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
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EMC ENGINEERS, INC.

DENVER, COLORADO
ATLANTA, GEORGIA

DEPARTMENT OF THE ARMY
CONSTRUCTION ENGINEERING RESEARCH LABORATORIES, CORPS OF ENGINEERS
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EMC No. 1406-001

DTIC QUALITY INSPECTED

July 1995

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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

EMC ENGINEERS, INC.
DENVER - ATLANTA

PROJECT:	FEASIBILITY STUDY FOR INSTALLATION OF UMCS	EMC NO:	1406-001
		CALC. BY:	AJN
LOCATION:	FORT RILEY, KANSAS	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 FT²
CFMI	1512 CFM
UA	582 BTU/HR-°F
BLDG CONSTR.	1 (1 FOR LIGHT) (2 FOR HEAVY)

EZDOE COMPUTER RUN DEFINITION:	
BASERUN	EXISTING OPERATION
RUN1	NIGHT SETBACK
RUN2	DDC CONTROL
RUN3	ECONOMIZER
RUN4	NIGHTIME 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/EQUP =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& 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 ..
```

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	GLASS U-VALUE (BTU/HR-SQFT-F)	GLASS AREA (SQFT)	WALL U-VALUE (BTU/HR-SQFT-F)	WALL AREA (SQFT)	WALL+GLASS U-VALUE (BTU/HR-SQFT-F)	WALL+GLASS AREA (SQFT)	AZIMUTH
	N_PERI_ZON	0.490	192.00	0.068	294.00	0.234	486.00	NORTH
	N_PERI_ZON	0.000	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	SOUTH
	S_PERI-ZON	0.000	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	WEST
	S_PERI-ZON	0.000	0.00	0.064	97.50	0.064	97.50	WEST
	N_PERI_ZON	0.000	0.00	0.068	328.50	0.068	328.50	WEST
	N_PERI_ZON	0.000	0.00	0.064	109.50	0.064	109.50	WEST
	S_PERI-ZON	0.000	0.00	0.036	1776.00	0.036	1776.00	ROOF
	N_PERI_ZON	0.000	0.00	0.036	1333.00	0.036	1333.00	ROOF
	CORE_ZONE	0.000	0.00	0.036	1801.25	0.036	1801.25	ROOF
	S_PERI-ZON	0.000	0.00	0.020	1776.00	0.020	1776.00	UNDERGRND
	N_PERI_ZON	0.000	0.00	0.020	1333.00	0.020	1333.00	UNDERGRND
	CORE_ZONE	0.000	0.00	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
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	0.490	0.066	0.178	192.00	537.00	729.00
SOUTH	0.490	0.066	0.126	140.00	845.50	985.50
WEST	0.000	0.067	0.067	0.00	828.00	828.00
ROOF	0.000	0.036	0.036	0.00	4910.25	4910.25
ALL WALLS	0.490	0.066	0.122	332.00	2210.50	2542.50
WALLS+ROOFS	0.490	0.045	0.065	332.00	7120.75	7452.75
UNDERGRND	0.000	0.020	0.020	0.00	4662.75	4662.75
BUILDING	0.490	0.035	0.048	332.00	11783.50	12115.50

*** 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		LATENT		SENSIBLE	
	(KBTU/H)	(KW)	(KBTU/H)	(KW)	(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	79.746	23.356	9.378	2.747	-26.864	-7.868
TOTAL LOAD	89.124 KBTU/H		26.102 KW		-26.864 KBTU/H	-7.868 KW
TOTAL LOAD / AREA	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
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR MZ_SYSTEM TOPEKA, KS

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-49.094	15	5	-8.F	-9.F	-171.380	8003.	19.956
FEB	0.00000					0.000	-34.759	3	5	-1.F	-2.F	-150.421	7193.	18.956
MAR	0.00000					0.000	-24.629	4	5	14.F	12.F	-115.125	7957.	18.956
APR	0.00000					0.000	-5.136	5	5	31.F	29.F	-70.895	7701.	18.956
MAY	19.02822	31	16	88.F	75.F	130.626	-0.659	5	5	44.F	40.F	-26.835	9709.	31.032
JUN	51.40051	24	12	84.F	76.F	131.101	0.000					0.000	12457.	31.318
JUL	69.27947	1	16	86.F	80.F	141.854	0.000					0.000	14363.	31.889
AUG	65.85220	20	13	92.F	78.F	131.421	0.000					0.000	14261.	31.736
SEP	34.29221	22	18	85.F	75.F	132.800	0.000					0.000	10882.	31.165
OCT	0.81302	1	18	83.F	68.F	109.631	-3.490	20	5	25.F	25.F	-81.055	8035.	29.008
NOV	0.00000					0.000	-18.773	3	5	13.F	12.F	-114.579	7701.	18.956
DEC	0.00000					0.000	-42.321	12	5	4.F	3.F	-138.342	7958.	18.956
TOTAL	240.665						-178.861						116219.	
MAX						141.854						-171.380		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
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR MZ_SYSTEM TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	-60.222	3.847
FEB	0	672	0	0	672	0	672	0	0	0	-58.174	3.847
MAR	0	744	0	0	744	0	744	0	0	0	-61.906	3.847
APR	0	720	0	0	720	0	720	0	0	0	-1.775	3.847
MAY	244	360	0	140	360	384	744	0	0	140	0.000	24.295
JUN	564	0	0	156	0	720	720	0	0	156	0.000	31.086
JUL	707	0	0	37	0	744	744	0	0	37	0.000	24.691
AUG	686	0	0	58	0	744	744	0	0	58	0.000	27.751
SEP	410	0	0	310	0	720	720	0	0	310	0.000	30.654
OCT	11	720	0	13	720	24	744	0	0	13	0.000	29.008
NOV	0	720	0	0	720	0	720	0	0	0	-77.140	3.847
DEC	0	744	0	0	744	0	744	0	0	0	-76.802	3.847
ANNUAL	2622	5424	0	714	5424	3336	8760	0	0	714		

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	29.860	71.294
JAN	PEAK(KBTU)	72.103	216.188
	DY/HR	15/12	15/ 5
	TOTAL(MBTU)	26.727	52.768
FEB	PEAK(KBTU)	68.688	193.981
	DY/HR	17/12	3/ 5
	TOTAL(MBTU)	28.923	38.822
MAR	PEAK(KBTU)	68.688	155.443
	DY/HR	29/12	4/ 5
	TOTAL(MBTU)	26.914	10.010
APR	PEAK(KBTU)	65.910	105.133
	DY/HR	4/12	5/ 5
	TOTAL(MBTU)	33.317	2.002
MAY	PEAK(KBTU)	105.957	46.419
	DY/HR	31/18	5/ 5
	TOTAL(MBTU)	42.535	0.000
JUN	PEAK(KBTU)	106.933	0.000
	DY/HR	28/12	30/ 1
	TOTAL(MBTU)	49.043	0.000
JUL	PEAK(KBTU)	108.881	0.000
	DY/HR	23/12	31/ 1
	TOTAL(MBTU)	48.695	0.000
AUG	PEAK(KBTU)	108.360	0.000
	DY/HR	21/12	31/ 1
	TOTAL(MBTU)	37.154	0.000
SEP	PEAK(KBTU)	106.409	0.000
	DY/HR	7/12	30/ 1
	TOTAL(MBTU)	27.931	7.424
OCT	PEAK(KBTU)	99.046	116.889
	DY/HR	1/18	20/ 5
	TOTAL(MBTU)	27.708	30.173
NOV	PEAK(KBTU)	67.920	154.836
	DY/HR	30/12	3/ 5
	TOTAL(MBTU)	29.608	63.063
DEC	PEAK(KBTU)	68.688	180.953
	DY/HR	31/12	12/ 5
	ONE YEAR	408.414	275.557
	USE/PEAK	108.881	216.188

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
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.

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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 #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
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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.
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                    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
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR MZ_SYSTEM TOPEKA, KS

	COOLING						HEATING						ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-44.919	15	5	-8.F	-9.F	-208.905	8003.	19.956
FEB	0.00000					0.000	-31.233	3	5	-1.F	-2.F	-192.986	7193.	18.956
MAR	0.00000					0.000	-21.536	4	5	14.F	12.F	-157.481	7957.	18.956
APR	0.00000					0.000	-4.247	5	5	31.F	29.F	-104.523	7701.	18.956
MAY	19.02814	31	16	88.F	75.F	130.626	-0.593	5	5	44.F	40.F	-31.970	9709.	31.032
JUN	51.40051	24	12	84.F	76.F	131.101	0.000					0.000	12457.	31.318
JUL	69.27947	1	16	86.F	80.F	141.854	0.000					0.000	14363.	31.889
AUG	65.85220	20	13	92.F	78.F	131.421	0.000					0.000	14261.	31.736
SEP	34.29221	22	18	85.F	75.F	132.800	0.000					0.000	10882.	31.165
OCT	0.81302	1	18	83.F	68.F	109.631	-2.955	20	5	25.F	25.F	-113.495	8035.	29.008
NOV	0.00000					0.000	-16.194	3	5	13.F	12.F	-156.962	7701.	18.956
DEC	0.00000					0.000	-38.353	12	5	4.F	3.F	-180.691	7958.	18.956
TOTAL	240.665						-160.031						116219.	
MAX						141.854						-208.905		31.889

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
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR MZ_SYSTEM TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	-1.802	3.847
FEB	0	672	0	0	672	0	672	0	0	0	-1.016	3.847
MAR	0	744	0	0	744	0	744	0	0	0	-1.276	3.847
APR	0	720	0	0	720	0	720	0	0	0	-1.775	3.847
MAY	244	360	0	140	360	384	744	0	0	140	0.000	24.295
JUN	564	0	0	156	0	720	720	0	0	156	0.000	31.086
JUL	707	0	0	37	0	744	744	0	0	37	0.000	24.691
AUG	686	0	0	58	0	744	744	0	0	58	0.000	27.751
SEP	410	0	0	310	0	720	720	0	0	310	0.000	30.654
OCT	11	720	0	13	720	24	744	0	0	13	0.000	29.008
NOV	0	720	0	0	720	0	720	0	0	0	-13.139	3.847
DEC	0	744	0	0	744	0	744	0	0	0	-11.680	3.847
ANNUAL	2622	5424	0	714	5424	3336	8760	0	0	714		

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- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

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

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.

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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 #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)  ..
```

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                    $ 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 #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. EZDOE - 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
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR MZ_SYSTEM TOPEKA, KS

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-42.471	15	5	-8.F	-9.F	-162.377	8003.	19.956
FEB	0.00000					0.000	-28.888	3	5	-1.F	-2.F	-141.440	7193.	18.956
MAR	0.00000					0.000	-18.896	4	5	14.F	12.F	-106.070	7957.	18.956
APR	0.00000					0.000	-3.061	5	5	31.F	29.F	-56.599	7701.	18.956
MAY	13.44425	31	18	90.F	76.F	129.536	-0.214	1	20	62.F	53.F	-2.932	9218.	31.020
JUN	39.20008	27	15	88.F	77.F	128.451	0.000					0.000	11394.	31.109
JUL	55.78997	17	18	88.F	80.F	139.656	0.000					0.000	13188.	31.804
AUG	54.11045	20	13	92.F	78.F	131.521	0.000					0.000	13230.	31.674
SEP	24.53618	6	13	88.F	75.F	130.606	0.000					0.000	10027.	30.939
OCT	0.43671	1	18	83.F	68.F	84.986	-1.686	20	5	25.F	25.F	-63.234	8001.	26.784
NOV	0.00000					0.000	-14.038	3	5	13.F	12.F	-105.624	7701.	18.956
DEC	0.00000					0.000	-35.787	12	5	4.F	3.F	-129.340	7958.	18.956
TOTAL	187.518						-145.041						111569.	
MAX						139.656						-162.377		31.804

EMC ENGINEERS INC. EZDOE - 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
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR MZ_SYSTEM TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	-48.945	3.847
FEB	0	672	0	0	672	0	672	0	0	0	-44.910	3.847
MAR	0	744	0	0	744	0	744	0	0	0	-51.195	3.847
APR	0	720	0	0	720	0	720	0	0	0	-1.774	3.847
MAY	187	360	0	197	360	384	744	0	0	197	0.000	31.020
JUN	466	0	0	254	0	720	720	0	0	254	0.000	24.207
JUL	617	0	0	127	0	744	744	0	0	127	0.000	31.349
AUG	620	0	0	124	0	744	744	0	0	124	0.000	27.756
SEP	324	0	0	396	0	720	720	0	0	396	0.000	27.292
OCT	8	720	0	16	720	24	744	0	0	16	0.000	26.784
NOV	0	720	0	0	720	0	720	0	0	0	-67.878	3.847
DEC	0	744	0	0	744	0	744	0	0	0	-67.814	3.847
ANNUAL	2222	5424	0	1114	5424	3336	8760	0	0	1114		

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	29.582	62.073
JAN	PEAK(KBTU)	71.894	204.831
	DY/HR	15/12	15/ 5
	TOTAL(MBTU)	26.462	44.460
FEB	PEAK(KBTU)	68.480	182.634
	DY/HR	17/12	3/ 5
	TOTAL(MBTU)	28.582	30.276
MAR	PEAK(KBTU)	68.101	143.928
	DY/HR	29/12	4/ 5
	TOTAL(MBTU)	26.752	6.687
APR	PEAK(KBTU)	65.376	87.249
	DY/HR	4/12	5/ 5
	TOTAL(MBTU)	31.594	1.225
MAY	PEAK(KBTU)	105.914	7.223
	DY/HR	31/18	1/20
	TOTAL(MBTU)	38.906	0.000
JUN	PEAK(KBTU)	106.218	0.000
	DY/HR	28/12	30/ 1
	TOTAL(MBTU)	45.031	0.000
JUL	PEAK(KBTU)	108.594	0.000
	DY/HR	23/12	31/ 1
	TOTAL(MBTU)	45.172	0.000
AUG	PEAK(KBTU)	108.147	0.000
	DY/HR	21/12	31/ 1
	TOTAL(MBTU)	34.236	0.000
SEP	PEAK(KBTU)	105.639	0.000
	DY/HR	7/12	30/ 1
	TOTAL(MBTU)	27.656	4.439
OCT	PEAK(KBTU)	91.451	95.024
	DY/HR	1/18	20/ 5
	TOTAL(MBTU)	27.429	23.117
NOV	PEAK(KBTU)	67.026	143.430
	DY/HR	30/12	3/ 5
	TOTAL(MBTU)	29.326	53.909
DEC	PEAK(KBTU)	68.480	169.563
	DY/HR	31/12	12/ 5
	ONE YEAR	390.727	226.187
	USE/PEAK	108.594	204.831

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

EMC ENGINEERS, INC.

DENVER - ATLANTA

PROJECT:	FEASIBILITY STUDY FOR INSTALLATION OF UMCS	EMC NO:	1406-001
		CALC. BY:	AJN
LOCATION:	FORT RILEY, KANSAS	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 FT²
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	NIGHTIME INFILTRATION (OA)
RUN5	DAYTIME INFILTRATION (OA)

HOURS OF OCCUPANCY			
M-F	600	1700	55 HR
SAT.	0	0	0 HR
SUN.	0	0	0 HR
	TOTAL OCCUPY HR.		55 HR/WK
	TOTAL UNOCC. HR.		113 HR/WK
	ANNUAL OCCUPY HR.		2868 HR/YR
	ANNUAL UNOCC. HR.		5892 HR/YR

ANNUAL HEATING & COOLING HOURS	
HR. ON HEATING	1784 HR/YR
HR. ON COOLING	1084 HR/YR
HR. OFF HEATING	3664 HR/YR
HR. OFF COOLING	2228 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 ..
```

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	GLASS U-VALUE (BTU/HR-SQFT-F)	GLASS AREA (SQFT)	WALL U-VALUE (BTU/HR-SQFT-F)	WALL AREA (SQFT)	WALL+GLASS U-VALUE (BTU/HR-SQFT-F)	WALL+GLASS AREA (SQFT)	AZIMUTH
	FRONT-SPAC	0.000	0.00	0.092	453.60	0.092	453.60	NORTH-EAST
	FRONT-SPAC	0.490	63.60	0.210	44.40	0.375	108.00	NORTH-EAST
	BACK-SPACE	0.000	0.00	0.092	453.60	0.092	453.60	NORTH-EAST
	BACK-SPACE	0.490	63.60	0.210	44.40	0.375	108.00	NORTH-EAST
	FRONT-SPAC	0.614	377.80	0.210	270.20	0.445	648.00	SOUTH-EAST
	FRONT-SPAC	0.000	0.00	0.092	1539.00	0.092	1539.00	SOUTH-EAST
	BACK-SPACE	0.000	0.00	0.092	453.60	0.092	453.60	SOUTH-WEST
	FRONT-SPAC	0.000	0.00	0.092	453.60	0.092	453.60	SOUTH-WEST
	FRONT-SPAC	0.490	63.60	0.210	44.40	0.375	108.00	SOUTH-WEST
	BACK-SPACE	0.490	48.00	0.210	60.00	0.334	108.00	SOUTH-WEST
	BACK-SPACE	1.021	18.00	0.092	1737.00	0.102	1755.00	NORTH-WEST
	BACK-SPACE	0.490	192.00	0.210	240.00	0.334	432.00	NORTH-WEST
	FRONT-SPAC	0.000	0.00	0.048	1200.00	0.048	1200.00	ROOF
	BACK-SPACE	0.000	0.00	0.048	1200.00	0.048	1200.00	ROOF
	CORE-ZONE	0.000	0.00	0.048	800.00	0.048	800.00	ROOF
	FRONT-SPAC	0.000	0.00	0.020	1500.00	0.020	1500.00	UNDERGRND
	BACK-SPACE	0.000	0.00	0.020	1500.00	0.020	1500.00	UNDERGRND
	CORE-ZONE	0.000	0.00	0.020	800.00	0.020	800.00	UNDERGRND

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/16/1995 8:25:23 LDL RUN 1
DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #7450 REGIMENTAL HQ BLDG
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	0.490	0.103	0.147	127.20	996.00	1123.20
SOUTH-EAST	0.614	0.110	0.197	377.80	1809.20	2187.00
SOUTH-WEST	0.490	0.104	0.143	111.60	1011.60	1123.20
NORTH-WEST	0.536	0.106	0.148	210.00	1977.00	2187.00
ROOF	0.000	0.048	0.048	0.00	3200.00	3200.00
ALL WALLS	0.558	0.106	0.163	826.60	5793.80	6620.40
WALLS+ROOFS	0.558	0.086	0.125	826.60	8993.80	9820.40
UNDERGRND	0.000	0.020	0.020	0.00	3800.00	3800.00
BUILDING	0.558	0.066	0.096	826.60	12793.80	13620.40

*** BUILDING ***

FLOOR AREA	3200 SQFT	297 SQMT
VOLUME	92800 CUFT	2628 CUMT

	COOLING LOAD				HEATING LOAD	
TIME	MAY 31 5PM				JAN 15 8AM	
DRY-BULB TEMP	90F 32C				-6F -21C	
WET-BULB TEMP	75F 24C				-7F -22C	
	SENSIBLE		LATENT		SENSIBLE	
	(KBTU/H)	(KW)	(KBTU/H)	(KW)	(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	-27.798 KW
TOTAL LOAD / AREA	57.27BTU/H.SQFT		180.545 W /SQMT		29.660BTU/H.SQFT	93.503 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 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

	COOLING						HEATING						ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-28.429	15	6	-8.F	-9.F	-71.786	2303.	7.368
FEB	0.00000					0.000	-21.520	3	7	-5.F	-6.F	-68.049	2080.	7.368
MAR	0.00000					0.000	-16.876	4	5	14.F	12.F	-57.181	2483.	7.268
APR	0.00000					0.000	-6.469	3	1	33.F	32.F	-38.825	2287.	7.268
MAY	4.35980	31	18	90.F	76.F	57.444	-1.782	1	6	37.F	37.F	-35.187	2712.	12.741
JUN	14.95887	27	16	89.F	77.F	62.585	0.000					0.000	3790.	13.184
JUL	20.04893	21	16	89.F	79.F	68.010	0.000					0.000	4089.	13.494
AUG	20.85109	22	17	95.F	77.F	63.675	0.000					0.000	4518.	13.550
SEP	9.39246	7	16	93.F	76.F	60.206	0.000					0.000	3178.	13.236
OCT	0.03419	1	17	85.F	68.F	9.316	-6.053	20	5	25.F	25.F	-44.094	2210.	7.268
NOV	0.00000					0.000	-14.618	3	5	13.F	12.F	-57.299	2195.	7.268
DEC	0.00000					0.000	-25.319	14	22	2.F	1.F	-63.534	2299.	7.368
TOTAL	69.645						-121.066						34143.	
MAX						68.010						-71.786		13.550

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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	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

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-9.721	15	8	-6.F	-7.F	-49.373	3111.	10.448
FEB	0.00000					0.000	-5.976	3	5	-1.F	-2.F	-38.358	2814.	10.448
MAR	0.00000					0.000	-3.966	14	5	16.F	14.F	-35.298	3387.	10.448
APR	0.00000					0.000	-1.243	17	7	35.F	31.F	-15.599	3104.	10.448
MAY	9.62606	31	17	90.F	75.F	68.866	-0.568	9	5	45.F	44.F	-7.997	3111.	10.448
JUN	20.08339	28	17	90.F	76.F	65.469	0.000					0.000	3242.	10.448
JUL	20.98320	13	17	92.F	78.F	67.194	0.000					0.000	2972.	10.448
AUG	22.92898	11	16	100.F	71.F	70.168	0.000					0.000	3387.	10.448
SEP	16.07776	7	17	92.F	75.F	67.545	0.000					0.000	3104.	10.448
OCT	0.20464	1	17	85.F	68.F	22.552	-1.595	30	24	46.F	42.F	-17.484	2972.	10.448
NOV	0.00000					0.000	-3.799	12	6	19.F	18.F	-32.281	2966.	10.448
DEC	0.00000					0.000	-8.742	12	5	4.F	3.F	-43.583	3111.	10.448
TOTAL	89.904						-35.609						37285.	
MAX						70.168						-49.373		10.448

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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	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	0	720	720	0	0	98	0.000	10.448
OCT	17	421	0	306	720	24	744	0	0	306	0.000	0.277
NOV	0	470	0	250	720	0	720	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. 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

	COOLING						HEATING						ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-10.180	15	8	-6.F	-7.F	-43.423	3147.	10.497
FEB	0.00000					0.000	-6.667	3	5	-1.F	-2.F	-34.673	2847.	10.497
MAR	0.00000					0.000	-4.198	6	7	19.F	18.F	-31.775	3424.	10.497
APR	0.00000					0.000	-1.416	4	5	33.F	31.F	-17.536	3139.	10.497
MAY	8.71709	31	17	90.F	75.F	68.669	-0.581	9	5	45.F	44.F	-7.756	3147.	10.497
JUN	18.35137	27	17	89.F	77.F	62.128	0.000					0.000	3278.	10.497
JUL	19.34946	7	17	83.F	73.F	64.465	0.000					0.000	3009.	10.497
AUG	20.47105	4	17	92.F	70.F	64.924	0.000					0.000	3424.	10.497
SEP	13.65467	7	17	92.F	75.F	59.898	0.000					0.000	3139.	10.497
OCT	0.07060	1	18	83.F	68.F	12.211	-1.733	2	6	53.F	51.F	-15.650	3009.	10.497
NOV	0.00000					0.000	-4.457	12	6	19.F	18.F	-30.260	3001.	10.497
DEC	0.00000					0.000	-8.453	12	5	4.F	3.F	-37.248	3147.	10.497
TOTAL	80.614						-37.687						37712.	
MAX						68.669						-43.423		10.497

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-#2 TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	566	0	178	744	0	744	0	0	178	-5.619	1.343
FEB	0	472	0	200	672	0	672	0	0	200	-3.034	1.343
MAR	0	468	0	276	744	0	744	0	0	276	-2.924	1.343
APR	0	395	0	325	720	0	720	0	0	325	-3.432	0.326
MAY	371	200	0	173	360	384	744	0	0	173	0.000	10.497
JUN	703	0	0	17	0	720	720	0	0	17	0.000	10.497
JUL	744	0	0	0	0	744	744	0	0	0	0.000	10.497
AUG	744	0	0	0	0	744	744	0	0	0	0.000	10.497
SEP	618	0	0	102	0	720	720	0	0	102	0.000	10.497
OCT	13	424	0	307	720	24	744	0	0	307	0.000	0.326
NOV	0	486	0	234	720	0	720	0	0	234	-9.988	1.343
DEC	0	543	0	201	744	0	744	0	0	201	-27.439	0.326
ANNUAL	3193	3554	0	2013	5424	3336	8760	0	0	2013		

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

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
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.

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                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.) ..
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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.) ..

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  ..
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$ 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
                      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_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  ..


                $-------------------------------------$
                $ 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*
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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 FRESH-AIR TOPEKA, KS

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-12.905	14	9	-3.F	-4.F	-66.436	2163.	7.368
FEB	0.00000					0.000	-8.552	3	7	-5.F	-6.F	-68.518	1950.	7.368
MAR	0.00000					0.000	-6.171	14	7	16.F	14.F	-61.571	2384.	7.268
APR	0.00000					0.000	-1.545	4	7	32.F	30.F	-40.360	2262.	7.268
MAY	2.90320	31	18	90.F	76.F	57.444	-0.259	9	7	43.F	43.F	-29.638	2527.	12.741
JUN	8.91745	27	16	89.F	77.F	62.585	0.000					0.000	3122.	13.184
JUL	10.53200	21	16	89.F	79.F	68.010	0.000					0.000	3042.	13.494
AUG	12.07589	22	17	95.F	77.F	63.675	0.000					0.000	3558.	13.550
SEP	6.23749	7	16	93.F	76.F	60.206	0.000					0.000	2818.	13.236
OCT	0.00000					0.000	-1.402	20	7	23.F	23.F	-44.399	2185.	7.268
NOV	0.00000					0.000	-4.506	3	6	13.F	12.F	-50.054	2086.	7.268
DEC	0.00000					0.000	-10.649	12	6	3.F	2.F	-63.944	2156.	7.368
TOTAL	40.666						-45.989						30252.	
MAX						68.010						-68.518		13.550

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 FRESH-AIR TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	421	0	323	744	0	456	183	0	35	0.000	0.678
FEB	0	364	0	308	672	0	406	159	0	42	0.000	0.678
MAR	0	329	0	415	744	0	539	240	0	210	0.000	0.678
APR	0	126	0	594	720	0	669	396	0	543	0.000	0.487
MAY	138	29	0	577	360	218	658	385	0	491	0.000	9.499
JUN	292	0	0	428	0	494	536	250	0	244	0.000	13.184
JUL	291	0	0	453	0	620	448	188	0	157	0.000	13.459
AUG	347	0	0	397	0	578	533	234	0	186	0.000	13.525
SEP	245	0	0	475	0	375	603	330	0	358	0.000	13.236
OCT	0	116	0	628	720	0	699	439	0	583	0.000	1.165
NOV	0	258	0	462	720	0	496	236	0	238	0.000	0.678
DEC	0	403	0	341	744	0	450	177	0	47	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

	COOLING						HEATING						ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-5.129	28	6	-2.F	-3.F	-58.180	3079.	10.448
FEB	0.00000					0.000	-2.683	7	6	26.F	25.F	-56.005	2800.	10.448
MAR	0.00000					0.000	-1.903	14	6	15.F	13.F	-54.109	3383.	10.448
APR	0.00000					0.000	-0.649	15	19	51.F	44.F	-6.309	3104.	10.448
MAY	8.05695	31	17	90.F	75.F	73.996	-0.854	24	5	56.F	55.F	-21.718	3069.	10.448
JUN	16.98055	27	16	89.F	77.F	71.544	-0.766	11	7	58.F	56.F	-24.007	3162.	10.448
JUL	16.69001	13	16	93.F	77.F	72.529	-0.284	30	7	62.F	59.F	-16.971	2880.	10.448
AUG	19.31336	11	13	96.F	73.F	74.163	-0.388	4	4	56.F	55.F	-16.274	3305.	10.448
SEP	14.49438	6	16	93.F	76.F	73.100	-2.285	18	7	51.F	50.F	-33.688	3031.	10.448
OCT	0.03265	1	17	85.F	68.F	13.304	-0.831	1	7	46.F	44.F	-37.269	2968.	10.448
NOV	0.00000					0.000	-1.434	14	6	29.F	29.F	-36.176	2961.	10.448
DEC	0.00000					0.000	-4.365	12	6	3.F	2.F	-77.704	3088.	10.448
TOTAL	75.568						-21.572						36832.	
MAX						74.163						-77.704		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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	474	0	270	744	0	629	356	0	155	-3.029	1.294
FEB	0	416	0	256	663	0	620	373	0	204	-2.779	1.294
MAR	0	418	0	326	711	0	727	428	0	309	-2.896	1.294
APR	0	206	0	514	452	0	720	447	0	514	-3.247	0.277
MAY	179	118	0	447	450	384	594	321	0	297	0.000	10.448
JUN	362	67	0	291	491	720	429	143	0	0	0.000	10.448
JUL	375	36	0	333	445	744	411	151	0	0	0.000	10.448
AUG	406	40	0	298	383	744	446	147	0	0	0.000	10.448
SEP	315	139	0	266	538	720	454	181	0	0	0.000	10.448
OCT	3	240	0	501	482	24	729	469	0	486	0.000	0.277
NOV	0	370	0	350	629	0	701	441	0	331	-2.751	1.294
DEC	0	512	0	232	744	0	662	389	0	150	0.000	0.000
ANNUAL	1640	3036	0	4084	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

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-5.817	31	6	21.F	19.F	-55.412	3107.	10.497
FEB	0.00000					0.000	-3.192	28	6	12.F	11.F	-56.688	2818.	10.497
MAR	0.00000					0.000	-2.049	14	6	15.F	13.F	-49.514	3415.	10.497
APR	0.00000					0.000	-0.669	4	6	32.F	31.F	-8.805	3139.	10.497
MAY	7.40370	31	17	90.F	75.F	75.031	-0.879	24	5	56.F	55.F	-19.993	3097.	10.497
JUN	15.71539	27	17	89.F	77.F	68.491	-0.820	2	5	50.F	49.F	-22.934	3183.	10.497
JUL	15.52774	13	17	92.F	78.F	68.717	-0.296	30	7	62.F	59.F	-15.312	2897.	10.497
AUG	17.43436	11	17	98.F	71.F	68.970	-0.470	4	5	55.F	54.F	-16.407	3324.	10.497
SEP	12.82128	6	17	93.F	75.F	65.156	-2.599	11	7	40.F	40.F	-32.794	3057.	10.497
OCT	0.00000					0.000	-0.854	1	7	46.F	44.F	-33.600	3004.	10.497
NOV	0.00000					0.000	-1.713	14	6	29.F	29.F	-45.502	2983.	10.497
DEC	0.00000					0.000	-4.171	12	6	3.F	2.F	-66.140	3116.	10.497
TOTAL	68.902						-23.529						37141.	
MAX						75.031						-66.140		10.497

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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	497	0	247	744	0	620	347	0	123	-2.633	1.343
FEB	0	420	0	252	663	0	582	335	0	162	-2.495	1.343
MAR	0	435	0	309	711	0	716	417	0	281	-2.797	1.343
APR	0	212	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	730	470	0	483	-2.238	1.343
NOV	0	354	0	366	629	0	666	406	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		

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

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  ..


              $---------------------------------------$
              $ 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. #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.) ..
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```
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.) ..

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
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                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  ..
```

