	0.00	
	6.		
	7. INSIDE AIR FILM	0.68	
	TOTAL R-ROOF =	6.91	
	U=1/R	0.145	
GLASS TYPE:	SINGLE PANE	R-GLASS	0.90
SLAB TYPE FLOOR:	CONCRETE	SLF	0.68
BASEMENT TYPE:	NONE	R-BASEM.	0.00
OVERHEAD DOOR TYPE:	NONE	R-ODOOR	0.00
PERSONNEL DOOR TYPE:	HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	160 X 0.33 Sq.In./LF=	Sq.In.	53	X CFM/Sq.In.	1.530	=	81
PERSONNEL DOORS (SF)	462 X 0.16 Sq.In./SF=	Sq.In.	74	X CFM/Sq.In.	1.530	=	113
DOOR OPENINGS / HR - SINGLE DOOR		X CFM / OPENING /HR		1.600	=	0	
DOOR OPENINGS / HR - DOUBLE DOORS		X CFM / OPENING /HR	12	1.385	=	17	
		TOTAL INFILTRATION (CFM)			=	211	

UA ODOOR	=	ODOOR AREA	0	X DOOR "U"	0.000	=	0
UA PDOOR	=	PDOOR AREA	462	X DOOR "U"	0.552	=	255
UA WALL	=	WALL AREA	8,563	X WALL "U"	0.084	=	717
UA ROOF	=	ROOF AREA	20,736	X ROOF "U"	0.145	=	3,001
UA GLASS	=	GLASS AREA	328	X GLASS "U"	1.111	=	364
UA SLAB	=	SLAB PERIM.	578	X SLF	0.680	=	393
UA BASEM.	=	B-WALL AREA	0	X BASE. "U"	0.000	=	0
INFILTRATION	=	CFM	211	X A. T. F.	1.037	=	218
		TOTAL UA (BTU/HR°F)					4,949

E M C ENGINEERS, INC.  
 PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 18-Jul-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	7285	BLDG NAME:	THEATRE/CLOTHING SALES
BLDG FUNCTION:			
FLOOR AREA: (SQ. FT)	18,272	# FLOORS:	1 & 2
SLAB PERIMETER: (FT)	495		

**I. AREAS: ( [ ] FIELD VERIFIED ELEVATION PLANS )**

		NORTH	SOUTH	EAST	WEST	TOTAL
WALLS, GROSS	(SQ. FT)	3,778	3,778	1,428	2,783	11,766
GLASS	(SQ. FT)	0	0	0	28	28
PERSONNEL DOOR	(SQ. FT)	63	63	0	126	252
OVERHEAD DOOR	(SQ. FT)	0	0	0	0	0
WALLS, NET	(SQ. FT)	3,715	3,715	1,428	2,628	11,485
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)						(SQ. FT) 18,272
OVERHEAD DOOR	(SQ. FT)	0	PERSONNEL DOOR		(SQ. FT)	252
BASEMENT WALLS	(SQ. FT)					0

**II. CONSTRUCTION: ( [ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES )**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. 4' MASONRY UNITS	0.72
	3. AIR SPACE	1.00
	4. 6" MASONRY UNITS	0.92
	5. 1/2" GYPSUM BOARD	0.45
	6.	
	7. INSIDE AIR FILM	0.68
	TOTAL R-WALL =	3.94
	U=1/R	0.254

ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. BUR	0.33
	3. 2.5" CONCRETE DECK	0.21
	4. 1/2" GYPSUM BOARD	0.45
	5.	
	6.	
	7. INSIDE AIR FILM	0.68
	TOTAL R-ROOF =	1.84
	U=1/R	0.543

GLASS TYPE:	SINGLE PANE	R-GLASS	0.90
SLAB TYPE FLOOR:	CONCRETE	SLF	0.68
BASEMENT TYPE:	NONE	R-BASEM.	0.00
OVERHEAD DOOR TYPE:	NONE	R-ODOOR	0.00
PERSONNEL DOOR TYPE:	HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	0 X 0.33 Sq.In./LF=	Sq.In.	0	X CFM/Sq.In.	1.530	=	0
PERSONNEL DOORS (SF)	252 X 0.16 Sq.In./SF=	Sq.In.	40	X CFM/Sq.In.	1.530	=	62
DOOR OPENINGS / HR - SINGLE DOOR		X CFM / OPENING / HR	1.600	=	0		
DOOR OPENINGS / HR - DOUBLE DOORS		X CFM / OPENING / HR	1.385	=	0		
		TOTAL INFILTRATION (CFM)		=	62		

UA ODOOR	=	ODOOR AREA	0	X DOOR "U"	0.000	=	0
UA PDOOR	=	PDOOR AREA	252	X DOOR "U"	0.552	=	139
UA WALL	=	WALL AREA	11,485	X WALL "U"	0.254	=	2,915
UA ROOF	=	ROOF AREA	18,272	X ROOF "U"	0.543	=	9,930
UA GLASS	=	GLASS AREA	28	X GLASS "U"	1.111	=	32
UA SLAB	=	SLAB PERIM.	495	X SLF	0.680	=	337
UA BASEM.	=	B-WALL AREA	0	X BASE. "U"	0.000	=	0
INFILTRATION	=	CFM	62	X A. T. F.	0.852	=	53
		TOTAL UA (BTU/HR°F)					13,405

E M C ENGINEERS, INC.  
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 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 18-Jul-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	7305	BLDG NAME:	APP INSTR BLDG
BLDG FUNCTION:			
FLOOR AREA: (SQ. FT)	11,520	# FLOORS:	1
SLAB PERIMETER: (FT)	88		

**I. AREAS: ([ ] FIELD VERIFIED ELEVATION PLANS)**

		NORTH	SOUTH	EAST	WEST	TOTAL
WALLS, GROSS	(SQ. FT)	2,281	2,281	811	811	6,183
GLASS	(SQ. FT)	120	0	80	20	220
PERSONNEL DOOR	(SQ. FT)	126	0	80	20	226
OVERHEAD DOOR	(SQ. FT)	0	0	84	0	84
WALLS, NET	(SQ. FT)	2,035	2,281	567	771	5,653
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)						(SQ. FT) 11,520
OVERHEAD DOOR	(SQ. FT)	84	PERSONNEL DOOR		(SQ. FT)	226
BASEMENT WALLS	(SQ. FT)					0

**II. CONSTRUCTION: ([ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES)**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. 4" CMU	0.72
	3. AIR SPACE	1.00
	4. 6" LT WT CMU	0.92
	5.	
	6.	
	7. INSIDE AIR FILM	0.68
	TOTAL R-WALL =	3.49
	U=1/R	0.287

ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. BUR	0.33
	3. AIR SPACE	1.00
	4. 2" RIGID INSUL.	5.56
	5. 1/2" GYP. BD. CEILING	0.45
	6.	
	7. INSIDE AIR FILM	0.68
	TOTAL R-ROOF =	8.19
	U=1/R	0.122

GLASS TYPE:	SINGLE PANE	R-GLASS	0.90
SLAB TYPE FLOOR:	CONCRETE	SLF	0.68
BASEMENT TYPE:	NONE	R-BASEM.	0.00
OVERHEAD DOOR TYPE:	NONE	R-ODOOR	0.00
PERSONNEL DOOR TYPE:	HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	99 X 0.33 Sq.In./LF=	Sq.In.	33	X CFM/Sq.In.	1.530	=	50
PERSONNEL DOORS (SF)	226 X 0.16 Sq.In./SF=	Sq.In.	36	X CFM/Sq.In.	1.530	=	55
DOOR OPENINGS / HR - SINGLE DOOR				X CFM /OPENING /HR	1.600	=	0
DOOR OPENINGS / HR - DOUBLE DOORS				X CFM /OPENING /HR	1.385	=	0
<b>TOTAL INFILTRATION (CFM)</b>							<b>105</b>

UA ODOOR	=	ODOOR AREA	84	X DOOR "U"	0.000	=	0
UA PDOOR	=	PDOOR AREA	226	X DOOR "U"	0.552	=	125
UA WALL	=	WALL AREA	5,653	X WALL "U"	0.287	=	1,620
UA ROOF	=	ROOF AREA	11,520	X ROOF "U"	0.122	=	1,407
UA GLASS	=	GLASS AREA	220	X GLASS "U"	1.111	=	244
UA SLAB	=	SLAB PERIM.	88	X SLF	0.680	=	60
UA BASEM.	=	B-WALL AREA	0	X BASE. "U"	0.000	=	0
INFILTRATION	=	CFM	105	X A. T. F.	0.852	=	90
<b>TOTAL UA (BTU/HR°F)</b>							<b>3,545</b>

E M C ENGINEERS, INC.  
 PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 12-Jun-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	7350	BLDG NAME:	VEH MNT SHOP ORG
BLDG FUNCTION:			
FLOOR AREA: (SQ. FT)	22,345	# FLOORS:	1
SLAB PERIMETER: (FT)	994		

**I. AREAS: ([ ] FIELD VERIFIED ELEVATION PLANS)**

		NORTH	SOUTH	EAST	WEST	TOTAL
WALLS, GROSS	(SQ. FT)	7,865	7,865	6,696	6,696	29,121
GLASS	(SQ. FT)	112	96	720	440	1,368
PERSONNEL DOOR	(SQ. FT)	84	21	189	270	564
OVERHEAD DOOR	(SQ. FT)	3,080	3,080	2,080	2,080	10,320
WALLS, NET	(SQ. FT)	4,589	4,668	3,707	3,906	16,869
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)	(SQ. FT)					20,345
OVERHEAD DOOR	(SQ. FT)	10,320	PERSONNEL DOOR		(SQ. FT)	564
BASEMENT WALLS	(SQ. FT)					0

**II. CONSTRUCTION: ([ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES)**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE	
COMPONENTS: 12" MASONRY UNITS = 3.7 INSULATED METAL PANELS = 7.33 BAY DOORS = .07 OA FILM = .17 IA FILM = .68	1. N WALL	3.09	
	2. S WALL	3.09	
	3. E WALL	6.22	
	4. W WALL	7.10	
	5.		
	6.		
	7. INSIDE AIR FILM	0.68	
TOTAL R-WALL =		20.18	
U=1/R		0.050	
ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE	
	1. OUTSIDE AIR FILM	0.17	
	2. 5 PLY BUR	0.33	
	3. 2" RIGID INSUL	5.56	
	4.		
	5.		
	6.		
	7. INSIDE AIR FILM	0.68	
TOTAL R-ROOF =		6.74	
U=1/R		0.148	
GLASS TYPE:	SINGLE PANE	R-GLASS	0.90
SLAB TYPE FLOOR:	CONCRETE	SLF	0.68
BASEMENT TYPE:	NONE	R-BASEM.	0.00
OVERHEAD DOOR TYPE:	INSULATED METAL	R-ODOOR	7.33
PERSONNEL DOOR TYPE:	HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	908 X 0.33 Sq.In./LF=	Sq.In.	300	X CFM/Sq.In.	1.530	=	458	
PERSONNEL DOORS (SF)	564 X 0.16 Sq.In./SF=	Sq.In.	90	X CFM/Sq.In.	1.530	=	138	
OVERHEAD DOORS (SF)			10320	X CFM/Sq.Ft.	0.114	=	1176	
DOOR OPENINGS / HR - SINGLE DOOR				X CFM /OPENING /HR	1.600	=	0	
DOOR OPENINGS / HR - DOUBLE DOORS				X CFM /OPENING /HR	1.385	=	0	
<b>TOTAL INFILTRATION (CFM)</b>							<b>=</b>	<b>1773</b>

UA ODOOR	=	ODOOR AREA	10,320	X DOOR "U"	0.136	=	1,408	
UA PDOOR	=	PDOOR AREA	564	X DOOR "U"	0.552	=	312	
UA WALL	=	WALL AREA	16,869	X WALL "U"	0.050	=	836	
UA ROOF	=	ROOF AREA	20,345	X ROOF "U"	0.148	=	3,019	
UA GLASS	=	GLASS AREA	1,368	X GLASS "U"	1.111	=	1,520	
UA SLAB	=	SLAB PERIM.	994	X SLF	0.680	=	676	
UA BASEM.	=	B-WALL AREA	0	X BASE. "U"	0.000	=	0	
INFILTRATION	=	CFM	1773	X A. T. F.	0.852	=	1,511	
<b>TOTAL UA (BTU/HR°F)</b>							<b>=</b>	<b>9,281</b>

E M C ENGINEERS, INC.  
 PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 12-Jun-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	7404	BLDG NAME:	ENL BARRACKS W/O DIN
BLDG FUNCTION:	BARRACKS		
FLOOR AREA: (SQ. FT)	50,730	# FLOORS:	3
SLAB PERIMETER: (FT)	0		