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 FRESH-AIR TOPEKA, KS

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-25.663	15	6	-8.F	-9.F	-71.787	2303.	7.368
FEB	0.00000					0.000	-18.899	3	5	-1.F	-2.F	-64.311	2080.	7.368
MAR	0.00000					0.000	-14.199	4	5	14.F	12.F	-53.087	2483.	7.268
APR	0.00000					0.000	-4.741	3	1	33.F	32.F	-34.855	2287.	7.268
MAY	3.30266	31	17	90.F	75.F	55.194	-1.130	1	6	37.F	37.F	-31.165	2615.	12.741
JUN	12.22892	27	16	89.F	77.F	62.585	0.000					0.000	3545.	13.184
JUL	16.58689	21	16	89.F	79.F	68.010	0.000					0.000	3777.	13.494
AUG	17.81778	22	17	95.F	77.F	63.675	0.000					0.000	4240.	13.550
SEP	7.66400	7	16	93.F	76.F	60.206	0.000					0.000	3024.	13.236
OCT	0.00000					0.000	-4.206	20	5	25.F	25.F	-40.042	2207.	7.268
NOV	0.00000					0.000	-12.234	3	5	13.F	12.F	-53.246	2195.	7.268
DEC	0.00000					0.000	-22.419	14	22	2.F	1.F	-63.534	2299.	7.368
TOTAL	57.600						-103.490						33054.	
MAX						68.010						-71.787		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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	715	0	29	744	0	744	0	0	29	-31.047	1.165
FEB	0	651	0	21	672	0	672	0	0	21	-30.982	1.165
MAR	0	609	0	135	744	0	744	0	0	135	-30.800	1.165
APR	0	352	0	368	720	0	720	0	0	368	-18.865	0.487
MAY	211	119	0	414	360	213	744	0	0	414	0.000	12.741
JUN	565	0	0	155	0	570	720	0	0	155	0.000	13.184
JUL	642	0	0	102	0	646	744	0	0	102	0.000	13.459
AUG	651	0	0	93	0	655	744	0	0	93	0.000	13.525
SEP	364	0	0	356	0	371	720	0	0	356	0.000	13.236
OCT	0	348	0	396	720	0	744	0	0	396	-20.159	1.165
NOV	0	541	0	179	720	0	720	0	0	179	-37.420	1.165
DEC	0	706	0	38	744	0	744	0	0	38	-41.058	0.487
ANNUAL	2433	4041	0	2286	5424	2455	8760	0	0	2286		

MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC-TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
	COOLING						HEATING						ELEC	
JAN	0.00000					0.000	-8.245	15	8	-6.F	-7.F	-46.744	3111.	10.448
FEB	0.00000					0.000	-4.787	3	5	-1.F	-2.F	-35.101	2814.	10.448
MAR	0.00000					0.000	-3.148	6	7	19.F	18.F	-32.740	3387.	10.448
APR	0.00000					0.000	-1.137	4	5	33.F	31.F	-7.162	3104.	10.448
MAY	8.61113	31	17	90.F	75.F	66.399	-0.556	3	19	65.F	61.F	-5.999	3111.	10.448
JUN	18.26715	28	17	90.F	76.F	62.839	0.000					0.000	3242.	10.448
JUL	19.09994	13	17	92.F	78.F	64.560	0.000					0.000	2972.	10.448
AUG	21.02761	11	16	100.F	71.F	67.409	0.000					0.000	3387.	10.448
SEP	14.40827	7	17	92.F	75.F	64.824	0.000					0.000	3104.	10.448
OCT	0.15326	1	17	85.F	68.F	18.804	-1.336	30	24	46.F	42.F	-13.998	2972.	10.448
NOV	0.00000					0.000	-2.919	12	6	19.F	18.F	-28.891	2966.	10.448
DEC	0.00000					0.000	-7.239	12	5	4.F	3.F	-40.849	3111.	10.448
TOTAL	81.567						-29.366						37285.	
MAX						67.409						-46.744		10.448

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 CYCLE ON	HOURS NIGHT VENTING	HOURS FLOATING WHEN FANS ON	--COINCIDENT LOADS-- HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)
	NUMBER OF HOURS											
JAN	0	546	0	198	744	0	744	0	0	198	-3.261	1.294
FEB	0	445	0	227	672	0	672	0	0	227	-2.991	1.294
MAR	0	449	0	295	744	0	744	0	0	295	-2.925	1.294
APR	0	392	0	328	720	0	720	0	0	328	-3.247	0.277
MAY	343	200	0	201	360	384	744	0	0	201	0.000	10.448
JUN	691	0	0	29	0	720	720	0	0	29	0.000	10.448
JUL	725	0	0	19	0	744	744	0	0	19	0.000	10.448
AUG	735	0	0	9	0	744	744	0	0	9	0.000	10.448
SEP	586	0	0	134	0	720	720	0	0	134	0.000	10.448
OCT	14	419	0	311	720	24	744	0	0	311	0.000	0.277
NOV	0	457	0	263	720	0	720	0	0	263	-2.764	1.294
DEC	0	526	0	218	744	0	744	0	0	218	-28.833	0.277
ANNUAL	3094	3434	0	2232	5424	3336	8760	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

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-8.783	15	6	-8.F	-9.F	-41.176	3147.	10.497
FEB	0.00000					0.000	-5.488	3	5	-1.F	-2.F	-31.818	2847.	10.497
MAR	0.00000					0.000	-3.362	6	7	19.F	18.F	-29.541	3424.	10.497
APR	0.00000					0.000	-1.176	4	5	33.F	31.F	-12.465	3139.	10.497
MAY	7.80364	31	17	90.F	75.F	66.592	-0.568	13	19	78.F	65.F	-6.546	3147.	10.497
JUN	16.72780	27	17	89.F	77.F	59.886	0.000					0.000	3278.	10.497
JUL	17.65842	7	17	83.F	73.F	62.328	0.000					0.000	3009.	10.497
AUG	18.77177	4	17	92.F	70.F	62.742	0.000					0.000	3424.	10.497
SEP	12.18850	7	17	92.F	75.F	57.594	0.000					0.000	3139.	10.497
OCT	0.04249	1	18	83.F	68.F	8.207	-1.304	30	24	46.F	42.F	-12.052	3009.	10.497
NOV	0.00000					0.000	-3.547	12	6	19.F	18.F	-27.829	3001.	10.497
DEC	0.00000					0.000	-7.049	12	5	4.F	3.F	-34.859	3147.	10.497
TOTAL	73.193						-31.276						37712.	
MAX						66.592						-41.176		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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	547	0	197	744	0	744	0	0	197	-2.857	1.343
FEB	0	459	0	213	672	0	672	0	0	213	-2.696	1.343
MAR	0	459	0	285	744	0	744	0	0	285	-2.818	1.343
APR	0	388	0	332	720	0	720	0	0	332	-3.431	0.326
MAY	347	200	0	197	360	384	744	0	0	197	0.000	10.497
JUN	692	0	0	28	0	720	720	0	0	28	0.000	10.497
JUL	728	0	0	16	0	744	744	0	0	16	0.000	10.497
AUG	734	0	0	10	0	744	744	0	0	10	0.000	10.497
SEP	579	0	0	141	0	720	720	0	0	141	0.000	10.497
OCT	11	415	0	318	720	24	744	0	0	318	0.000	0.326
NOV	0	468	0	252	720	0	720	0	0	252	-3.681	1.343
DEC	0	525	0	219	744	0	744	0	0	219	-25.045	0.326
ANNUAL	3091	3461	0	2208	5424	3336	8760	0	0	2208		

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

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
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

EMC ENGINEERS, INC.

DENVER - ATLANTA

PROJECT:	FEASIBILITY STUDY FOR INSTALLATION OF UMCS	EMC NO:	1406-001
		CALC. BY:	AJN
LOCATION:	FORT RILEY, KANSAS	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	FT²
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	NIGHTIME 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		
COAUC	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		
COAOC	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 ..
```

```
1EQUPMAIN  =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 = 5EQUPMAIN    ..

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

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

5EQUPMAIN   =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-EQUPMAN   ..

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

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


3-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 ..


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-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 ..


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  ..
```

```
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   ..

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   ..

5EQUPMAIN  =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  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 = (1EQUPMAIN, 2-EQUPMAN, 5EQUPMAIN,
                                  3-EQUPMAN, 4-EQUPMAN)  ..


                  $ 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 = 1EQUPMAIN
                         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 - - - - U-VALUE (BTU/HR-SQFT-F)	AREA (SQFT)	- - - - W A L L - - - - 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
	1ST_COMPNY	0.000	0.00	0.096	420.00	0.096	420.00	NORTH-EAST
	1EQUPMAIN	0.000	0.00	0.096	767.00	0.096	767.00	NORTH-EAST
	1ST_COMPNY	1.021	144.00	0.096	456.00	0.318	600.00	SOUTH-EAST
	2-COMPNY	1.021	144.00	0.096	456.00	0.318	600.00	SOUTH-EAST
	5TH_COMPNY	1.021	144.00	0.096	456.00	0.318	600.00	SOUTH-EAST
	3-COMPNY	1.021	144.00	0.096	456.00	0.318	600.00	SOUTH-EAST
	4-COMPNY	1.021	144.00	0.096	456.00	0.318	600.00	SOUTH-EAST
	5TH_COMPNY	0.000	0.00	0.096	420.00	0.096	420.00	SOUTH-WEST
	5EQUPMAIN	0.000	0.00	0.096	767.00	0.096	767.00	SOUTH-WEST
	1EQUPMAIN	0.000	0.00	0.096	650.00	0.096	650.00	NORTH-WEST
	2-EQUPMAN	0.000	0.00	0.096	650.00	0.096	650.00	NORTH-WEST
	3-EQUPMAN	0.000	0.00	0.096	650.00	0.096	650.00	NORTH-WEST
	5EQUPMAIN	0.000	0.00	0.096	650.00	0.096	650.00	NORTH-WEST
	4-EQUPMAN	0.000	0.00	0.096	650.00	0.096	650.00	NORTH-WEST
	5TH_COMPNY	0.000	0.00	0.020	1334.00	0.020	1334.00	ROOF
	5-VALT	0.000	0.00	0.020	340.00	0.020	340.00	ROOF
	2-COMPNY	0.000	0.00	0.020	1334.00	0.020	1334.00	ROOF
	2-VALT	0.000	0.00	0.020	340.00	0.020	340.00	ROOF
	5EQUPMAIN	0.000	0.00	0.127	2950.00	0.127	2950.00	ROOF
	1ARMS-VALT	0.000	0.00	0.020	340.00	0.020	340.00	ROOF
	3-COMPNY	0.000	0.00	0.020	1334.00	0.020	1334.00	ROOF
	3-VALT	0.000	0.00	0.020	340.00	0.020	340.00	ROOF

2-EQUPMAN	0.000	0.00	0.127	2950.00	0.127	2950.00	ROOF
3-EQUPMAN	0.000	0.00	0.127	2950.00	0.127	2950.00	ROOF
1EQUPMAIN	0.000	0.00	0.127	2950.00	0.127	2950.00	ROOF
4-COMPNY	0.000	0.00	0.020	1334.00	0.020	1334.00	ROOF
4-VALT	0.000	0.00	0.020	340.00	0.020	340.00	ROOF
1ST_COMPNY	0.000	0.00	0.020	1334.00	0.020	1334.00	ROOF
4-EQUPMAN	0.000	0.00	0.127	2950.00	0.127	2950.00	ROOF
1ST_COMPNY	0.000	0.00	0.020	1334.00	0.020	1334.00	UNDERGRND
1ARMS-VALT	0.000	0.00	0.020	340.00	0.020	340.00	UNDERGRND
1EQUPMAIN	0.000	0.00	0.020	2950.00	0.020	2950.00	UNDERGRND
2-COMPNY	0.000	0.00	0.020	1334.00	0.020	1334.00	UNDERGRND
2-VALT	0.000	0.00	0.020	340.00	0.020	340.00	UNDERGRND
2-EQUPMAN	0.000	0.00	0.020	2950.00	0.020	2950.00	UNDERGRND
5TH_COMPNY	0.000	0.00	0.020	1334.00	0.020	1334.00	UNDERGRND
5-VALT	0.000	0.00	0.020	340.00	0.020	340.00	UNDERGRND
5EQUPMAIN	0.000	0.00	0.020	2950.00	0.020	2950.00	UNDERGRND
3-COMPNY	0.000	0.00	0.020	1334.00	0.020	1334.00	UNDERGRND
3-VALT	0.000	0.00	0.020	340.00	0.020	340.00	UNDERGRND
3-EQUPMAN	0.000	0.00	0.020	2950.00	0.020	2950.00	UNDERGRND
4-COMPNY	0.000	0.00	0.020	1334.00	0.020	1334.00	UNDERGRND
4-VALT	0.000	0.00	0.020	340.00	0.020	340.00	UNDERGRND
4-EQUPMAN	0.000	0.00	0.020	2950.00	0.020	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/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	0.090	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

*** BUILDING ***

FLOOR AREA	20818	SQFT	1934	SQMT
VOLUME	263970	CUFT	7476	CUMT

	COOLING LOAD		HEATING LOAD
TIME	AUG 11	4PM	JAN 4	3AM
DRY-BULB TEMP	100F	38C	8F	-13C
WET-BULB TEMP	71F	22C	7F	-14C

	SENSIBLE (KBTU/H)	SENSIBLE (KW)	LATENT (KBTU/H)	LATENT (KW)	SENSIBLE (KBTU/H)	SENSIBLE (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	-383.304 KBTU/H	-112.260 KW
TOTAL LOAD / AREA	19.74BTU/H.SQFT		62.224	W /SQMT	18.413BTU/H.SQFT	58.045 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 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

	COOLING						HEATING						ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELECTRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000					0.000	-34.494	15	9	-5.F	-6.F	-135.616	4297.	19.586
FEB	0.00000					0.000	-23.329	3	6	-1.F	-2.F	-121.064	3887.	19.586
MAR	0.00000					0.000	-14.772	14	6	15.F	13.F	-107.451	4682.	19.586
APR	0.00000					0.000	-2.034	5	6	31.F	28.F	-63.247	4289.	19.586
MAY	25.39890	16	2	62.F	59.F	182.727	-0.399	9	6	44.F	44.F	-19.714	4297.	19.586
JUN	57.86850	24	12	84.F	76.F	166.287	0.000					0.000	4481.	19.586
JUL	67.40594	1	16	86.F	80.F	173.787	0.000					0.000	4104.	19.586
AUG	71.34351	23	16	96.F	77.F	170.002	0.000					0.000	4682.	19.586
SEP	45.86646	7	15	92.F	76.F	168.401	0.000					0.000	4289.	19.586
OCT	0.68924	1	15	82.F	67.F	71.670	-2.136	2	6	53.F	51.F	-54.155	4104.	19.586
NOV	0.00000					0.000	-11.580	2	6	15.F	14.F	-93.824	4096.	19.586
DEC	0.00000					0.000	-31.279	12	6	3.F	2.F	-128.025	4297.	19.586
TOTAL	268.572						-120.022						51502.	
MAX						182.727						-135.616		19.586

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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	646	0	98	744	0	744	0	0	98	-11.914	0.344
FEB	0	556	0	116	672	0	672	0	0	116	-7.735	0.344
MAR	0	542	0	202	744	0	744	0	0	202	-17.510	0.344
APR	0	457	0	263	720	0	720	0	0	263	-1.914	0.344
MAY	350	227	0	167	360	384	744	0	0	167	0.000	0.344
JUN	699	0	0	21	0	720	720	0	0	21	0.000	19.586
JUL	744	0	0	0	0	744	744	0	0	0	0.000	19.586
AUG	743	0	0	1	0	744	744	0	0	1	0.000	19.586
SEP	612	0	0	108	0	720	720	0	0	108	0.000	19.586
OCT	17	474	0	253	720	24	744	0	0	253	0.000	0.344
NOV	0	530	0	190	720	0	720	0	0	190	-48.955	0.344
DEC	0	643	0	101	744	0	744	0	0	101	-85.856	0.344
ANNUAL	3165	4075	0	1520	5424	3336	8760	0	0	1520		

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 H&V TOPEKA, KS

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-62.477	16	7	12.F	9.F	-160.034	10994.	28.552
FEB	0.00000					0.000	-45.660	3	6	-1.F	-2.F	-124.666	9936.	28.552
MAR	0.00000					0.000	-33.283	3	5	15.F	13.F	-118.201	11378.	28.552
APR	0.00000					0.000	-8.176	5	6	31.F	28.F	-66.756	10770.	28.552
MAY	0.00000					0.000	-0.503	9	6	44.F	44.F	-18.344	10994.	28.552
JUN	0.00000					0.000	0.000					0.000	10961.	28.552
JUL	0.00000					0.000	0.000					0.000	10802.	28.552
AUG	0.00000					0.000	0.000					0.000	11378.	28.552
SEP	0.00000					0.000	0.000					0.000	10770.	28.552
OCT	0.00000					0.000	-4.335	2	2	64.F	59.F	-65.295	10802.	28.552
NOV	0.00000					0.000	-22.457	2	6	15.F	14.F	-84.963	10578.	28.552
DEC	0.00000					0.000	-53.419	12	6	3.F	2.F	-135.579	10994.	28.552
TOTAL	0.000						-230.310						130357.	
MAX						0.000						-160.034		28.552

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 H&V TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	-62.952	9.360
FEB	0	672	0	0	672	0	672	0	0	0	-62.644	9.360
MAR	0	714	0	30	744	0	744	0	0	30	-60.989	9.360
APR	0	545	0	175	720	0	720	0	0	175	-3.179	9.360
MAY	0	206	0	538	360	0	744	0	0	538	0.000	9.360
JUN	0	0	0	720	0	0	720	0	0	720	0.000	9.360
JUL	0	0	0	744	0	0	744	0	0	744	0.000	9.360
AUG	0	0	0	744	0	0	744	0	0	744	0.000	9.360
SEP	0	0	0	720	0	0	720	0	0	720	0.000	9.360
OCT	0	491	0	253	720	0	744	0	0	253	-34.568	9.360
NOV	0	631	0	89	720	0	720	0	0	89	-69.537	9.360
DEC	0	744	0	0	744	0	744	0	0	0	-91.490	9.360
ANNUAL	0	4747	0	4013	5424	0	8760	0	0	4013		

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

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
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.

```
4-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 ..


END  ..
COMPUTE LOADS  ..

INPUT SYSTEMS  ..


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

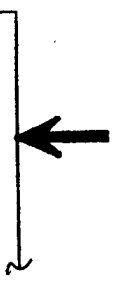
                     $ GENERAL PROJECT DATA

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. 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.) ..
```



```
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
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                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   ..

5EQUPMAIN   =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 = (1EQUPMAIN, 2-EQUPMAN, 5EQUPMAIN,
                                    3-EQUPMAN, 4-EQUPMAN)  ..


                $ 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 = 1EQUPMAIN
                         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 $
               $-------------------------------------$
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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

	COOLING						HEATING						ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-15.740	17	7	27.F	24.F	-267.956	4172.	19.586
FEB	0.00000					0.000	-9.221	7	7	26.F	25.F	-269.115	3789.	19.586
MAR	0.00000					0.000	-4.201	14	7	16.F	14.F	-213.156	4570.	19.586
APR	0.00000					0.000	-0.365	5	7	30.F	27.F	-43.832	4187.	19.586
MAY	16.41863	16	7	58.F	57.F	183.821	-0.110	7	2	45.F	44.F	-4.841	4186.	19.586
JUN	36.29034	27	7	72.F	71.F	189.239	0.000					0.000	4349.	19.586
JUL	39.63266	18	7	76.F	72.F	198.243	0.000					0.000	3949.	19.586
AUG	43.48590	24	14	94.F	77.F	190.613	0.000					0.000	4529.	19.586
SEP	31.72237	6	7	75.F	71.F	198.166	0.000					0.000	4164.	19.586
OCT	0.05722	1	12	75.F	64.F	10.600	-0.368	31	7	43.F	39.F	-45.669	4008.	19.586
NOV	0.00000					0.000	-2.215	14	7	32.F	32.F	-156.019	4000.	19.586
DEC	0.00000					0.000	-13.233	12	8	2.F	1.F	-302.088	4184.	19.586
TOTAL	167.607						-45.453						50086.	
MAX						198.243						-302.088		19.586

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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	311	0	433	744	0	382	172	0	71	0.000	0.000
FEB	0	305	0	367	672	0	387	197	0	82	0.000	0.000
MAR	0	255	0	489	744	0	419	189	0	164	0.000	0.000
APR	0	164	0	556	720	0	426	216	0	262	-1.998	0.344
MAY	155	87	0	502	360	384	421	211	0	179	0.000	19.586
JUN	285	0	0	435	0	720	337	117	0	52	0.000	19.586
JUL	291	0	0	453	0	744	292	92	0	1	0.000	19.586
AUG	295	0	0	449	0	744	300	70	0	5	0.000	19.586
SEP	274	0	0	446	0	720	358	148	0	84	0.000	19.586
OCT	10	197	0	537	720	24	464	264	0	257	0.000	0.344
NOV	0	248	0	472	720	0	440	240	0	192	0.000	0.000
DEC	0	331	0	413	744	0	416	206	0	85	0.000	0.000
ANNUAL	1310	1898	0	5552	5424	3336	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

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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	407	0	337	744	0	407	197	0	0	0.000	0.000
FEB	0	402	0	270	672	0	402	212	0	0	0.000	0.000
MAR	0	418	0	326	744	0	421	191	0	3	0.000	0.000
APR	0	301	0	419	720	0	426	216	0	125	-2.866	9.360
MAY	0	89	0	655	360	0	450	240	0	361	0.000	0.000
JUN	0	0	0	720	0	0	376	156	0	376	0.000	0.000
JUL	0	0	0	744	0	0	345	145	0	345	0.000	9.360
AUG	0	0	0	744	0	0	349	119	0	349	0.000	0.000
SEP	0	0	0	720	0	0	423	213	0	423	0.000	0.000
OCT	0	250	0	494	720	0	464	264	0	214	0.000	0.000
NOV	0	388	0	332	720	0	440	240	0	52	0.000	0.000
DEC	0	424	0	320	744	0	424	214	0	0	-113.233	9.360
ANNUAL	0	2679	0	6081	5424	0	4927	2407	0	2248		

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

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
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.

```
4-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 ..


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.) ..

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
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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   ..

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


                  $ 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 = 1EQUPMAIN
                         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. EZDOE - 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

	COOLING						HEATING						ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-29.066	15	8	-6.F	-7.F	-127.838	4297.	19.586
FEB	0.00000					0.000	-18.482	3	6	-1.F	-2.F	-112.392	3887.	19.586
MAR	0.00000					0.000	-10.596	14	6	15.F	13.F	-98.073	4682.	19.586
APR	0.00000					0.000	-1.093	5	6	31.F	28.F	-45.544	4289.	19.586
MAY	21.31055	16	2	62.F	59.F	178.789	-0.352	3	17	69.F	63.F	-6.690	4297.	19.586
JUN	50.54285	28	14	89.F	76.F	170.374	0.000					0.000	4481.	19.586
JUL	59.61588	13	13	90.F	79.F	177.422	0.000					0.000	4104.	19.586
AUG	64.02199	23	14	94.F	77.F	174.616	0.000					0.000	4682.	19.586
SEP	39.25426	7	15	92.F	76.F	172.963	0.000					0.000	4289.	19.586
OCT	0.43014	1	15	82.F	67.F	52.475	-1.053	31	6	44.F	39.F	-37.126	4104.	19.586
NOV	0.00000					0.000	-7.809	2	6	15.F	14.F	-82.734	4096.	19.586
DEC	0.00000					0.000	-25.721	12	6	3.F	2.F	-120.030	4297.	19.586
TOTAL	235.175						-94.173						51502.	
MAX						178.789						-127.838		19.586

EMC ENGINEERS INC. EZDOE - 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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	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	720	0	0	151	0.000	19.586
OCT	14	468	0	262	720	24	744	0	0	262	0.000	0.344
NOV	0	503	0	217	720	0	720	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. EZDOE - 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

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

EMC ENGINEERS INC. EZDOE - 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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	-63.565	9.360
FEB	0	672	0	0	672	0	672	0	0	0	-63.217	9.360
MAR	0	715	0	29	744	0	744	0	0	29	-61.544	9.360
APR	0	545	0	175	720	0	720	0	0	175	-3.179	9.360
MAY	0	206	0	538	360	0	744	0	0	538	0.000	9.360
JUN	0	0	0	720	0	0	720	0	0	720	0.000	9.360
JUL	0	0	0	744	0	0	744	0	0	744	0.000	9.360
AUG	0	0	0	744	0	0	744	0	0	744	0.000	9.360
SEP	0	0	0	720	0	0	720	0	0	720	0.000	9.360
OCT	0	491	0	253	720	0	744	0	0	253	-34.899	9.360
NOV	0	632	0	88	720	0	720	0	0	88	-70.056	9.360
DEC	0	744	0	0	744	0	744	0	0	0	-92.145	9.360
ANNUAL	0	4749	0	4011	5424	0	8760	0	0	4011		

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- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

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

EMC ENGINEERS, INC.

DENVER - ATLANTA

PROJECT:	FEASIBILITY STUDY FOR INSTALLATION OF UMCS	EMC NO:	1406-001
		CALC. BY:	AJN
LOCATION:	FORT RILEY, KANSAS	CHECKED BY:	CEL
		DATE:	05-Jul-95
BUILDING NO.:	406		
BLDG. TYPE:	CID BUILDING		

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 FT²
CFM/	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	NIGHTIME 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 $
                $-----------------------------------$

                   $ 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  ..
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```
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
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                        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
```

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


END  ..
COMPUTE PLANT ..
STOP ..
```

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	- - - - G L A S S - - - - U-VALUE (BTU/HR-SQFT-F)	AREA (SQFT)	- - - - W A L L - - - - 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	NORTH-EAST
	SPACE_2	0.490	52.50	0.237	552.00	0.259	604.50	NORTH-EAST
	SPACE_3	0.490	45.00	0.237	559.50	0.256	604.50	NORTH-EAST
	SPACE_1	0.000	0.00	0.237	495.00	0.237	495.00	SOUTH-EAST
	SPACE_2	0.490	180.00	0.237	2014.50	0.258	2194.50	SOUTH-EAST
	SPACE_1	0.490	60.00	0.237	742.50	0.256	802.50	SOUTH-WEST
	SPACE_2	0.490	52.50	0.237	552.00	0.259	604.50	SOUTH-WEST
	SPACE_3	0.490	45.00	0.237	559.50	0.256	604.50	SOUTH-WEST
	SPACE_3	0.490	247.50	0.237	2440.50	0.260	2688.00	NORTH-WEST
	SPACE_2	0.000	0.00	0.060	585.00	0.060	585.00	ROOF
	SPACE_1	0.000	0.00	0.098	1914.00	0.098	1914.00	ROOF
	SPACE_2	0.000	0.00	0.060	791.20	0.060	791.20	ROOF
	SPACE_2	0.000	0.00	0.060	585.00	0.060	585.00	ROOF
	SPACE_3	0.000	0.00	0.060	791.20	0.060	791.20	ROOF
	SPACE_3	0.000	0.00	0.060	585.00	0.060	585.00	ROOF
	SPACE_3	0.000	0.00	0.060	585.00	0.060	585.00	ROOF
	SPACE_1	0.000	0.00	0.020	1914.00	0.020	1914.00	UNDERGRND
	SPACE_2	0.000	0.00	0.020	2112.00	0.020	2112.00	UNDERGRND
	SPACE_3	0.000	0.00	0.020	2112.00	0.020	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
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	0.490	0.237	0.255	142.50	1869.00	2011.50
SOUTH-EAST	0.490	0.237	0.254	180.00	2509.50	2689.50
SOUTH-WEST	0.490	0.237	0.257	157.50	1854.00	2011.50
NORTH-WEST	0.490	0.237	0.260	247.50	2440.50	2688.00
ROOF	0.000	0.073	0.073	0.00	5836.40	5836.40
ALL WALLS	0.490	0.237	0.257	727.50	8673.00	9400.50
WALLS+ROOFS	0.490	0.171	0.186	727.50	14509.40	15236.90
UNDERGRND	0.000	0.020	0.020	0.00	6138.00	6138.00
BUILDING	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				HEATING LOAD	
TIME	AUG 11 5PM				JAN 16 5AM	
DRY-BULB TEMP	98F 37C				8F -13C	
WET-BULB TEMP	71F 22C				6F -14C	
	SENSIBLE		LATENT		SENSIBLE	
	(KBTU/H)	(KW)	(KBTU/H)	(KW)	(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	-57.977 KW
TOTAL LOAD / AREA	40.14BTU/H.SQFT		126.533 W /SQMT		42.630BTU/H.SQFT	134.390 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/ 5/1995 14:37:58 SDL RUN 1
DENVER, CO 80227 BASELINE SIMULATION FOR BLDG #406 CID BLDG
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR MZ_W/_DX TOPEKA, KS

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELECTRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000					0.000	-125.109	15	8	-6.F	-7.F	-319.861	9589.	30.465
FEB	0.00000					0.000	-92.922	3	6	-1.F	-2.F	-272.156	8667.	30.465
MAR	0.00000					0.000	-69.375	4	6	14.F	12.F	-219.964	10203.	30.365
APR	0.00000					0.000	-22.387	1	1	32.F	29.F	-145.275	9484.	30.365
MAY	22.73035	31	16	88.F	75.F	183.098	-4.692	1	7	38.F	36.F	-91.021	11735.	49.140
JUN	71.02290	30	10	82.F	75.F	188.741	0.000					0.000	16509.	49.063
JUL	92.81859	1	16	86.F	80.F	201.904	0.000					0.000	18099.	50.182
AUG	91.01701	23	13	93.F	77.F	187.422	0.000					0.000	19150.	50.394
SEP	43.21564	1	13	78.F	73.F	188.607	0.000					0.000	13597.	49.619
OCT	0.00000					0.000	-20.038	20	6	24.F	23.F	-146.760	9275.	30.365
NOV	0.00000					0.000	-59.799	3	6	13.F	12.F	-209.583	9175.	30.365
DEC	0.00000					0.000	-111.451	13	6	2.F	1.F	-277.072	9584.	30.465
TOTAL	320.805						-505.770						145063.	
MAX						201.904						-319.861		50.394

H4-15

EMC ENGINEERS INC. EZDOE - 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
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR MZ_W/_DX TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	360	384	744	0	0	112	0.000	49.140
JUN	647	0	0	73	0	720	720	0	0	73	0.000	48.602
JUL	734	0	0	10	0	744	744	0	0	10	0.000	50.182
AUG	723	0	0	21	0	744	744	0	0	21	0.000	50.325
SEP	458	0	0	262	0	720	720	0	0	262	0.000	47.916
OCT	0	720	0	24	720	24	744	0	0	24	-92.602	6.772
NOV	0	720	0	0	720	0	720	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-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	37.856	182.168
JAN	PEAK(KBTU)	111.127	419.978
	DY/HR	28/ 9	15/ 8
	TOTAL(MBTU)	34.153	140.576
FEB	PEAK(KBTU)	111.127	367.279
	DY/HR	3/ 8	3/ 6
	TOTAL(MBTU)	39.032	110.381
MAR	PEAK(KBTU)	110.785	307.958
	DY/HR	31/10	4/ 6
	TOTAL(MBTU)	34.319	40.701
APR	PEAK(KBTU)	110.462	220.040
	DY/HR	5/ 8	1/ 1
	TOTAL(MBTU)	40.580	9.913
MAY	PEAK(KBTU)	167.783	153.943
	DY/HR	31/16	1/ 7
	TOTAL(MBTU)	56.367	0.000
JUN	PEAK(KBTU)	167.522	0.000
	DY/HR	27/15	30/ 1
	TOTAL(MBTU)	61.796	0.000
JUL	PEAK(KBTU)	171.342	0.000
	DY/HR	1/16	31/ 1
	TOTAL(MBTU)	65.386	0.000
AUG	PEAK(KBTU)	172.066	0.000
	DY/HR	22/13	31/ 1
	TOTAL(MBTU)	46.425	0.000
SEP	PEAK(KBTU)	169.419	0.000
	DY/HR	7/15	30/ 1
	TOTAL(MBTU)	33.514	37.335
OCT	PEAK(KBTU)	110.785	221.823
	DY/HR	20/ 9	20/ 6
	TOTAL(MBTU)	35.036	96.006
NOV	PEAK(KBTU)	110.785	295.951
	DY/HR	30/12	3/ 6
	TOTAL(MBTU)	37.773	165.790
DEC	PEAK(KBTU)	111.127	372.776
	DY/HR	13/ 8	13/ 6
	ONE YEAR	522.237	782.871
	USE/PEAK	172.066	419.978

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
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.)
```

```
                          (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
                        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  ..


                $------------------------------------$
                $ 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 #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. 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
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR MZ_W/_DX TOPEKA, KS

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-68.448	28	7	-1.F	-3.F	-404.079	8684.	30.465
FEB	0.00000					0.000	-46.951	3	7	-5.F	-6.F	-381.993	7920.	30.465
MAR	0.00000					0.000	-31.893	14	7	16.F	14.F	-342.696	9713.	30.365
APR	0.00000					0.000	-6.659	5	7	30.F	27.F	-203.601	9430.	30.365
MAY	15.61987	31	16	88.F	75.F	185.644	-1.042	9	7	43.F	43.F	-134.071	11011.	49.305
JUN	40.18599	30	10	82.F	75.F	192.377	0.000					0.000	13106.	49.383
JUL	43.89425	1	16	86.F	80.F	206.404	0.000					0.000	12237.	50.447
AUG	48.86752	23	13	93.F	77.F	192.741	0.000					0.000	13919.	50.752
SEP	27.80221	1	13	78.F	73.F	192.928	0.000					0.000	11944.	49.894
OCT	0.00000					0.000	-5.617	20	7	23.F	23.F	-209.355	9242.	30.365
NOV	0.00000					0.000	-23.700	14	7	32.F	32.F	-299.824	8640.	30.365
DEC	0.00000					0.000	-57.670	12	7	2.F	1.F	-401.139	8717.	30.465
TOTAL	176.370						-241.981						124564.	
MAX						206.404						-404.079		50.752

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
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR MZ_W/_DX TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	526	0	218	744	0	526	295	0	0	-13.029	6.772
FEB	0	489	0	183	672	0	492	283	0	3	0.000	2.621
MAR	0	607	0	137	744	0	626	373	0	19	-5.345	6.772
APR	0	501	0	219	720	0	707	476	0	206	-2.373	4.151
MAY	139	223	0	382	360	384	742	511	0	380	0.000	49.305
JUN	335	0	0	385	0	720	611	369	0	276	0.000	48.787
JUL	380	0	0	364	0	744	447	227	0	67	0.000	50.447
AUG	395	0	0	349	0	744	474	221	0	79	0.000	50.636
SEP	272	0	0	448	0	720	683	452	0	411	0.000	48.225
OCT	0	506	0	238	720	24	736	516	0	230	-1.920	6.772
NOV	0	553	0	167	720	0	591	371	0	38	0.000	2.621
DEC	0	535	0	209	744	0	535	304	0	0	-147.505	4.151
ANNUAL	1521	3940	0	3299	5424	3336	7170	4398	0	1709		

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	33.267	105.465
JAN	PEAK(KBTU)	112.998	530.555
	DY/HR	28/ 9	28/ 7
	TOTAL(MBTU)	29.960	75.480
FEB	PEAK(KBTU)	112.998	506.371
	DY/HR	3/ 8	3/ 7
	TOTAL(MBTU)	35.440	54.267
MAR	PEAK(KBTU)	112.657	462.730
	DY/HR	31/13	14/ 7
	TOTAL(MBTU)	32.884	14.330
APR	PEAK(KBTU)	112.657	301.984
	DY/HR	18/ 8	5/ 7
	TOTAL(MBTU)	37.763	3.286
MAY	PEAK(KBTU)	168.347	217.964
	DY/HR	31/16	9/ 7
	TOTAL(MBTU)	44.751	0.000
JUN	PEAK(KBTU)	168.613	0.000
	DY/HR	27/15	30/ 1
	TOTAL(MBTU)	41.782	0.000
JUL	PEAK(KBTU)	172.247	0.000
	DY/HR	1/16	31/ 1
	TOTAL(MBTU)	47.524	0.000
AUG	PEAK(KBTU)	173.290	0.000
	DY/HR	22/13	31/ 1
	TOTAL(MBTU)	40.783	0.000
SEP	PEAK(KBTU)	170.361	0.000
	DY/HR	7/15	30/ 1
	TOTAL(MBTU)	32.171	12.711
OCT	PEAK(KBTU)	112.657	308.828
	DY/HR	31/10	20/ 7
	TOTAL(MBTU)	31.342	41.669
NOV	PEAK(KBTU)	112.657	414.227
	DY/HR	30/14	14/ 7
	TOTAL(MBTU)	33.058	90.708
DEC	PEAK(KBTU)	112.998	527.350
	DY/HR	13/ 8	12/ 7
	ONE YEAR	440.725	397.915
	USE/PEAK	173.290	530.555

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
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  ..
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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
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR MZ_W/_DX TOPEKA, KS

	COOLING						HEATING						ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELECTRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000					0.000	-111.220	15	8	-6.F	-7.F	-301.864	9589.	30.465
FEB	0.00000					0.000	-80.400	3	6	-1.F	-2.F	-253.887	8667.	30.465
MAR	0.00000					0.000	-56.335	4	6	14.F	12.F	-201.509	10203.	30.365
APR	0.00000					0.000	-14.520	1	1	32.F	29.F	-126.430	9484.	30.365
MAY	16.94104	31	16	88.F	75.F	184.568	-2.315	1	7	38.F	36.F	-65.235	11212.	49.224
JUN	56.28429	20	13	86.F	76.F	186.971	0.000					0.000	15189.	49.173
JUL	76.40015	1	16	86.F	80.F	203.295	0.000					0.000	16618.	50.260
AUG	76.55418	23	13	93.F	77.F	188.650	0.000					0.000	17821.	50.494
SEP	32.22479	6	13	88.F	75.F	185.167	0.000					0.000	12601.	49.711
OCT	0.00000					0.000	-12.013	20	6	24.F	23.F	-126.694	9275.	30.365
NOV	0.00000					0.000	-48.053	3	6	13.F	12.F	-191.837	9175.	30.365
DEC	0.00000					0.000	-97.448	13	6	2.F	1.F	-258.871	9584.	30.465
TOTAL	258.405						-422.306						139416.	
MAX						203.295						-301.864		50.494

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
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR MZ_W/_DX TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	743	0	1	744	0	744	0	0	1	-136.743	6.772
FEB	0	667	0	5	672	0	672	0	0	5	-129.556	6.772
MAR	0	676	0	68	744	0	744	0	0	68	-124.822	6.772
APR	0	513	0	207	720	0	720	0	0	207	-14.946	4.151
MAY	278	223	0	243	360	384	744	0	0	243	0.000	49.224
JUN	641	0	0	79	0	720	720	0	0	79	0.000	49.047
JUL	742	0	0	2	0	744	744	0	0	2	0.000	50.260
AUG	739	0	0	5	0	744	744	0	0	5	0.000	50.392
SEP	431	0	0	289	0	720	720	0	0	289	0.000	49.309
OCT	0	505	0	239	720	24	744	0	0	239	-70.399	6.772
NOV	0	634	0	86	720	0	720	0	0	86	-141.949	6.772
DEC	0	740	0	4	744	0	744	0	0	4	-186.964	4.151
ANNUAL	2831	4701	0	1228	5424	3336	8760	0	0	1228		

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	37.463	163.133
JAN	PEAK(KBTU)	110.727	396.347
	DY/HR	28/ 9	15/ 8
	TOTAL(MBTU)	33.758	123.085
FEB	PEAK(KBTU)	110.727	343.299
	DY/HR	3/ 8	3/ 6
	TOTAL(MBTU)	38.399	90.631
MAR	PEAK(KBTU)	110.385	283.607
	DY/HR	31/ 9	4/ 6
	TOTAL(MBTU)	33.682	26.696
APR	PEAK(KBTU)	108.719	194.805
	DY/HR	5/ 8	1/ 1
	TOTAL(MBTU)	38.545	5.078
MAY	PEAK(KBTU)	168.071	115.998
	DY/HR	31/16	1/ 7
	TOTAL(MBTU)	51.863	0.000
JUN	PEAK(KBTU)	167.897	0.000
	DY/HR	27/15	30/ 1
	TOTAL(MBTU)	56.740	0.000
JUL	PEAK(KBTU)	171.608	0.000
	DY/HR	1/16	31/ 1
	TOTAL(MBTU)	60.848	0.000
AUG	PEAK(KBTU)	172.406	0.000
	DY/HR	22/13	31/ 1
	TOTAL(MBTU)	43.025	0.000
SEP	PEAK(KBTU)	169.733	0.000
	DY/HR	7/15	30/ 1
	TOTAL(MBTU)	32.820	22.799
OCT	PEAK(KBTU)	110.385	195.125
	DY/HR	20/ 8	20/ 6
	TOTAL(MBTU)	34.436	77.944
NOV	PEAK(KBTU)	110.385	272.381
	DY/HR	30/ 9	3/ 6
	TOTAL(MBTU)	37.362	146.446
DEC	PEAK(KBTU)	110.727	348.883
	DY/HR	13/ 8	13/ 6
	ONE YEAR	498.939	655.813
	USE/PEAK	172.406	396.347

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
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.)
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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  ..

$ 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. EZDOE - 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
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR MZ_W/_DX TOPEKA, KS

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-85.770	14	7	-1.F	-2.F	-457.677	8605.	30.465
FEB	0.00000					0.000	-59.386	3	7	-5.F	-6.F	-463.837	7816.	30.465
MAR	0.00000					0.000	-42.445	4	7	14.F	12.F	-415.615	9464.	30.365
APR	0.00000					0.000	-10.741	5	7	30.F	27.F	-281.737	9248.	30.365
MAY	13.00987	31	16	88.F	75.F	195.731	-2.444	9	7	43.F	43.F	-205.555	10760.	50.089
JUN	38.45084	30	10	82.F	75.F	202.977	0.000					0.000	12983.	49.905
JUL	44.77910	1	16	86.F	80.F	218.906	0.000					0.000	12362.	51.278
AUG	49.48270	16	8	69.F	66.F	210.160	0.000					0.000	14077.	51.290
SEP	25.91281	23	16	69.F	67.F	210.841	0.000					0.000	11786.	50.416
OCT	0.00000					0.000	-9.914	20	7	23.F	23.F	-297.108	9067.	30.365
NOV	0.00000					0.000	-32.096	3	7	19.F	17.F	-373.890	8453.	30.365
DEC	0.00000					0.000	-72.542	13	7	2.F	1.F	-452.998	8600.	30.465
TOTAL	171.635						-315.337						123223.	
MAX						218.906						-463.837		51.290

EMC ENGINEERS INC. EZDOE - 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
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR MZ_W/_DX TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	497	0	247	744	0	507	276	0	10	-21.738	6.772
FEB	0	444	0	228	672	0	467	258	0	23	-18.663	6.772
MAR	0	422	0	322	744	0	566	313	0	144	0.000	2.621
APR	0	242	0	478	720	0	663	432	0	421	0.000	4.151
MAY	123	98	0	523	360	384	734	503	0	513	0.000	50.089
JUN	320	0	0	400	0	720	619	377	0	299	0.000	49.603
JUL	368	0	0	376	0	744	463	243	0	95	0.000	51.278
AUG	389	0	0	355	0	744	502	249	0	113	0.000	48.106
SEP	241	0	0	479	0	720	686	455	0	445	0.000	48.176
OCT	0	210	0	534	720	24	694	474	0	484	0.000	6.772
NOV	0	387	0	333	720	0	546	326	0	159	-23.835	6.772
DEC	0	491	0	253	744	0	507	276	0	16	0.000	0.000
ANNUAL	1441	2791	0	4528	5424	3336	6954	4182	0	2722		

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	33.640	130.107
JAN	PEAK(KBTU)	114.326	602.298
	DY/HR	28/ 9	14/ 7
	TOTAL(MBTU)	30.173	93.765
FEB	PEAK(KBTU)	114.326	609.018
	DY/HR	3/ 8	3/ 7
	TOTAL(MBTU)	35.089	69.217
MAR	PEAK(KBTU)	113.984	555.970
	DY/HR	31/13	4/ 7
	TOTAL(MBTU)	32.447	19.227
APR	PEAK(KBTU)	113.984	403.326
	DY/HR	18/ 8	5/ 7
	TOTAL(MBTU)	36.976	4.826
MAY	PEAK(KBTU)	171.026	312.941
	DY/HR	31/16	9/ 7
	TOTAL(MBTU)	44.329	0.000
JUN	PEAK(KBTU)	170.397	0.000
	DY/HR	27/15	30/ 1
	TOTAL(MBTU)	42.208	0.000
JUL	PEAK(KBTU)	175.083	0.000
	DY/HR	1/16	31/ 1
	TOTAL(MBTU)	48.064	0.000
AUG	PEAK(KBTU)	175.127	0.000
	DY/HR	22/13	31/ 1
	TOTAL(MBTU)	40.243	0.000
SEP	PEAK(KBTU)	172.142	0.000
	DY/HR	7/15	30/ 1
	TOTAL(MBTU)	31.764	17.675
OCT	PEAK(KBTU)	113.984	421.253
	DY/HR	31/11	20/ 7
	TOTAL(MBTU)	31.154	53.809
NOV	PEAK(KBTU)	113.984	509.243
	DY/HR	30/17	3/ 7
	TOTAL(MBTU)	33.293	112.304
DEC	PEAK(KBTU)	114.326	597.183
	DY/HR	13/ 8	13/ 7
	ONE YEAR	439.378	500.930
	USE/PEAK	175.127	609.018

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  ..
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```
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
```

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                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      *
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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
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR MZ_W/_DX TOPEKA, KS

	COOLING						HEATING						ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-90.732	15	7	-7.F	-8.F	-325.757	9589.	30.465
FEB	0.00000					0.000	-65.501	3	7	-5.F	-6.F	-259.752	8667.	30.465
MAR	0.00000					0.000	-44.605	6	7	19.F	18.F	-218.430	10203.	30.365
APR	0.00000					0.000	-11.860	17	7	35.F	31.F	-127.868	9484.	30.365
MAY	24.35596	31	16	88.F	75.F	183.090	-1.768	1	7	38.F	36.F	-81.905	11896.	49.139
JUN	65.14420	30	10	82.F	75.F	188.987	0.000					0.000	16008.	49.063
JUL	79.40778	1	16	86.F	80.F	201.815	0.000					0.000	16921.	50.176
AUG	81.15347	23	13	93.F	77.F	187.189	0.000					0.000	18253.	50.405
SEP	42.64534	1	13	78.F	73.F	188.566	0.000					0.000	13568.	49.615
OCT	0.00717	1	17	85.F	68.F	5.588	-10.084	20	7	23.F	23.F	-125.685	9276.	30.365
NOV	0.00000					0.000	-38.403	12	7	21.F	20.F	-193.500	9175.	30.365
DEC	0.00000					0.000	-79.959	13	7	2.F	1.F	-257.308	9584.	30.465
TOTAL	292.714						-342.913						142623.	
MAX						201.815						-325.757		50.405

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
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR MZ_W/_DX TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	-84.557	6.772
FEB	0	672	0	0	672	0	672	0	0	0	-76.574	6.772
MAR	0	744	0	0	744	0	744	0	0	0	-73.037	6.772
APR	0	720	0	0	720	0	720	0	0	0	-1.563	4.151
MAY	351	360	0	33	360	384	744	0	0	33	0.000	49.139
JUN	699	0	0	21	0	720	720	0	0	21	0.000	48.627
JUL	741	0	0	3	0	744	744	0	0	3	0.000	50.176
AUG	739	0	0	5	0	744	744	0	0	5	0.000	50.312
SEP	592	0	0	128	0	720	720	0	0	128	0.000	47.913
OCT	2	720	0	22	720	24	744	0	0	22	0.000	4.784
NOV	0	720	0	0	720	0	720	0	0	0	-78.823	6.772
DEC	0	744	0	0	744	0	744	0	0	0	-128.062	4.151
ANNUAL	3124	5424	0	212	5424	3336	8760	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
REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	37.837	141.184
JAN	PEAK(KBTU)	111.258	427.719
	DY/HR	28/ 9	15/ 7
	TOTAL(MBTU)	34.065	107.004
FEB	PEAK(KBTU)	111.258	354.443
	DY/HR	3/ 8	3/ 7
	TOTAL(MBTU)	38.354	76.584
MAR	PEAK(KBTU)	110.916	307.179
	DY/HR	31/10	6/ 7
	TOTAL(MBTU)	33.597	23.949
APR	PEAK(KBTU)	110.452	199.849
	DY/HR	5/ 8	17/ 7
	TOTAL(MBTU)	40.876	4.996
MAY	PEAK(KBTU)	167.782	143.407
	DY/HR	31/16	1/ 7
	TOTAL(MBTU)	54.658	0.000
JUN	PEAK(KBTU)	167.523	0.000
	DY/HR	27/15	30/ 1
	TOTAL(MBTU)	57.777	0.000
JUL	PEAK(KBTU)	171.324	0.000
	DY/HR	1/16	31/ 1
	TOTAL(MBTU)	62.324	0.000
AUG	PEAK(KBTU)	172.103	0.000
	DY/HR	22/13	31/ 1
	TOTAL(MBTU)	46.328	0.000
SEP	PEAK(KBTU)	169.407	0.000
	DY/HR	7/15	30/ 1
	TOTAL(MBTU)	32.747	21.036
OCT	PEAK(KBTU)	110.916	197.197
	DY/HR	20/ 8	20/ 7
	TOTAL(MBTU)	34.437	66.697
NOV	PEAK(KBTU)	110.916	278.146
	DY/HR	30/12	12/ 7
	TOTAL(MBTU)	37.707	127.642
DEC	PEAK(KBTU)	111.258	351.677
	DY/HR	13/ 8	13/ 7
	ONE YEAR	510.709	569.091
	USE/PEAK	172.103	427.719

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  ..
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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
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                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      *
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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

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-97.958	15	6	-8.F	-9.F	-318.149	9589.	30.465
FEB	0.00000					0.000	-71.810	3	6	-1.F	-2.F	-272.115	8667.	30.465
MAR	0.00000					0.000	-52.842	4	6	14.F	12.F	-219.661	10203.	30.365
APR	0.00000					0.000	-16.847	1	1	32.F	29.F	-143.026	9484.	30.365
MAY	24.18091	31	18	90.F	76.F	192.347	-3.292	1	6	37.F	37.F	-84.753	11858.	46.592
JUN	65.55560	27	18	88.F	76.F	192.395	0.000					0.000	16037.	47.111
JUL	81.51467	1	18	87.F	79.F	214.158	0.000					0.000	17113.	47.585
AUG	81.84739	22	18	93.F	76.F	185.717	0.000					0.000	18350.	48.754
SEP	42.60931	22	18	85.F	75.F	190.580	0.000					0.000	13548.	47.425
OCT	0.00000					0.000	-14.769	20	6	24.F	23.F	-139.971	9275.	30.365
NOV	0.00000					0.000	-45.894	3	6	13.F	12.F	-208.658	9175.	30.365
DEC	0.00000					0.000	-86.720	13	6	2.F	1.F	-277.031	9584.	30.465
TOTAL	295.708						-390.130						142881.	
MAX						214.158						-318.149		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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	-154.527	6.772
FEB	0	672	0	0	672	0	672	0	0	0	-146.773	6.772
MAR	0	744	0	0	744	0	744	0	0	0	-141.194	6.772
APR	0	720	0	0	720	0	720	0	0	0	-41.135	4.151
MAY	308	360	0	76	360	384	744	0	0	76	0.000	26.916
JUN	667	0	0	53	0	720	720	0	0	53	0.000	26.514
JUL	737	0	0	7	0	744	744	0	0	7	0.000	27.954
AUG	729	0	0	15	0	744	744	0	0	15	0.000	26.841
SEP	514	0	0	206	0	720	720	0	0	206	0.000	25.825
OCT	0	720	0	24	720	24	744	0	0	24	-83.578	6.772
NOV	0	720	0	0	720	0	720	0	0	0	-158.688	6.772
DEC	0	744	0	0	744	0	744	0	0	0	-205.313	4.151
ANNUAL	2955	5424	0	381	5424	3336	8760	0	0	381		

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	37.131	145.418
JAN	PEAK(KBTU)	111.089	417.730
	DY/HR	28/ 9	15/ 6
	TOTAL(MBTU)	33.302	110.201
FEB	PEAK(KBTU)	111.089	366.897
	DY/HR	3/ 8	3/ 6
	TOTAL(MBTU)	38.116	85.188
MAR	PEAK(KBTU)	109.125	307.317
	DY/HR	4/ 8	4/ 6
	TOTAL(MBTU)	33.902	31.643
APR	PEAK(KBTU)	105.435	217.094
	DY/HR	1/ 8	1/ 1
	TOTAL(MBTU)	40.878	7.535
MAY	PEAK(KBTU)	159.085	145.965
	DY/HR	31/17	1/ 6
	TOTAL(MBTU)	54.758	0.000
JUN	PEAK(KBTU)	160.856	0.000
	DY/HR	28/17	30/ 1
	TOTAL(MBTU)	58.430	0.000
JUL	PEAK(KBTU)	162.474	0.000
	DY/HR	22/16	31/ 1
	TOTAL(MBTU)	62.655	0.000
AUG	PEAK(KBTU)	166.467	0.000
	DY/HR	11/16	31/ 1
	TOTAL(MBTU)	46.259	0.000
SEP	PEAK(KBTU)	161.930	0.000
	DY/HR	7/16	30/ 1
	TOTAL(MBTU)	33.088	28.566
OCT	PEAK(KBTU)	104.580	213.420
	DY/HR	20/ 8	20/ 6
	TOTAL(MBTU)	34.286	74.918
NOV	PEAK(KBTU)	108.061	294.595
	DY/HR	3/ 8	3/ 6
	TOTAL(MBTU)	36.999	131.501
DEC	PEAK(KBTU)	111.089	372.391
	DY/HR	13/ 8	13/ 6
	ONE YEAR	509.802	614.970
	USE/PEAK	166.467	417.730

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

ENGINEERS, INC.

DENVER - ATLANTA

PROJECT:	FEASIBILITY STUDY FOR INSTALLATION OF UMCS	EMC NO:	1406-001
		CALC. BY:	AJN
LOCATION:	FORT RILEY, KANSAS	CHECKED BY:	CEL
		DATE:	05-Jul-95
BUILDING NO.:	7618		
BLDG. TYPE:	ENL BARRACKS W/O DINING		

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 FT²
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	NIGHTIME INFILTRATION (OA)
RUN5	DAYTIME INFILTRATION (OA)

HOURS OF OCCUPANCY				
M-F	0	2400	120	HR
SAT.	0	2400	24	HR
SUN.	0	2400	24	HR
	TOTAL OCCUPY HR.		168	HR/WK
	TOTAL UNOCC. HR.		0	HR/WK
	ANNUAL OCCUPY HR.		8760	HR/YR
	ANNUAL UNOCC. HR.		0	HR/YR

ANNUAL HEATING & COOLING HOURS	
HR. ON HEATING	5448 HR/YR
HR. ON COOLING	3312 HR/YR
HR. OFF HEATING	0 HR/YR
HR. OFF COOLING	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.) ..
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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 BARRAKS
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& 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 & 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 & 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
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                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 ..
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          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_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  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 *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 ..
```

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	- - - - G L A S S - - - - U-VALUE (BTU/HR-SQFT-F)	AREA (SQFT)	- - - - W A L L - - - - 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
	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. EZDOE - 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- 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	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

*** BUILDING ***

FLOOR AREA 13958 SQFT 1297 SQMT
VOLUME 418734 CUFT 11859 CUMT

	COOLING LOAD				HEATING LOAD	
TIME	AUG 24 7PM				JAN 4 3AM	
DRY-BULB TEMP	92F 33C				8F -13C	
WET-BULB TEMP	76F 24C				7F -14C	
	SENSIBLE		LATENT		SENSIBLE	
	(KBTU/H)	(KW)	(KBTU/H)	(KW)	(KBTU/H)	(KW)
WALLS	69.083	20.233	0.000	0.000	-230.041	-67.373
ROOFS	19.337	5.663	0.000	0.000	-39.155	-11.467
GLASS CONDUCTION	40.916	11.983	0.000	0.000	-151.937	-44.499
GLASS SOLAR	99.635	29.181	0.000	0.000	6.654	1.949
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	-1.321	-0.387	0.000	0.000	-6.405	-1.876
OCCUPANTS TO SPACE	27.009	7.910	46.875	13.729	46.820	13.712
LIGHT TO SPACE	104.108	30.491	0.000	0.000	24.551	7.190
EQUIPMENT TO SPACE	96.808	28.353	0.000	0.000	14.187	4.155
PROCESS TO SPACE	0.000	0.000	0.000	0.000	0.000	0.000
INFILTRATION	188.739	55.277	318.441	93.264	-659.139	-193.045
TOTAL	644.316	188.704	365.316	106.992	-994.467	-291.254
TOTAL LOAD	1009.632 KBTU/H		295.696 KW		-994.467 KBTU/H	-291.254 KW
TOTAL LOAD / AREA	72.33BTU/H.SQFT		228.034 W /SQMT		71.248BTU/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. EZDOE - 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
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR MULTIZONE TOPEKA, KS

	COOLING						HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-185.666	4	3	8.F	7.F	-883.762	50190.	98.953
FEB	0.00000					0.000	-118.677	1	23	17.F	15.F	-701.903	45333.	98.953
MAR	0.00000					0.000	-81.129	3	4	16.F	13.F	-657.438	50190.	98.953
APR	0.00000					0.000	-16.407	4	10	34.F	31.F	-331.413	48571.	98.953
MAY	162.08939	16	2	62.F	59.F	1161.146	-3.089	3	22	58.F	56.F	-85.753	50190.	98.953
JUN	354.96628	19	19	86.F	75.F	916.070	0.000					0.000	48571.	98.953
JUL	416.69571	2	19	84.F	77.F	899.956	0.000					0.000	50190.	98.953
AUG	410.92154	24	19	92.F	76.F	962.199	0.000					0.000	50190.	98.953
SEP	276.45010	5	17	90.F	77.F	956.819	0.000					0.000	48571.	98.953
OCT	6.72422	1	18	83.F	68.F	581.717	-13.900	31	7	43.F	39.F	-287.784	50190.	98.953
NOV	0.00000					0.000	-43.304	2	4	17.F	15.F	-365.821	48571.	98.953
DEC	0.00000					0.000	-164.413	8	10	24.F	22.F	-728.727	50190.	98.953
TOTAL	1627.847						-626.590						590934.	
MAX						1161.146						-883.762		98.953