**I. AREAS: ([ ] FIELD VERIFIED ELEVATION PLANS)**

		NORTH-W	NORTH-E	SOUTH-W	SOUTH-E	TOTAL
WALLS, GROSS	(SQ. FT)	1,845	9,088	9,088	1,845	21,866
GLASS	(SQ. FT)	124	2,740	2,896	124	5,884
PERSONNEL DOOR	(SQ. FT)	0	42	84	0	126
OVERHEAD DOOR	(SQ. FT)	0	0	0	0	0
WALLS, NET	(SQ. FT)	1,721	6,306	6,108	1,721	15,856
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)	(SQ. FT)					19,342
OVERHEAD DOOR	(SQ. FT)	0	PERSONNEL DOOR	(SQ. FT)	126	
BASEMENT WALLS	(SQ. FT)					4,928

**II. CONSTRUCTION: ([ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES)**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. BRICK	1.20
	3. AIR SPACE	1.00
	4. GSU	0.72
	5.	
	6.	
	7. INSIDE AIR FILM	0.68
	TOTAL R-WALL =	3.77
	U=1/R	0.265

ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. BUILT UP ROOF	0.34
	3. RIGID INSULATION, 2"	5.56
	4.	
	5.	
	6.	
	7. INSIDE AIR FILM	0.68
	TOTAL R-ROOF =	6.75
	U=1/R	0.148

GLASS TYPE:	SINGLE PANE	R-GLASS	0.90
SLAB TYPE FLOOR:	CONCRETE	SLF	0.68
BASEMENT TYPE:	CONCRETE & SOIL	R-BASEM.	10.00
OVERHEAD DOOR TYPE:	NONE	R-ODOOR	0.00
PERSONNEL DOOR TYPE:	HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	8270 X 0.33 Sq.In./LF=	Sq.In.	2729	X CFM/Sq.In.	1.530	=	4176
PERSONNEL DOORS (SF)	126 X 0.16 Sq.In./SF=	Sq.In.	20	X CFM/Sq.In.	1.530	=	31
DOOR OPENINGS / HR - SINGLE DOOR	4	X CFM / OPENING / HR	1.600	=	6		
DOOR OPENINGS / HR - DOUBLE DOORS	8	X CFM / OPENING / HR	1.385	=	11		
TOTAL INFILTRATION (CFM)						=	4224

UA ODOOR	=	ODOOR AREA	0	X DOOR "U"	0.000	=	0
UA PDOOR	=	PDOOR AREA	126	X DOOR "U"	0.552	=	70
UA WALL	=	WALL AREA	15,856	X WALL "U"	0.265	=	4,206
UA ROOF	=	ROOF AREA	19,342	X ROOF "U"	0.148	=	2,868
UA GLASS	=	GLASS AREA	5,884	X GLASS "U"	1.111	=	6,538
UA SLAB	=	SLAB PERIM.	0	X SLF	0.680	=	0
UA BASEM.	=	B-WALL AREA	4,928	X BASE "U"	0.100	=	493
INFILTRATION	=	CFM	4224	X A. T. F.	1.037	=	4,380
TOTAL UA (BTU/HR°F)						=	18,554

E M C ENGINEERS, INC.  
 PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 12-Jun-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	7424	BLDG NAME:	ENL BARRACKS W/O DIN
BLDG FUNCTION:	BARRACKS		
FLOOR AREA: (SQ. FT)	50,730	# FLOORS:	3
SLAB PERIMETER: (FT)	0		

**I. AREAS: ([ ] FIELD VERIFIED ELEVATION PLANS)**

		NORTH-W	NORTH-E	SOUTH-W	SOUTH-E	TOTAL
WALLS, GROSS	(SQ. FT)	9,088	1,845	1,845	9,088	21,866
GLASS	(SQ. FT)	2,896	124	124	2,740	5,884
PERSONNEL DOOR	(SQ. FT)	84	0	0	42	126
OVERHEAD DOOR	(SQ. FT)	0	0	0	0	0
WALLS, NET	(SQ. FT)	6,108	1,721	1,721	6,306	15,856
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)	(SQ. FT)					19,342
OVERHEAD DOOR	(SQ. FT)	0	PERSONNEL DOOR	(SQ. FT)		126
BASEMENT WALLS	(SQ. FT)					4,928

**II. CONSTRUCTION: ([ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES)**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE	
	1. OUTSIDE AIR FILM	0.17	
	2. BRICK	1.20	
	3. AIR SPACE	1.00	
	4. GSU	0.72	
	5.		
	6.		
	7. INSIDE AIR FILM	0.68	
	TOTAL R-WALL =	3.77	
	U=1/R	0.265	
ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE	
	1. OUTSIDE AIR FILM	0.17	
	2. BUILT UP ROOF	0.34	
	3. RIGID INSULATION, 2"	5.56	
	4.		
	5.		
	6.		
	7. INSIDE AIR FILM	0.68	
	TOTAL R-ROOF =	6.75	
	U=1/R	0.148	
GLASS TYPE:	SINGLE PANE W/STORMS	R-GLASS	1.60
SLAB TYPE FLOOR:	CONCRETE	SLF	0.68
BASEMENT TYPE:	CONCRETE	R-BASEM.	10.00
OVERHEAD DOOR TYPE:	NONE	R-ODOOR	0.00
PERSONNEL DOOR TYPE:	HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	8270 X 0.33 Sq.In./LF=	Sq.In.	2729	X CFM/Sq.In.	1.530	=	4176
PERSONNEL DOORS (SF)	126 X 0.16 Sq.In./SF=	Sq.In.	20	X CFM/Sq.In.	1.530	=	31
DOOR OPENINGS / HR - SINGLE DOOR		4	X CFM /OPENING /HR	1.600	=	6	
DOOR OPENINGS / HR - DOUBLE DOORS		8	X CFM /OPENING /HR	1.385	=	11	
			TOTAL INFILTRATION (CFM)		=	4224	

UA ODOOR	=	ODOOR AREA	0	X DOOR "U"	0.000	=	0
UA PDOOR	=	PDOOR AREA	126	X DOOR "U"	0.552	=	70
UA WALL	=	WALL AREA	15,856	X WALL "U"	0.265	=	4,206
UA ROOF	=	ROOF AREA	19,342	X ROOF "U"	0.148	=	2,868
UA GLASS	=	GLASS AREA	5,884	X GLASS "U"	0.625	=	3,678
UA SLAB	=	SLAB PERIM.	0	X SLF	0.680	=	0
UA BASEM.	=	B-WALL AREA	4,928	X BASE "U"	0.100	=	493
INFILTRATION	=	CFM	4224	X A. T. F.	1.037	=	4,380
			TOTAL UA (BTU/HR°F)				15,693

E M C ENGINEERS, INC  
 PROJECT: EEP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 18-Jul-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	7485	BLDG NAME:	BOWLING ALLEY
BLDG FUNCTION:	REC		
FLOOR AREA: (SQ. FT)	16,112	# FLOORS:	1
SLAB PERIMETER: (FT)	516		

**I. AREAS: ([ ] FIELD VERIFIED ELEVATION PLANS)**

		NORTH	SOUTH	EAST	WEST	TOTAL
WALLS, GROSS	(SQ. FT)	2,968	2,968	4,256	4,256	14,448
GLASS	(SQ. FT)	0	192	0	0	192
PERSONNEL DOOR	(SQ. FT)	42	84	21	21	168
OVERHEAD DOOR	(SQ. FT)	0	0	0	0	0
WALLS, NET	(SQ. FT)	2,926	2,692	4,235	4,235	14,088
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)	(SQ. FT)					16,112
OVERHEAD DOOR	(SQ. FT)	0	PERSONNEL DOOR	(SQ. FT)	168	
BASEMENT WALLS	(SQ. FT)					0

**II. CONSTRUCTION: ([ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES)**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. 4" FACE BRICK	1.20
	3. 2" RIGID INSULATION	5.56
	4. AIR SPACE	1.00
	5. 8" CMU	1.11
	6.	
	7. INSIDE AIR FILM	0.68
	TOTAL R-WALL =	9.72
	U=1/R	0.103

ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. 3/16" EPDM ROOF	0.85
	3. 1-1/2" STEEL DECK	0.00
	4. 3" RIGID INSUL	8.34
	5. VAPOR BARRIER	0.00
	6.	
	7. INSIDE AIR FILM	0.68
	TOTAL R-ROOF =	10.04
	U=1/R	0.100

GLASS TYPE:	DOUBLE PANE	R-GLASS	1.75
SLAB TYPE FLOOR:	CONCRETE	SLF	0.68
BASEMENT TYPE:	NONE	R-BASEM.	0.00
OVERHEAD DOOR TYPE:	NONE	R-ODOOR	0.00
PERSONNEL DOOR TYPE:	HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	30 X 0.27 Sq.In./LF=	Sq.In.	8	X CFM/Sq.In.	1.530	=	12
PERSONNEL DOORS (SF)	168 X 0.16 Sq.In./SF=	Sq.In.	27	X CFM/Sq.In.	1.530	=	41
DOOR OPENINGS / HR - SINGLE DOOR		X CFM / OPENING / HR	1.600	=	0		
DOOR OPENINGS / HR - DOUBLE DOORS		X CFM / OPENING / HR	1.385	=	0		
<b>TOTAL INFILTRATION (CFM)</b>						=	<b>54</b>

UA ODOOR	=	ODOOR AREA	0	X DOOR "U"	0.000	=	0
UA PDOOR	=	PDOOR AREA	168	X DOOR "U"	0.552	=	93
UA WALL	=	WALL AREA	14,088	X WALL "U"	0.103	=	1,449
UA ROOF	=	ROOF AREA	16,112	X ROOF "U"	0.100	=	1,605
UA GLASS	=	GLASS AREA	192	X GLASS "U"	0.571	=	110
UA SLAB	=	SLAB PERIM.	516	X SLF	0.680	=	351
UA BASEM.	=	B-WALL AREA	0	X BASE. "U"	0.000	=	0
INFILTRATION	=	CFM	54	X A. T. F.	0.852	=	46
<b>TOTAL UA (BTU/HR°F)</b>							<b>3,653</b>



E M C ENGINEERS, INC.  
 PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 18-Jul-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	7604	BLDG NAME:	GEN INST BLDG
BLDG FUNCTION:			
FLOOR AREA: (SQ. FT)	11,404	# FLOORS:	1
SLAB PERIMETER: (FT)			

**I. AREAS: ([ ] FIELD VERIFIED ELEVATION PLANS)**

		NORTH-W	NORTH-E	SOUTH-W	SOUTH-E	TOTAL
WALLS, GROSS	(SQ. FT)	2,514	1,716	1,716	2,514	8,459
GLASS	(SQ. FT)	431	240	84	455	1,210
PERSONNEL DOOR	(SQ. FT)	63	0	42	84	189
OVERHEAD DOOR	(SQ. FT)	0	0	0	0	0
WALLS, NET	(SQ. FT)	2,020	1,476	1,590	1,975	7,060
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)						(SQ. FT) 11,404
OVERHEAD DOOR	(SQ. FT)	0	PERSONNEL DOOR		(SQ. FT)	189
BASEMENT WALLS	(SQ. FT)					0

**II. CONSTRUCTION: ([ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES)**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. 4" BRICK	1.20
	3. 2" AIR SPACE	1.00
	4. 1" RIGID INSULATION	2.78
	5. 8" CMU	1.11
	6. 1/2" GYPSUM BOARD	0.45
	7. INSIDE AIR FILM	0.68
	TOTAL R-WALL =	7.39
	U=1/R	0.135

ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. BUR	0.33
	3. 3" RIGID INSUL.	8.34
	4. AIR SPACE	1.00
	5. 1/2" GWB	0.45
	6.	
	7. INSIDE AIR FILM	0.68
	TOTAL R-ROOF =	10.97
	U=1/R	0.091

GLASS TYPE:	SINGLE PANE	R-GLASS	0.90
SLAB TYPE FLOOR:	CONCRETE	SLF	0.68
BASEMENT TYPE:	NONE	R-BASEM.	0.00
OVERHEAD DOOR TYPE:	NONE	R-ODOOR	0.00
PERSONNEL DOOR TYPE:	HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	216 X 0.33 Sq.In./LF=	Sq.In.	71	X CFM/Sq.In.	1.530	=	109
PERSONNEL DOORS (SF)	189 X 0.16 Sq.In./SF=	Sq.In.	30	X CFM/Sq.In.	1.530	=	46
DOOR OPENINGS / HR - SINGLE DOOR							
				X CFM /OPENING /HR	1.600	=	0
DOOR OPENINGS / HR - DOUBLE DOORS							
				X CFM /OPENING /HR	1.385	=	0
TOTAL INFILTRATION (CFM)						=	155

UA ODOOR	=	ODOOR AREA	0	X DOOR "U"	0.000	=	0
UA PDOOR	=	PDOOR AREA	189	X DOOR "U"	0.552	=	104
UA WALL	=	WALL AREA	7,060	X WALL "U"	0.135	=	955
UA ROOF	=	ROOF AREA	11,404	X ROOF "U"	0.091	=	1,040
UA GLASS	=	GLASS AREA	1,210	X GLASS "U"	1.111	=	1,344
UA SLAB	=	SLAB PERIM.	0	X SLF	0.680	=	0
UA BASEM.	=	B-WALL AREA	0	X BASE. "U"	0.000	=	0
INFILTRATION	=	CFM	155	X A. T. F.	0.852	=	132
TOTAL UA (BTU/HR°F)							3,576