EMC ENGINEERS INC. EZDOE - 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
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR MULTIZONE TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	-136.753	33.650
FEB	0	672	0	0	672	0	672	0	0	0	-118.913	33.650
MAR	0	744	0	0	744	0	744	0	0	0	-193.627	33.650
APR	0	720	0	0	720	0	720	0	0	0	-23.532	33.650
MAY	384	360	0	0	360	384	744	0	0	0	0.000	33.650
JUN	720	0	0	0	0	720	720	0	0	0	0.000	98.953
JUL	744	0	0	0	0	744	744	0	0	0	0.000	98.953
AUG	744	0	0	0	0	744	744	0	0	0	0.000	98.953
SEP	718	0	0	2	0	720	720	0	0	2	0.000	80.199
OCT	24	720	0	0	720	24	744	0	0	0	0.000	98.953
NOV	0	720	0	0	720	0	720	0	0	0	-226.291	33.650
DEC	0	744	0	0	744	0	744	0	0	0	-237.822	33.650
ANNUAL	3334	5424	0	2	5424	3336	8760	0	0	2		

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- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	184.359	277.371
JAN	PEAK(KBTU)	360.717	1112.063
	DY/HR	28/ 8	4/ 3
	TOTAL(MBTU)	165.654	189.359
FEB	PEAK(KBTU)	360.717	917.868
	DY/HR	27/18	1/23
	TOTAL(MBTU)	179.606	130.718
MAR	PEAK(KBTU)	360.717	869.264
	DY/HR	31/ 9	3/ 4
	TOTAL(MBTU)	169.986	33.577
APR	PEAK(KBTU)	360.717	499.429
	DY/HR	4/ 9	4/10
	TOTAL(MBTU)	231.126	8.511
MAY	PEAK(KBTU)	658.803	149.754
	DY/HR	30/18	3/22
	TOTAL(MBTU)	292.952	0.000
JUN	PEAK(KBTU)	658.410	0.000
	DY/HR	19/19	30/ 1
	TOTAL(MBTU)	318.887	0.000
JUL	PEAK(KBTU)	680.153	0.000
	DY/HR	23/18	31/ 1
	TOTAL(MBTU)	322.748	0.000
AUG	PEAK(KBTU)	689.452	0.000
	DY/HR	24/18	31/ 1
	TOTAL(MBTU)	269.572	0.000
SEP	PEAK(KBTU)	678.056	0.000
	DY/HR	5/18	30/ 1
	TOTAL(MBTU)	177.996	29.458
OCT	PEAK(KBTU)	577.426	448.138
	DY/HR	1/18	31/ 7
	TOTAL(MBTU)	172.059	76.033
NOV	PEAK(KBTU)	360.717	539.579
	DY/HR	30/ 9	2/ 4
	TOTAL(MBTU)	183.931	250.832
DEC	PEAK(KBTU)	360.717	946.975
	DY/HR	31/ 9	8/10
	ONE YEAR	2668.876	995.860
	USE/PEAK	689.452	1112.063

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
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_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 #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
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR MULTIZONE TOPEKA, KS

	COOLING						HEATING						ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-164.169	4	5	7.F	6.F	-830.917	50190.	98.953
FEB	0.00000					0.000	-101.110	2	6	6.F	5.F	-602.559	45333.	98.953
MAR	0.00000					0.000	-68.509	3	5	15.F	13.F	-707.752	50190.	98.953
APR	0.00000					0.000	-13.942	4	10	34.F	31.F	-342.604	48571.	98.953
MAY	161.85303	16	2	62.F	59.F	1161.146	-3.054	3	22	58.F	56.F	-85.729	50190.	98.953
JUN	354.06180	19	19	86.F	75.F	916.544	0.000					0.000	48571.	98.953
JUL	416.12445	2	19	84.F	77.F	902.444	0.000					0.000	50190.	98.953
AUG	409.96030	24	19	92.F	76.F	967.654	0.000					0.000	50190.	98.953
SEP	275.14450	5	18	90.F	77.F	959.195	0.000					0.000	48571.	98.953
OCT	6.63783	1	18	83.F	68.F	573.880	-12.160	31	5	45.F	40.F	-365.775	50190.	98.953
NOV	0.00000					0.000	-35.900	2	5	16.F	15.F	-430.584	48571.	98.953
DEC	0.00000					0.000	-143.762	8	10	24.F	22.F	-786.953	50190.	98.953
TOTAL	1623.784						-542.606						590934.	
MAX						1161.146						-830.917		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
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR MULTIZONE TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	19	744	0	744	0	0	19	-39.767	33.650
FEB	0	650	0	22	672	0	672	0	0	22	-29.649	33.650
MAR	0	612	0	132	744	0	744	0	0	132	-29.541	33.650
APR	0	392	0	328	720	0	720	0	0	328	-23.509	33.650
MAY	384	161	0	199	360	384	744	0	0	199	0.000	33.650
JUN	720	0	0	0	0	720	720	0	0	0	0.000	98.953
JUL	744	0	0	0	0	744	744	0	0	0	0.000	98.953
AUG	744	0	0	0	0	744	744	0	0	0	0.000	98.953
SEP	720	0	0	0	0	720	720	0	0	0	0.000	98.953
OCT	24	386	0	334	720	24	744	0	0	334	0.000	98.953
NOV	0	519	0	201	720	0	720	0	0	201	-12.527	33.650
DEC	0	714	0	30	744	0	744	0	0	30	-14.388	33.650
ANNUAL	3336	4159	0	1265	5424	3336	8760	0	0	1265		

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	182.626	243.540
JAN	PEAK(KBTU)	359.351	1045.567
	DY/HR	31/ 8	4/ 5
	TOTAL(MBTU)	163.878	160.019
FEB	PEAK(KBTU)	359.351	800.165
	DY/HR	28/ 9	2/ 6
	TOTAL(MBTU)	177.887	108.572
MAR	PEAK(KBTU)	359.351	914.746
	DY/HR	31/ 9	3/ 5
	TOTAL(MBTU)	168.399	25.983
APR	PEAK(KBTU)	359.351	505.753
	DY/HR	5/ 9	4/10
	TOTAL(MBTU)	230.223	6.447
MAY	PEAK(KBTU)	655.958	149.140
	DY/HR	30/18	3/22
	TOTAL(MBTU)	292.852	0.000
JUN	PEAK(KBTU)	658.505	0.000
	DY/HR	19/19	30/ 1
	TOTAL(MBTU)	318.677	0.000
JUL	PEAK(KBTU)	682.260	0.000
	DY/HR	23/18	31/ 1
	TOTAL(MBTU)	322.328	0.000
AUG	PEAK(KBTU)	689.613	0.000
	DY/HR	24/18	31/ 1
	TOTAL(MBTU)	269.279	0.000
SEP	PEAK(KBTU)	680.666	0.000
	DY/HR	5/18	30/ 1
	TOTAL(MBTU)	176.360	23.133
OCT	PEAK(KBTU)	526.842	532.646
	DY/HR	1/18	31/ 5
	TOTAL(MBTU)	170.451	61.304
NOV	PEAK(KBTU)	359.351	607.190
	DY/HR	30/ 9	2/ 5
	TOTAL(MBTU)	182.139	217.718
DEC	PEAK(KBTU)	359.351	999.283
	DY/HR	31/20	8/10
	ONE YEAR	2655.101	846.715
	USE/PEAK	689.613	1045.567

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
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  ..
```

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/11/1995 13:46: 9 SDL RUN 1
DENVER, CO 80227 RUN #2 DDC CONTROL OF BLDG. 7618 ENL MEN BARRACKS W/O DIN
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR MULTIZONE TOPEKA, KS

	COOLING						HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-150.091	4	3	8.F	7.F	-820.753	50190.	98.953
FEB	0.00000					0.000	-86.406	1	23	17.F	15.F	-629.502	45333.	98.953
MAR	0.00000					0.000	-55.972	3	4	16.F	13.F	-589.142	50190.	98.953
APR	0.00000					0.000	-9.262	4	10	34.F	31.F	-226.484	48571.	98.953
MAY	140.76512	16	2	62.F	59.F	1224.737	-2.987	3	22	58.F	56.F	-85.729	50190.	98.953
JUN	317.55890	19	20	84.F	75.F	860.561	0.000					0.000	48571.	98.953
JUL	378.86865	1	18	87.F	79.F	858.940	0.000					0.000	50190.	98.953
AUG	374.46912	24	19	92.F	76.F	935.340	0.000					0.000	50190.	98.953
SEP	234.02747	5	18	90.F	77.F	875.073	0.000					0.000	48571.	98.953
OCT	5.33917	1	18	83.F	68.F	512.011	-8.489	31	7	43.F	39.F	-185.514	50190.	98.953
NOV	0.00000					0.000	-27.057	2	4	17.F	15.F	-310.865	48571.	98.953
DEC	0.00000					0.000	-128.658	8	10	24.F	22.F	-650.391	50190.	98.953
TOTAL	1451.029						-468.923						590934.	
MAX						1224.737						-820.753		98.953

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/11/1995 13:46: 9 SDL RUN 1
DENVER, CO 80227 RUN #2 DDC CONTROL OF BLDG. 7618 ENL MEN BARRACKS W/O DIN
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR MULTIZONE TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	695	0	49	744	0	744	0	0	49	-79.229	33.650
FEB	0	630	0	42	672	0	672	0	0	42	-69.146	33.650
MAR	0	543	0	201	744	0	744	0	0	201	-122.456	33.650
APR	0	363	0	357	720	0	720	0	0	357	-23.510	33.650
MAY	384	158	0	202	360	384	744	0	0	202	0.000	33.650
JUN	720	0	0	0	0	720	720	0	0	0	0.000	98.953
JUL	744	0	0	0	0	744	744	0	0	0	0.000	98.953
AUG	744	0	0	0	0	744	744	0	0	0	0.000	98.953
SEP	720	0	0	0	0	720	720	0	0	0	0.000	98.953
OCT	24	376	0	344	720	24	744	0	0	344	0.000	98.953
NOV	0	470	0	250	720	0	720	0	0	250	-169.767	33.650
DEC	0	684	0	60	744	0	744	0	0	60	-194.766	33.650
ANNUAL	3336	3919	0	1505	5424	3336	8760	0	0	1505		

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	182.084	224.874
JAN	PEAK(KBTU)	359.088	1032.776
	DY/HR	28/ 8	4/ 3
	TOTAL(MBTU)	163.367	140.373
FEB	PEAK(KBTU)	359.088	828.039
	DY/HR	27/18	1/23
	TOTAL(MBTU)	177.160	90.855
MAR	PEAK(KBTU)	359.088	783.711
	DY/HR	31/ 9	3/ 4
	TOTAL(MBTU)	167.934	18.367
APR	PEAK(KBTU)	353.851	367.847
	DY/HR	5/ 9	4/10
	TOTAL(MBTU)	225.990	6.293
MAY	PEAK(KBTU)	643.814	149.029
	DY/HR	30/18	3/22
	TOTAL(MBTU)	284.679	0.000
JUN	PEAK(KBTU)	653.619	0.000
	DY/HR	19/19	30/ 1
	TOTAL(MBTU)	309.142	0.000
JUL	PEAK(KBTU)	679.873	0.000
	DY/HR	23/19	31/ 1
	TOTAL(MBTU)	312.468	0.000
AUG	PEAK(KBTU)	693.323	0.000
	DY/HR	24/18	31/ 1
	TOTAL(MBTU)	260.260	0.000
SEP	PEAK(KBTU)	670.206	0.000
	DY/HR	5/18	30/ 1
	TOTAL(MBTU)	175.771	17.232
OCT	PEAK(KBTU)	519.934	312.092
	DY/HR	1/18	31/ 7
	TOTAL(MBTU)	169.783	47.927
NOV	PEAK(KBTU)	359.088	467.427
	DY/HR	3/ 9	2/ 4
	TOTAL(MBTU)	181.531	197.532
DEC	PEAK(KBTU)	359.088	850.828
	DY/HR	31/ 9	8/10
	ONE YEAR	2610.166	743.454
	USE/PEAK	693.323	1032.776

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
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

EMC ENGINEERS, INC.

DENVER - ATLANTA

PROJECT:	FEASIBILITY STUDY FOR INSTALLATION OF UMCS	EMC NO:	1406-001
		CALC. BY:	AJN
LOCATION:	FORT RILEY, KANSAS	CHECKED BY:	CEL
		DATE:	05-Jul-95
BUILDING NO.:	409		
BLDG. TYPE:	ENL BARRACKS W/AS		

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 FT²
CFMI	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	NIGHTIME 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			
COAUC	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			
COAOC	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

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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_PEOPLEE =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) ..
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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 ENTERAINMT
L_PEO_ENT  =SCHEDULE THRU DEC 31 LW_PEO_ENT  ..


                $ CONSTRUCTION TYPES
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 $ 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   ..
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          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
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                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
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                    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.) ..
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```
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  ..

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
                       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 ..
```

```
STOP ..
```

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	GLASS U-VALUE (BTU/HR-SQFT-F)	GLASS AREA (SQFT)	WALL U-VALUE (BTU/HR-SQFT-F)	WALL AREA (SQFT)	WALL+GLASS U-VALUE (BTU/HR-SQFT-F)	WALL+GLASS 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-WEST
	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

	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	0.490	0.231	0.279	410.50	1805.50	2216.00
SOUTH-EAST	0.490	0.231	0.285	72.00	271.00	343.00
SOUTH-WEST	0.490	0.231	0.279	385.00	1683.00	2068.00
NORTH-WEST	0.490	0.231	0.276	184.00	871.00	1055.00
ROOF	0.000	0.041	0.041	0.00	2280.00	2280.00
ALL WALLS	0.490	0.231	0.279	1051.50	4630.50	5682.00
WALLS+ROOFS	0.490	0.168	0.210	1051.50	6910.50	7962.00
UNDERGRND	0.000	0.020	0.020	0.00	4834.00	4834.00
BUILDING	0.490	0.107	0.139	1051.50	11744.50	12796.00

*** BUILDING ***

FLOOR AREA 5304 SQFT 493 SQMT
VOLUME 98592 CUFT 2792 CUMT

	COOLING LOAD				HEATING LOAD	
TIME	JUL 23 5PM				JAN 28 5AM	
DRY-BULB TEMP	97F 36C				-1F -18C	
WET-BULB TEMP	79F 26C				-2F -19C	
	SENSIBLE		LATENT		SENSIBLE	
	(KBTU/H)	(KW)	(KBTU/H)	(KW)	(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	-28.387 KW
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 LOADS
2) TIMES GIVEN IN STANDARD TIME FOR THE LOCATION IN CONSIDERATION

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- LS-D BUILDING MONTHLY LOADS SUMMARY TOPEKA, KS

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC-TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.21470	9	16	50.F	38.F	10.346	-33.117	28	5	-1.F	-2.F	-96.924	4378.	8.762
FEB	0.53246	13	17	54.F	46.F	15.654	-22.035	3	5	-1.F	-2.F	-80.606	3955.	8.762
MAR	2.88930	10	17	64.F	50.F	33.694	-13.465	4	5	14.F	12.F	-64.779	4383.	8.762
APR	14.07210	27	17	74.F	66.F	63.489	-2.435	1	3	36.F	32.F	-40.694	4239.	8.762
MAY	27.51047	31	17	90.F	76.F	85.182	-0.198	5	4	44.F	40.F	-12.358	4378.	8.762
JUN	37.07587	27	18	88.F	76.F	89.200	-0.001	11	5	58.F	56.F	-0.619	4241.	8.762
JUL	43.51595	23	16	97.F	79.F	94.924	0.000					0.000	4376.	8.762
AUG	42.90731	12	18	94.F	73.F	93.659	0.000					0.000	4383.	8.762
SEP	26.28091	7	17	91.F	74.F	85.493	-0.110	18	6	51.F	50.F	-9.381	4239.	8.762
OCT	13.10257	11	17	82.F	66.F	58.879	-1.998	20	4	25.F	25.F	-33.271	4376.	8.762
NOV	3.55864	23	16	70.F	58.F	36.108	-11.306	3	5	13.F	12.F	-58.599	4236.	8.762
DEC	0.43201	3	16	55.F	44.F	14.620	-28.657	15	5	8.F	7.F	-88.115	4378.	8.762
TOTAL	212.092						-113.321						51562.	
MAX						94.924						-96.924		8.762

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- SV-A SYSTEM DESIGN PARAMETERS MZ-ZN_1&2 TOPEKA, KS

SYSTEM NAME: MZ-ZN_1&2 — ALTITUDE MULTIPLIER: 1.040

SUPPLY FAN (CFM)	ELEC (KW)	DELTA-T (F)	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)
6360.	5.381	2.6	0.	0.000	0.0	0.091	151.000	0.841	-174.600	0.00	0.00

ZONE NAME	SUPPLY FLOW	EXHAUST FLOW	FAN (KW)	MINIMUM FLOW RATIO	OUTSIDE AIR FLOW	COOLING CAPACITY (KBTU/HR)	SENSIBLE (SHR)	EXTRACTION RATE (KBTU/HR)	HEATING CAPACITY (KBTU/HR)	ADDITION RATE (KBTU/HR)	MULTIPLIER
SW_ROOMS	3180.	0.	0.000	1.000	290.	0.00	0.00	42.63	0.00	-70.25	1.0
NE_ROOMS	3180.	0.	0.000	1.000	290.	0.00	0.00	42.63	0.00	-70.25	1.0

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- SV-A SYSTEM DESIGN PARAMETERS MZ-ZN_3&4 TOPEKA, KS

SYSTEM NAME	ALTITUDE MULTIPLIER										
MZ-ZN_3&4	1.040										
SUPPLY FAN (CFM)	ELEC (KW)	DELTA-T (F)	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)
2028.	1.716	2.6	0.	0.000	0.0	0.088	50.400	0.808	-42.200	0.00	0.00

ZONE NAME	SUPPLY FLOW	EXHAUST FLOW	FAN (KW)	MINIMUM FLOW RATIO	OUTSIDE AIR FLOW	COOLING CAPACITY (KBTU/HR)	SENSIBLE (SHR)	EXTRACTION RATE (KBTU/HR)	HEATING CAPACITY (KBTU/HR)	ADDITION RATE (KBTU/HR)	MULTIPLIER
TV/POOL_RM	1629.	0.	0.000	1.000	143.	0.00	0.00	21.59	0.00	-25.97	1.0
BASE_HALL	399.	0.	0.000	1.000	35.	0.00	0.00	5.29	0.00	-6.36	1.0

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-A SYSTEM MONTHLY LOADS SUMMARY FOR MZ-ZN_1&2 TOPEKA, KS

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-49.586	15	7	-7.F	-8.F	-139.382	6908.	11.194
FEB	0.00000					0.000	-33.954	3	5	-1.F	-2.F	-118.579	6240.	11.194
MAR	0.00000					0.000	-21.519	4	5	14.F	12.F	-91.308	6911.	11.194
APR	0.00000					0.000	-3.379	1	1	32.F	29.F	-52.066	6687.	11.194
MAY	24.36190	31	18	90.F	76.F	137.630	-0.359	10	23	60.F	56.F	-4.717	6908.	11.194
JUN	58.90283	27	17	89.F	77.F	143.714	0.000					0.000	6688.	11.194
JUL	73.04342	17	18	88.F	80.F	153.108	0.000					0.000	6907.	11.194
AUG	69.46891	22	17	95.F	77.F	146.653	0.000					0.000	6911.	11.194
SEP	38.63323	5	18	90.F	77.F	132.812	0.000					0.000	6687.	11.194
OCT	0.70455	1	18	83.F	68.F	72.976	-2.985	20	8	23.F	22.F	-57.293	6907.	11.194
NOV	0.00000					0.000	-18.309	3	5	13.F	12.F	-87.805	6685.	11.194
DEC	0.00000					0.000	-43.211	15	2	3.F	2.F	-120.453	6908.	11.194
TOTAL	265.115						-173.299						81351.	
MAX						153.108						-139.382		11.194

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 CYCLE ON	HOURS NIGHT VENTING	HOURS FLOATING WHEN FANS ON	--COINCIDENT LOADS-- HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)
	- N U M B E R O F H O U R S -											
JAN	0	744	0	0	744	0	744	0	0	0	-57.761	5.963
FEB	0	672	0	0	672	0	672	0	0	0	-54.478	5.963
MAR	0	744	0	0	744	0	744	0	0	0	-51.100	5.963
APR	0	720	0	0	720	0	720	0	0	0	-4.653	5.963
MAY	380	360	0	4	360	384	744	0	0	4	0.000	11.194
JUN	714	0	0	6	0	720	720	0	0	6	0.000	11.194
JUL	744	0	0	0	0	744	744	0	0	0	0.000	11.194
AUG	744	0	0	0	0	744	744	0	0	0	0.000	11.194
SEP	611	0	0	109	0	720	720	0	0	109	0.000	11.194
OCT	15	720	0	9	720	24	744	0	0	9	0.000	11.194
NOV	0	720	0	0	720	0	720	0	0	0	-63.991	5.963
DEC	0	744	0	0	744	0	744	0	0	0	-68.513	8.288
ANNUAL	3208	5424	0	128	5424	3336	8760	0	0	128		

MONTH	AVERAGE SPACE TEMP ALL HOURS (F)	COOLING HOURS (F)	HEATING HOURS (F)	FAN ON HOURS (F)	FAN OFF HOURS (F)	AVERAGE TEMPERATURE DIFFERENCE BETWEEN OUTDOOR& ROOM AIR ALL HOURS (F)	BETWEEN OUTDOOR& ROOM AIR FAN ON HOURS (F)	BETWEEN OUTDOOR& ROOM AIR FAN OFF HOURS (F)	SUMMED TEMP DIFFERENCE BETWEEN OUTDOOR& ROOM AIR HEATING HOURS (F)	BETWEEN OUTDOOR& ROOM AIR ALL HOURS (F)	HUMIDITY RATIO DIFFERENCE BETWEEN OUTDOOR AND ROOM AIR (FRAC.OR MULT.)
JAN	74.04		74.04	74.04	0.00	-48.23	-48.23	0.00	1495.16	1495.16	-0.00363
FEB	74.08		74.08	74.08	0.00	-42.40	-42.40	0.00	1187.14	1187.14	-0.00365
MAR	74.54		74.54	74.54	0.00	-34.26	-34.26	0.00	1062.15	1062.15	-0.00362
APR	81.12		81.12	81.12	0.00	-24.35	-24.35	0.00	730.36	730.36	-0.00373
MAY	78.87	71.84	86.36	78.87	0.00	-12.78	-12.78	0.00	354.63	478.73	-0.00244
JUN	71.84	71.84		71.84	0.00	1.81	1.81	0.00		213.21	0.00126
JUL	71.86	71.86		71.86	0.00	5.32	5.32	0.00		215.06	0.00309
AUG	71.85	71.85		71.85	0.00	7.27	7.27	0.00		293.05	0.00178
SEP	71.75	71.82		71.75	0.00	-4.20	-4.20	0.00		303.31	-0.00085
OCT	79.92	71.79	80.23	79.92	0.00	-22.03	-22.03	0.00	676.92	689.18	-0.00372
NOV	75.17		75.17	75.17	0.00	-31.06	-31.06	0.00	931.81	931.81	-0.00368
DEC	74.06		74.06	74.06	0.00	-44.02	-44.02	0.00	1364.50	1364.50	-0.00362
ANNUAL	74.93	71.84	76.85	74.93	0.00	-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

TOTAL HOURS AT TEMPERATURE LEVEL AND TIME OF DAY

HOUR	1AM	2	3	4	5	6	7	8	9	10	11	12	1PM	2	3	4	5	6	7	8	9	10	11	12	TOTAL
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	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	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	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_1&2 FOR NE_ROOMS TOPEKA, KS

TOTAL HOURS AT TEMPERATURE LEVEL AND TIME OF DAY

HOUR	1AM	2	3	4	5	6	7	8	9	10	11	12	1PM	2	3	4	5	6	7	8	9	10	11	12	TOTAL
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	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-A SYSTEM MONTHLY LOADS SUMMARY FOR MZ-ZN_3&4 TOPEKA, KS

	COOLING						HEATING						ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELECTRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000					0.000	-11.336	15	6	-8.F	-9.F	-37.881	2750.	4.665
FEB	0.00000					0.000	-7.861	3	5	-1.F	-2.F	-33.571	2484.	4.665
MAR	0.00000					0.000	-4.768	4	5	14.F	12.F	-26.332	2752.	4.665
APR	0.00000					0.000	-0.421	1	1	32.F	29.F	-15.251	2662.	4.665
MAY	7.46482	16	2	62.F	59.F	51.430	-0.035	8	1	50.F	48.F	-0.680	2750.	4.665
JUN	16.70531	19	17	87.F	76.F	45.504	0.000					0.000	2663.	4.665
JUL	21.08891	17	18	88.F	80.F	50.891	0.000					0.000	2749.	4.665
AUG	20.23787	21	17	95.F	77.F	48.409	0.000					0.000	2752.	4.665
SEP	12.41614	5	18	90.F	77.F	45.965	0.000					0.000	2662.	4.665
OCT	0.32934	1	18	83.F	68.F	28.421	-0.124	2	2	64.F	59.F	-9.923	2749.	4.665
NOV	0.00000					0.000	-2.816	3	5	13.F	12.F	-23.858	2661.	4.665
DEC	0.00000					0.000	-9.277	15	3	4.F	3.F	-31.684	2750.	4.665
TOTAL	78.242						-36.636						32384.	
MAX						51.430						-37.881		4.665

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-C SYSTEM MONTHLY LOAD HOURS FOR MZ-ZN_3&4 TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	-15.722	2.011
FEB	0	672	0	0	672	0	672	0	0	0	-15.317	2.011
MAR	0	744	0	0	744	0	744	0	0	0	-14.588	2.011
APR	0	720	0	0	720	0	720	0	0	0	-0.823	2.011
MAY	380	360	0	4	360	384	744	0	0	4	0.000	2.011
JUN	714	0	0	6	0	720	720	0	0	6	0.000	4.665
JUL	744	0	0	0	0	744	744	0	0	0	0.000	4.665
AUG	744	0	0	0	0	744	744	0	0	0	0.000	4.665
SEP	612	0	0	108	0	720	720	0	0	108	0.000	4.665
OCT	16	720	0	8	720	24	744	0	0	8	0.000	4.665
NOV	0	720	0	0	720	0	720	0	0	0	-16.202	2.011
DEC	0	744	0	0	744	0	744	0	0	0	-12.051	3.190
ANNUAL	3210	5424	0	126	5424	3336	8760	0	0	126		

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-K SPACE TEMPERATURE SUMMARY MZ-ZN_3&4 TOPEKA, KS

	AVERAGE SPACE TEMP					AVERAGE TEMPERATURE DIFFERENCE BETWEEN OUTDOOR& ROOM AIR			SUMMED TEMP DIFFERENCE BETWEEN OUTDOOR& ROOM AIR		
MONTH	ALL HOURS (F)	COOLING HOURS (F)	HEATING HOURS (F)	FAN ON HOURS (F)	FAN OFF HOURS (F)	ALL HOURS (F)	FAN ON HOURS (F)	FAN OFF HOURS (F)	HEATING HOURS (F)	ALL HOURS (F)	HUMIDITY RATIO DIFFERENCE BETWEEN 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	-0.00255
FEB	74.08		74.08	74.08	0.00	-42.40	-42.40	0.00	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	-0.00241
APR	80.02		80.02	80.02	0.00	-23.25	-23.25	0.00	697.60	697.60	-0.00257
MAY	78.98	72.22	86.19	78.98	0.00	-12.89	-12.89	0.00	352.17	479.32	-0.00149
JUN	71.82	71.82		71.82	0.00	1.83	1.83	0.00		213.25	0.00173
JUL	71.83	71.83		71.83	0.00	5.35	5.35	0.00		215.42	0.00333
AUG	71.83	71.83		71.83	0.00	7.30	7.30	0.00		293.30	0.00217
SEP	71.78	71.81		71.78	0.00	-4.24	-4.24	0.00		304.77	0.00002
OCT	82.29	71.80	82.66	82.29	0.00	-24.41	-24.41	0.00	749.61	762.70	-0.00263
NOV	75.66		75.66	75.66	0.00	-31.55	-31.55	0.00	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	-0.00254
ANNUAL	75.08	71.87	77.06	75.08	0.00	-20.78	-20.78	0.00	7851.67	9018.65	-0.00100

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 TV/POOL_RM TOPEKA, KS

TOTAL HOURS AT TEMPERATURE LEVEL AND TIME OF DAY

HOUR	1AM	2	3	4	5	6	7	8	9	10	11	12	1PM	2	3	4	5	6	7	8	9	10	11	12	TOTAL
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	27	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	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

TOTAL HOURS AT TEMPERATURE LEVEL AND TIME OF DAY

HOUR	1AM	2	3	4	5	6	7	8	9	10	11	12	1PM	2	3	4	5	6	7	8	9	10	11	12	TOTAL
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	35	38	37	40	41	41	43	40	44	47	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 1FROM 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	SIZE (MBTU/H)	NUMBER INSTD	AVAIL	SIZE (MBTU/H)	NUMBER INSTD	AVAIL	SIZE (MBTU/H)	NUMBER INSTD	AVAIL	SIZE (MBTU/H)	NUMBER INSTD	AVAIL	SIZE (MBTU/H)	NUMBER INSTD	AVAIL
STM-BOILER	0.179	1	1															
HERM-REC-CHLR	0.103	2	2															

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	35.771	90.629
JAN	PEAK(KBTU)	58.087	232.643
	DY/HR	31/13	15/ 6
	TOTAL(MBTU)	32.159	65.336
FEB	PEAK(KBTU)	58.087	205.008
	DY/HR	28/11	3/ 5
	TOTAL(MBTU)	34.768	43.348
MAR	PEAK(KBTU)	58.087	165.728
	DY/HR	31/11	4/ 5
	TOTAL(MBTU)	32.348	8.531
APR	PEAK(KBTU)	58.087	105.989
	DY/HR	5/ 8	1/ 1
	TOTAL(MBTU)	43.246	1.753
MAY	PEAK(KBTU)	113.673	12.035
	DY/HR	31/18	10/23
	TOTAL(MBTU)	56.064	0.000
JUN	PEAK(KBTU)	113.519	0.000
	DY/HR	27/19	30/ 1
	TOTAL(MBTU)	62.897	0.000
JUL	PEAK(KBTU)	121.901	0.000
	DY/HR	23/16	31/ 1
	TOTAL(MBTU)	62.670	0.000
AUG	PEAK(KBTU)	119.834	0.000
	DY/HR	21/17	31/ 1
	TOTAL(MBTU)	48.402	0.000
SEP	PEAK(KBTU)	113.566	0.000
	DY/HR	5/18	30/ 1
	TOTAL(MBTU)	33.687	7.413
OCT	PEAK(KBTU)	84.867	93.794
	DY/HR	1/17	20/ 8
	TOTAL(MBTU)	33.427	35.607
NOV	PEAK(KBTU)	58.087	158.786
	DY/HR	30/20	3/ 5
	TOTAL(MBTU)	35.647	79.965
DEC	PEAK(KBTU)	58.087	204.990
	DY/HR	31/22	15/ 2
	ONE YEAR	511.088	332.581
	USE/PEAK	121.901	232.643

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
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.