E M C ENGINEERS, INC.  
 PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 12-Jun-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	7610	BLDG NAME:	ENL BARRACKS W/O DIN
BLDG FUNCTION:	BARRACKS		
FLOOR AREA: (SQ. FT)	40,986	# FLOORS:	3
SLAB PERIMETER: (FT)	0		

**I. AREAS: ([ ] FIELD VERIFIED ELEVATION PLANS)**

		NORTH-W	NORTH-E	SOUTH-W	SOUTH-E	TOTAL
WALLS, GROSS	(SQ. FT)	1,845	9,088	9,088	1,845	21,866
GLASS	(SQ. FT)	124	2,740	2,896	124	5,884
PERSONNEL DOOR	(SQ. FT)	0	42	84	0	126
OVERHEAD DOOR	(SQ. FT)	0	0	0	0	0
WALLS, NET	(SQ. FT)	1,721	6,306	6,108	1,721	15,856
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)	(SQ. FT)					19,342
OVERHEAD DOOR	(SQ. FT)	0 PERSONNEL DOOR				126
BASEMENT WALLS	(SQ. FT)					0

**II. CONSTRUCTION: ([ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES)**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. BRICK	1.20
	3. AIR SPACE	1.00
	4. GSU	0.72
	5.	
	6.	
	7. INSIDE AIR FILM	0.68
	TOTAL R-WALL =	3.77
	U=1/R	0.265

ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. BUILT UP ROOF	0.34
	3. RIGID INSULATION, 2"	5.56
	4.	
	5.	
	6.	
	7. INSIDE AIR FILM	0.68
	TOTAL R-ROOF =	6.75
	U=1/R	0.148

GLASS TYPE:	SINGLE PANE W/STORMS	R-GLASS	1.60
SLAB TYPE FLOOR:	CONCRETE	SLF	0.68
BASEMENT TYPE:	CONCRETE	R-BASEM.	10.00
OVERHEAD DOOR TYPE:	NONE	R-ODOOR	0.00
PERSONNEL DOOR TYPE:	HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	8270 X 0.33 Sq.In./LF=	Sq.In.	2729	X CFM/Sq.In.	1.530	=	4176
PERSONNEL DOORS (SF)	126 X 0.16 Sq.In./SF=	Sq.In.	20	X CFM/Sq.In.	1.530	=	31
DOOR OPENINGS / HR - SINGLE DOOR		4	X CFM /OPENING /HR	1.600	=	6	
DOOR OPENINGS / HR - DOUBLE DOORS		8	X CFM /OPENING /HR	1.385	=	11	
<b>TOTAL INFILTRATION (CFM)</b>						=	<b>4224</b>

UA ODOOR	=	ODOOR AREA	0	X DOOR "U"	0.000	=	0
UA PDOOR	=	PDOOR AREA	126	X DOOR "U"	0.552	=	70
UA WALL	=	WALL AREA	15,856	X WALL "U"	0.265	=	4,206
UA ROOF	=	ROOF AREA	19,342	X ROOF "U"	0.148	=	2,868
UA GLASS	=	GLASS AREA	5,884	X GLASS "U"	0.625	=	3,678
UA SLAB	=	SLAB PERIM.	0	X SLF	0.680	=	0
UA BASEM.	=	B-WALL AREA	0	X BASE. "U"	0.100	=	0
INFILTRATION	=	CFM	4224	X A. T. F.	1.037	=	4,380
<b>TOTAL UA (BTU/HR*F)</b>						=	<b>15,201</b>

E M C ENGINEERS, INC.  
 PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 12-Jun-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	7618	BLDG NAME:	ENL BARRACKS W/O DIN
BLDG FUNCTION:	BARRACKS		
FLOOR AREA: (SQ. FT)	40,986	# FLOORS:	3
SLAB PERIMETER: (FT)	0		

**I. AREAS: ([ ] FIELD VERIFIED ELEVATION PLANS)**

		NORTH-W	NORTH-E	SOUTH-W	SOUTH-E	TOTAL
WALLS, GROSS	(SQ. FT)	1,845	9,088	9,088	1,845	21,866
GLASS	(SQ. FT)	124	2,740	2,896	124	5,884
PERSONNEL DOOR	(SQ. FT)	0	42	84	0	126
OVERHEAD DOOR	(SQ. FT)	0	0	0	0	0
WALLS, NET	(SQ. FT)	1,721	6,306	6,108	1,721	15,856
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)	(SQ. FT)					19,342
OVERHEAD DOOR	(SQ. FT)	0 PERSONNEL DOOR		(SQ. FT)	126	
BASEMENT WALLS	(SQ. FT)					0

**II. CONSTRUCTION: ([ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES)**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. BRICK	1.20
	3. AIR SPACE	1.00
	4. GSU	0.72
	5.	
	6.	
	7. INSIDE AIR FILM	0.68
	TOTAL R-WALL =	3.77
	U=1/R	0.265

ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. BUILT UP ROOF	0.34
	3. RIGID INSULATION, 2"	5.56
	4.	
	5.	
	6.	
	7. INSIDE AIR FILM	0.68
	TOTAL R-ROOF =	6.75
	U=1/R	0.148

GLASS TYPE:	SINGLE PANE W/STORMS	R-GLASS	1.60
SLAB TYPE FLOOR:	CONCRETE	SLF	0.68
BASEMENT TYPE:	CONCRETE	R-BASEM.	10.00
OVERHEAD DOOR TYPE:	NONE	R-ODOOR	0.00
PERSONNEL DOOR TYPE:	HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	8270 X 0.33 Sq.In./LF=	Sq.In.	2729	X CFM/Sq.In.	1.530	=	4176
PERSONNEL DOORS (SF)	126 X 0.16 Sq.In./SF=	Sq.In.	20	X CFM/Sq.In.	1.530	=	31
DOOR OPENINGS / HR - SINGLE DOOR		4	X CFM /OPENING /HR	1.600	=	6	
DOOR OPENINGS / HR - DOUBLE DOORS		8	X CFM /OPENING /HR	1.385	=	11	
<b>TOTAL INFILTRATION (CFM)</b>							<b>4224</b>

UA ODOOR	=	ODOOR AREA	0	X DOOR "U"	0.000	=	0
UA PDOOR	=	PDOOR AREA	126	X DOOR "U"	0.552	=	70
UA WALL	=	WALL AREA	15,856	X WALL "U"	0.265	=	4,206
UA ROOF	=	ROOF AREA	19,342	X ROOF "U"	0.148	=	2,868
UA GLASS	=	GLASS AREA	5,884	X GLASS "U"	0.625	=	3,678
UA SLAB	=	SLAB PERIM.	0	X SLF	0.680	=	0
UA BASEM.	=	B-WALL AREA	0	X BASE. "U"	0.100	=	0
INFILTRATION	=	CFM	4224	X A. T. F.	1.037	=	4,380
<b>TOTAL UA (BTU/HR°F)</b>							<b>15,201</b>

E M C ENGINEERS, INC.  
 PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 12-Jun-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	7620	BLDG NAME:	BN ADMIN & CLRM
BLDG FUNCTION:			
FLOOR AREA: (SQ. FT)	6,255	# FLOORS:	1
SLAB PERIMETER: (FT)	345		

**I. AREAS: ([ ] FIELD VERIFIED ELEVATION PLANS)**

		NORTH-W	NORTH-E	SOUTH-W	SOUTH-E	TOTAL
WALLS, GROSS (SQ. FT)		1,176	900	900	1,176	4,152
GLASS (SQ. FT)		90	0	120	120	330
PERSONNEL DOOR (SQ. FT)		0	0	42	0	42
OVERHEAD DOOR (SQ. FT)		0	0	0	0	0
WALLS, NET (SQ. FT)		1,086	900	738	1,056	3,780
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED) (SQ. FT)						6,255
OVERHEAD DOOR (SQ. FT)		0				42
PERSONNEL DOOR (SQ. FT)						42
BASEMENT WALLS (SQ. FT)						0

**II. CONSTRUCTION: ([ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES)**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. 4" BRICK	1.20
	3. 2" AIR SPACE	1.00
	4. 4" CMU	0.72
	5.	
	6.	
	7. INSIDE AIR FILM	0.68
	TOTAL R-WALL =	3.77
	U=1/R	0.265
ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. BUR	0.33
	3. 2" RIGID INSUL	5.56
	4. AIR SPACE	1.00
	5. ACOUSTIC TILE CEILING	1.25
	6.	
	7. INSIDE AIR FILM	0.68
	TOTAL R-ROOF =	8.99
	U=1/R	0.111
GLASS TYPE: SINGLE PANE	R-GLASS	0.90
SLAB TYPE FLOOR: CONCRETE	SLF	0.68
BASEMENT TYPE: NONE	R-BASEM.	0.00
OVERHEAD DOOR TYPE: NONE	R-ODOOR	0.00
PERSONNEL DOOR TYPE: HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	176 X 0.33 Sq.In./LF=	Sq.In.	58	X CFM/Sq.In.	1.530	=	89
PERSONNEL DOORS (SF)	42 X 0.16 Sq.In./SF=	Sq.In.	7	X CFM/Sq.In.	1.530	=	10
DOOR OPENINGS / HR - SINGLE DOOR							
				X CFM / OPENING / HR	1.600	=	0
DOOR OPENINGS / HR - DOUBLE DOORS							
			1	X CFM / OPENING / HR	1.385	=	1
						TOTAL INFILTRATION (CFM)	101

UA ODOOR	=	ODOOR AREA	0	X DOOR "U"	0.000	=	0
UA PDOOR	=	PDOOR AREA	42	X DOOR "U"	0.552	=	23
UA WALL	=	WALL AREA	3,780	X WALL "U"	0.265	=	1,003
UA ROOF	=	ROOF AREA	6,255	X ROOF "U"	0.111	=	696
UA GLASS	=	GLASS AREA	330	X GLASS "U"	1.111	=	367
UA SLAB	=	SLAB PERIM.	345	X SLF	0.680	=	235
UA BASEM.	=	B-WALL AREA	0	X BASE. "U"	0.000	=	0
INFILTRATION	=	CFM	101	X A. T. F.	1.037	=	104
						TOTAL UA (BTU/HR°F)	2,427

E M C ENGINEERS, INC.  
 PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 12-Jun-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	7656	BLDG NAME:	GEN INST BLDG
BLDG FUNCTION:			
FLOOR AREA: (SQ. FT)	11,404	# FLOORS:	1
SLAB PERIMETER: (FT)			

**I. AREAS: ([ ] FIELD VERIFIED ELEVATION PLANS)**

	(SQ. FT)	NORTH-W	NORTH-E	SOUTH-W	SOUTH-E	TOTAL	
WALLS, GROSS		2,514	1,716	1,716	2,514	8,459	
GLASS		431	240	84	455	1,210	
PERSONNEL DOOR		63	0	42	84	189	
OVERHEAD DOOR		0	0	0	0	0	
WALLS, NET		2,020	1,476	1,590	1,975	7,060	
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)						(SQ. FT)	11,404
OVERHEAD DOOR		0	PERSONNEL DOOR			(SQ. FT)	189
BASEMENT WALLS							0

**II. CONSTRUCTION: ([ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES)**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE	
	1. OUTSIDE AIR FILM	0.17	
	2. 4" BRICK	1.20	
	3. 2" AIR SPACE	1.00	
	4. 1" RIGID INSULATION	2.78	
	5. 8" CMU	1.11	
	6. 1/2" GYPSUM BOARD	0.45	
	7. INSIDE AIR FILM	0.68	
	TOTAL R-WALL =	7.39	
	U=1/R	0.135	
ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE	
	1. OUTSIDE AIR FILM	0.17	
	2. BUR	0.33	
	3. 3" RIGID INSUL.	8.34	
	4. AIR SPACE	1.00	
	5. 1/2" GWB	0.45	
	6.		
	7. INSIDE AIR FILM	0.68	
	TOTAL R-ROOF =	10.97	
	U=1/R	0.091	
GLASS TYPE:	SINGLE PANE	R-GLASS	0.90
SLAB TYPE FLOOR:	CONCRETE	SLF	0.68
BASEMENT TYPE:	NONE	R-BASEM.	0.00
OVERHEAD DOOR TYPE:	NONE	R-ODOOR	0.00
PERSONNEL DOOR TYPE:	HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	216 X 0.33 Sq.In./LF=	Sq.In.	71	X CFM/Sq.In.	1.530	=	109
PERSONNEL DOORS (SF)	189 X 0.16 Sq.In./SF=	Sq.In.	30	X CFM/Sq.In.	1.530	=	46
DOOR OPENINGS / HR - SINGLE DOOR		4	X CFM /OPENING /HR	1.600	=	6	
DOOR OPENINGS / HR - DOUBLE DOORS		20	X CFM /OPENING /HR	1.385	=	28	
<b>TOTAL INFILTRATION (CFM)</b>							<b>189</b>

UA ODOOR	=	ODOOR AREA	0	X DOOR "U"	0.000	=	0
UA PDOOR	=	PDOOR AREA	189	X DOOR "U"	0.552	=	104
UA WALL	=	WALL AREA	7,060	X WALL "U"	0.135	=	955
UA ROOF	=	ROOF AREA	11,404	X ROOF "U"	0.091	=	1,040
UA GLASS	=	GLASS AREA	1,210	X GLASS "U"	1.111	=	1,344
UA SLAB	=	SLAB PERIM.	0	X SLF	0.680	=	0
UA BASEM.	=	B-WALL AREA	0	X BASE. "U"	0.000	=	0
INFILTRATION	=	CFM	189	X A. T. F.	1.037	=	196
<b>TOTAL UA (BTU/HR°F)</b>							<b>3,640</b>



E M C ENGINEERS, INC.  
 PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 18-Jul-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	7760	BLDG NAME:	MOTOR REPAIR SHOP
BLDG FUNCTION:			
FLOOR AREA: (SQ. FT)	16,192	# FLOORS:	1
SLAB PERIMETER: (FT)	796		

**I. AREAS: ( [ ] FIELD VERIFIED ELEVATION PLANS)**

		NORTH	SOUTH	EAST	WEST	TOTAL
WALLS, GROSS	(SQ. FT)	6,096	6,096	3,456	3,456	19,104
GLASS	(SQ. FT)	16	48	0	16	80
PERSONNEL DOOR	(SQ. FT)	126	252	21	84	483
OVERHEAD DOOR	(SQ. FT)	2,160	2,160	1,800	1,800	7,920
WALLS, NET	(SQ. FT)	3,794	3,636	1,635	1,556	10,621
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)						(SQ. FT) 16,192
OVERHEAD DOOR	(SQ. FT)	7,920	PERSONNEL DOOR		(SQ. FT)	483
BASEMENT WALLS	(SQ. FT)					0

**II. CONSTRUCTION: ( [ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES)**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. 12" MASONRY UNITS	3.70
	3. BAY DOORS	0.07
	4.	
	5.	
	6.	
	7. INSIDE AIR FILM	0.68
	TOTAL R-WALL =	4.62
	U=1/R	0.216

ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. BUR	0.33
	3. 2" RIGID INSULATION	5.56
	4.	
	5.	
	6.	
	7. INSIDE AIR FILM	0.68
	TOTAL R-ROOF =	6.74
	U=1/R	0.148

GLASS TYPE:	SINGLE PANE	R-GLASS	0.90
SLAB TYPE FLOOR:	CONCRETE	SLF	0.68
BASEMENT TYPE:	NONE	R-BASEM.	0.00
OVERHEAD DOOR TYPE:	NONE	R-ODOOR	0.00
PERSONNEL DOOR TYPE:	HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	72 X 0.33 Sq.In./LF=	Sq.In.	24	X CFM/Sq.In.	1.530	=	36
PERSONNEL DOORS (SF)	483 X 0.16 Sq.In./SF=	Sq.In.	77	X CFM/Sq.In.	1.530	=	118
DOOR OPENINGS / HR - SINGLE DOOR							
				X CFM / OPENING / HR	1.600	=	0
DOOR OPENINGS / HR - DOUBLE DOORS							
				X CFM / OPENING / HR	1.385	=	0
						TOTAL INFILTRATION (CFM)	= 155

UA ODOOR	=	ODOOR AREA	7,920	X DOOR "U"	0.000	=	0
UA PDOOR	=	PDOOR AREA	483	X DOOR "U"	0.552	=	267
UA WALL	=	WALL AREA	10,621	X WALL "U"	0.216	=	2,299
UA ROOF	=	ROOF AREA	16,192	X ROOF "U"	0.148	=	2,402
UA GLASS	=	GLASS AREA	80	X GLASS "U"	1.111	=	89
UA SLAB	=	SLAB PERIM.	796	X SLF	0.680	=	541
UA BASEM.	=	B-WALL AREA	0	X BASE. "U"	0.000	=	0
INFILTRATION	=	CFM	155	X A. T. F.	0.852	=	132
						<b>TOTAL UA (BTU/HR°F)</b>	<b>5,730</b>

E M C ENGINEERS, INC.  
 PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 12-Jun-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	7802	BLDG NAME:	ADM & SUPP BLDG
BLDG FUNCTION:			
FLOOR AREA: (SQ. FT)	12,432	# FLOORS:	1
SLAB PERIMETER: (FT)	556		

**I. AREAS: ([ ] FIELD VERIFIED ELEVATION PLANS)**

		NORTH	SOUTH	EAST	WEST	TOTAL
WALLS, GROSS	(SQ. FT)	728	728	2,886	2,886	7,228
GLASS	(SQ. FT)	0	0	280	448	728
PERSONNEL DOOR	(SQ. FT)	64	0	420	105	589
OVERHEAD DOOR	(SQ. FT)	0	0	0	0	0
WALLS, NET	(SQ. FT)	664	728	2,186	2,333	5,911
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)					(SQ. FT)	12,432
OVERHEAD DOOR	(SQ. FT)	0	PERSONNEL DOOR		(SQ. FT)	589
BASEMENT WALLS	(SQ. FT)					0

**II. CONSTRUCTION: ([ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES)**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE	
	1. OUTSIDE AIR FILM	0.17	
	2. 4" FACE BRICK	1.20	
	3. 2" AIR SPACE	1.00	
	4. "6" CMU	0.92	
	5.		
	6.		
	7. INSIDE AIR FILM	0.68	
	TOTAL R-WALL =	3.97	
	U=1/R	0.252	
ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE	
	1. OUTSIDE AIR FILM	0.17	
	2. BUR	0.33	
	3. 2" RIGID INSULATION	5.56	
	4. METAL DECK	0.00	
	5. AIR SPACE	1.00	
	6. ACOUSTIC TILE	1.79	
	7. INSIDE AIR FILM	0.68	
	TOTAL R-ROOF =	9.46	
	U=1/R	0.106	
GLASS TYPE:	SINGLE PANE	R-GLASS	0.90
SLAB TYPE FLOOR:	CONCRETE	SLF	0.68
BASEMENT TYPE:	NONE	R-BASEM.	0.00
OVERHEAD DOOR TYPE:	NONE	R-ODOOR	0.00
PERSONNEL DOOR TYPE:	HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	390 X 0.33 Sq.In./LF=	Sq.In.	129	X CFM/Sq.In.	1.530	=	197
PERSONNEL DOORS (SF)	589 X 0.16 Sq.In./SF=	Sq.In.	94	X CFM/Sq.In.	1.530	=	144
DOOR OPENINGS / HR - SINGLE DOOR				X CFM / OPENING /HR	1.600	=	0
DOOR OPENINGS / HR - DOUBLE DOORS				X CFM / OPENING /HR	1.385	=	0
				TOTAL INFILTRATION (CFM)		=	341

UA ODOOR	=	ODOOR AREA	0	X DOOR "U"	0.000	=	0
UA PDOOR	=	PDOOR AREA	589	X DOOR "U"	0.552	=	325
UA WALL	=	WALL AREA	5,911	X WALL "U"	0.252	=	1,489
UA ROOF	=	ROOF AREA	12,432	X ROOF "U"	0.106	=	1,314
UA GLASS	=	GLASS AREA	728	X GLASS "U"	1.111	=	809
UA SLAB	=	SLAB PERIM.	556	X SLF	0.680	=	378
UA BASEM.	=	B-WALL AREA	0	X BASE. "U"	0.000	=	0
INFILTRATION	=	CFM	341	X A. T. F.	1.037	=	354
				TOTAL UA (BTU/HR°F)			4,669



E M C ENGINEERS, INC  
 PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 12-Jun-95  
 BY: AMS  
 JOB: 1406 001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	7820	BLDG NAME:	BN ADMIN & CLRM
BLDG FUNCTION:			
FLOOR AREA: (SQ. FT)	6,655	# FLOORS:	1
SLAB PERIMETER: (FT)	356		

**I. AREAS: ([ ] FIELD VERIFIED ELEVATION PLANS)**

		NORTH-W	NORTH-E	SOUTH-W	SOUTH-E	TOTAL	
WALLS, GROSS	(SQ. FT)	936	1,200	1,200	936	4,272	
GLASS	(SQ. FT)	90	0	120	120	330	
PERSONNEL DOOR	(SQ. FT)	42	0	0	0	42	
OVERHEAD DOOR	(SQ. FT)	0	0	0	0	0	
WALLS, NET	(SQ. FT)	804	1,200	1,080	816	3,900	
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)						(SQ. FT)	6,655
OVERHEAD DOOR	(SQ. FT)	0	PERSONNEL DOOR		(SQ. FT)	42	
BASEMENT WALLS	(SQ. FT)					0	

**II. CONSTRUCTION: ([ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES)**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE	
	1. OUTSIDE AIR FILM	0.17	
	2. 4" BRICK	1.20	
	3. 2" AIR SPACE	1.00	
	4. 4" CMU	0.72	
	5.		
	6.		
	7. INSIDE AIR FILM	0.68	
	TOTAL R-WALL =	3.77	
	U=1/R	0.265	
ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE	
	1. OUTSIDE AIR FILM	0.17	
	2. BUR	0.33	
	3. 2" RIGID INSUL	5.56	
	4. AIR SPACE	1.00	
	5. ACOUSTIC TILE CEILING	1.25	
	6.		
	7. INSIDE AIR FILM	0.68	
	TOTAL R-ROOF =	8.99	
	U=1/R	0.111	
GLASS TYPE:	SINGLE PANE	R-GLASS	0.90
SLAB TYPE FLOOR:	CONCRETE	SLF	0.68
BASEMENT TYPE:	NONE	R-BASEM.	0.00
OVERHEAD DOOR TYPE:	NONE	R-ODOOR	0.00
PERSONNEL DOOR TYPE:	HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	176 X 0.33 Sq.In./LF=	Sq.In.	58	X CFM/Sq.In.	1.530	=	89
PERSONNEL DOORS (SF)	42 X 0.16 Sq.In./SF=	Sq.In.	7	X CFM/Sq.In.	1.530	=	10
DOOR OPENINGS / HR - SINGLE DOOR							
				X CFM /OPENING /HR	1.600	=	0
DOOR OPENINGS / HR - DOUBLE DOORS							
			2	X CFM /OPENING /HR	1.385	=	3
TOTAL INFILTRATION (CFM)							102

UA ODOOR	=	ODOOR AREA	0	X DOOR "U"	0.000	=	0
UA PDOOR	=	PDOOR AREA	42	X DOOR "U"	0.552	=	23
UA WALL	=	WALL AREA	3,900	X WALL "U"	0.265	=	1,034
UA ROOF	=	ROOF AREA	6,655	X ROOF "U"	0.111	=	740
UA GLASS	=	GLASS AREA	330	X GLASS "U"	1.111	=	367
UA SLAB	=	SLAB PERIM.	356	X SLF	0.680	=	242
UA BASEM.	=	B-WALL AREA	0	X BASE. "U"	0.000	=	0
INFILTRATION	=	CFM	102	X A. T. F.	1.037	=	106
TOTAL UA (BTU/HR°F)							2,512

E M C ENGINEERS, INC.  
 PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 12-Jun-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	7834	BLDG NAME:	REGEMENTAL HQ BLDG.
BLDG FUNCTION:			
FLOOR AREA: (SQ. FT)	9,843	# FLOORS:	3
SLAB PERIMETER: (FT)			

**I. AREAS: ([ ] FIELD VERIFIED ELEVATION PLANS)**

		NORTH-W	NORTH-E	SOUTH-W	SOUTH-E	TOTAL
WALLS, GROSS	(SQ. FT)	1,220	2,420	2,420	1,220	7,280
GLASS	(SQ. FT)	336	632	504	336	1,808
PERSONNEL DOOR	(SQ. FT)	0	42	42	0	84
OVERHEAD DOOR	(SQ. FT)	0	0	0	0	0
WALLS, NET	(SQ. FT)	884	1,746	1,874	884	5,388
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)						(SQ. FT)
OVERHEAD DOOR	(SQ. FT)	0	PERSONNEL DOOR		(SQ. FT)	84
BASEMENT WALLS	(SQ. FT)	102	202	202	102	607

**II. CONSTRUCTION: ([ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES)**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE	
	1. OUTSIDE AIR FILM	0.17	
	2. 6" BRICK	1.80	
	3. 2" AIR SPACE	1.00	
	4. 8" CMU	1.11	
	5. 1/2" GYPSUM BD.	0.45	
	6.		
	7. INSIDE AIR FILM	0.68	
	TOTAL R-WALL =	5.21	
	U=1/R	0.192	
ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE	
	1. OUTSIDE AIR FILM	0.17	
	2. BUR	0.33	
	3. WOOD DECK	0.83	
	4. AIR SPACE	1.00	
	5. 2" RIGID INSULATION	5.56	
	6.		
	7. INSIDE AIR FILM	0.68	
	TOTAL R-ROOF =	8.57	
	U=1/R	0.117	
GLASS TYPE:	SINGLE PANE	R-GLASS	0.90
SLAB TYPE FLOOR:	CONCRETE	SLF	0.68
BASEMENT TYPE:	NONE	R-BASEM.	0.00
OVERHEAD DOOR TYPE:	NONE	R-ODOOR	0.00
PERSONNEL DOOR TYPE:	HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	1712 X 0.33 Sq.In./LF=	Sq.In.	565	X CFM/Sq.In.	1.530	=	864
PERSONNEL DOORS (SF)	84 X 0.16 Sq.In./SF=	Sq.In.	13	X CFM/Sq.In.	1.530	=	21
DOOR OPENINGS / HR - SINGLE DOOR							
				X CFM / OPENING / HR	1.600	=	0
DOOR OPENINGS / HR - DOUBLE DOORS							
				X CFM / OPENING / HR	1.385	=	0
						TOTAL INFILTRATION (CFM)	885