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                    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.) ..
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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
```

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                    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. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 6/12/1995 13:18: 7 SDL RUN 1
DENVER, CO 80227 RUN #1 NIGHT SETBACK FOR BLDG #409 ENL BARRACKS W/AS
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR MZ-ZN_1&2 TOPEKA, KS

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-44.767	15	6	-8.F	-9.F	-158.822	6908.	11.194
FEB	0.00000					0.000	-29.927	3	5	-1.F	-2.F	-139.190	6240.	11.194
MAR	0.00000					0.000	-18.265	4	5	14.F	12.F	-111.514	6911.	11.194
APR	0.00000					0.000	-2.723	5	5	31.F	29.F	-60.163	6687.	11.194
MAY	24.47659	31	18	90.F	76.F	137.196	-0.350	10	23	60.F	56.F	-4.689	6908.	11.194
JUN	59.06521	27	17	89.F	77.F	143.185	0.000					0.000	6688.	11.194
JUL	73.11463	23	18	95.F	79.F	152.921	0.000					0.000	6907.	11.194
AUG	69.58331	22	17	95.F	77.F	145.963	0.000					0.000	6911.	11.194
SEP	38.96878	5	18	90.F	77.F	132.747	0.000					0.000	6687.	11.194
OCT	0.70920	1	18	83.F	68.F	73.346	-2.513	20	5	25.F	25.F	-72.644	6907.	11.194
NOV	0.00000					0.000	-15.512	3	5	13.F	12.F	-108.116	6685.	11.194
DEC	0.00000					0.000	-38.599	13	6	2.F	1.F	-138.847	6908.	11.194
TOTAL	265.917						-152.655						81351.	
MAX						152.921						-158.822		11.194

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 6/12/1995 13:18: 7 SDL RUN 1
DENVER, CO 80227 RUN #1 NIGHT SETBACK FOR BLDG #409 ENL BARRACKS W/AS
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR MZ-ZN_1&2 TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	-9.147	5.963
FEB	0	670	0	2	672	0	672	0	0	2	-7.102	5.963
MAR	0	672	0	72	744	0	744	0	0	72	-3.390	5.963
APR	0	421	0	299	720	0	720	0	0	299	-4.626	5.963
MAY	384	177	0	183	360	384	744	0	0	183	0.000	11.194
JUN	720	0	0	0	0	720	720	0	0	0	0.000	11.194
JUL	744	0	0	0	0	744	744	0	0	0	0.000	11.194
AUG	744	0	0	0	0	744	744	0	0	0	0.000	11.194
SEP	671	0	0	49	0	720	720	0	0	49	0.000	11.194
OCT	16	471	0	257	720	24	744	0	0	257	0.000	11.194
NOV	0	627	0	93	720	0	720	0	0	93	-17.212	5.963
DEC	0	744	0	0	744	0	744	0	0	0	-22.691	8.288
ANNUAL	3279	4526	0	955	5424	3336	8760	0	0	955		

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
REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	35.750	83.978
JAN	PEAK(KBTU)	58.590	262.395
	DY/HR	31/14	15/ 6
	TOTAL(MBTU)	32.024	59.166
FEB	PEAK(KBTU)	58.590	237.250
	DY/HR	28/12	3/ 6
	TOTAL(MBTU)	34.573	37.875
MAR	PEAK(KBTU)	58.590	205.279
	DY/HR	31/12	4/ 6
	TOTAL(MBTU)	32.247	6.593
APR	PEAK(KBTU)	58.590	127.532
	DY/HR	5/ 8	1/ 5
	TOTAL(MBTU)	43.247	1.242
MAY	PEAK(KBTU)	113.543	12.338
	DY/HR	31/18	10/23
	TOTAL(MBTU)	56.153	0.000
JUN	PEAK(KBTU)	113.435	0.000
	DY/HR	27/19	30/ 1
	TOTAL(MBTU)	62.926	0.000
JUL	PEAK(KBTU)	121.764	0.000
	DY/HR	23/16	31/ 1
	TOTAL(MBTU)	62.701	0.000
AUG	PEAK(KBTU)	119.602	0.000
	DY/HR	21/17	31/ 1
	TOTAL(MBTU)	48.643	0.000
SEP	PEAK(KBTU)	113.460	0.000
	DY/HR	5/18	30/ 1
	TOTAL(MBTU)	33.622	5.977
OCT	PEAK(KBTU)	93.240	115.904
	DY/HR	1/18	20/ 5
	TOTAL(MBTU)	33.249	30.802
NOV	PEAK(KBTU)	58.590	200.546
	DY/HR	30/20	3/ 5
	TOTAL(MBTU)	35.568	73.358
DEC	PEAK(KBTU)	58.590	239.898
	DY/HR	31/21	13/ 6
	ONE YEAR	510.701	298.992
	USE/PEAK	121.764	262.395

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.) ..
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```
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_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 #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. EZDOE - 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

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-42.631	15	6	-8.F	-9.F	-130.790	6908.	11.194
FEB	0.00000					0.000	-27.723	3	5	-1.F	-2.F	-109.663	6240.	11.194
MAR	0.00000					0.000	-15.679	4	5	14.F	12.F	-82.232	6911.	11.194
APR	0.00000					0.000	-1.909	1	1	32.F	29.F	-42.452	6687.	11.194
MAY	19.97078	31	18	90.F	76.F	125.130	-0.349	10	23	60.F	56.F	-4.689	6908.	11.194
JUN	50.25921	27	17	89.F	77.F	130.811	0.000					0.000	6688.	11.194
JUL	63.75431	23	17	97.F	79.F	141.901	0.000					0.000	6907.	11.194
AUG	60.45490	22	17	95.F	77.F	133.830	0.000					0.000	6911.	11.194
SEP	31.18378	5	18	90.F	77.F	120.005	0.000					0.000	6687.	11.194
OCT	0.44644	1	18	83.F	68.F	56.906	-1.559	20	8	23.F	22.F	-47.019	6907.	11.194
NOV	0.00000					0.000	-13.381	3	5	13.F	12.F	-78.936	6685.	11.194
DEC	0.00000					0.000	-36.234	15	2	3.F	2.F	-111.339	6908.	11.194
TOTAL	226.069						-139.467						81351.	
MAX						141.901						-130.790		11.194

EMC ENGINEERS INC. EZDOE - 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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	-48.207	5.963
FEB	0	659	0	13	672	0	672	0	0	13	-44.574	5.963
MAR	0	613	0	131	744	0	744	0	0	131	-41.418	5.963
APR	0	394	0	326	720	0	720	0	0	326	-4.626	5.963
MAY	384	176	0	184	360	384	744	0	0	184	0.000	11.194
JUN	719	0	0	1	0	720	720	0	0	1	0.000	11.194
JUL	744	0	0	0	0	744	744	0	0	0	0.000	11.194
AUG	744	0	0	0	0	744	744	0	0	0	0.000	11.194
SEP	615	0	0	105	0	720	720	0	0	105	0.000	11.194
OCT	14	440	0	290	720	24	744	0	0	290	0.000	11.194
NOV	0	579	0	141	720	0	720	0	0	141	-54.599	5.963
DEC	0	739	0	5	744	0	744	0	0	5	-59.243	8.288
ANNUAL	3220	4344	0	1196	5424	3336	8760	0	0	1196		

EMC ENGINEERS INC. EZDOE - 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

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-9.376	15	6	-8.F	-9.F	-35.569	2750.	4.665
FEB	0.00000					0.000	-6.149	3	5	-1.F	-2.F	-31.171	2484.	4.665
MAR	0.00000					0.000	-3.091	4	5	14.F	12.F	-23.809	2752.	4.665
APR	0.00000					0.000	-0.129	1	1	32.F	29.F	-12.350	2662.	4.665
MAY	6.18017	16	2	62.F	59.F	51.430	-0.027	8	1	50.F	48.F	-0.659	2750.	4.665
JUN	14.29015	27	19	88.F	76.F	41.653	0.000					0.000	2663.	4.665
JUL	18.43104	17	18	88.F	80.F	46.906	0.000					0.000	2749.	4.665
AUG	17.69712	21	17	95.F	77.F	44.654	0.000					0.000	2752.	4.665
SEP	10.25095	5	18	90.F	77.F	42.046	0.000					0.000	2662.	4.665
OCT	0.24603	1	18	83.F	68.F	23.707	-0.049	19	23	32.F	29.F	-0.734	2749.	4.665
NOV	0.00000					0.000	-1.494	3	5	13.F	12.F	-20.882	2661.	4.665
DEC	0.00000					0.000	-7.323	15	3	4.F	3.F	-29.202	2750.	4.665
TOTAL	67.095						-27.638						32384.	
MAX						51.430						-35.569		4.665

EMC ENGINEERS INC. EZDOE - 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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	717	0	27	744	0	744	0	0	27	-12.939	2.011
FEB	0	623	0	49	672	0	672	0	0	49	-11.647	2.011
MAR	0	491	0	253	744	0	744	0	0	253	-11.641	2.011
APR	0	261	0	459	720	0	720	0	0	459	-0.802	2.011
MAY	370	131	0	243	360	384	744	0	0	243	0.000	2.011
JUN	711	0	0	9	0	720	720	0	0	9	0.000	4.665
JUL	744	0	0	0	0	744	744	0	0	0	0.000	4.665
AUG	744	0	0	0	0	744	744	0	0	0	0.000	4.665
SEP	626	0	0	94	0	720	720	0	0	94	0.000	4.665
OCT	16	259	0	469	720	24	744	0	0	469	0.000	4.665
NOV	0	362	0	358	720	0	720	0	0	358	-13.393	2.011
DEC	0	656	0	88	744	0	744	0	0	88	-9.299	3.190
ANNUAL	3211	3500	0	2049	5424	3336	8760	0	0	2049		

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
REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	35.472	78.122
JAN	PEAK(KBTU)	57.846	218.429
	DY/HR	31/12	15/ 6
	TOTAL(MBTU)	31.847	53.859
FEB	PEAK(KBTU)	57.846	190.221
	DY/HR	28/10	3/ 5
	TOTAL(MBTU)	34.305	31.295
MAR	PEAK(KBTU)	57.846	150.481
	DY/HR	31/10	4/ 5
	TOTAL(MBTU)	32.153	4.557
APR	PEAK(KBTU)	56.732	89.251
	DY/HR	5/ 8	1/ 1
	TOTAL(MBTU)	41.578	1.136
MAY	PEAK(KBTU)	108.678	11.769
	DY/HR	31/18	10/23
	TOTAL(MBTU)	52.754	0.000
JUN	PEAK(KBTU)	108.625	0.000
	DY/HR	27/19	30/ 1
	TOTAL(MBTU)	59.349	0.000
JUL	PEAK(KBTU)	116.817	0.000
	DY/HR	23/16	31/ 1
	TOTAL(MBTU)	59.180	0.000
AUG	PEAK(KBTU)	114.465	0.000
	DY/HR	21/17	31/ 1
	TOTAL(MBTU)	45.666	0.000
SEP	PEAK(KBTU)	108.444	0.000
	DY/HR	5/18	30/ 1
	TOTAL(MBTU)	33.424	3.965
OCT	PEAK(KBTU)	79.978	79.697
	DY/HR	1/18	20/ 8
	TOTAL(MBTU)	33.050	25.538
NOV	PEAK(KBTU)	57.846	143.217
	DY/HR	30/20	3/ 5
	TOTAL(MBTU)	35.307	67.172
DEC	PEAK(KBTU)	57.846	189.885
	DY/HR	31/22	15/ 2
	ONE YEAR	494.085	265.643
	USE/PEAK	116.817	218.429

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
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

EMC ENGINEERS, INC.

DENVER - ATLANTA

PROJECT:	FEASIBILITY STUDY FOR INSTALLATION OF UMCS	EMC NO:	1406-001
		CALC. BY:	AJN
LOCATION:	FORT RILEY, KANSAS	CHECKED BY:	CEL
		DATE:	05-Jul-95
BUILDING NO.:	7108		
BLDG. TYPE:	BN ADMIN & CLRM		

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 FT²
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	NIGHTIME 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

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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  ..
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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  ..
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 $ 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 ..
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          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 ..
```

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 - - - - U-VALUE (BTU/HR-SQFT-F)	AREA (SQFT)	- - - - W A L L - - - - 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	0.000	0.00	0.065	190.00	0.065	190.00	NORTH
	SPACE_3	0.000	0.00	0.065	360.00	0.065	360.00	NORTH
	SPACE_4	0.000	0.00	0.065	220.00	0.065	220.00	NORTH
	PLENUM_1	0.000	0.00	0.094	429.00	0.094	429.00	NORTH
	SPACE_4	0.000	0.00	0.103	420.00	0.103	420.00	EAST
	PLENUM_1	0.000	0.00	0.094	924.00	0.094	924.00	EAST
	SPACE_1	0.490	133.65	0.103	1136.35	0.144	1270.00	EAST
	SPACE_2	0.000	0.00	0.065	420.00	0.065	420.00	SOUTH
	PLENUM_1	0.000	0.00	0.094	429.00	0.094	429.00	SOUTH
	SPACE_1	0.000	0.00	0.065	360.00	0.065	360.00	SOUTH
	PLENUM_1	0.000	0.00	0.094	924.00	0.094	924.00	WEST
	SPACE_2	0.490	74.25	0.103	695.75	0.141	770.00	WEST
	SPACE_3	0.490	29.70	0.103	880.30	0.116	910.00	WEST
	PLENUM_1	0.000	0.00	0.128	17160.00	0.128	17160.00	ROOF
	SPACE_1	0.000	0.00	0.020	4445.00	0.020	4445.00	UNDERGRND
	SPACE_2	0.000	0.00	0.020	3234.00	0.020	3234.00	UNDERGRND
	SPACE_3	0.000	0.00	0.020	3570.00	0.020	3570.00	UNDERGRND
	SPACE_4	0.000	0.00	0.020	924.00	0.020	924.00	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
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	0.000	0.076	0.076	0.00	1199.00	1199.00
EAST	0.490	0.100	0.120	133.65	2480.35	2614.00
SOUTH	0.000	0.076	0.076	0.00	1209.00	1209.00
WEST	0.490	0.100	0.115	103.95	2500.05	2604.00
ROOF	0.000	0.128	0.128	0.00	17160.00	17160.00
ALL WALLS	0.490	0.092	0.104	237.60	7388.40	7626.00
WALLS+ROOFS	0.490	0.117	0.120	237.60	24548.40	24786.00
UNDERGRND	0.000	0.020	0.020	0.00	12173.00	12173.00
BUILDING	0.490	0.085	0.087	237.60	36721.40	36959.00

*** BUILDING ***

FLOOR AREA	12179	SQFT	1131	SQMT
VOLUME	188775	CUFT	5346	CUMT

	COOLING LOAD		HEATING LOAD	
TIME	AUG 24	6PM	JAN 16	6AM
DRY-BULB TEMP	93F	34C	10F	-12C
WET-BULB TEMP	76F	24C	8F	-13C

	SENSIBLE (KBTU/H)	SENSIBLE (KW)	LATENT (KBTU/H)	LATENT (KW)	SENSIBLE (KBTU/H)	SENSIBLE (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	-20.191 KW
TOTAL LOAD / AREA	11.32BTU/H.SQFT		35.690 W /SQMT		5.661BTU/H.SQFT	17.845 W /SQMT

```
**********************************************************************
*                                                                    *
*  NOTE  1)THE ABOVE LOADS EXCLUDE OUTSIDE VENTILATION AIR           *
*  ----     LOADS                                                    *
*        2)TIMES GIVEN IN STANDARD TIME FOR THE LOCATION             *
*          IN CONSIDERATION                                          *
*                                                                    *
**********************************************************************
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EMC ENGINEERS INC. EZDOE - 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-A SYSTEM MONTHLY LOADS SUMMARY FOR MZ-FAN-SYS TOPEKA, KS

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-6.F	-7.F	-273.478	10918.	27.438
FEB	0.00000					0.000	-69.797	3	5	-1.F	-2.F	-240.197	9869.	27.438
MAR	0.00000					0.000	-50.681	3	5	15.F	13.F	-193.289	11411.	27.438
APR	0.00000					0.000	-13.714	5	5	31.F	29.F	-129.702	10732.	27.438
MAY	30.68973	31	18	90.F	76.F	278.564	-2.152	9	5	45.F	44.F	-79.934	10918.	27.438
JUN	76.41174	29	15	88.F	75.F	274.997	0.000					0.000	10979.	27.438
JUL	94.50362	7	18	83.F	74.F	300.327	0.000					0.000	10671.	27.438
AUG	96.42191	4	17	92.F	70.F	290.192	0.000					0.000	11411.	27.438
SEP	48.79247	7	15	92.F	76.F	264.794	0.000					0.000	10732.	27.438
OCT	0.17299	1	18	83.F	68.F	43.344	-11.298	20	5	25.F	25.F	-140.569	10671.	27.438
NOV	0.00000					0.000	-42.580	3	5	13.F	12.F	-186.719	10486.	27.438
DEC	0.00000					0.000	-84.120	15	5	8.F	7.F	-233.355	10918.	27.438
TOTAL	346.993						-369.476						129722.	
MAX						300.327						-273.478		27.438

EMC ENGINEERS INC. EZDOE - 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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	-117.027	7.716
FEB	0	672	0	0	672	0	672	0	0	0	-119.979	7.716
MAR	0	744	0	0	744	0	744	0	0	0	-116.748	7.716
APR	0	720	0	0	720	0	720	0	0	0	-0.036	7.716
MAY	311	360	0	73	360	384	744	0	0	73	0.000	27.438
JUN	664	0	0	56	0	720	720	0	0	56	0.000	27.438
JUL	736	0	0	8	0	744	744	0	0	8	0.000	27.438
AUG	727	0	0	17	0	744	744	0	0	17	0.000	27.438
SEP	491	0	0	229	0	720	720	0	0	229	0.000	27.438
OCT	6	720	0	18	720	24	744	0	0	18	0.000	7.716
NOV	0	720	0	0	720	0	720	0	0	0	-140.023	7.716
DEC	0	744	0	0	744	0	744	0	0	0	-156.261	7.716
ANNUAL	2935	5424	0	401	5424	3336	8760	0	0	401		

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	42.281	133.874
JAN	PEAK(KBTU)	100.921	343.935
	DY/HR	31/10	15/ 8
	TOTAL(MBTU)	38.039	101.619
FEB	PEAK(KBTU)	100.921	308.672
	DY/HR	28/10	3/ 5
	TOTAL(MBTU)	42.820	76.464
MAR	PEAK(KBTU)	100.921	257.615
	DY/HR	31/ 9	3/ 5
	TOTAL(MBTU)	38.610	23.349
APR	PEAK(KBTU)	100.921	185.869
	DY/HR	15/ 8	5/ 5
	TOTAL(MBTU)	49.771	4.490
MAY	PEAK(KBTU)	189.118	127.682
	DY/HR	31/18	9/ 5
	TOTAL(MBTU)	66.518	0.000
JUN	PEAK(KBTU)	188.307	0.000
	DY/HR	28/16	30/ 1
	TOTAL(MBTU)	72.114	0.000
JUL	PEAK(KBTU)	193.603	0.000
	DY/HR	22/16	31/ 1
	TOTAL(MBTU)	76.150	0.000
AUG	PEAK(KBTU)	199.465	0.000
	DY/HR	11/16	31/ 1
	TOTAL(MBTU)	55.884	0.000
SEP	PEAK(KBTU)	189.212	0.000
	DY/HR	7/16	30/ 1
	TOTAL(MBTU)	38.403	19.871
OCT	PEAK(KBTU)	100.921	198.337
	DY/HR	20/10	20/ 5
	TOTAL(MBTU)	39.237	64.890
NOV	PEAK(KBTU)	100.921	250.336
	DY/HR	30/11	3/ 5
	TOTAL(MBTU)	42.209	121.051
DEC	PEAK(KBTU)	100.921	301.323
	DY/HR	30/18	15/ 5
	ONE YEAR	602.036	545.608
	USE/PEAK	199.465	343.935

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
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/SQFT-YR NET-AREA
TOTAL SOURCE ENERGY 2353.52 MBTU 191.8 KBTU/SQFT-YR GROSS-AREA 193.2 KBTU/SQFT-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 $
              $---------------------------------------$

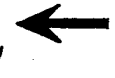
                 $ GENERAL PROJECT DATA

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.)
```



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                          (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
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                    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
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                    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.) ..
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EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 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

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-76.286	15	7	-7.F	-8.F	-357.783	8286.	27.438
FEB	0.00000					0.000	-56.537	3	7	-5.F	-6.F	-349.900	7493.	27.438
MAR	0.00000					0.000	-40.338	4	7	14.F	12.F	-337.881	8780.	27.438
APR	0.00000					0.000	-12.067	5	6	31.F	28.F	-313.756	8186.	27.438
MAY	24.82872	31	18	90.F	76.F	279.010	-2.234	9	6	44.F	44.F	-177.382	8288.	28.486
JUN	61.75295	29	15	88.F	75.F	281.268	0.000					0.000	8433.	27.438
JUL	75.18604	7	18	83.F	74.F	304.253	0.000					0.000	8040.	27.438
AUG	77.02224	4	17	92.F	70.F	294.195	0.000					0.000	8780.	27.438
SEP	39.93212	7	16	93.F	76.F	268.403	0.000					0.000	8188.	27.438
OCT	0.11945	1	18	83.F	68.F	42.766	-9.572	20	6	24.F	23.F	-316.584	8040.	27.438
NOV	0.00000					0.000	-34.039	3	7	19.F	17.F	-337.925	7940.	27.438
DEC	0.00000					0.000	-68.145	15	7	11.F	9.F	-344.684	8286.	27.438
TOTAL	278.841						-299.217						98739.	
MAX						304.253						-357.783		28.486

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	403	0	341	744	0	403	0	0	0	0.000	0.000
FEB	0	363	0	309	672	0	364	0	0	1	0.000	0.000
MAR	0	390	0	354	744	0	403	0	0	13	0.000	0.000
APR	0	322	0	398	720	0	390	0	0	68	0.000	0.000
MAY	187	138	0	419	360	384	403	0	0	78	0.000	27.438
JUN	375	0	0	345	0	720	390	0	0	15	0.000	27.438
JUL	403	0	0	341	0	744	403	0	0	0	0.000	27.438
AUG	403	0	0	341	0	744	403	0	0	0	0.000	27.438
SEP	293	0	0	427	0	720	390	0	0	97	0.000	27.438
OCT	4	314	0	426	720	24	403	0	0	85	0.000	7.716
NOV	0	356	0	364	720	0	390	0	0	34	0.000	0.000
DEC	0	403	0	341	744	0	403	0	0	0	0.000	0.000
ANNUAL	1665	2689	0	4406	5424	3336	4745	0	0	391		

EMC ENGINEERS INC. EZDOE - 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
REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	31.871	104.869
JAN	PEAK(KBTU)	103.151	449.959
	DY/HR	31/12	15/ 7
	TOTAL(MBTU)	28.671	79.861
FEB	PEAK(KBTU)	103.151	441.685
	DY/HR	28/12	3/ 7
	TOTAL(MBTU)	32.618	58.621
MAR	PEAK(KBTU)	103.151	429.002
	DY/HR	31/11	4/ 7
	TOTAL(MBTU)	29.279	19.292
APR	PEAK(KBTU)	103.151	403.304
	DY/HR	15/ 9	5/ 6
	TOTAL(MBTU)	37.682	4.096
MAY	PEAK(KBTU)	189.750	252.012
	DY/HR	31/18	9/ 6
	TOTAL(MBTU)	50.509	0.000
JUN	PEAK(KBTU)	189.762	0.000
	DY/HR	28/16	30/ 1
	TOTAL(MBTU)	53.984	0.000
JUL	PEAK(KBTU)	195.191	0.000
	DY/HR	22/16	31/ 1
	TOTAL(MBTU)	57.683	0.000
AUG	PEAK(KBTU)	201.143	0.000
	DY/HR	11/16	31/ 1
	TOTAL(MBTU)	42.634	0.000
SEP	PEAK(KBTU)	190.640	0.000
	DY/HR	7/16	30/ 1
	TOTAL(MBTU)	28.771	15.942
OCT	PEAK(KBTU)	103.151	406.334
	DY/HR	31/ 9	20/ 6
	TOTAL(MBTU)	29.479	50.081
NOV	PEAK(KBTU)	103.151	429.048
	DY/HR	30/13	3/ 7
	TOTAL(MBTU)	31.778	95.154
DEC	PEAK(KBTU)	103.151	436.190
	DY/HR	30/18	15/ 7
	ONE YEAR	454.958	427.917
	USE/PEAK	201.143	449.959

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/SQFT-YR GROSS-AREA 72.5 KBTU/SQFT-YR NET-AREA
TOTAL SOURCE ENERGY 1794.16 MBTU 146.2 KBTU/SQFT-YR GROSS-AREA 147.3 KBTU/SQFT-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  ..