UA ODOOR	=	ODOOR AREA	0	X DOOR "U"	0.000	=	0
UA PDOOR	=	PDOOR AREA	84	X DOOR "U"	0.552	=	46
UA WALL	=	WALL AREA	5,388	X WALL "U"	0.192	=	1,034
UA ROOF	=	ROOF AREA	0	X ROOF "U"	0.117	=	0
UA GLASS	=	GLASS AREA	1,808	X GLASS "U"	1.111	=	2,009
UA SLAB	=	SLAB PERIM.	0	X SLF	0.680	=	0
UA BASEM.	=	B-WALL AREA	607	X BASE. "U"	0.000	=	0
INFILTRATION	=	CFM	885	X A. T. F.	1.037	=	918
						TOTAL UA (BTU/HR°F)	4,007

E M C ENGINEERS, INC.  
 PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 12-Jun-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	7865	BLDG NAME:	UNIT CHAPEL
BLDG FUNCTION:	CHAPEL		
FLOOR AREA: (SQ. FT)	6,642	# FLOORS:	1
SLAB PERIMETER: (FT)	421		

**I. AREAS: ([ ] FIELD VERIFIED ELEVATION PLANS)**

	(SQ. FT)	NORTH-E	NORTH-W	SOUTH-E	SOUTH-W	TOTAL
WALLS, GROSS		1,690	1,090	1,263	1,690	5,734
GLASS		326	39	0	117	482
PERSONNEL DOOR		42	84	0	21	147
OVERHEAD DOOR		0	0	0	0	0
WALLS, NET		1,322	967	1,263	1,552	5,105
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)						6,888
OVERHEAD DOOR		0	PERSONNEL DOOR			147
BASEMENT WALLS						0

**II. CONSTRUCTION: ([ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES)**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. 4" BRICK	1.20
	3. AIR SPACE	1.00
	4. 8" CMU	1.11
	5.	
	6.	
	7. INSIDE AIR FILM	0.68
	TOTAL R-WALL =	4.16
	U=1/R	0.240

ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. 2.5" BUR	0.33
	3. 4" RIGID INSUL.	11.12
	4. 2" ROOF DECK (WOOD)	2.20
	5.	
	6.	
	7. INSIDE AIR FILM	0.68
	TOTAL R-ROOF =	14.50
	U=1/R	0.069

GLASS TYPE:	SINGLE PANE W/STORMS	R-GLASS	1.60
SLAB TYPE FLOOR:	CONCRETE	SLF	0.68
BASEMENT TYPE:	NONE	R-BASEM.	0.00
OVERHEAD DOOR TYPE:	NONE	R-ODOOR	0.00
PERSONNEL DOOR TYPE:	WOOD	R-PDOOR	1.88

**III. INFILTRATION:**

WINDOWS (LF of Crack)	269 X 0.27 Sq.In./LF=	Sq.In.	73	X CFM/Sq.In.	1.530	=	111
PERSONNEL DOORS (SF)	147 X 0.16 Sq.In./SF=	Sq.In.	24	X CFM/Sq.In.	1.530	=	36
DOOR OPENINGS / HR - SINGLE DOOR		1	X CFM /OPENING /HR	1.600	=	2	
DOOR OPENINGS / HR - DOUBLE DOORS		3	X CFM /OPENING /HR	1.385	=	4	
<b>TOTAL INFILTRATION (CFM)</b>						=	153

UA ODOOR	=	ODOOR AREA	0	X DOOR "U"	0.000	=	0
UA PDOOR	=	PDOOR AREA	147	X DOOR "U"	0.532	=	78
UA WALL	=	WALL AREA	5,105	X WALL "U"	0.240	=	1,227
UA ROOF	=	ROOF AREA	6,888	X ROOF "U"	0.069	=	475
UA GLASS	=	GLASS AREA	482	X GLASS "U"	0.625	=	301
UA SLAB	=	SLAB PERIM.	421	X SLF	0.680	=	286
UA BASEM.	=	B-WALL AREA	0	X BASE. "U"	0.000	=	0
INFILTRATION	=	CFM	153	X A. T. F.	1.037	=	159
<b>TOTAL UA (BTU/HR°F)</b>						=	2,526

E M C ENGINEERS, INC.  
 PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 12-Jun-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	7920	BLDG NAME:	VEH MAINT SHOP
BLDG FUNCTION:	MAINT		
FLOOR AREA: (SQ. FT)	124,553	# FLOORS:	1
SLAB PERIMETER: (FT)	3,057		

**I. AREAS: ([ ] FIELD VERIFIED ELEVATION PLANS)**

		NORTH	SOUTH	EAST	WEST	TOTAL
WALLS, GROSS	(SQ. FT)	17,578	17,578	17,578	17,578	70,312
GLASS	(SQ. FT)	49	25	25	25	123
PERSONNEL DOOR	(SQ. FT)	84	84	63	63	294
OVERHEAD DOOR	(SQ. FT)	9,216	4,608	4,608	4,608	23,040
WALLS, NET	(SQ. FT)	8,229	12,862	12,883	12,883	46,856
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)	(SQ. FT)					124,553
OVERHEAD DOOR	(SQ. FT)	23,040	PERSONNEL DOOR		(SQ. FT)	294
BASEMENT WALLS	(SQ. FT)					0

**II. CONSTRUCTION: ([ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES)**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE	
COMPOSITE: 12" CONCRETE = 3.7 INSULATED METAL PANELS = 7.33 O'HEAD INSULATED METAL DOORS = 7.33 COMPOSITE = 4.8	1. OUTSIDE AIR FILM	0.17	
	2. COMPOSITE	4.80	
	3.		
	4.		
	5.		
	6.		
	7. INSIDE AIR FILM	0.68	
	TOTAL R-WALL =	5.65	
	U=1/R	0.177	
ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE	
	1. OUTSIDE AIR FILM	0.17	
	2. BUR	0.33	
	3. STEEL DECK	0.00	
	4. 2" RIGID INSULATION	5.56	
	5.		
	6.		
	7. INSIDE AIR FILM	0.68	
	TOTAL R-ROOF =	6.74	
	U=1/R	0.148	
GLASS TYPE:	SINGLE PANE	R-GLASS	0.90
SLAB TYPE FLOOR:	CONCRETE	SLF	0.68
BASEMENT TYPE:	NONE	R-BASEM.	0.00
OVERHEAD DOOR TYPE:	NONE	R-ODOOR	7.33
PERSONNEL DOOR TYPE:	HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	105 X 0.33 Sq.In./LF=	Sq.In.	35	X CFM/Sq.In.	1.530	=	53
PERSONNEL DOORS (SF)	294 X 0.16 Sq.In./SF=	Sq.In.	47	X CFM/Sq.In.	1.530	=	72
OVERHEAD DOORS (SF)			23040	X CFM/Sq.Ft.	0.456	=	10506
DOOR OPENINGS / HR - SINGLE DOOR			10	X CFM / OPENING / HR	1.600	=	16
DOOR OPENINGS / HR - DOUBLE DOORS			10	X CFM / OPENING / HR	1.385	=	14
				TOTAL INFILTRATION (CFM)		=	10661

UA ODOOR	=	ODOOR AREA	23,040	X DOOR "U"	0.136	=	3,143
UA PDOOR	=	PDOOR AREA	294	X DOOR "U"	0.552	=	162
UA WALL	=	WALL AREA	46,856	X WALL "U"	0.177	=	8,293
UA ROOF	=	ROOF AREA	124,553	X ROOF "U"	0.148	=	18,480
UA GLASS	=	GLASS AREA	123	X GLASS "U"	1.111	=	136
UA SLAB	=	SLAB PERIM.	3,057	X SLF	0.680	=	2,079
UA BASEM.	=	B-WALL AREA	0	X BASE. "U"	0.000	=	0
INFILTRATION	=	CFM	10661	X A. T. F.	1.037	=	11,056
				TOTAL UA (BTU/HR°F)		=	43,349

E M C ENGINEERS, INC.  
 PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 12-Jun-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	7940	BLDG NAME:	VEH MNT SHOP ORG
BLDG FUNCTION:			
FLOOR AREA: (SQ. FT)	22,345	# FLOORS:	1
SLAB PERIMETER: (FT)	994		

**I. AREAS: ( [ ] FIELD VERIFIED ELEVATION PLANS)**

		NORTH	SOUTH	EAST	WEST	TOTAL
WALLS, GROSS	(SQ. FT)	7,865	7,865	6,696	6,696	29,121
GLASS	(SQ. FT)	112	96	720	440	1,368
PERSONNEL DOOR	(SQ. FT)	84	21	189	270	564
OVERHEAD DOOR	(SQ. FT)	3,080	3,080	2,080	2,080	10,320
WALLS, NET	(SQ. FT)	4,589	4,668	3,707	3,906	16,869
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)	(SQ. FT)					20,345
OVERHEAD DOOR	(SQ. FT)	10,320				10,320
PERSONNEL DOOR	(SQ. FT)					564
BASEMENT WALLS	(SQ. FT)					0

**II. CONSTRUCTION: ( [ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES)**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE
COMPONENTS:	1. N WALL	3.09
12" MASONRY UNITS = 3.7	2. S WALL	3.09
INSULATED METAL PANELS = 7.33	3. E WALL	6.22
BAY DOORS = .07	4. W WALL	7.10
OA FILM = .17	5.	
IA FILM = .68	6.	
	7. INSIDE AIR FILM	0.68
	TOTAL R-WALL =	20.18
	U=1/R	0.050
ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. 5 PLY BUR	0.33
	3. 2" RIGID INSUL	5.56
	4.	
	5.	
	6.	
	7. INSIDE AIR FILM	0.68
	TOTAL R-ROOF =	6.74
	U=1/R	0.148
GLASS TYPE: SINGLE PANE	R-GLASS	0.90
SLAB TYPE FLOOR: CONCRETE	SLF	0.68
BASEMENT TYPE: NONE	R-BASEM.	0.00
OVERHEAD DOOR TYPE: INSULATED METAL	R-ODOOR	7.33
PERSONNEL DOOR TYPE: HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	908 X 0.33 Sq.In./LF=	Sq.In.	300	X CFM/Sq.In.	1.530	=	458
PERSONNEL DOORS (SF)	564 X 0.16 Sq.In./SF=	Sq.In.	90	X CFM/Sq.In.	1.530	=	138
OVERHEAD DOORS (SF)			10320	X CFM/Sq.Ft.	0.114	=	1176
DOOR OPENINGS / HR - SINGLE DOOR				X CFM /OPENING /HR	1.600	=	0
DOOR OPENINGS / HR - DOUBLE DOORS				X CFM /OPENING /HR	1.385	=	0
				TOTAL INFILTRATION (CFM)		=	1773

UA ODOOR	=	ODOOR AREA	10,320	X DOOR "U"	0.136	=	1,408
UA PDOOR	=	PDOOR AREA	564	X DOOR "U"	0.552	=	312
UA WALL	=	WALL AREA	16,869	X WALL "U"	0.050	=	836
UA ROOF	=	ROOF AREA	20,345	X ROOF "U"	0.148	=	3,019
UA GLASS	=	GLASS AREA	1,368	X GLASS "U"	1.111	=	1,520
UA SLAB	=	SLAB PERIM.	994	X SLF	0.680	=	676
UA BASEM.	=	B-WALL AREA	0	X BASE. "U"	0.000	=	0
INFILTRATION	=	CFM	1773	X A. T. F.	1.037	=	1,839
				TOTAL UA (BTU/HR°F)		=	9,609

E M C ENGINEERS, INC.  
 PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 12-Jun-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	8002	BLDG NAME:	ENL BARRACKS W/O DIN
BLDG FUNCTION:	BARRACKS		
FLOOR AREA: (SQ. FT)	20,349	# FLOORS:	3
SLAB PERIMETER: (FT)	634		

**I. AREAS: ([ ] FIELD VERIFIED ELEVATION PLANS)**

		NORTH-W	NORTH-E	SOUTH-W	SOUTH-E	TOTAL
WALLS, GROSS	(SQ. FT)	5,306	4,491	4,491	5,306	19,594
GLASS	(SQ. FT)	936	0	0	744	1,680
PERSONNEL DOOR	(SQ. FT)	0	126	126	28	280
OVERHEAD DOOR	(SQ. FT)	0	0	0	0	0
WALLS, NET	(SQ. FT)	4,370	4,365	4,365	4,534	17,634
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)	(SQ. FT)					6,783
OVERHEAD DOOR	(SQ. FT)	0	PERSONNEL DOOR		(SQ. FT)	280
BASEMENT WALLS	(SQ. FT)					0

**II. CONSTRUCTION: ([ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES)**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE
*COMPOSITE= JUMBO BRICK - 1.8 1/4" ASBESTOS CEMENT - .034 PRE-FAB FASCIA PANELS - 1.17	1. OUTSIDE AIR FILM	0.17
	2. COMPOSITE*	1.50
	3. 2" RIGID INSULATION	5.56
	4. 1" AIR SPACE	1.00
	5. 6" CMU	0.92
	6.	
	7. INSIDE AIR FILM	0.68
	TOTAL R-WALL =	9.83
	U=1/R	0.102
ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. BUILT UP ROOF	0.33
	3. 3" RIGID INSULATION	8.34
	4. 2.5" CONCRETE DECK	0.21
	5.	
	6.	
	7. INSIDE AIR FILM	0.68
	TOTAL R-ROOF =	9.73
	U=1/R	0.103
GLASS TYPE: SINGLE PANE	R-GLASS	0.90
SLAB TYPE FLOOR: CONCRETE	SLF	0.68
BASEMENT TYPE: NONE	R-BASEM.	0.00
OVERHEAD DOOR TYPE: NONE	R-ODOOR	0.00
PERSONNEL DOOR TYPE: HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	1416 X 0.33 Sq.In./LF=	Sq.In.	467	X CFM/Sq.In.	1.530	=	715
PERSONNEL DOORS (SF)	280 X 0.16 Sq.In./SF=	Sq.In.	45	X CFM/Sq.In.	1.530	=	69
DOOR OPENINGS / HR - SINGLE DOOR		12	X CFM /OPENING /HR	1.600	=	19	
DOOR OPENINGS / HR - DOUBLE DOORS			X CFM /OPENING /HR	1.385	=	0	
TOTAL INFILTRATION (CFM)						=	803

UA ODOOR	=	ODOOR AREA	0	X DOOR "U"	0.000	=	0
UA PDOOR	=	PDOOR AREA	280	X DOOR "U"	0.552	=	155
UA WALL	=	WALL AREA	17,634	X WALL "U"	0.102	=	1,795
UA ROOF	=	ROOF AREA	6,783	X ROOF "U"	0.103	=	697
UA GLASS	=	GLASS AREA	1,680	X GLASS "U"	1.111	=	1,867
UA SLAB	=	SLAB PERIM.	634	X SLF	0.680	=	431
UA BASEM.	=	B-WALL AREA	0	X BASE. "U"	0.000	=	0
INFILTRATION	=	CFM	803	X A. T. F.	1.037	=	832
TOTAL UA (BTU/HR°F)							5,777

E M C ENGINEERS, INC.  
 PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 12-Jun-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	8008	BLDG NAME:	ENL BARRACKS W/O DIN
BLDG FUNCTION:	BARRACKS		
FLOOR AREA: (SQ. FT)	10,174	# FLOORS:	3
SLAB PERIMETER: (FT)	317		

**I. AREAS: ([ ] FIELD VERIFIED ELEVATION PLANS)**

		NORTH-W	NORTH-E	SOUTH-W	SOUTH-E	TOTAL
WALLS, GROSS	(SQ. FT)	2,653	2,249	2,246	2,653	9,800
GLASS	(SQ. FT)	468	0	0	372	840
PERSONNEL DOOR	(SQ. FT)	0	63	63	28	154
OVERHEAD DOOR	(SQ. FT)	0	0	0	0	0
WALLS, NET	(SQ. FT)	2,185	2,186	2,183	2,253	8,806
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)	(SQ. FT)					3,391
OVERHEAD DOOR	(SQ. FT)	0	PERSONNEL DOOR	(SQ. FT)	154	
BASEMENT WALLS	(SQ. FT)					0

**II. CONSTRUCTION: ([ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES)**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE
*COMPOSITE= JUMBO BRICK - 1.8 1/4" ASBESTOS CEMENT - .034 PRE-FAB FASCIA PANELS - 1.17	1. OUTSIDE AIR FILM	0.17
	2. COMPOSITE*	1.50
	3. 2" RIGID INSULATION	5.56
	4. 1" AIR SPACE	1.00
	5. 6" CMU	0.92
	6.	
	7. INSIDE AIR FILM	0.68
	TOTAL R-WALL =	9.83
	U=1/R	0.102

ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. BUILT UP ROOF	0.33
	3. 3" RIGID INSULATION	8.34
	4. 2.5" CONCRETE DECK	0.21
	5.	
	6.	
	7. INSIDE AIR FILM	0.68
	TOTAL R-ROOF =	9.73
	U=1/R	0.103

GLASS TYPE:	SINGLE PANE	R-GLASS	0.90
SLAB TYPE FLOOR:	CONCRETE	SLF	0.68
BASEMENT TYPE:	NONE	R-BASEM.	0.00
OVERHEAD DOOR TYPE:	NONE	R-ODOOR	0.00
PERSONNEL DOOR TYPE:	HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	708 X 0.33 Sq.In./LF=	Sq.In.	234	X CFM/Sq.In.	1.530	=	357
PERSONNEL DOORS (SF)	154 X 0.16 Sq.In./SF=	Sq.In.	25	X CFM/Sq.In.	1.530	=	38
DOOR OPENINGS / HR - SINGLE DOOR		6	X CFM /OPENING /HR	1.600	=	10	
DOOR OPENINGS / HR - DOUBLE DOORS			X CFM /OPENING /HR	1.385	=	0	
			TOTAL INFILTRATION (CFM)		=	405	

UA ODOOR	=	ODOOR AREA	0	X DOOR "U"	0.000	=	0
UA PDOOR	=	PDOOR AREA	154	X DOOR "U"	0.552	=	85
UA WALL	=	WALL AREA	8,806	X WALL "U"	0.102	=	896
UA ROOF	=	ROOF AREA	3,391	X ROOF "U"	0.103	=	349
UA GLASS	=	GLASS AREA	840	X GLASS "U"	1.111	=	933
UA SLAB	=	SLAB PERIM.	317	X SLF	0.680	=	216
UA BASEM.	=	B-WALL AREA	0	X BASE. "U"	0.000	=	0
INFILTRATION	=	CFM	405	X A. T. F.	1.037	=	420
			TOTAL UA (BTU/HR°F)			=	2,899

E M C ENGINEERS, INC.  
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 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 12-Jun-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	8010	BLDG NAME:	DET DAY ROOM
BLDG FUNCTION:	ADMIN		
FLOOR AREA: (SQ. FT)	2,070	# FLOORS:	1
SLAB PERIMETER: (FT)	157		

**I. AREAS: ([ ] FIELD VERIFIED ELEVATION PLANS)**

		NORTH-E	NORTH-W	SOUTH-E	SOUTH-W	TOTAL
WALLS, GROSS	(SQ. FT)	575	460	575	427	2,038
GLASS	(SQ. FT)	62	0	56	62	181
PERSONNEL DOOR	(SQ. FT)	21	0	0	21	42
OVERHEAD DOOR	(SQ. FT)	0	0	0	0	0
WALLS, NET	(SQ. FT)	492	460	519	344	1,815
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)	(SQ. FT)					2,070
OVERHEAD DOOR	(SQ. FT)	0 PERSONNEL DOOR				42
BASEMENT WALLS	(SQ. FT)					0

**II. CONSTRUCTION: ([ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES)**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. 6" JUMBO BRICK	1.80
	3. 2" RIGID INSUL.	5.56
	4. AIR SPACE	1.00
	5. 6" FILLED CMU	3.00
	6.	
	7. INSIDE AIR FILM	0.68
	TOTAL R-WALL =	12.21
	U=1/R	0.082

ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. BUR	0.33
	3. 3" RIGID INSUL.	8.34
	4. AIR SPACE	1.00
	5. ACOUSTIC TILE	1.79
	6.	
	7. INSIDE AIR FILM	0.68
	TOTAL R-ROOF =	12.31
	U=1/R	0.081

GLASS TYPE:	DOUBLE PANE	R-GLASS	1.75
SLAB TYPE FLOOR:	CONCRETE	SLF	0.68
BASEMENT TYPE:	NONE	R-BASEM.	0.00
OVERHEAD DOOR TYPE:	NONE	R-ODOOR	0.00
PERSONNEL DOOR TYPE:	HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	181 X 0.27 Sq.In./LF=	Sq.In.	49	X CFM/Sq.In.	1.530	=	75
PERSONNEL DOORS (SF)	42 X 0.16 Sq.In./SF=	Sq.In.	7	X CFM/Sq.In.	1.530	=	10
DOOR OPENINGS / HR - SINGLE DOOR		16	X CFM / OPENING / HR	1.600	=	26	
DOOR OPENINGS / HR - DOUBLE DOORS			X CFM / OPENING / HR	1.385	=	0	
<b>TOTAL INFILTRATION (CFM)</b>							<b>111</b>

UA ODOOR	=	ODOOR AREA	0	X DOOR "U"	0.000	=	0
UA PDOOR	=	PDOOR AREA	42	X DOOR "U"	0.552	=	23
UA WALL	=	WALL AREA	1,815	X WALL "U"	0.082	=	149
UA ROOF	=	ROOF AREA	2,070	X ROOF "U"	0.081	=	168
UA GLASS	=	GLASS AREA	181	X GLASS "U"	0.571	=	103
UA SLAB	=	SLAB PERIM.	157	X SLF	0.680	=	107
UA BASEM.	=	B-WALL AREA	0	X BASE. "U"	0.000	=	0
INFILTRATION	=	CFM	111	X A. T. F.	1.037	=	115
<b>TOTAL UA (BTU/HR*F)</b>							<b>665</b>



E M C ENGINEERS, INC.  
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 LOCATION: FT. RILEY, KANSAS

DATE: 12-Jun-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	8021	BLDG NAME:	ADM & SUPPORT BLDG
BLDG FUNCTION:	ADMIN/SUPPORT		
FLOOR AREA: (SQ. FT)	23,486	# FLOORS:	1
SLAB PERIMETER: (FT)	679		

**I. AREAS: ( [ ] FIELD VERIFIED ELEVATION PLANS)**

		NORTH-W	NORTH-E	SOUTH-W	SOUTH-E	TOTAL	
WALLS, GROSS	(SQ. FT)	3,600	1,435	1,435	3,600	10,069	
GLASS	(SQ. FT)	448	0	0	0	448	
PERSONNEL DOOR	(SQ. FT)	86	0	0	344	430	
OVERHEAD DOOR	(SQ. FT)	0	0	0	0	0	
WALLS, NET	(SQ. FT)	3,066	1,435	1,435	3,256	9,191	
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)						(SQ. FT)	23,486
OVERHEAD DOOR	(SQ. FT)	0	PERSONNEL DOOR		(SQ. FT)	430	
BASEMENT WALLS	(SQ. FT)					0	

**II. CONSTRUCTION: ( [ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES)**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. PRE-FAB FASCIA	1.17
	3. 3/4" PLYWOOD BACK-UP	0.83
	4. 3" BATT INSULATION	12.00
	5.	
	6.	
	7. INSIDE AIR FILM	0.68
	TOTAL R-WALL =	14.85
	U=1/R	0.067

ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. BUILT UP ROOF	0.34
	3. RIGID INSULATION, 2"	5.56
	4.	
	5.	
	6.	
	7. INSIDE AIR FILM	0.61
	TOTAL R-ROOF =	6.68
	U=1/R	0.150

GLASS TYPE:	DOUBLE HUNG IN ALUMINUM FRAMES	R-GLASS	1.00
SLAB TYPE FLOOR:	CONCRETE	SLF	0.83
BASEMENT TYPE:	CONCRETE	R-BASEM.	10.00
OVERHEAD DOOR TYPE:	NONE	R-ODOOR	0.00
PERSONNEL DOOR TYPE:	HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	0 X 0.33 Sq.In./LF=	Sq.In.	0	X CFM/Sq.In.	1.530	=	0
PERSONNEL DOORS (SF)	430 X 0.16 Sq.In./SF=	Sq.In.	69	X CFM/Sq.In.	1.530	=	105
DOOR OPENINGS / HR - SINGLE DOOR		X CFM / OPENING / HR	1.600	=	0		
DOOR OPENINGS / HR - DOUBLE DOORS		X CFM / OPENING / HR	1.385	=	0		
<b>TOTAL INFILTRATION (CFM)</b>							<b>105</b>

UA ODOOR	=	ODOOR AREA	0	X DOOR "U"	0.000	=	0
UA PDOOR	=	PDOOR AREA	430	X DOOR "U"	0.552	=	238
UA WALL	=	WALL AREA	9,191	X WALL "U"	0.067	=	619
UA ROOF	=	ROOF AREA	23,486	X ROOF "U"	0.150	=	3,519
UA GLASS	=	GLASS AREA	448	X GLASS "U"	1.000	=	448
UA SLAB	=	SLAB PERIM.	679	X SLF	0.830	=	564
UA BASEM.	=	B-WALL AREA	0	X BASE "U"	0.100	=	0
INFILTRATION	=	CFM	105	X A. T. F.	1.037	=	109
<b>TOTAL UA (BTU/HR°F)</b>							<b>5,496</b>