$ 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 8:13: 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

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-83.388	15	8	-6.F	-7.F	-259.654	10918.	27.438
FEB	0.00000					0.000	-59.224	3	5	-1.F	-2.F	-225.835	9869.	27.438
MAR	0.00000					0.000	-39.818	3	5	15.F	13.F	-177.086	11411.	27.438
APR	0.00000					0.000	-8.014	5	5	31.F	29.F	-112.071	10732.	27.438
MAY	23.60585	31	18	90.F	76.F	273.245	-1.108	9	5	45.F	44.F	-36.997	10918.	27.438
JUN	63.63251	29	15	88.F	75.F	270.306	0.000					0.000	10979.	27.438
JUL	80.88409	7	18	83.F	74.F	319.355	0.000					0.000	10671.	27.438
AUG	83.24850	4	18	92.F	70.F	306.622	0.000					0.000	11411.	27.438
SEP	37.76545	7	16	93.F	76.F	255.437	0.000					0.000	10732.	27.438
OCT	0.00000	1	20	70.F	64.F	0.001	-5.579	20	5	25.F	25.F	-111.177	10671.	27.438
NOV	0.00000					0.000	-33.100	3	5	13.F	12.F	-172.275	10486.	27.438
DEC	0.00000					0.000	-72.337	15	2	3.F	2.F	-218.468	10918.	27.438
TOTAL	289.137						-302.568						129722.	
MAX						319.355						-259.654		27.438

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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	734	0	10	744	0	744	0	0	10	-96.903	7.716
FEB	0	660	0	12	672	0	672	0	0	12	-98.216	7.716
MAR	0	676	0	68	744	0	744	0	0	68	-95.868	7.716
APR	0	473	0	247	720	0	720	0	0	247	0.000	7.716
MAY	256	168	0	320	360	384	744	0	0	320	0.000	27.438
JUN	620	0	0	100	0	720	720	0	0	100	0.000	27.438
JUL	710	0	0	34	0	744	744	0	0	34	0.000	27.438
AUG	710	0	0	34	0	744	744	0	0	34	0.000	27.438
SEP	424	0	0	296	0	720	720	0	0	296	0.000	27.438
OCT	1	393	0	350	720	24	744	0	0	350	0.000	7.716
NOV	0	597	0	123	720	0	720	0	0	123	-124.366	7.716
DEC	0	731	0	13	744	0	744	0	0	13	-140.990	7.716
ANNUAL	2721	4432	0	1607	5424	3336	8760	0	0	1607		

EMC ENGINEERS INC. EZDOE - 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
REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	41.885	118.361
JAN	PEAK(KBTU)	100.555	326.549
	DY/HR	31/10	15/ 8
	TOTAL(MBTU)	37.630	87.334
FEB	PEAK(KBTU)	100.555	290.688
	DY/HR	28/10	3/ 5
	TOTAL(MBTU)	42.160	60.718
MAR	PEAK(KBTU)	100.555	237.466
	DY/HR	31/ 9	3/ 5
	TOTAL(MBTU)	37.865	13.900
APR	PEAK(KBTU)	100.555	163.678
	DY/HR	5/ 8	5/ 5
	TOTAL(MBTU)	47.231	2.246
MAY	PEAK(KBTU)	190.643	63.050
	DY/HR	31/18	9/ 5
	TOTAL(MBTU)	63.191	0.000
JUN	PEAK(KBTU)	189.581	0.000
	DY/HR	28/16	30/ 1
	TOTAL(MBTU)	68.657	0.000
JUL	PEAK(KBTU)	196.192	0.000
	DY/HR	22/16	31/ 1
	TOTAL(MBTU)	72.938	0.000
AUG	PEAK(KBTU)	206.254	0.000
	DY/HR	11/16	31/ 1
	TOTAL(MBTU)	52.454	0.000
SEP	PEAK(KBTU)	189.902	0.000
	DY/HR	7/16	30/ 1
	TOTAL(MBTU)	37.410	10.030
OCT	PEAK(KBTU)	100.555	162.641
	DY/HR	20/ 9	20/ 5
	TOTAL(MBTU)	38.565	50.911
NOV	PEAK(KBTU)	100.555	232.116
	DY/HR	30/ 9	3/ 5
	TOTAL(MBTU)	41.798	105.386
DEC	PEAK(KBTU)	100.555	282.760
	DY/HR	30/18	15/ 2
	ONE YEAR	581.783	448.885
	USE/PEAK	206.254	326.549

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

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 #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.)
```

```
                          (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
                      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
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR MZ-FAN-SYS TOPEKA, KS

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-72.294	15	6	-8.F	-9.F	-343.803	8286.	27.438
FEB	0.00000					0.000	-53.879	3	6	-1.F	-2.F	-338.988	7493.	27.438
MAR	0.00000					0.000	-40.477	4	6	14.F	12.F	-327.051	8780.	27.438
APR	0.00000					0.000	-14.530	5	6	31.F	28.F	-257.431	8186.	27.438
MAY	20.61729	31	18	90.F	76.F	270.260	-3.682	1	6	37.F	37.F	-205.377	8289.	29.589
JUN	55.40369	29	15	88.F	75.F	273.388	0.000					0.000	8434.	28.983
JUL	71.55746	7	18	83.F	74.F	298.085	0.000					0.000	8040.	27.438
AUG	73.18030	4	17	92.F	70.F	291.513	0.000					0.000	8780.	27.438
SEP	36.54521	7	16	93.F	76.F	259.242	0.000					0.000	8188.	29.325
OCT	0.12637	1	18	83.F	68.F	42.923	-11.874	20	6	24.F	23.F	-275.227	8040.	27.438
NOV	0.00000					0.000	-34.186	3	6	13.F	12.F	-328.386	7940.	27.438
DEC	0.00000					0.000	-64.897	12	6	3.F	2.F	-334.846	8286.	27.438
TOTAL	257.431						-295.819						98742.	
MAX						298.085						-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
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR MZ-FAN-SYS TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	403	0	341	744	0	403	0	0	0	0.000	0.000
FEB	0	364	0	308	672	0	364	0	0	0	0.000	0.000
MAR	0	403	0	341	744	0	403	0	0	0	0.000	0.000
APR	0	324	0	396	720	0	390	0	0	66	0.000	0.000
MAY	160	134	0	450	360	384	403	0	0	109	0.000	27.438
JUN	352	0	0	368	0	720	390	0	0	38	0.000	27.438
JUL	396	0	0	348	0	744	403	0	0	7	0.000	27.438
AUG	396	0	0	348	0	744	403	0	0	7	0.000	27.438
SEP	262	0	0	458	0	720	390	0	0	128	0.000	27.438
OCT	4	318	0	422	720	24	403	0	0	81	0.000	7.716
NOV	0	370	0	350	720	0	390	0	0	20	0.000	0.000
DEC	0	403	0	341	744	0	403	0	0	0	0.000	0.000
ANNUAL	1570	2719	0	4471	5424	3336	4745	0	0	456		

REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	31.742	99.860
JAN	PEAK(KBTU)	102.781	432.378
	DY/HR	31/12	15/ 6
	TOTAL(MBTU)	28.552	76.340
FEB	PEAK(KBTU)	102.781	427.327
	DY/HR	28/12	3/ 6
	TOTAL(MBTU)	32.625	58.921
MAR	PEAK(KBTU)	102.781	414.748
	DY/HR	31/11	4/ 6
	TOTAL(MBTU)	29.372	22.730
APR	PEAK(KBTU)	102.781	339.759
	DY/HR	25/ 7	5/ 6
	TOTAL(MBTU)	36.349	6.167
MAY	PEAK(KBTU)	187.202	281.874
	DY/HR	31/18	1/ 6
	TOTAL(MBTU)	48.645	0.000
JUN	PEAK(KBTU)	187.171	0.000
	DY/HR	28/16	30/ 1
	TOTAL(MBTU)	52.849	0.000
JUL	PEAK(KBTU)	192.329	0.000
	DY/HR	22/16	31/ 1
	TOTAL(MBTU)	56.476	0.000
AUG	PEAK(KBTU)	198.964	0.000
	DY/HR	11/16	31/ 1
	TOTAL(MBTU)	41.412	0.000
SEP	PEAK(KBTU)	187.908	0.000
	DY/HR	7/16	30/ 1
	TOTAL(MBTU)	28.895	19.329
OCT	PEAK(KBTU)	102.781	359.193
	DY/HR	31/ 9	20/ 6
	TOTAL(MBTU)	29.504	50.464
NOV	PEAK(KBTU)	102.781	416.159
	DY/HR	30/12	3/ 6
	TOTAL(MBTU)	31.641	90.888
DEC	PEAK(KBTU)	102.781	422.972
	DY/HR	30/18	12/ 6
	ONE YEAR	448.061	424.700
	USE/PEAK	198.964	432.378

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	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.) ..
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```
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  ..
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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 NIGHTIME INFILT. FOR BLDG. #7108 BN ADMIN & CLRM
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR MZ-FAN-SYS TOPEKA, KS

	COOLING						HEATING						ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-82.443	15	8	-6.F	-7.F	-272.958	10918.	27.438
FEB	0.00000					0.000	-59.633	3	6	-1.F	-2.F	-223.503	9869.	27.438
MAR	0.00000					0.000	-41.478	6	8	26.F	25.F	-182.113	11411.	27.438
APR	0.00000					0.000	-9.962	5	6	31.F	28.F	-110.904	10732.	27.438
MAY	31.06560	31	18	90.F	76.F	278.567	-1.335	9	6	44.F	44.F	-56.720	10918.	27.438
JUN	73.35986	29	15	88.F	75.F	274.988	0.000					0.000	10979.	27.438
JUL	88.47661	7	18	83.F	74.F	300.323	0.000					0.000	10671.	27.438
AUG	91.48322	4	17	92.F	70.F	290.490	0.000					0.000	11411.	27.438
SEP	48.36908	7	15	92.F	76.F	264.802	0.000					0.000	10732.	27.438
OCT	0.27038	1	18	83.F	68.F	56.456	-7.796	20	6	24.F	23.F	-122.327	10671.	27.438
NOV	0.00000					0.000	-34.798	12	7	21.F	20.F	-170.750	10486.	27.438
DEC	0.00000					0.000	-72.499	12	6	3.F	2.F	-212.158	10918.	27.438
TOTAL	333.025						-309.939						129722.	
MAX						300.323						-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 NIGHTIME INFILT. FOR BLDG. #7108 BN ADMIN & CLRM
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR MZ-FAN-SYS TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	-86.034	7.716
FEB	0	672	0	0	672	0	672	0	0	0	-88.026	7.716
MAR	0	744	0	0	744	0	744	0	0	0	-85.579	7.716
APR	0	720	0	0	720	0	720	0	0	0	-0.037	7.716
MAY	327	360	0	57	360	384	744	0	0	57	0.000	27.438
JUN	680	0	0	40	0	720	720	0	0	40	0.000	27.438
JUL	739	0	0	5	0	744	744	0	0	5	0.000	27.438
AUG	733	0	0	11	0	744	744	0	0	11	0.000	27.438
SEP	527	0	0	193	0	720	720	0	0	193	0.000	27.438
OCT	8	720	0	16	720	24	744	0	0	16	0.000	7.716
NOV	0	720	0	0	720	0	720	0	0	0	-104.373	7.716
DEC	0	744	0	0	744	0	744	0	0	0	-122.944	7.716
ANNUAL	3014	5424	0	322	5424	3336	8760	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 NIGHTIME INFILT. FOR BLDG. #7108 BN ADMIN & CLRM
REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	42.253	119.297
JAN	PEAK(KBTU)	100.907	343.282
	DY/HR	31/10	15/ 8
	TOTAL(MBTU)	37.992	89.637
FEB	PEAK(KBTU)	100.907	290.591
	DY/HR	28/10	3/ 6
	TOTAL(MBTU)	42.586	64.529
MAR	PEAK(KBTU)	100.907	245.135
	DY/HR	31/ 9	6/ 8
	TOTAL(MBTU)	38.387	17.780
APR	PEAK(KBTU)	100.907	164.035
	DY/HR	15/ 8	5/ 6
	TOTAL(MBTU)	49.986	3.161
MAY	PEAK(KBTU)	189.118	95.412
	DY/HR	31/18	9/ 6
	TOTAL(MBTU)	65.837	0.000
JUN	PEAK(KBTU)	188.305	0.000
	DY/HR	28/16	30/ 1
	TOTAL(MBTU)	70.553	0.000
JUL	PEAK(KBTU)	193.600	0.000
	DY/HR	22/16	31/ 1
	TOTAL(MBTU)	74.859	0.000
AUG	PEAK(KBTU)	199.463	0.000
	DY/HR	11/16	31/ 1
	TOTAL(MBTU)	56.135	0.000
SEP	PEAK(KBTU)	189.209	0.000
	DY/HR	7/16	30/ 1
	TOTAL(MBTU)	38.206	14.469
OCT	PEAK(KBTU)	100.907	177.291
	DY/HR	20/10	20/ 6
	TOTAL(MBTU)	39.061	54.885
NOV	PEAK(KBTU)	100.907	232.439
	DY/HR	30/11	12/ 7
	TOTAL(MBTU)	42.166	107.475
DEC	PEAK(KBTU)	100.907	278.254
	DY/HR	30/18	12/ 6
	ONE YEAR	598.021	471.234
	USE/PEAK	199.463	343.282

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
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
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR MZ-FAN-SYS TOPEKA, KS

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-81.103	15	5	-8.F	-9.F	-267.516	10918.	27.438
FEB	0.00000					0.000	-58.558	3	5	-1.F	-2.F	-240.070	9869.	27.438
MAR	0.00000					0.000	-41.729	3	5	15.F	13.F	-193.076	11411.	27.438
APR	0.00000					0.000	-10.499	5	5	31.F	29.F	-127.463	10732.	27.438
MAY	31.41247	31	19	84.F	76.F	255.970	-1.598	9	5	45.F	44.F	-74.389	10918.	27.438
JUN	72.31274	29	15	88.F	75.F	247.661	0.000					0.000	10979.	27.438
JUL	86.62682	7	18	83.F	74.F	278.848	0.000					0.000	10671.	27.438
AUG	89.39081	4	17	92.F	70.F	280.826	0.000					0.000	11411.	27.438
SEP	48.50097	14	15	83.F	60.F	236.621	0.000					0.000	10732.	27.438
OCT	0.17676	1	19	81.F	66.F	40.966	-8.395	20	5	25.F	25.F	-131.912	10671.	27.438
NOV	0.00000					0.000	-35.211	3	5	13.F	12.F	-186.055	10486.	27.438
DEC	0.00000					0.000	-71.406	15	5	8.F	7.F	-233.218	10918.	27.438
TOTAL	328.421						-308.495						129722.	
MAX						280.826						-267.516		27.438

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
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR MZ-FAN-SYS TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	-109.258	7.716
FEB	0	672	0	0	672	0	672	0	0	0	-113.546	7.716
MAR	0	744	0	0	744	0	744	0	0	0	-108.494	7.716
APR	0	720	0	0	720	0	720	0	0	0	-0.036	7.716
MAY	325	360	0	59	360	384	744	0	0	59	0.000	7.716
JUN	676	0	0	44	0	720	720	0	0	44	0.000	27.438
JUL	741	0	0	3	0	744	744	0	0	3	0.000	27.438
AUG	732	0	0	12	0	744	744	0	0	12	0.000	27.438
SEP	510	0	0	210	0	720	720	0	0	210	0.000	27.438
OCT	8	720	0	16	720	24	744	0	0	16	0.000	7.716
NOV	0	720	0	0	720	0	720	0	0	0	-139.501	7.716
DEC	0	744	0	0	744	0	744	0	0	0	-156.051	7.716
ANNUAL	2992	5424	0	344	5424	3336	8760	0	0	344		

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
REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	41.890	115.601
JAN	PEAK(KBTU)	100.763	336.437
	DY/HR	31/ 9	15/ 5
	TOTAL(MBTU)	37.571	86.077
FEB	PEAK(KBTU)	100.763	307.408
	DY/HR	28/10	3/ 5
	TOTAL(MBTU)	42.350	63.574
MAR	PEAK(KBTU)	100.763	256.415
	DY/HR	31/ 7	3/ 5
	TOTAL(MBTU)	38.374	18.402
APR	PEAK(KBTU)	99.840	182.494
	DY/HR	5/ 7	5/ 5
	TOTAL(MBTU)	49.772	3.568
MAY	PEAK(KBTU)	180.603	120.380
	DY/HR	31/18	9/ 5
	TOTAL(MBTU)	64.899	0.000
JUN	PEAK(KBTU)	179.581	0.000
	DY/HR	28/16	30/ 1
	TOTAL(MBTU)	69.315	0.000
JUL	PEAK(KBTU)	183.961	0.000
	DY/HR	22/16	31/ 1
	TOTAL(MBTU)	73.438	0.000
AUG	PEAK(KBTU)	192.869	0.000
	DY/HR	11/16	31/ 1
	TOTAL(MBTU)	55.566	0.000
SEP	PEAK(KBTU)	180.022	0.000
	DY/HR	7/16	30/ 1
	TOTAL(MBTU)	38.183	15.313
OCT	PEAK(KBTU)	100.130	187.607
	DY/HR	20/ 8	20/ 5
	TOTAL(MBTU)	38.823	54.142
NOV	PEAK(KBTU)	100.763	248.656
	DY/HR	29/ 8	3/ 5
	TOTAL(MBTU)	41.821	104.228
DEC	PEAK(KBTU)	100.763	300.075
	DY/HR	30/13	15/ 5
	ONE YEAR	592.002	460.906
	USE/PEAK	192.869	336.437

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
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

EMC ENGINEERS, INC.

DENVER - ATLANTA

PROJECT:	FEASIBILITY STUDY FOR INSTALLATION OF UMCS	EMC NO:	1406-001
		CALC. BY:	AJN
LOCATION:	FORT RILEY, KANSAS	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 FT²
CFMI	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	NIGHTIME 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	=	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

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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  ..


                $-------------------------------------$
                $ 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*
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 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 ..
```

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 - - - - U-VALUE (BTU/HR-SQFT-F)	AREA (SQFT)	- - - - W A L L - - - - 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
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. 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- 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	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

*** BUILDING ***

FLOOR AREA	4590	SQFT	426	SQMT
VOLUME	123930	CUFT	3510	CUMT

	COOLING LOAD		HEATING LOAD	
TIME	JUL 23	4PM	JAN 4	3AM
DRY-BULB TEMP	98F	37C	8F	-13C
WET-BULB TEMP	79F	26C	7F	-14C

	SENSIBLE		LATENT		SENSIBLE	
	(KBTU/H)	(KW)	(KBTU/H)	(KW)	(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	-53.501 KW
TOTAL LOAD / AREA	28.06BTU/H.SQFT		88.469 W /SQMT		39.799BTU/H.SQFT	125.464 W /SQMT

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

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-132.870	15	3	-8.F	-9.F	-321.525	7046.	14.737
FEB	0.00000					0.000	-101.107	3	6	-1.F	-2.F	-287.310	6360.	14.737
MAR	0.00000					0.000	-84.020	3	4	16.F	13.F	-252.079	7041.	14.637
APR	0.00000					0.000	-30.302	5	6	31.F	28.F	-161.000	6814.	14.637
MAY	20.62210	31	16	88.F	75.F	191.043	-6.965	5	5	44.F	40.F	-106.771	9025.	34.720
JUN	64.83260	19	10	82.F	74.F	258.862	0.000					0.000	13111.	38.743
JUL	92.03951	24	10	80.F	75.F	277.938	0.000					0.000	15954.	42.044
AUG	89.48664	21	10	86.F	76.F	284.550	0.000					0.000	16048.	40.818
SEP	38.51266	6	16	93.F	76.F	229.718	0.000					0.000	10579.	39.252
OCT	0.16323	1	17	85.F	68.F	55.474	-26.102	20	6	24.F	23.F	-167.285	7059.	20.972
NOV	0.00000					0.000	-66.373	2	6	15.F	14.F	-217.994	6814.	14.637
DEC	0.00000					0.000	-120.204	15	5	8.F	7.F	-290.509	7041.	14.737
TOTAL	305.657						-567.944						112900.	
MAX						284.550						-321.525		42.044

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	-159.635	4.543
FEB	0	672	0	0	672	0	672	0	0	0	-157.478	4.543
MAR	0	736	0	8	744	0	744	0	0	8	-158.809	4.543
APR	0	602	0	118	720	0	720	0	0	118	-56.766	4.543
MAY	291	257	0	196	360	293	744	0	0	196	0.000	34.720
JUN	651	0	0	69	0	651	720	0	0	69	0.000	38.743
JUL	740	0	0	4	0	740	744	0	0	4	0.000	39.366
AUG	733	0	0	11	0	733	744	0	0	11	0.000	40.818
SEP	452	0	0	268	0	455	720	0	0	268	0.000	39.252
OCT	4	569	0	171	720	4	744	0	0	171	0.000	20.972
NOV	0	687	0	33	720	0	720	0	0	33	-180.423	4.543
DEC	0	744	0	0	744	0	744	0	0	0	-178.018	4.543
ANNUAL	2871	5011	0	878	5424	2876	8760	0	0	878		

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	29.557	184.608
JAN	PEAK(KBTU)	57.754	405.590
	DY/HR	28/ 9	15/ 3
	TOTAL(MBTU)	26.637	145.332
FEB	PEAK(KBTU)	57.754	369.390
	DY/HR	3/ 8	3/ 6
	TOTAL(MBTU)	29.002	125.834
MAR	PEAK(KBTU)	57.413	331.368
	DY/HR	31/17	3/ 4
	TOTAL(MBTU)	25.781	49.913
APR	PEAK(KBTU)	57.413	229.553
	DY/HR	17/ 8	5/ 6
	TOTAL(MBTU)	31.553	12.528
MAY	PEAK(KBTU)	118.549	166.524
	DY/HR	31/16	5/ 5
	TOTAL(MBTU)	44.766	0.000
JUN	PEAK(KBTU)	132.286	0.000
	DY/HR	19/10	30/ 1
	TOTAL(MBTU)	54.473	0.000
JUL	PEAK(KBTU)	143.556	0.000
	DY/HR	23/16	31/ 1
	TOTAL(MBTU)	54.794	0.000
AUG	PEAK(KBTU)	139.370	0.000
	DY/HR	21/10	31/ 1
	TOTAL(MBTU)	36.121	0.000
SEP	PEAK(KBTU)	134.024	0.000
	DY/HR	6/16	30/ 1
	TOTAL(MBTU)	26.460	44.078
OCT	PEAK(KBTU)	71.608	236.742
	DY/HR	1/17	20/ 6
	TOTAL(MBTU)	27.506	101.395
NOV	PEAK(KBTU)	57.413	293.859
	DY/HR	30/17	2/ 6
	TOTAL(MBTU)	29.494	170.162
DEC	PEAK(KBTU)	57.754	372.805
	DY/HR	13/ 8	15/ 5
	ONE YEAR	416.143	833.850
	USE/PEAK	143.556	405.590

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
```

REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR AC-1 TOPEKA, KS

	COOLING						HEATING					ELEC	
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	-98.405	14	7	-1.F	-2.F	-403.083	6469.	14.737
FEB	0.00000					0.000	-73.456	3	8	-2.F	-3.F	-368.960	5906.	14.737
MAR	0.00000					0.000	-60.361	3	6	15.F	12.F	-349.182	6805.	14.637
APR	0.00000					0.000	-21.263	5	6	31.F	28.F	-246.954	6796.	14.637
MAY	16.25379	31	16	88.F	75.F	202.995	-4.643	5	6	44.F	40.F	-158.567	8594.	35.873
JUN	49.50651	19	10	82.F	74.F	293.534	0.000					0.000	11591.	40.192
JUL	68.60999	24	10	80.F	75.F	322.057	0.000					0.000	13609.	42.437
AUG	67.31927	21	9	83.F	75.F	322.721	0.000					0.000	13698.	41.618
SEP	30.50548	5	10	75.F	72.F	251.557	0.000					0.000	9765.	40.189
OCT	0.14094	1	17	85.F	68.F	55.567	-17.611	20	6	24.F	23.F	-252.533	7048.	20.983
NOV	0.00000					0.000	-46.661	2	6	15.F	14.F	-316.165	6605.	14.637
DEC	0.00000					0.000	-88.245	14	7	10.F	8.F	-386.114	6541.	14.737
TOTAL	232.336						-410.645						103437.	
MAX						322.721						-403.083		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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	617	0	127	744	0	617	214	0	0	-5.670	4.543
FEB	0	571	0	101	672	0	572	208	0	1	-4.005	4.543
MAR	0	692	0	52	744	0	692	289	0	0	-4.335	4.543
APR	0	622	0	98	720	0	716	326	0	94	-4.040	4.543
MAY	183	270	0	291	360	183	744	341	0	291	0.000	35.873
JUN	371	0	0	349	0	371	720	330	0	349	0.000	40.192
JUL	403	0	0	341	0	404	743	340	0	340	0.000	40.182
AUG	403	0	0	341	0	409	738	335	0	335	0.000	40.337
SEP	272	0	0	448	0	272	720	330	0	448	0.000	36.788
OCT	3	589	0	152	720	3	742	339	0	150	0.000	20.983
NOV	0	657	0	63	720	0	674	284	0	17	0.000	0.000
DEC	0	634	0	110	744	0	634	231	0	0	0.000	0.000
ANNUAL	1635	4652	0	2473	5424	1642	8312	3567	0	2025		

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	26.645	139.846
JAN	PEAK(KBTU)	59.640	508.472
	DY/HR	28/ 9	14/ 7
	TOTAL(MBTU)	24.048	107.565
FEB	PEAK(KBTU)	59.640	472.442
	DY/HR	3/ 8	3/ 8
	TOTAL(MBTU)	27.094	92.532
MAR	PEAK(KBTU)	59.299	451.300
	DY/HR	31/17	3/ 6
	TOTAL(MBTU)	25.129	36.523
APR	PEAK(KBTU)	59.299	338.973
	DY/HR	24/ 8	5/ 6
	TOTAL(MBTU)	29.919	9.099
MAY	PEAK(KBTU)	122.485	237.748
	DY/HR	31/16	5/ 6
	TOTAL(MBTU)	39.577	0.000
JUN	PEAK(KBTU)	137.234	0.000
	DY/HR	19/10	30/ 1
	TOTAL(MBTU)	46.467	0.000
JUL	PEAK(KBTU)	144.899	0.000
	DY/HR	23/16	31/ 1
	TOTAL(MBTU)	46.773	0.000
AUG	PEAK(KBTU)	142.103	0.000
	DY/HR	24/16	31/ 1
	TOTAL(MBTU)	33.342	0.000
SEP	PEAK(KBTU)	137.223	0.000
	DY/HR	6/16	30/ 1
	TOTAL(MBTU)	25.800	31.171
OCT	PEAK(KBTU)	71.644	345.235
	DY/HR	1/17	20/ 6
	TOTAL(MBTU)	25.774	73.136
NOV	PEAK(KBTU)	59.299	415.578
	DY/HR	30/17	2/ 6
	TOTAL(MBTU)	26.768	127.647
DEC	PEAK(KBTU)	59.640	490.626
	DY/HR	13/ 8	14/ 7
	ONE YEAR	377.336	617.519
	USE/PEAK	144.899	508.472

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
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/SQFT-YR GROSS-AREA 216.7 KBTU/SQFT-YR NET-AREA
TOTAL SOURCE ENERGY 1750.66 MBTU 381.4 KBTU/SQFT-YR GROSS-AREA 381.4 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.

```
                    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
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```
                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. EZDOE - 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

	COOLING						HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-119.890	15	3	-8.F	-9.F	-305.106	7046.	14.737
FEB	0.00000					0.000	-89.335	3	6	-1.F	-2.F	-270.659	6360.	14.737
MAR	0.00000					0.000	-70.990	3	5	15.F	13.F	-232.920	7041.	14.637
APR	0.00000					0.000	-21.139	5	6	31.F	28.F	-143.281	6814.	14.637
MAY	12.98170	31	16	88.F	75.F	166.104	-3.949	5	5	44.F	40.F	-88.411	8330.	31.996
JUN	47.83162	19	10	82.F	74.F	222.754	0.000					0.000	11539.	35.921
JUL	72.38590	24	10	80.F	75.F	243.422	0.000					0.000	14144.	40.290
AUG	71.82764	21	10	86.F	76.F	253.064	0.000					0.000	14371.	39.195
SEP	25.89304	6	16	93.F	76.F	200.558	0.000					0.000	9405.	36.601
OCT	0.00000					0.000	-17.225	20	6	24.F	23.F	-151.041	7041.	14.637
NOV	0.00000					0.000	-54.678	2	6	15.F	14.F	-200.964	6814.	14.637
DEC	0.00000					0.000	-107.118	15	5	8.F	7.F	-272.302	7041.	14.737
TOTAL	230.920						-484.324						105956.	
MAX						253.064						-305.106		40.290

EMC ENGINEERS INC. EZDOE - 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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	-142.073	4.543
FEB	0	672	0	0	672	0	672	0	0	0	-140.183	4.543
MAR	0	722	0	22	744	0	744	0	0	22	-141.020	4.543
APR	0	541	0	179	720	0	720	0	0	179	-29.727	4.543
MAY	209	232	0	303	360	212	744	0	0	303	0.000	31.996
JUN	563	0	0	157	0	565	720	0	0	157	0.000	35.921
JUL	723	0	0	21	0	724	744	0	0	21	0.000	37.187
AUG	699	0	0	45	0	699	744	0	0	45	0.000	39.195
SEP	363	0	0	357	0	364	720	0	0	357	0.000	36.601
OCT	0	525	0	219	720	0	744	0	0	219	-98.292	4.543
NOV	0	668	0	52	720	0	720	0	0	52	-163.318	4.543
DEC	0	744	0	0	744	0	744	0	0	0	-161.851	4.543
ANNUAL	2557	4848	0	1355	5424	2564	8760	0	0	1355		

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-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	29.223	167.779
JAN	PEAK(KBTU)	57.374	384.878
	DY/HR	28/ 9	15/ 3
	TOTAL(MBTU)	26.320	129.912
FEB	PEAK(KBTU)	57.374	348.410
	DY/HR	3/ 8	3/ 6
	TOTAL(MBTU)	28.431	107.509
MAR	PEAK(KBTU)	57.033	307.580
	DY/HR	31/13	3/ 5
	TOTAL(MBTU)	25.108	35.460
APR	PEAK(KBTU)	57.033	206.921
	DY/HR	17/ 7	5/ 6
	TOTAL(MBTU)	28.909	7.495
MAY	PEAK(KBTU)	109.249	142.750
	DY/HR	31/16	5/ 5
	TOTAL(MBTU)	39.400	0.000
JUN	PEAK(KBTU)	122.649	0.000
	DY/HR	19/10	30/ 1
	TOTAL(MBTU)	48.295	0.000
JUL	PEAK(KBTU)	137.568	0.000
	DY/HR	23/16	31/ 1
	TOTAL(MBTU)	49.068	0.000
AUG	PEAK(KBTU)	133.827	0.000
	DY/HR	21/10	31/ 1
	TOTAL(MBTU)	32.114	0.000
SEP	PEAK(KBTU)	124.972	0.000
	DY/HR	6/16	30/ 1
	TOTAL(MBTU)	25.694	29.830
OCT	PEAK(KBTU)	57.033	215.840
	DY/HR	31/10	20/ 6
	TOTAL(MBTU)	26.903	84.435
NOV	PEAK(KBTU)	57.033	272.289
	DY/HR	30/17	2/ 6
	TOTAL(MBTU)	29.125	152.984
DEC	PEAK(KBTU)	57.374	350.167
	DY/HR	13/ 8	15/ 5
	ONE YEAR	388.590	715.404
	USE/PEAK	137.568	384.878

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
```

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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. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/12/1995 11:35: 2 SDL RUN 1
DENVER, CO 80227 RUN #3 ECONOMIZER FOR BLDG. 7086 UNIT CHAPEL W/ SINGLE ZONE
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR AC-1 TOPEKA, KS

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-97.675	14	8	-2.F	-3.F	-402.941	6373.	14.737
FEB	0.00000					0.000	-72.940	3	8	-2.F	-3.F	-369.569	5792.	14.737
MAR	0.00000					0.000	-61.474	3	6	15.F	12.F	-340.113	6709.	14.637
APR	0.00000					0.000	-24.809	5	6	31.F	28.F	-255.449	6768.	14.637
MAY	14.15590	31	16	88.F	75.F	202.995	-6.659	5	6	44.F	40.F	-188.239	8412.	35.873
JUN	46.32540	19	10	82.F	74.F	293.534	0.000					0.000	11314.	40.192
JUL	67.40615	24	10	80.F	75.F	322.057	0.000					0.000	13508.	42.437
AUG	65.74354	21	9	83.F	75.F	322.721	0.000					0.000	13568.	41.618
SEP	28.14796	5	10	75.F	72.F	251.477	0.000					0.000	9562.	40.189
OCT	0.15025	1	17	85.F	68.F	58.482	-22.059	20	6	24.F	23.F	-259.822	7044.	21.317
NOV	0.00000					0.000	-48.462	2	6	15.F	14.F	-318.706	6537.	14.637
DEC	0.00000					0.000	-87.574	14	8	9.F	7.F	-383.646	6423.	14.737
TOTAL	221.929						-421.651						102022.	
MAX						322.721						-402.941		42.437

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/12/1995 11:35: 2 SDL RUN 1
DENVER, CO 80227 RUN #3 ECONOMIZER FOR BLDG. 7086 UNIT CHAPEL W/ SINGLE ZONE
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR AC-1 TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	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	-28.505	4.543
DEC	0	512	0	232	744	0	608	205	0	96	0.000	0.000
ANNUAL	1507	3209	0	4044	5424	1642	8197	3452	0	3481		

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	26.160	137.949
JAN	PEAK(KBTU)	59.637	508.293
	DY/HR	28/ 9	14/ 8
	TOTAL(MBTU)	23.484	105.767
FEB	PEAK(KBTU)	59.637	473.062
	DY/HR	3/ 8	3/ 8
	TOTAL(MBTU)	26.546	92.137
MAR	PEAK(KBTU)	59.296	441.515
	DY/HR	31/17	3/ 6
	TOTAL(MBTU)	25.026	39.989
APR	PEAK(KBTU)	59.296	348.480
	DY/HR	30/ 8	5/ 6
	TOTAL(MBTU)	29.343	11.398
MAY	PEAK(KBTU)	122.485	272.136
	DY/HR	31/16	5/ 6
	TOTAL(MBTU)	38.630	0.000
JUN	PEAK(KBTU)	137.234	0.000
	DY/HR	19/10	30/ 1
	TOTAL(MBTU)	46.124	0.000
JUL	PEAK(KBTU)	144.899	0.000
	DY/HR	23/16	31/ 1
	TOTAL(MBTU)	46.327	0.000
AUG	PEAK(KBTU)	142.103	0.000
	DY/HR	24/16	31/ 1
	TOTAL(MBTU)	32.648	0.000
SEP	PEAK(KBTU)	137.223	0.000
	DY/HR	6/16	30/ 1
	TOTAL(MBTU)	25.816	35.860
OCT	PEAK(KBTU)	72.785	353.371
	DY/HR	1/17	20/ 6
	TOTAL(MBTU)	25.401	73.977
NOV	PEAK(KBTU)	59.296	418.321
	DY/HR	30/17	2/ 6
	TOTAL(MBTU)	26.148	125.424
DEC	PEAK(KBTU)	59.637	487.989
	DY/HR	13/ 8	14/ 8
	ONE YEAR	371.652	622.502
	USE/PEAK	144.899	508.293

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
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  ..