E M C ENGINEERS, INC.  
 PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 12-Jun-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	8042	BLDG NAME:	ENL BARRACKS W/O DIN
BLDG FUNCTION:	BARRACKS		
FLOOR AREA: (SQ. FT)	20,349	# FLOORS:	3
SLAB PERIMETER: (FT)	634		

**I. AREAS: ([ ] FIELD VERIFIED ELEVATION PLANS)**

		NORTH-W	NORTH-E	SOUTH-W	SOUTH-E	TOTAL
WALLS, GROSS	(SQ. FT)	5,306	4,491	4,491	5,306	19,594
GLASS	(SQ. FT)	936	0	0	744	1,680
PERSONNEL DOOR	(SQ. FT)	0	126	126	28	280
OVERHEAD DOOR	(SQ. FT)	0	0	0	0	0
WALLS, NET	(SQ. FT)	4,370	4,365	4,365	4,534	17,634
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)	(SQ. FT)					6,783
OVERHEAD DOOR	(SQ. FT)	0	PERSONNEL DOOR		(SQ. FT)	280
BASEMENT WALLS	(SQ. FT)					0

**II. CONSTRUCTION: ([ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES)**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE	
*COMPOSITE= JUMBO BRICK - 1.8 1/4" ASBESTOS CEMENT - .034 PRE-FAB FASCIA PANELS - 1.17	1. OUTSIDE AIR FILM	0.17	
	2. COMPOSITE*	1.50	
	3. 2" RIGID INSULATION	5.56	
	4. 1" AIR SPACE	1.00	
	5. 6" CMU	0.92	
	6.		
	7. INSIDE AIR FILM	0.68	
	TOTAL R-WALL =	9.83	
	U=1/R	0.102	
ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE	
	1. OUTSIDE AIR FILM	0.17	
	2. BUILT UP ROOF	0.33	
	3. 3" RIGID INSULATION	8.34	
	4. 2.5" CONCRETE DECK	0.21	
	5.		
	6.		
	7. INSIDE AIR FILM	0.68	
	TOTAL R-ROOF =	9.73	
	U=1/R	0.103	
GLASS TYPE:	SINGLE PANE	R-GLASS	0.90
SLAB TYPE FLOOR:	CONCRETE	SLF	0.68
BASEMENT TYPE:	NONE	R-BASEM.	0.00
OVERHEAD DOOR TYPE:	NONE	R-ODOOR	0.00
PERSONNEL DOOR TYPE:	HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	1416 X 0.33 Sq.In./LF=	Sq.In.	467	X CFM/Sq.In.	1.530	=	715
PERSONNEL DOORS (SF)	280 X 0.16 Sq.In./SF=	Sq.In.	45	X CFM/Sq.In.	1.530	=	69
DOOR OPENINGS / HR - SINGLE DOOR		12	X CFM /OPENING /HR	1.600	=	19	
DOOR OPENINGS / HR - DOUBLE DOORS			X CFM /OPENING /HR	1.385	=	0	
<b>TOTAL INFILTRATION (CFM)</b>							<b>803</b>

UA ODOOR	=	ODOOR AREA	0	X DOOR "U"	0.000	=	0
UA PDOOR	=	PDOOR AREA	280	X DOOR "U"	0.552	=	155
UA WALL	=	WALL AREA	17,634	X WALL "U"	0.102	=	1,795
UA ROOF	=	ROOF AREA	6,783	X ROOF "U"	0.103	=	697
UA GLASS	=	GLASS AREA	1,680	X GLASS "U"	1.111	=	1,867
UA SLAB	=	SLAB PERIM.	634	X SLF	0.680	=	431
UA BASEM.	=	B-WALL AREA	0	X BASE. "U"	0.000	=	0
INFILTRATION	=	CFM	803	X A. T. F.	1.037	=	832
<b>TOTAL UA (BTU/HR°F)</b>							<b>5,777</b>

E M C ENGINEERS, INC.  
 PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 12-Jun-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	8044	BLDG NAME:	APP INSTR BLDG.
BLDG FUNCTION:			
FLOOR AREA: (SQ. FT)	2,467	# FLOORS:	1
SLAB PERIMETER: (FT)	199		

**I. AREAS: ([ ] FIELD VERIFIED ELEVATION PLANS)**

		NORTH	SOUTH	EAST	WEST	TOTAL	
WALLS, GROSS	(SQ. FT)	646	646	646	646	2,583	
GLASS	(SQ. FT)	48	48	36	24	156	
PERSONNEL DOOR	(SQ. FT)	0	28	21	42	91	
OVERHEAD DOOR	(SQ. FT)	0	0	0	0	0	
WALLS, NET	(SQ. FT)	598	570	589	580	2,336	
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)						(SQ. FT)	2,467
OVERHEAD DOOR	(SQ. FT)	0	PERSONNEL DOOR		(SQ. FT)	91	
BASEMENT WALLS	(SQ. FT)					0	

**II. CONSTRUCTION: ([ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES)**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE	
	1. OUTSIDE AIR FILM	0.17	
	2. 4" BRICK	1.20	
	3. AIR SPACE	1.00	
	4. 8" CONCRETE	1.11	
	5. AIR SPACE	1.00	
	6. 1/2" GWB	0.45	
	7. INSIDE AIR FILM	0.68	
	TOTAL R-WALL =	5.61	
	U=1/R	0.178	
ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE	
	1. OUTSIDE AIR FILM	0.17	
	2. BUR	0.33	
	3. URETHANE BD.	16.29	
	4. 3/4" WOOD	0.83	
	5. AIR SPACE	1.00	
	6. ACOUSTIC TILE CEILING	1.25	
	7. INSIDE AIR FILM	0.68	
	TOTAL R-ROOF =	20.55	
	U=1/R	0.049	
GLASS TYPE:	DOUBLE PANE	R-GLASS	1.75
SLAB TYPE FLOOR:	CONCRETE	SLF	0.68
BASEMENT TYPE:	NONE	R-BASEM.	0.00
OVERHEAD DOOR TYPE:	NONE	R-ODOOR	0.00
PERSONNEL DOOR TYPE:	HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	130 X 0.27 Sq.In./LF=	Sq.In.	35	X CFM/Sq.In.	1.530	=	54
PERSONNEL DOORS (SF)	91 X 0.16 Sq.In./SF=	Sq.In.	15	X CFM/Sq.In.	1.530	=	22
DOOR OPENINGS / HR - SINGLE DOOR		4	X CFM /OPENING /HR	1.600	=	6	
DOOR OPENINGS / HR - DOUBLE DOORS		4	X CFM /OPENING /HR	1.385	=	6	
TOTAL INFILTRATION (CFM)							88

UA ODOOR	=	ODOOR AREA	0	X DOOR "U"	0.000	=	0
UA PDOOR	=	PDOOR AREA	91	X DOOR "U"	0.552	=	50
UA WALL	=	WALL AREA	2,336	X WALL "U"	0.178	=	416
UA ROOF	=	ROOF AREA	2,467	X ROOF "U"	0.049	=	120
UA GLASS	=	GLASS AREA	156	X GLASS "U"	0.571	=	89
UA SLAB	=	SLAB PERIM.	199	X SLF	0.680	=	135
UA BASEM.	=	B-WALL AREA	0	X BASE. "U"	0.000	=	0
INFILTRATION	=	CFM	88	X A. T. F.	1.037	=	91
TOTAL UA (BTU/HR°F)							902

E M C ENGINEERS, INC.  
 PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 12-Jun-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	8063	BLDG NAME:	ENL PERS DIN
BLDG FUNCTION:	DINING		
FLOOR AREA: (SQ. FT)	17,663	# FLOORS:	1
SLAB PERIMETER: (FT)	355		

**I. AREAS: ([ ] FIELD VERIFIED ELEVATION PLANS)**

		NORTH-E	NORTH-W	SOUTH-E	SOUTH-W	TOTAL
WALLS, GROSS	(SQ. FT)	2,310	2,940	2,940	2,310	10,500
GLASS	(SQ. FT)	654	398	368	27	1,447
PERSONNEL DOOR	(SQ. FT)	84	168	84	63	399
OVERHEAD DOOR	(SQ. FT)	0	0	0	0	0
WALLS, NET	(SQ. FT)	1,572	2,374	2,488	2,220	8,654
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)	(SQ. FT)					17,663
OVERHEAD DOOR	(SQ. FT)	0	PERSONNEL DOOR	(SQ. FT)	399	
BASEMENT WALLS	(SQ. FT)					0

**II. CONSTRUCTION: ([ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES)**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE
COMPOSITE	1. OUTSIDE AIR FILM	0.17
6" JUMBO BRICK = 1.8	2. 8" REINF. CMU	1.11
CEMENT ASBESTOS PANELS = .034	3. COMPOSITE	1.41
PRE-FAB FASCIA = 1.17	4. 2" RIGID INSUL.	5.56
COMPOSITE = 1.41	5. AIR SPACE	1.00
	6.	
	7. INSIDE AIR FILM	0.68
	TOTAL R-WALL =	9.93
	U=1/R	0.101
ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. BUR.	0.33
	3. 2" RIGID INSUL	5.56
	4. 2" BATT INSUL.	8.00
	5. AIR SPACE	1.00
	6. ACOUSTIC TILE CEILING	1.25
	7. INSIDE AIR FILM	0.68
	TOTAL R-ROOF =	16.99
	U=1/R	0.059
GLASS TYPE: DOUBLE PANE	R-GLASS	1.75
SLAB TYPE FLOOR: CONCRETE	SLF	0.68
BASEMENT TYPE: NONE	R-BASEM.	0.00
OVERHEAD DOOR TYPE: NONE	R-ODOOR	0.00
PERSONNEL DOOR TYPE: HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	0 X 0.27 Sq.In./LF=	Sq.In.	0	X CFM/Sq.In.	1.530	=	0
PERSONNEL DOORS (SF)	399 X 0.16 Sq.In./SF=	Sq.In.	64	X CFM/Sq.In.	1.530	=	98
DOOR OPENINGS / HR - SINGLE DOOR				X CFM / OPENING / HR	1.600	=	0
DOOR OPENINGS / HR - DOUBLE DOORS			20	X CFM / OPENING / HR	1.385	=	28
				TOTAL INFILTRATION (CFM)		=	125

UA ODOOR	=	ODOOR AREA	0	X DOOR "U"	0.000	=	0
UA PDOOR	=	PDOOR AREA	399	X DOOR "U"	0.552	=	220
UA WALL	=	WALL AREA	8,654	X WALL "U"	0.101	=	872
UA ROOF	=	ROOF AREA	17,663	X ROOF "U"	0.059	=	1,040
UA GLASS	=	GLASS AREA	1,447	X GLASS "U"	0.571	=	827
UA SLAB	=	SLAB PERIM.	355	X SLF	0.680	=	241
UA BASEM.	=	B-WALL AREA	0	X BASE. "U"	0.000	=	0
INFILTRATION	=	CFM	125	X A. T. F.	1.037	=	130
				TOTAL UA (BTU/HR°F)		=	3,330

E M C ENGINEERS, INC.  
 PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 12-Jun-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	8065	BLDG NAME:	CLINIC W/O BEDS
BLDG FUNCTION:	CLINIC		
FLOOR AREA: (SQ. FT)	3,574	# FLOORS:	1
SLAB PERIMETER: (FT)	298		

**I. AREAS: ([ ] FIELD VERIFIED ELEVATION PLANS)**

		NORTH	SOUTH	EAST	WEST	TOTAL
WALLS, GROSS	(SQ. FT)	1,288	1,288	560	560	3,697
GLASS	(SQ. FT)	24	24	20	0	68
PERSONNEL DOOR	(SQ. FT)	56	0	0	42	98
OVERHEAD DOOR	(SQ. FT)	0	0	0	0	0
WALLS, NET	(SQ. FT)	1,208	1,264	540	518	3,531
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)						(SQ. FT) 3,574
OVERHEAD DOOR	(SQ. FT)	0		PERSONNEL DOOR	(SQ. FT)	98
BASEMENT WALLS	(SQ. FT)					0

**II. CONSTRUCTION: ([ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES)**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE
COMPOSITE: JUMBO BRICK (6") = 1.8 PRE-FAB FASCIA = 1.17	1. OUTSIDE AIR FILM	0.17
	2. COMPOSITE	1.66
	3. 8" CMU	1.11
	4. AIR SPACE	1.00
	5.	
	6.	
	7. INSIDE AIR FILM	0.68
TOTAL R-WALL =		4.62
U=1/R		0.216

ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. BUR	0.33
	3. 2" RIGID INSUL.	5.56
	4. AIR SPACE	1.00
	5. 1/2" GYPSUM BD.	0.45
	6.	
	7. INSIDE AIR FILM	0.68
TOTAL R-ROOF =		8.19
U=1/R		0.122

GLASS TYPE:	SINGLE PANE WITH STORMS	R-GLASS	1.60
SLAB TYPE FLOOR:	CONCRETE	SLF	0.68
BASEMENT TYPE:	NONE	R-BASEM.	0.00
OVERHEAD DOOR TYPE:	NONE	R-ODOOR	0.00
PERSONNEL DOOR TYPE:	HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	132 X 0.33 Sq.In./LF=	Sq.In.	44	X CFM/Sq.In.	1.530	=	67
PERSONNEL DOORS (SF)	98 X 0.16 Sq.In./SF=	Sq.In.	16	X CFM/Sq.In.	1.530	=	24
DOOR OPENINGS / HR - SINGLE DOOR							
				X CFM /OPENING /HR	1.600	=	0
DOOR OPENINGS / HR - DOUBLE DOORS							
				2 X CFM /OPENING /HR	1.385	=	3
TOTAL INFILTRATION (CFM)						=	93

UA ODOOR	=	ODOOR AREA	0	X DOOR "U"	0.000	=	0
UA PDOOR	=	PDOOR AREA	98	X DOOR "U"	0.552	=	54
UA WALL	=	WALL AREA	3,531	X WALL "U"	0.216	=	764
UA ROOF	=	ROOF AREA	3,574	X ROOF "U"	0.122	=	436
UA GLASS	=	GLASS AREA	68	X GLASS "U"	0.625	=	43
UA SLAB	=	SLAB PERIM.	298	X SLF	0.680	=	203
UA BASEM.	=	B-WALL AREA	0	X BASE. "U"	0.000	=	0
INFILTRATION	=	CFM	93	X A. T. F.	1.037	=	97
TOTAL UA (BTU/HR°F)							1,597

E M C ENGINEERS, INC.  
 PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 12-Jun-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	8071	BLDG NAME:	BTN HQTRS
BLDG FUNCTION:			
FLOOR AREA: (SQ. FT)	9,963	# FLOORS:	3
SLAB PERIMETER: (FT)			

**I. AREAS: ([ ] FIELD VERIFIED ELEVATION PLANS)**

		NORTH-W	NORTH-E	SOUTH-W	SOUTH-E	TOTAL
WALLS, GROSS	(SQ. FT)	861	1,701	1,701	861	5,124
GLASS	(SQ. FT)	186	198	198	186	768
PERSONNEL DOOR	(SQ. FT)	0	42	42	0	84
OVERHEAD DOOR	(SQ. FT)	0	0	0	0	0
WALLS, NET	(SQ. FT)	675	1,461	1,461	675	4,272
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)	(SQ. FT)					3,321
OVERHEAD DOOR	(SQ. FT)	0	PERSONNEL DOOR		(SQ. FT)	84
BASEMENT WALLS	(SQ. FT)	328	648	648	328	1,952

**II. CONSTRUCTION: ([ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES)**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. 4" BRICK	1.20
	3. AIR SPACE	1.00
	4. 4" CMU	0.72
	5. AIR SPACE	1.00
	6. 1/4" GYPSUM BD.	0.45
	7. INSIDE AIR FILM	0.68
	TOTAL R-WALL =	5.22
	U=1/R	0.192

ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. BUR	0.33
	3. GYPSUM DECK	0.35
	4. 2" RIGID INSULATION	5.56
	5. AIR SPACE	1.00
	6. ACOUSTIC TILE CEILING	1.25
	7. INSIDE AIR FILM	0.68
	TOTAL R-ROOF =	9.34
	U=1/R	0.107

GLASS TYPE:	SINGLE PANE	R-GLASS	0.90
SLAB TYPE FLOOR:	CONCRETE	SLF	0.68
BASEMENT TYPE:	NONE	R-BASEM.	10.00
OVERHEAD DOOR TYPE:	NONE	R-ODOOR	0.00
PERSONNEL DOOR TYPE:	HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	482 X 0.33 Sq.In./LF=	Sq.In.	159	X CFM/Sq.In.	1.530	=	243
PERSONNEL DOORS (SF)	84 X 0.16 Sq.In./SF=	Sq.In.	13	X CFM/Sq.In.	1.530	=	21
DOOR OPENINGS / HR - SINGLE DOOR				X CFM / OPENING / HR	1.600	=	0
DOOR OPENINGS / HR - DOUBLE DOORS			2	X CFM / OPENING / HR	1.385	=	3
				TOTAL INFILTRATION (CFM)		=	267

UA ODOOR	=	ODOOR AREA	0	X DOOR "U"	0.000	=	0
UA PDOOR	=	PDOOR AREA	84	X DOOR "U"	0.552	=	46
UA WALL	=	WALL AREA	4,272	X WALL "U"	0.192	=	818
UA ROOF	=	ROOF AREA	3,321	X ROOF "U"	0.107	=	356
UA GLASS	=	GLASS AREA	768	X GLASS "U"	1.111	=	853
UA SLAB	=	SLAB PERIM.	0	X SLF	0.680	=	0
UA BASEM.	=	B-WALL AREA	1,952	X BASE. "U"	0.100	=	195
INFILTRATION	=	CFM	267	X A. T. F.	1.037	=	277
				TOTAL UA (BTU/HR°F)		=	2,545

E M C ENGINEERS, INC.  
 PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT CONTRACT NO.: D4CA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 18-Jul-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO:	8360	BLDG NAME:	VEH MNT SHOP ORG
BLDG FUNCTION:	MAINT		
FLOOR AREA (SQ. FT)	44,905	# FLOORS:	1
SLAB PERIMETER (FT)	1,019		

**I. AREAS: ( [ ] FIELD VERIFIED ELEVATION PLANS )**

		NORTH-E	NORTH-W	SOUTH-E	SOUTH-W	TOTAL	
WALLS, GROSS	(SQ. FT)	9,407	8,106	8,106	9,407	35,027	
GLASS	(SQ. FT)	206	136	48	0	390	
PERSONNEL DOOR	(SQ. FT)	84	63	126	21	294	
OVERHEAD DOOR	(SQ. FT)	6,512	3,807	3,951	6,512	20,782	
WALLS, NET	(SQ. FT)	2,605	4,100	3,961	2,874	13,561	
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)						(SQ. FT)	44,905
OVERHEAD DOOR	(SQ. FT)	20,782	PERSONNEL DOOR		(SQ. FT)	294	
BASEMENT WALLS	(SQ. FT)					0	

**II. CONSTRUCTION: ( [ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES )**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPOSITES:	R-VALUE
COMPONENTS:	1. NE WALL	3.77
12" CONC BLOCK W/ LOOSE FILL = 3.7	2. NW WALL	8.78
6" BATT INSUL. = 19	3. SE WALL	8.78
METAL PANEL W/ 3" INSUL = 11	4. SW WALL	5.76
O'HEAD DOORS = .125	5.	
OA FILM = .17	6.	
IA FILM = .68	7.	
	COMP. R-WALL =	7.18
	U=1/R	0.139

ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. BUR	0.33
	3. 2" RIGID INSUL.	5.56
	4.	
	5.	
	6.	
	7. INSIDE AIR FILM	0.68
	TOTAL R-ROOF =	6.74
	U=1/R	0.148

GLASS TYPE:	SINGLE PANEL	R-GLASS	0.90
SLAB TYPE FLOOR:	CONCRETE	Sl F	0.68
BASEMENT TYPE:	NONE	R-BASEM	0.00
OVERHEAD DOOR TYPE:	NONE	R-O'DOOR	0.00
PERSONNEL DOOR TYPE:	HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Cash)	0 X 0.27 Sq.In./LF=	Sq.In.	0	X CFM/Sq.In.	1,530	=	0
PERSONNEL DOORS (SF)	294 X 0.16 Sq.In./SF=	Sq.In.	47	X CFM/Sq.In.	1,530	=	72
DOOR OPENINGS / HR - SINGLE DOOR		X CFM / OPENING / HR	1,600	=	0		
DOOR OPENINGS / HR - DOUBLE DOORS		X CFM / OPENING / HR	1,365	=	0		
		[TOTAL INFILTRATION (CFM)]		=	72		

UA ODCOR	=	O DOOR AREA	20,782	X DOOR "U"	0.000	=	0
UA PDOOR	=	P DOOR AREA	294	X DOOR "U"	0.552	=	162
UA WALL	=	WALL AREA	13,561	X WALL "U"	0.139	=	1,889
UA ROOF	=	ROOF AREA	44,905	X ROOF "U"	0.148	=	6,663
UA GLASS	=	GLASS AREA	390	X GLASS "U"	1.111	=	433
UA SLAB	=	SLAB PERIM	1,019	X SLF	0.680	=	693
UA BASEM	=	B-WALL AREA	0	X BASE. "U"	0.000	=	0
INFILTRATION	=	CFM	72	X A.T.F.	0.852	=	61
		[TOTAL UA (BTU/HR°F)]					9,901





E M C ENGINEERS, INC.  
 PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS  
 CLIENT CONTRACT NO.: DACA 01-94-D-0033  
 CLIENT: CORPS OF ENGINEERS, KANSAS CITY  
 LOCATION: FT. RILEY, KANSAS

DATE: 12-Jun-95  
 BY: AMS  
 JOB: 1406.001  
 CHK: AJN  
 FILE:

**BUILDING HEATING LOAD CALCULATION SHEET**

BLDG NO: 8410	BLDG NAME: VEH MNT SHOP ORG
BLDG FUNCTION: MAINT	
FLOOR AREA: (SQ. FT) 73,376	# FLOORS:
SLAB PERIMETER: (FT) 2,118	

**I. AREAS: ( [ ] FIELD VERIFIED ELEVATION PLANS )**

		NORTH	SOUTH	EAST	WEST	TOTAL
WALLS, GROSS	(SQ. FT)	16,326	16,326	6,827	6,827	46,306
GLASS	(SQ. FT)	1,704	1,914	144	144	3,906
PERSONNEL DOOR	(SQ. FT)	301	189	105	168	763
OVERHEAD DOOR	(SQ. FT)	5,366	6,014	540	0	11,920
WALLS, NET	(SQ. FT)	8,955	8,209	6,038	6,515	29,717
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)	(SQ. FT)					77,775
OVERHEAD DOOR	(SQ. FT)	11,920		PERSONNEL DOOR	(SQ. FT)	763
BASEMENT WALLS	(SQ. FT)					0

**II. CONSTRUCTION: ( [ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES )**

WALLS: (SKETCH CROSS SECTION OF WALL)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. 2" INS. METAL PANEL	7.33
	3. 2" AIR SPACE	1.00
	4. 8" CONC. BLOCK	1.11
	5.	
	6.	
	7. INSIDE AIR FILM	0.68
	TOTAL R-WALL =	10.29
	U=1/R	0.097

ROOF: (SKETCH CROSS SECTION OF ROOF)	COMPONENTS	R-VALUE
	1. OUTSIDE AIR FILM	0.17
	2. METAL STANDING SEAM	0.00
	3. 3" RIGID INSUL.	8.34
	4. METAL DECK	0.00
	5.	
	6.	
	7. INSIDE AIR FILM	0.68
	TOTAL R-ROOF =	9.19
	U=1/R	0.109

GLASS TYPE:	DOUBLE PANE	R-GLASS	1.75
SLAB TYPE FLOOR:	CONCRETE	SLF	0.68
BASEMENT TYPE:	NONE	R-BASEM.	0.00
OVERHEAD DOOR TYPE:	NONE	R-ODOOR	0.00
PERSONNEL DOOR TYPE:	HOLLOW METAL	R-PDOOR	1.81

**III. INFILTRATION:**

WINDOWS (LF of Crack)	304 X 0.33 Sq.In./LF=	Sq.In.	100	X CFM/Sq.In.	1.530	=	153
PERSONNEL DOORS (SF)	763 X 0.16 Sq.In./SF=	Sq.In.	122	X CFM/Sq.In.	1.530	=	187
OVERHEAD DOOR							
DOOR OPENINGS / HR - SINGLE DOOR		15	X CFM / OPENING / HR	1.600	=	24	
DOOR OPENINGS / HR - DOUBLE DOORS		8	X CFM / OPENING / HR	1.385	=	11	
			<b>TOTAL INFILTRATION (CFM)</b>		=	<b>375</b>	

UA ODOOR	=	ODOOR AREA	11,920	X DOOR "U"	0.000	=	0
UA PDOOR	=	PDOOR AREA	763	X DOOR "U"	0.552	=	422
UA WALL	=	WALL AREA	29,717	X WALL "U"	0.097	=	2,888
UA ROOF	=	ROOF AREA	77,775	X ROOF "U"	0.109	=	8,463
UA GLASS	=	GLASS AREA	3,906	X GLASS "U"	0.571	=	2,232
UA SLAB	=	SLAB PERIM.	2,118	X SLF	0.680	=	1,440
UA BASEM.	=	B-WALL AREA	0	X BASE. "U"	0.000	=	0
INFILTRATION	=	CFM	375	X A. T. F.	1.037	=	389
				<b>TOTAL UA (BTU/HR°F)</b>		=	<b>15,834</b>