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EMC ENGINEERS INC. EZDOE - 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

	COOLING						HEATING						ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-99.116	14	9	-3.F	-4.F	-306.658	7046.	14.737
FEB	0.00000					0.000	-74.045	3	6	-1.F	-2.F	-290.389	6360.	14.737
MAR	0.00000					0.000	-59.125	3	6	15.F	12.F	-246.903	7041.	14.637
APR	0.00000					0.000	-18.280	5	6	31.F	28.F	-161.694	6814.	14.637
MAY	21.13025	31	16	88.F	75.F	190.940	-3.358	5	6	44.F	40.F	-106.547	9063.	34.710
JUN	57.72066	19	10	82.F	74.F	258.608	0.000					0.000	12484.	38.728
JUL	77.85484	24	10	80.F	75.F	277.571	0.000					0.000	14700.	42.040
AUG	77.04541	21	10	86.F	76.F	284.204	0.000					0.000	14899.	40.807
SEP	36.90620	6	16	93.F	76.F	229.602	0.000					0.000	10437.	39.244
OCT	0.26216	1	17	85.F	68.F	73.420	-14.655	20	6	24.F	23.F	-167.903	7070.	22.587
NOV	0.00000					0.000	-44.617	2	6	15.F	14.F	-219.556	6814.	14.637
DEC	0.00000					0.000	-89.226	12	6	3.F	2.F	-280.344	7041.	14.737
TOTAL	270.920						-402.422						109778.	
MAX						284.204						-306.658		42.040

EMC ENGINEERS INC. EZDOE - 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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	-77.699	4.543
FEB	0	672	0	0	672	0	672	0	0	0	-73.898	4.543
MAR	0	735	0	9	744	0	744	0	0	9	-77.167	4.543
APR	0	578	0	142	720	0	720	0	0	142	-2.556	4.543
MAY	343	228	0	173	360	343	744	0	0	173	0.000	34.710
JUN	691	0	0	29	0	692	720	0	0	29	0.000	38.728
JUL	742	0	0	2	0	742	744	0	0	2	0.000	39.349
AUG	738	0	0	6	0	738	744	0	0	6	0.000	40.807
SEP	537	0	0	183	0	537	720	0	0	183	0.000	39.244
OCT	7	546	0	191	720	7	744	0	0	191	0.000	22.587
NOV	0	682	0	38	720	0	720	0	0	38	-86.117	4.543
DEC	0	744	0	0	744	0	744	0	0	0	-88.817	4.543
ANNUAL	3058	4929	0	773	5424	3059	8760	0	0	773		

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	29.200	143.880
JAN	PEAK(KBTU)	57.410	386.836
	DY/HR	28/ 9	14/ 9
	TOTAL(MBTU)	26.286	111.939
FEB	PEAK(KBTU)	57.410	369.708
	DY/HR	3/ 8	3/ 6
	TOTAL(MBTU)	28.261	92.772
MAR	PEAK(KBTU)	57.069	323.095
	DY/HR	31/17	3/ 6
	TOTAL(MBTU)	24.989	31.537
APR	PEAK(KBTU)	57.069	228.242
	DY/HR	17/ 8	5/ 6
	TOTAL(MBTU)	31.356	6.497
MAY	PEAK(KBTU)	118.514	164.372
	DY/HR	31/16	5/ 6
	TOTAL(MBTU)	42.625	0.000
JUN	PEAK(KBTU)	132.234	0.000
	DY/HR	19/10	30/ 1
	TOTAL(MBTU)	50.190	0.000
JUL	PEAK(KBTU)	143.543	0.000
	DY/HR	23/16	31/ 1
	TOTAL(MBTU)	50.873	0.000
AUG	PEAK(KBTU)	139.334	0.000
	DY/HR	21/10	31/ 1
	TOTAL(MBTU)	35.638	0.000
SEP	PEAK(KBTU)	133.995	0.000
	DY/HR	6/16	30/ 1
	TOTAL(MBTU)	25.606	25.877
OCT	PEAK(KBTU)	77.123	235.311
	DY/HR	1/17	20/ 6
	TOTAL(MBTU)	26.719	71.684
NOV	PEAK(KBTU)	57.069	293.160
	DY/HR	30/17	2/ 6
	TOTAL(MBTU)	29.082	132.082
DEC	PEAK(KBTU)	57.410	359.049
	DY/HR	13/ 8	12/ 6
	ONE YEAR	400.826	616.267
	USE/PEAK	143.543	386.836

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
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  ..


              $-------------------------------------$
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	COOLING						HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-96.077	15	3	-8.F	-9.F	-320.839	7046.	14.737
FEB	0.00000					0.000	-72.493	3	4	0.F	-1.F	-282.860	6360.	14.737
MAR	0.00000					0.000	-59.877	3	4	16.F	13.F	-251.793	7041.	14.637
APR	0.00000					0.000	-20.235	5	5	31.F	29.F	-159.951	6814.	14.637
MAY	18.61114	22	10	75.F	63.F	179.727	-4.182	5	5	44.F	40.F	-106.311	8832.	30.983
JUN	51.07773	19	10	82.F	74.F	214.059	0.000					0.000	11811.	35.460
JUL	70.71615	24	10	80.F	75.F	224.986	0.000					0.000	13956.	35.938
AUG	68.61514	21	10	86.F	76.F	221.032	0.000					0.000	14010.	36.968
SEP	32.96278	5	10	75.F	72.F	198.648	0.000					0.000	10053.	32.629
OCT	0.13247	1	19	81.F	66.F	36.244	-16.526	20	5	25.F	25.F	-162.348	7056.	18.804
NOV	0.00000					0.000	-46.232	2	5	16.F	15.F	-216.154	6814.	14.637
DEC	0.00000					0.000	-86.653	15	5	8.F	7.F	-290.107	7041.	14.737
TOTAL	242.115						-402.276						106843.	
MAX						224.986						-320.839		36.968

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	743	0	1	744	0	744	0	0	1	-159.229	4.543
FEB	0	671	0	1	672	0	672	0	0	1	-157.144	4.543
MAR	0	705	0	39	744	0	744	0	0	39	-158.433	4.543
APR	0	498	0	222	720	0	720	0	0	222	-43.554	4.543
MAY	306	208	0	230	360	312	744	0	0	230	0.000	30.983
JUN	658	0	0	62	0	664	720	0	0	62	0.000	35.460
JUL	741	0	0	3	0	741	744	0	0	3	0.000	35.938
AUG	737	0	0	7	0	737	744	0	0	7	0.000	36.968
SEP	491	0	0	229	0	494	720	0	0	229	0.000	32.629
OCT	4	472	0	268	720	5	744	0	0	268	0.000	8.503
NOV	0	624	0	96	720	0	720	0	0	96	-179.903	4.543
DEC	0	742	0	2	744	0	744	0	0	2	-177.453	4.543
ANNUAL	2937	4663	0	1160	5424	2953	8760	0	0	1160		

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	28.932	138.833
JAN	PEAK(KBTU)	57.738	404.724
	DY/HR	28/ 9	15/ 3
	TOTAL(MBTU)	25.927	108.134
FEB	PEAK(KBTU)	57.738	364.498
	DY/HR	3/ 8	3/ 4
	TOTAL(MBTU)	27.950	91.976
MAR	PEAK(KBTU)	57.397	330.934
	DY/HR	31/ 9	3/ 4
	TOTAL(MBTU)	25.029	33.950
APR	PEAK(KBTU)	56.332	228.255
	DY/HR	5/ 7	5/ 5
	TOTAL(MBTU)	30.630	7.783
MAY	PEAK(KBTU)	105.788	165.894
	DY/HR	22/10	5/ 5
	TOTAL(MBTU)	40.329	0.000
JUN	PEAK(KBTU)	121.074	0.000
	DY/HR	19/10	30/ 1
	TOTAL(MBTU)	47.652	0.000
JUL	PEAK(KBTU)	122.707	0.000
	DY/HR	24/10	31/ 1
	TOTAL(MBTU)	47.837	0.000
AUG	PEAK(KBTU)	126.223	0.000
	DY/HR	21/10	31/ 1
	TOTAL(MBTU)	34.326	0.000
SEP	PEAK(KBTU)	111.410	0.000
	DY/HR	5/10	30/ 1
	TOTAL(MBTU)	25.659	28.508
OCT	PEAK(KBTU)	64.204	231.000
	DY/HR	1/17	20/ 5
	TOTAL(MBTU)	26.436	72.019
NOV	PEAK(KBTU)	57.397	291.704
	DY/HR	30/ 8	2/ 5
	TOTAL(MBTU)	28.782	127.431
DEC	PEAK(KBTU)	57.738	372.242
	DY/HR	13/ 8	15/ 5
	ONE YEAR	389.490	608.634
	USE/PEAK	126.223	404.724

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
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

EMC ENGINEERS, INC.

DENVER - ATLANTA

PROJECT:	FEASIBILITY STUDY FOR INSTALLATION OF UMCS	EMC NO:	1406-001
		CALC. BY:	AJN
LOCATION:	FORT RILEY. KANSAS	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 FT²
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	NIGHTIME 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  ..

                $-----------------------------------$
                $ 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. #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_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 *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 ..
```

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	GLASS U-VALUE (BTU/HR-SQFT-F)	GLASS AREA (SQFT)	WALL U-VALUE (BTU/HR-SQFT-F)	WALL AREA (SQFT)	WALL+GLASS U-VALUE (BTU/HR-SQFT-F)	WALL+GLASS AREA (SQFT)	AZIMUTH
	UP-STAIRS	1.021	50.00	0.198	1023.00	0.236	1073.00	NORTH-EAST
	BASEMENT	1.021	27.00	0.198	121.00	0.348	148.00	NORTH-EAST
	UP-STAIRS	1.021	70.00	0.198	1640.00	0.232	1710.00	SOUTH-EAST
	BASEMENT	1.021	63.00	0.198	317.00	0.334	380.00	SOUTH-EAST
	UP-STAIRS	1.021	40.00	0.198	1323.00	0.222	1363.00	SOUTH-WEST
	BASEMENT	1.021	18.00	0.198	170.00	0.277	188.00	SOUTH-WEST
	UP-STAIRS	1.021	100.00	0.198	440.00	0.350	540.00	NORTH-WEST
	BASEMENT	1.021	108.00	0.198	12.00	0.939	120.00	NORTH-WEST
	UP-STAIRS	0.000	0.00	0.103	2850.00	0.103	2850.00	ROOF
	UP-STAIRS	0.000	0.00	0.103	2850.00	0.103	2850.00	ROOF
	BASEMENT	0.000	0.00	0.020	2890.00	0.020	2890.00	UNDERGRND
	BASEMENT	0.000	0.00	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

	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	1.021	0.198	0.250	77.00	1144.00	1221.00
SOUTH-EAST	1.021	0.198	0.250	133.00	1957.00	2090.00
SOUTH-WEST	1.021	0.198	0.229	58.00	1493.00	1551.00
NORTH-WEST	1.021	0.198	0.457	208.00	452.00	660.00
ROOF	0.000	0.103	0.103	0.00	5700.00	5700.00
ALL WALLS	1.021	0.198	0.269	476.00	5046.00	5522.00
WALLS+ROOFS	1.021	0.148	0.185	476.00	10746.00	11222.00
UNDERGRND	0.000	0.020	0.020	0.00	4144.00	4144.00
BUILDING	1.021	0.112	0.140	476.00	14890.00	15366.00

*** BUILDING ***

FLOOR AREA 5780 SQFT 537 SQMT
VOLUME 112710 CUFT 3192 CUMT

	COOLING LOAD				HEATING LOAD	
TIME	AUG 21 11AM				JAN 16 6AM	
DRY-BULB TEMP	88F	31C			10F	-12C
WET-BULB TEMP	76F	24C			8F	-13C
	SENSIBLE		LATENT		SENSIBLE	
	(KBTU/H)	(KW)	(KBTU/H)	(KW)	(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. 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 PACK-COOLU TOPEKA, KS

	COOLING						HEATING						ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELECTRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000					0.000	-101.250	15	3	-8.F	-9.F	-226.381	4833.	7.709
FEB	0.00000					0.000	-77.103	3	6	-1.F	-2.F	-206.208	4361.	7.709
MAR	0.00000					0.000	-63.287	3	5	15.F	13.F	-168.434	4828.	7.609
APR	0.00000					0.000	-22.690	1	1	32.F	29.F	-114.722	4672.	7.609
MAY	17.28819	30	11	74.F	69.F	239.226	-5.072	5	6	44.F	40.F	-67.391	6501.	28.622
JUN	50.19612	26	11	82.F	74.F	290.135	0.000					0.000	9575.	32.869
JUL	70.73447	24	11	82.F	75.F	302.791	0.000					0.000	11714.	33.058
AUG	67.62566	21	11	88.F	76.F	305.923	0.000					0.000	11666.	34.029
SEP	29.33169	5	11	78.F	73.F	270.517	0.000					0.000	7566.	31.256
OCT	0.06924	1	18	83.F	68.F	25.375	-20.052	20	8	23.F	22.F	-115.936	4836.	10.437
NOV	0.00000					0.000	-51.497	3	4	13.F	12.F	-152.258	4672.	7.609
DEC	0.00000					0.000	-91.736	15	2	3.F	2.F	-209.624	4828.	7.709
TOTAL	235.245						-432.686						80053.	
MAX						305.923						-226.381		34.029

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 PACK-COOLU TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	-122.937	4.720
FEB	0	672	0	0	672	0	672	0	0	0	-113.051	4.720
MAR	0	743	0	1	744	0	744	0	0	1	-113.902	4.720
APR	0	620	0	100	720	0	720	0	0	100	-33.413	4.720
MAY	339	254	0	151	360	342	744	0	0	151	0.000	28.514
JUN	683	0	0	37	0	685	720	0	0	37	0.000	32.762
JUL	744	0	0	0	0	744	744	0	0	0	0.000	33.058
AUG	744	0	0	0	0	744	744	0	0	0	0.000	34.029
SEP	489	0	0	231	0	493	720	0	0	231	0.000	31.256
OCT	4	595	0	145	720	4	744	0	0	145	0.000	10.437
NOV	0	710	0	10	720	0	720	0	0	10	-127.817	4.720
DEC	0	744	0	0	744	0	744	0	0	0	-134.786	4.720
ANNUAL	3003	5082	0	675	5424	3012	8760	0	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

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-11.865	4	3	8.F	7.F	-34.457	1316.	2.889
FEB	0.00000					0.000	-8.782	2	3	13.F	11.F	-28.572	1189.	2.889
MAR	0.00000					0.000	-6.536	3	4	16.F	13.F	-27.845	1316.	2.889
APR	0.00000					0.000	-1.436	1	3	36.F	32.F	-15.543	1274.	2.889
MAY	0.00000					0.000	0.000					0.000	1316.	2.889
JUN	0.00000					0.000	0.000					0.000	1274.	2.889
JUL	0.00000					0.000	0.000					0.000	1316.	2.889
AUG	0.00000					0.000	0.000					0.000	1316.	2.889
SEP	0.00000					0.000	0.000					0.000	1274.	2.889
OCT	0.00000					0.000	-0.269	31	5	45.F	40.F	-12.874	1316.	2.889
NOV	0.00000					0.000	-3.923	30	5	29.F	26.F	-18.718	1274.	2.889
DEC	0.00000					0.000	-10.505	15	5	8.F	7.F	-29.776	1316.	2.889
TOTAL	0.000						-43.315						15499.	
MAX						0.000						-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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	744	744	0	0	0	-15.660	0.000
FEB	0	670	0	2	672	672	672	0	0	2	-13.959	0.000
MAR	0	680	0	64	744	744	744	0	0	64	-14.686	0.000
APR	0	250	0	470	720	720	720	0	0	470	0.000	0.000
MAY	0	0	0	744	360	744	360	0	0	360	0.000	0.000
JUN	0	0	0	720	0	720	0	0	0	0	0.000	0.000
JUL	0	0	0	744	0	744	0	0	0	0	0.000	0.000
AUG	0	0	0	744	0	744	0	0	0	0	0.000	0.000
SEP	0	0	0	720	0	720	0	0	0	0	0.000	0.000
OCT	0	70	0	674	720	744	720	0	0	650	-8.919	0.000
NOV	0	536	0	184	720	720	720	0	0	184	-14.610	0.000
DEC	0	744	0	0	744	744	744	0	0	0	-16.786	0.000
ANNUAL	0	3694	0	5066	5424	8760	5424	0	0	1730		

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	25.860	154.564
JAN	PEAK(KBTU)	42.729	318.515
	DY/HR	28/ 9	15/ 3
	TOTAL(MBTU)	23.327	121.305
FEB	PEAK(KBTU)	42.729	295.812
	DY/HR	3/ 8	3/ 6
	TOTAL(MBTU)	25.555	103.601
MAR	PEAK(KBTU)	42.388	257.215
	DY/HR	31/20	3/ 5
	TOTAL(MBTU)	22.760	39.389
APR	PEAK(KBTU)	42.388	183.397
	DY/HR	17/ 8	1/ 1
	TOTAL(MBTU)	27.413	8.984
MAY	PEAK(KBTU)	107.592	110.518
	DY/HR	22/11	5/ 6
	TOTAL(MBTU)	37.042	0.000
JUN	PEAK(KBTU)	122.092	0.000
	DY/HR	19/11	30/ 1
	TOTAL(MBTU)	44.491	0.000
JUL	PEAK(KBTU)	122.739	0.000
	DY/HR	24/11	31/ 1
	TOTAL(MBTU)	44.327	0.000
AUG	PEAK(KBTU)	126.054	0.000
	DY/HR	21/11	31/ 1
	TOTAL(MBTU)	30.185	0.000
SEP	PEAK(KBTU)	116.586	0.000
	DY/HR	5/11	30/ 1
	TOTAL(MBTU)	23.317	34.208
OCT	PEAK(KBTU)	45.502	167.475
	DY/HR	1/18	20/ 8
	TOTAL(MBTU)	24.303	83.896
NOV	PEAK(KBTU)	42.388	226.136
	DY/HR	30/20	2/ 6
	TOTAL(MBTU)	25.836	142.320
DEC	PEAK(KBTU)	42.729	303.714
	DY/HR	13/ 8	15/ 5
	ONE YEAR	354.417	688.268
	USE/PEAK	126.054	318.515

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
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  ..

                $----------------------------------------$
                $ 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. #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%  ..
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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     *
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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 PACK-COOLU TOPEKA, KS

	COOLING						HEATING						ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-82.543	28	6	-2.F	-3.F	-279.291	4309.	7.709
FEB	0.00000					0.000	-62.178	3	6	-1.F	-2.F	-263.889	3941.	7.709
MAR	0.00000					0.000	-50.703	3	6	15.F	12.F	-218.655	4625.	7.609
APR	0.00000					0.000	-17.652	5	6	31.F	28.F	-147.942	4658.	7.609
MAY	15.02411	30	11	74.F	69.F	246.375	-3.822	5	6	44.F	40.F	-89.738	6285.	29.324
JUN	41.79997	26	11	82.F	74.F	304.394	0.000					0.000	8762.	33.092
JUL	57.81033	24	11	82.F	75.F	316.384	0.000					0.000	10448.	33.070
AUG	55.58031	21	11	88.F	76.F	318.364	0.000					0.000	10395.	33.860
SEP	25.08428	5	11	78.F	73.F	283.408	0.000					0.000	7144.	31.813
OCT	0.06926	1	18	83.F	68.F	25.380	-15.445	20	6	24.F	23.F	-154.202	4831.	10.438
NOV	0.00000					0.000	-41.006	3	6	13.F	12.F	-203.021	4517.	7.609
DEC	0.00000					0.000	-74.744	13	6	2.F	1.F	-262.964	4385.	7.709
TOTAL	195.368						-348.092						74299.	
MAX						318.364						-279.291		33.860

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 PACK-COOLU TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	633	0	111	744	0	633	137	0	0	-8.440	4.720
FEB	0	583	0	89	672	0	583	135	0	0	-6.526	4.720
MAR	0	701	0	43	744	0	701	205	0	0	-6.900	4.720
APR	0	634	0	86	720	0	717	237	0	83	-4.271	4.720
MAY	242	265	0	237	360	245	744	248	0	237	0.000	29.015
JUN	467	0	0	253	0	468	720	240	0	253	0.000	32.956
JUL	496	0	0	248	0	498	742	246	0	246	0.000	33.070
AUG	496	0	0	248	0	512	728	232	0	232	0.000	33.860
SEP	355	0	0	365	0	355	720	240	0	365	0.000	31.813
OCT	4	608	0	132	720	4	743	247	0	131	0.000	10.438
NOV	0	681	0	39	720	0	687	207	0	6	-7.160	4.720
DEC	0	650	0	94	744	0	650	154	0	0	0.000	0.000
ANNUAL	2060	4755	0	1945	5424	2082	8368	2528	0	1553		

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

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-10.996	29	6	11.F	9.F	-37.420	1316.	2.889
FEB	0.00000					0.000	-8.162	3	6	-1.F	-2.F	-37.420	1189.	2.889
MAR	0.00000					0.000	-5.954	3	6	15.F	12.F	-37.420	1316.	2.889
APR	0.00000					0.000	-1.253	1	6	54.F	50.F	-22.512	1274.	2.889
MAY	0.00000					0.000	0.000					0.000	1316.	2.889
JUN	0.00000					0.000	0.000					0.000	1274.	2.889
JUL	0.00000					0.000	0.000					0.000	1316.	2.889
AUG	0.00000					0.000	0.000					0.000	1316.	2.889
SEP	0.00000					0.000	0.000					0.000	1274.	2.889
OCT	0.00000					0.000	-0.190	31	6	44.F	39.F	-16.793	1316.	2.889
NOV	0.00000					0.000	-3.499	2	6	15.F	14.F	-27.520	1274.	2.889
DEC	0.00000					0.000	-9.708	30	6	21.F	18.F	-37.420	1316.	2.889
TOTAL	0.000						-39.761						15499.	
MAX						0.000						-37.420		2.889

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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	496	0	248	744	744	744	0	0	248	0.000	0.000
FEB	0	448	0	224	672	672	672	0	0	224	0.000	0.000
MAR	0	484	0	260	744	744	744	0	0	260	0.000	0.000
APR	0	182	0	538	720	720	720	0	0	538	0.000	0.000
MAY	0	0	0	744	360	744	360	0	0	360	0.000	0.000
JUN	0	0	0	720	0	720	0	0	0	0	0.000	0.000
JUL	0	0	0	744	0	744	0	0	0	0	0.000	0.000
AUG	0	0	0	744	0	744	0	0	0	0	0.000	0.000
SEP	0	0	0	720	0	720	0	0	0	0	0.000	0.000
OCT	0	43	0	701	720	744	720	0	0	677	0.000	0.000
NOV	0	379	0	341	720	720	720	0	0	341	0.000	0.000
DEC	0	496	0	248	744	744	744	0	0	248	0.000	0.000
ANNUAL	0	2528	0	6232	5424	8760	5424	0	0	2896		

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/11/1995 16:34:56 PDL RUN 1
DENVER, CO 80227 RUN #1 NIGHT SETBACK BLDG. #6 POST CHAPEL
REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	23.845	130.799
JAN	PEAK(KBTU)	44.373	398.527
	DY/HR	28/ 9	28/ 6
	TOTAL(MBTU)	21.585	101.427
FEB	PEAK(KBTU)	44.373	382.319
	DY/HR	3/ 8	3/ 6
	TOTAL(MBTU)	24.528	86.040
MAR	PEAK(KBTU)	44.032	333.863
	DY/HR	31/20	3/ 6
	TOTAL(MBTU)	22.544	31.846
APR	PEAK(KBTU)	44.032	237.581
	DY/HR	17/ 8	5/ 6
	TOTAL(MBTU)	26.648	7.150
MAY	PEAK(KBTU)	109.987	144.731
	DY/HR	22/11	5/ 6
	TOTAL(MBTU)	34.268	0.000
JUN	PEAK(KBTU)	122.855	0.000
	DY/HR	19/11	30/ 1
	TOTAL(MBTU)	40.170	0.000
JUL	PEAK(KBTU)	122.778	0.000
	DY/HR	24/11	31/ 1
	TOTAL(MBTU)	39.987	0.000
AUG	PEAK(KBTU)	125.477	0.000
	DY/HR	21/11	31/ 1
	TOTAL(MBTU)	28.743	0.000
SEP	PEAK(KBTU)	118.488	0.000
	DY/HR	5/11	30/ 1
	TOTAL(MBTU)	23.099	27.165
OCT	PEAK(KBTU)	45.503	220.072
	DY/HR	1/18	20/ 6
	TOTAL(MBTU)	23.466	69.073
NOV	PEAK(KBTU)	44.032	299.928
	DY/HR	30/20	2/ 6
	TOTAL(MBTU)	24.067	120.223
DEC	PEAK(KBTU)	44.373	381.340
	DY/HR	13/ 8	13/ 6
	ONE YEAR	332.949	573.724
	USE/PEAK	125.477	398.527

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
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.

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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 #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
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                    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
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                    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.) ..
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	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-91.728	15	3	-8.F	-9.F	-214.177	4833.	7.709
FEB	0.00000					0.000	-68.459	3	6	-1.F	-2.F	-193.897	4361.	7.709
MAR	0.00000					0.000	-53.636	3	5	15.F	13.F	-155.016	4828.	7.609
APR	0.00000					0.000	-15.672	1	1	32.F	29.F	-101.829	4672.	7.609
MAY	11.12077	30	11	74.F	69.F	213.123	-2.816	5	6	44.F	40.F	-53.946	5941.	26.702
JUN	36.97848	26	11	82.F	74.F	264.296	0.000					0.000	8373.	31.701
JUL	55.90189	24	11	82.F	75.F	280.096	0.000					0.000	10382.	32.574
AUG	53.67009	21	11	88.F	76.F	288.588	0.000					0.000	10355.	34.044
SEP	19.23550	5	11	78.F	73.F	242.670	0.000					0.000	6619.	29.400
OCT	0.00000					0.000	-13.213	20	8	23.F	22.F	-103.539	4828.	7.609
NOV	0.00000					0.000	-42.501	3	5	13.F	12.F	-140.504	4672.	7.609
DEC	0.00000					0.000	-82.140	15	2	3.F	2.F	-197.033	4828.	7.709
TOTAL	176.907						-370.164						74692.	
MAX						288.588						-214.177		34.044

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	-110.061	4.720
FEB	0	671	0	1	672	0	672	0	0	1	-100.305	4.720
MAR	0	739	0	5	744	0	744	0	0	5	-100.927	4.720
APR	0	548	0	172	720	0	720	0	0	172	-14.313	4.720
MAY	256	223	0	265	360	257	744	0	0	265	0.000	26.311
JUN	629	0	0	91	0	631	720	0	0	91	0.000	31.701
JUL	739	0	0	5	0	740	744	0	0	5	0.000	32.574
AUG	732	0	0	12	0	732	744	0	0	12	0.000	34.044
SEP	392	0	0	328	0	397	720	0	0	328	0.000	29.400
OCT	0	547	0	197	720	0	744	0	0	197	-67.015	4.720
NOV	0	686	0	34	720	0	720	0	0	34	-115.155	4.720
DEC	0	744	0	0	744	0	744	0	0	0	-122.576	4.720
ANNUAL	2748	4902	0	1110	5424	2757	8760	0	0	1110		

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
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR BB-RADIATN TOPEKA, KS

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-10.284	4	3	8.F	7.F	-31.708	1316.	2.889
FEB	0.00000					0.000	-7.348	2	3	13.F	11.F	-26.082	1189.	2.889
MAR	0.00000					0.000	-4.953	3	4	16.F	13.F	-25.214	1316.	2.889
APR	0.00000					0.000	-0.651	1	3	36.F	32.F	-13.282	1274.	2.889
MAY	0.00000					0.000	0.000					0.000	1316.	2.889
JUN	0.00000					0.000	0.000					0.000	1274.	2.889
JUL	0.00000					0.000	0.000					0.000	1316.	2.889
AUG	0.00000					0.000	0.000					0.000	1316.	2.889
SEP	0.00000					0.000	0.000					0.000	1274.	2.889
OCT	0.00000					0.000	-0.003	31	5	45.F	40.F	-1.125	1316.	2.889
NOV	0.00000					0.000	-2.507	30	5	29.F	26.F	-15.696	1274.	2.889
DEC	0.00000					0.000	-8.907	15	5	8.F	7.F	-27.475	1316.	2.889
TOTAL	0.000						-34.653						15499.	
MAX						0.000						-31.708		2.889

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
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR BB-RADIATN TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	744	744	0	0	0	-13.558	0.000
FEB	0	661	0	11	672	672	672	0	0	11	-11.869	0.000
MAR	0	601	0	143	744	744	744	0	0	143	-12.469	0.000
APR	0	149	0	571	720	720	720	0	0	571	0.000	0.000
MAY	0	0	0	744	360	744	360	0	0	360	0.000	0.000
JUN	0	0	0	720	0	720	0	0	0	0	0.000	0.000
JUL	0	0	0	744	0	744	0	0	0	0	0.000	0.000
AUG	0	0	0	744	0	744	0	0	0	0	0.000	0.000
SEP	0	0	0	720	0	720	0	0	0	0	0.000	0.000
OCT	0	4	0	740	720	744	720	0	0	716	-0.881	0.000
NOV	0	416	0	304	720	720	720	0	0	304	-12.379	0.000
DEC	0	741	0	3	744	744	744	0	0	3	-14.920	0.000
ANNUAL	0	3316	0	5444	5424	8760	5424	0	0	2108		

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- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	25.578	140.406
JAN	PEAK(KBTU)	42.364	300.728
	DY/HR	28/ 9	15/ 3
	TOTAL(MBTU)	23.046	108.252
FEB	PEAK(KBTU)	42.364	277.847
	DY/HR	3/ 8	3/ 6
	TOTAL(MBTU)	25.069	88.053
MAR	PEAK(KBTU)	42.022	237.353
	DY/HR	31/20	3/ 5
	TOTAL(MBTU)	22.117	27.155
APR	PEAK(KBTU)	42.022	164.139
	DY/HR	17/ 7	1/ 1
	TOTAL(MBTU)	25.256	5.183
MAY	PEAK(KBTU)	101.035	90.757
	DY/HR	22/11	5/ 6
	TOTAL(MBTU)	32.938	0.000
JUN	PEAK(KBTU)	118.105	0.000
	DY/HR	26/11	30/ 1
	TOTAL(MBTU)	39.942	0.000
JUL	PEAK(KBTU)	121.087	0.000
	DY/HR	24/11	31/ 1
	TOTAL(MBTU)	39.851	0.000
AUG	PEAK(KBTU)	126.106	0.000
	DY/HR	21/11	31/ 1
	TOTAL(MBTU)	26.950	0.000
SEP	PEAK(KBTU)	110.248	0.000
	DY/HR	5/11	30/ 1
	TOTAL(MBTU)	22.650	22.744
OCT	PEAK(KBTU)	42.022	151.271
	DY/HR	31/ 9	20/ 8
	TOTAL(MBTU)	23.760	69.024
NOV	PEAK(KBTU)	42.022	207.461
	DY/HR	30/20	3/ 3
	TOTAL(MBTU)	25.532	127.892
DEC	PEAK(KBTU)	42.364	284.665
	DY/HR	13/ 8	15/ 5
	ONE YEAR	332.690	588.708
	USE/PEAK	126.106	300.728

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
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.

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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 #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%  ..
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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   ..
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                    $ 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      *
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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

	COOLING						HEATING						ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELECTRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000					0.000	-81.556	28	6	-2.F	-3.F	-279.321	4125.	7.709
FEB	0.00000					0.000	-61.129	3	6	-1.F	-2.F	-263.886	3724.	7.709
MAR	0.00000					0.000	-50.344	3	6	15.F	12.F	-220.044	4205.	7.609
APR	0.00000					0.000	-19.991	5	6	31.F	28.F	-152.387	4441.	7.609
MAY	12.75226	30	11	74.F	69.F	246.366	-5.326	5	6	44.F	40.F	-105.476	6050.	29.323
JUN	38.66085	26	11	82.F	74.F	304.394	0.000					0.000	8481.	33.092
JUL	56.66064	24	11	82.F	75.F	316.384	0.000					0.000	10349.	33.070
AUG	53.86172	21	11	88.F	76.F	318.364	0.000					0.000	10243.	33.860
SEP	22.85937	5	11	78.F	73.F	283.404	0.000					0.000	6945.	31.813
OCT	0.09829	1	18	83.F	68.F	28.998	-18.325	20	6	24.F	23.F	-158.405	4612.	10.843
NOV	0.00000					0.000	-41.293	3	6	13.F	12.F	-203.622	4186.	7.609
DEC	0.00000					0.000	-73.809	13	6	2.F	1.F	-262.159	4158.	7.709
TOTAL	184.893						-351.773						71520.	
MAX						318.364						-279.321		33.860

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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	563	0	181	744	0	594	98	0	31	-2.118	4.720
FEB	0	495	0	177	672	0	537	89	0	42	0.000	4.720
MAR	0	525	0	219	744	0	612	116	0	87	0.000	4.720
APR	0	413	0	307	720	0	671	191	0	258	0.000	4.720
MAY	175	160	0	409	360	245	736	240	0	401	0.000	29.014
JUN	394	0	0	326	0	468	720	240	0	326	0.000	32.956
JUL	479	0	0	265	0	498	742	246	0	263	0.000	33.070
AUG	469	0	0	275	0	512	728	232	0	259	0.000	33.860
SEP	294	0	0	426	0	355	720	240	0	426	0.000	31.813
OCT	5	383	0	356	720	5	696	200	0	308	0.000	10.843
NOV	0	500	0	220	720	0	617	137	0	117	-6.959	4.720
DEC	0	559	0	185	744	0	602	106	0	43	-11.314	4.720
ANNUAL	1816	3598	0	3346	5424	2083	7975	2135	0	2561		

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 BB-RADIATN TOPEKA, KS

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-10.996	29	6	11.F	9.F	-37.420	1316.	2.889
FEB	0.00000					0.000	-8.162	3	6	-1.F	-2.F	-37.420	1189.	2.889
MAR	0.00000					0.000	-5.954	3	6	15.F	12.F	-37.420	1316.	2.889
APR	0.00000					0.000	-1.253	1	6	54.F	50.F	-22.512	1274.	2.889
MAY	0.00000					0.000	0.000					0.000	1316.	2.889
JUN	0.00000					0.000	0.000					0.000	1274.	2.889
JUL	0.00000					0.000	0.000					0.000	1316.	2.889
AUG	0.00000					0.000	0.000					0.000	1316.	2.889
SEP	0.00000					0.000	0.000					0.000	1274.	2.889
OCT	0.00000					0.000	-0.190	31	6	44.F	39.F	-16.793	1316.	2.889
NOV	0.00000					0.000	-3.499	2	6	15.F	14.F	-27.520	1274.	2.889
DEC	0.00000					0.000	-9.708	30	6	21.F	18.F	-37.420	1316.	2.889
TOTAL	0.000						-39.761						15499.	
MAX						0.000						-37.420		2.889

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 BB-RADIATN TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	496	0	248	744	744	744	0	0	248	0.000	0.000
FEB	0	448	0	224	672	672	672	0	0	224	0.000	0.000
MAR	0	484	0	260	744	744	744	0	0	260	0.000	0.000
APR	0	182	0	538	720	720	720	0	0	538	0.000	0.000
MAY	0	0	0	744	360	744	360	0	0	360	0.000	0.000
JUN	0	0	0	720	0	720	0	0	0	0	0.000	0.000
JUL	0	0	0	744	0	744	0	0	0	0	0.000	0.000
AUG	0	0	0	744	0	744	0	0	0	0	0.000	0.000
SEP	0	0	0	720	0	720	0	0	0	0	0.000	0.000
OCT	0	43	0	701	720	744	720	0	0	677	0.000	0.000
NOV	0	379	0	341	720	720	720	0	0	341	0.000	0.000
DEC	0	496	0	248	744	744	744	0	0	248	0.000	0.000
ANNUAL	0	2528	0	6232	5424	8760	5424	0	0	2896		

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	23.001	128.765
JAN	PEAK(KBTU)	44.374	398.565
	DY/HR	28/ 9	28/ 6
	TOTAL(MBTU)	20.591	99.180
FEB	PEAK(KBTU)	44.374	382.322
	DY/HR	3/ 8	3/ 6
	TOTAL(MBTU)	22.735	84.382
MAR	PEAK(KBTU)	44.033	335.375
	DY/HR	31/20	3/ 6
	TOTAL(MBTU)	21.643	34.568
APR	PEAK(KBTU)	44.033	242.642
	DY/HR	25/ 7	5/ 6
	TOTAL(MBTU)	25.817	9.148
MAY	PEAK(KBTU)	109.986	163.367
	DY/HR	22/11	5/ 6
	TOTAL(MBTU)	33.308	0.000
JUN	PEAK(KBTU)	122.855	0.000
	DY/HR	19/11	30/ 1
	TOTAL(MBTU)	39.830	0.000
JUL	PEAK(KBTU)	122.778	0.000
	DY/HR	24/11	31/ 1
	TOTAL(MBTU)	39.470	0.000
AUG	PEAK(KBTU)	125.477	0.000
	DY/HR	21/11	31/ 1
	TOTAL(MBTU)	28.063	0.000
SEP	PEAK(KBTU)	118.488	0.000
	DY/HR	5/11	30/ 1
	TOTAL(MBTU)	22.228	30.728
OCT	PEAK(KBTU)	46.887	224.899
	DY/HR	1/18	20/ 6
	TOTAL(MBTU)	22.045	68.539
NOV	PEAK(KBTU)	44.033	302.110
	DY/HR	30/20	2/ 6
	TOTAL(MBTU)	23.042	118.134
DEC	PEAK(KBTU)	44.374	380.494
	DY/HR	13/ 8	13/ 6
	ONE YEAR	321.773	573.444
	USE/PEAK	125.477	398.565

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
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.

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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 #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.) ..
```

REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR PACK-COOLU TOPEKA, KS

	COOLING						HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-83.140	15	6	-8.F	-9.F	-219.394	4833.	7.709
FEB	0.00000					0.000	-62.451	3	6	-1.F	-2.F	-207.651	4361.	7.709
MAR	0.00000					0.000	-49.599	3	8	15.F	12.F	-167.240	4828.	7.609
APR	0.00000					0.000	-15.466	5	6	31.F	28.F	-108.532	4672.	7.609
MAY	17.91902	30	11	74.F	69.F	239.398	-2.839	5	6	44.F	40.F	-67.263	6549.	28.625
JUN	46.83541	26	11	82.F	74.F	289.876	0.000					0.000	9278.	32.859
JUL	63.72333	24	11	82.F	75.F	302.459	0.000					0.000	11117.	33.055
AUG	61.64609	21	11	88.F	76.F	305.603	0.000					0.000	11140.	34.031
SEP	29.05516	5	11	78.F	73.F	270.523	0.000					0.000	7534.	31.257
OCT	0.15188	1	18	83.F	68.F	34.730	-13.291	20	8	23.F	22.F	-115.476	4845.	11.486
NOV	0.00000					0.000	-39.470	3	6	13.F	12.F	-151.289	4672.	7.609
DEC	0.00000					0.000	-75.114	13	6	2.F	1.F	-204.382	4828.	7.709
TOTAL	219.331						-341.370						78657.	
MAX						305.603						-219.394		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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	-63.749	4.720
FEB	0	672	0	0	672	0	672	0	0	0	-52.652	4.720
MAR	0	743	0	1	744	0	744	0	0	1	-54.935	4.720
APR	0	592	0	128	720	0	720	0	0	128	-1.655	4.720
MAY	362	231	0	151	360	365	744	0	0	151	0.000	28.527
JUN	704	0	0	16	0	705	720	0	0	16	0.000	32.755
JUL	744	0	0	0	0	744	744	0	0	0	0.000	33.055
AUG	744	0	0	0	0	744	744	0	0	0	0.000	34.031
SEP	576	0	0	144	0	577	720	0	0	144	0.000	31.257
OCT	9	563	0	172	720	10	744	0	0	172	0.000	11.486
NOV	0	709	0	11	720	0	720	0	0	11	-59.754	4.720
DEC	0	744	0	0	744	0	744	0	0	0	-70.455	4.720
ANNUAL	3139	4998	0	623	5424	3145	8760	0	0	623		

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

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-11.865	4	3	8.F	7.F	-34.457	1316.	2.889
FEB	0.00000					0.000	-8.782	2	3	13.F	11.F	-28.572	1189.	2.889
MAR	0.00000					0.000	-6.536	3	4	16.F	13.F	-27.845	1316.	2.889
APR	0.00000					0.000	-1.436	1	3	36.F	32.F	-15.543	1274.	2.889
MAY	0.00000					0.000	0.000					0.000	1316.	2.889
JUN	0.00000					0.000	0.000					0.000	1274.	2.889
JUL	0.00000					0.000	0.000					0.000	1316.	2.889
AUG	0.00000					0.000	0.000					0.000	1316.	2.889
SEP	0.00000					0.000	0.000					0.000	1274.	2.889
OCT	0.00000					0.000	-0.269	31	5	45.F	40.F	-12.874	1316.	2.889
NOV	0.00000					0.000	-3.923	30	5	29.F	26.F	-18.718	1274.	2.889
DEC	0.00000					0.000	-10.505	15	5	8.F	7.F	-29.776	1316.	2.889
TOTAL	0.000						-43.315						15499.	
MAX						0.000						-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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	744	744	0	0	0	-15.660	0.000
FEB	0	670	0	2	672	672	672	0	0	2	-13.959	0.000
MAR	0	680	0	64	744	744	744	0	0	64	-14.686	0.000
APR	0	250	0	470	720	720	720	0	0	470	0.000	0.000
MAY	0	0	0	744	360	744	360	0	0	360	0.000	0.000
JUN	0	0	0	720	0	720	0	0	0	0	0.000	0.000
JUL	0	0	0	744	0	744	0	0	0	0	0.000	0.000
AUG	0	0	0	744	0	744	0	0	0	0	0.000	0.000
SEP	0	0	0	720	0	720	0	0	0	0	0.000	0.000
OCT	0	70	0	674	720	744	720	0	0	650	-8.919	0.000
NOV	0	536	0	184	720	720	720	0	0	184	-14.610	0.000
DEC	0	744	0	0	744	744	744	0	0	0	-16.786	0.000
ANNUAL	0	3694	0	5066	5424	8760	5424	0	0	1730		

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	25.708	133.165
JAN	PEAK(KBTU)	42.530	308.832
	DY/HR	28/ 9	28/ 6
	TOTAL(MBTU)	23.180	103.638
FEB	PEAK(KBTU)	42.530	295.821
	DY/HR	3/ 8	3/ 6
	TOTAL(MBTU)	25.230	85.981
MAR	PEAK(KBTU)	42.189	252.719
	DY/HR	31/20	3/ 6
	TOTAL(MBTU)	22.257	28.392
APR	PEAK(KBTU)	42.189	173.989
	DY/HR	17/ 8	5/ 6
	TOTAL(MBTU)	27.347	5.254
MAY	PEAK(KBTU)	107.601	109.447
	DY/HR	22/11	5/ 6
	TOTAL(MBTU)	36.030	0.000
JUN	PEAK(KBTU)	122.057	0.000
	DY/HR	19/11	30/ 1
	TOTAL(MBTU)	42.452	0.000
JUL	PEAK(KBTU)	122.727	0.000
	DY/HR	24/11	31/ 1
	TOTAL(MBTU)	42.531	0.000
AUG	PEAK(KBTU)	126.058	0.000
	DY/HR	21/11	31/ 1
	TOTAL(MBTU)	30.074	0.000
SEP	PEAK(KBTU)	116.587	0.000
	DY/HR	5/11	30/ 1
	TOTAL(MBTU)	22.752	23.296
OCT	PEAK(KBTU)	49.081	165.917
	DY/HR	1/18	20/ 8
	TOTAL(MBTU)	23.916	67.838
NOV	PEAK(KBTU)	42.189	225.499
	DY/HR	30/20	2/ 6
	TOTAL(MBTU)	25.671	122.386
DEC	PEAK(KBTU)	42.530	294.457
	DY/HR	13/ 8	14/ 8
	ONE YEAR	347.149	569.951
	USE/PEAK	126.058	308.832

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
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  ..

                $----------------------------------------$
                $ 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 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) (0.16)
                          (6,21) (0.)
                          (22,24) (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 #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 PACK-COOLU TOPEKA, KS

	COOLING						HEATING						ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-68.372	15	3	-8.F	-9.F	-225.819	4833.	7.709
FEB	0.00000					0.000	-51.462	3	4	0.F	-1.F	-201.794	4361.	7.709
MAR	0.00000					0.000	-41.278	3	5	15.F	13.F	-168.135	4828.	7.609
APR	0.00000					0.000	-13.526	1	1	32.F	29.F	-114.287	4672.	7.609
MAY	15.47526	22	11	76.F	65.F	252.983	-2.596	5	5	44.F	40.F	-66.043	6328.	29.836
JUN	38.22856	26	11	82.F	74.F	270.003	0.000					0.000	8494.	32.041
JUL	51.51688	24	11	82.F	75.F	278.953	0.000					0.000	9986.	32.253
AUG	49.07655	21	11	88.F	76.F	280.506	0.000					0.000	9920.	33.356
SEP	24.76225	5	11	78.F	73.F	259.022	0.000					0.000	7131.	30.604
OCT	0.03261	1	18	83.F	68.F	10.440	-11.183	20	5	25.F	25.F	-110.709	4832.	8.780
NOV	0.00000					0.000	-32.886	3	4	13.F	12.F	-151.900	4672.	7.609
DEC	0.00000					0.000	-61.681	15	2	3.F	2.F	-209.061	4828.	7.709
TOTAL	179.092						-282.985						74886.	
MAX						280.506						-225.819		33.356

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 LOAD HOURS FOR PACK-COOLU TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	741	0	3	744	0	744	0	0	3	-122.454	4.720
FEB	0	667	0	5	672	0	672	0	0	5	-112.616	4.720
MAR	0	733	0	11	744	0	744	0	0	11	-113.403	4.720
APR	0	494	0	226	720	0	720	0	0	226	-24.124	4.720
MAY	359	182	0	203	360	362	744	0	0	203	0.000	29.836
JUN	695	0	0	25	0	697	720	0	0	25	0.000	31.934
JUL	744	0	0	0	0	744	744	0	0	0	0.000	32.253
AUG	744	0	0	0	0	744	744	0	0	0	0.000	33.356
SEP	545	0	0	175	0	550	720	0	0	175	0.000	30.604
OCT	4	486	0	254	720	4	744	0	0	254	0.000	8.780
NOV	0	676	0	44	720	0	720	0	0	44	-127.211	4.720
DEC	0	740	0	4	744	0	744	0	0	4	-134.176	4.720
ANNUAL	3091	4719	0	950	5424	3101	8760	0	0	950		

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 BB-RADIATN TOPEKA, KS

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-11.865	4	3	8.F	7.F	-34.457	1316.	2.889
FEB	0.00000					0.000	-8.782	2	3	13.F	11.F	-28.572	1189.	2.889
MAR	0.00000					0.000	-6.536	3	4	16.F	13.F	-27.845	1316.	2.889
APR	0.00000					0.000	-1.436	1	3	36.F	32.F	-15.543	1274.	2.889
MAY	0.00000					0.000	0.000					0.000	1316.	2.889
JUN	0.00000					0.000	0.000					0.000	1274.	2.889
JUL	0.00000					0.000	0.000					0.000	1316.	2.889
AUG	0.00000					0.000	0.000					0.000	1316.	2.889
SEP	0.00000					0.000	0.000					0.000	1274.	2.889
OCT	0.00000					0.000	-0.269	31	5	45.F	40.F	-12.874	1316.	2.889
NOV	0.00000					0.000	-3.923	30	5	29.F	26.F	-18.718	1274.	2.889
DEC	0.00000					0.000	-10.505	15	5	8.F	7.F	-29.776	1316.	2.889
TOTAL	0.000						-43.315						15499.	
MAX						0.000						-34.457		2.889

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 LOAD HOURS FOR BB-RADIATN TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	744	744	0	0	0	-15.660	0.000
FEB	0	670	0	2	672	672	672	0	0	2	-13.959	0.000
MAR	0	680	0	64	744	744	744	0	0	64	-14.686	0.000
APR	0	250	0	470	720	720	720	0	0	470	0.000	0.000
MAY	0	0	0	744	360	744	360	0	0	360	0.000	0.000
JUN	0	0	0	720	0	720	0	0	0	0	0.000	0.000
JUL	0	0	0	744	0	744	0	0	0	0	0.000	0.000
AUG	0	0	0	744	0	744	0	0	0	0	0.000	0.000
SEP	0	0	0	720	0	720	0	0	0	0	0.000	0.000
OCT	0	70	0	674	720	744	720	0	0	650	-8.919	0.000
NOV	0	536	0	184	720	720	720	0	0	184	-14.610	0.000
DEC	0	744	0	0	744	744	744	0	0	0	-16.786	0.000
ANNUAL	0	3694	0	5066	5424	8760	5424	0	0	1730		

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	25.666	115.828
JAN	PEAK(KBTU)	42.715	317.809
	DY/HR	28/ 9	15/ 3
	TOTAL(MBTU)	23.038	89.934
FEB	PEAK(KBTU)	42.715	290.749
	DY/HR	3/ 8	3/ 4
	TOTAL(MBTU)	24.765	73.714
MAR	PEAK(KBTU)	42.373	256.792
	DY/HR	31/10	3/ 5
	TOTAL(MBTU)	21.972	24.848
APR	PEAK(KBTU)	42.326	182.822
	DY/HR	1/ 7	1/ 1
	TOTAL(MBTU)	26.526	4.739
MAY	PEAK(KBTU)	111.737	108.843
	DY/HR	22/11	5/ 5
	TOTAL(MBTU)	33.352	0.000
JUN	PEAK(KBTU)	119.264	0.000
	DY/HR	19/11	30/ 1
	TOTAL(MBTU)	38.593	0.000
JUL	PEAK(KBTU)	119.988	0.000
	DY/HR	24/11	31/ 1
	TOTAL(MBTU)	38.367	0.000
AUG	PEAK(KBTU)	123.755	0.000
	DY/HR	21/11	31/ 1
	TOTAL(MBTU)	28.698	0.000
SEP	PEAK(KBTU)	114.359	0.000
	DY/HR	5/11	30/ 1
	TOTAL(MBTU)	22.469	19.751
OCT	PEAK(KBTU)	41.233	161.357
	DY/HR	31/ 7	20/ 5
	TOTAL(MBTU)	23.470	57.764
NOV	PEAK(KBTU)	42.373	224.784
	DY/HR	30/11	3/ 3
	TOTAL(MBTU)	25.513	105.912
DEC	PEAK(KBTU)	42.715	303.206
	DY/HR	13/ 8	15/ 5
	ONE YEAR	332.428	492.490
	USE/PEAK	123.755	317.809

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
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

EMC ENGINEERS, INC.

DENVER - ATLANTA

PROJECT:	FEASIBILITY STUDY FOR INSTALLATION OF UMCS	EMC NO:	1406-001
		CALC. BY:	AJN
LOCATION:	FORT RILEY, KANSAS	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	FT²
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	NIGHTIME INFILTRATION (OA)
RUN5	DAYTIME INFILTRATION (OA)

HOURS OF OCCUPANCY				
M-F	800	1700	45	HR
SAT.	0	0	0	HR
SUN.	0	0	0	HR
	TOTAL OCCUPY HR.		45	HR/WK
	TOTAL UNOCC. HR.		123	HR/WK
	ANNUAL OCCUPY HR.		2346	HR/YR
	ANNUAL UNOCC. HR.		6414	HR/YR

ANNUAL HEATING & COOLING HOURS	
HR. ON HEATING	1459 HR/YR
HR. ON COOLING	887 HR/YR
HR. OFF HEATING	3989 HR/YR
HR. OFF COOLING	2425 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	
COAUC	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	
COAOC	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

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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.#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  ..
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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
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                        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  ..
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          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_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  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 ..
```

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	GLASS U-VALUE (BTU/HR-SQFT-F)	GLASS AREA (SQFT)	WALL U-VALUE (BTU/HR-SQFT-F)	WALL AREA (SQFT)	WALL+GLASS U-VALUE (BTU/HR-SQFT-F)	WALL+GLASS AREA (SQFT)	AZIMUTH
	SPACE_3	0.490	39.60	0.209	420.40	0.233	460.00	NORTH
	PLENUM_6	0.000	0.00	0.209	172.50	0.209	172.50	NORTH
	PLENUM_6	0.000	0.00	0.209	504.00	0.209	504.00	EAST
	SPACE_2	0.490	198.00	0.209	1146.00	0.251	1344.00	EAST
	PLENUM_6	0.000	0.00	0.209	172.50	0.209	172.50	SOUTH
	SPACE_4	0.490	78.00	0.209	382.00	0.257	460.00	SOUTH
	PLENUM_6	0.000	0.00	0.209	504.00	0.209	504.00	WEST
	SPACE_1	0.490	312.00	0.209	1032.00	0.274	1344.00	WEST
	SPACE_5	0.000	0.00	0.087	3795.00	0.087	3795.00	ROOF
	SPACE_1	0.000	0.00	0.087	2295.00	0.087	2295.00	ROOF
	SPACE_3	0.000	0.00	0.087	637.50	0.087	637.50	ROOF
	SPACE_2	0.000	0.00	0.087	2295.00	0.087	2295.00	ROOF
	SPACE_4	0.000	0.00	0.087	637.50	0.087	637.50	ROOF
	PLENUM_6	0.000	0.00	0.087	9660.00	0.087	9660.00	ROOF
	SPACE_1	0.000	0.00	0.020	2295.00	0.020	2295.00	UNDERGRND
	SPACE_2	0.000	0.00	0.020	2295.00	0.020	2295.00	UNDERGRND
	SPACE_3	0.000	0.00	0.020	637.50	0.020	637.50	UNDERGRND
	SPACE_4	0.000	0.00	0.020	637.50	0.020	637.50	UNDERGRND
	SPACE_5	0.000	0.00	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/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	0.490	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		HEATING LOAD
TIME	AUG 11 4PM		JAN 15 8AM
DRY-BULB TEMP	100F	38C	-6F -21C
WET-BULB TEMP	71F	22C	-7F -22C

	SENSIBLE (KBTU/H)	SENSIBLE (KW)	LATENT (KBTU/H)	LATENT (KW)	SENSIBLE (KBTU/H)	SENSIBLE (KW)
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	-40.883 KW
TOTAL LOAD / AREA	25.36BTU/H.SQFT		79.939 W /SQMT		14.473BTU/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 *
*
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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

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-38.011	15	8	-6.F	-7.F	-168.369	19885.	63.387
FEB	0.00000					0.000	-23.798	3	6	-1.F	-2.F	-132.328	17843.	63.387
MAR	0.00000					0.000	-22.495	6	7	19.F	18.F	-107.885	20637.	59.657
APR	0.00000					0.000	-26.800	22	18	67.F	52.F	-89.616	19390.	59.657
MAY	48.22987	16	4	60.F	58.F	461.241	-16.357	13	18	80.F	66.F	-98.800	24412.	95.141
JUN	98.47421	28	16	90.F	76.F	304.383	0.000					0.000	29769.	92.743
JUL	109.91195	13	16	93.F	77.F	314.285	0.000					0.000	30552.	95.026
AUG	113.19754	22	16	96.F	77.F	313.260	0.000					0.000	32646.	97.691
SEP	78.58515	7	16	93.F	76.F	302.555	0.000					0.000	27234.	93.694
OCT	0.96727	1	18	83.F	68.F	91.762	-24.237	6	18	67.F	52.F	-82.919	19352.	59.657
NOV	0.00000					0.000	-19.656	13	6	25.F	24.F	-88.392	18928.	59.657
DEC	0.00000					0.000	-30.216	12	6	3.F	2.F	-145.035	19717.	63.387
TOTAL	449.366						-201.571						280366.	
MAX						461.241						-168.369		97.691

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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	-29.292	13.455
FEB	0	672	0	0	672	0	672	0	0	0	-26.311	13.455
MAR	0	744	0	0	744	0	744	0	0	0	-33.254	13.455
APR	0	720	0	0	720	0	720	0	0	0	-49.273	13.455
MAY	384	360	0	0	360	384	744	0	0	0	0.000	53.245
JUN	720	0	0	0	0	720	720	0	0	0	0.000	92.743
JUL	744	0	0	0	0	744	744	0	0	0	0.000	95.026
AUG	744	0	0	0	0	744	744	0	0	0	0.000	96.162
SEP	709	0	0	11	0	720	720	0	0	11	0.000	93.694
OCT	21	720	0	3	720	24	744	0	0	3	0.000	23.729
NOV	0	720	0	0	720	0	720	0	0	0	-32.826	13.455
DEC	0	744	0	0	744	0	744	0	0	0	-91.653	13.455
ANNUAL	3322	5424	0	14	5424	3336	8760	0	0	14		

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	69.967	60.283
JAN	PEAK(KBTU)	220.173	226.170
	DY/HR	28/ 8	15/ 8
	TOTAL(MBTU)	62.622	40.586
FEB	PEAK(KBTU)	219.726	185.192
	DY/HR	3/ 8	3/ 6
	TOTAL(MBTU)	72.410	40.496
MAR	PEAK(KBTU)	206.722	156.484
	DY/HR	18/16	6/ 7
	TOTAL(MBTU)	68.446	47.486
APR	PEAK(KBTU)	207.437	134.543
	DY/HR	29/16	22/18
	TOTAL(MBTU)	84.564	27.949
MAY	PEAK(KBTU)	324.850	145.624
	DY/HR	16/15	13/18
	TOTAL(MBTU)	101.644	0.000
JUN	PEAK(KBTU)	316.665	0.000
	DY/HR	28/16	30/ 1
	TOTAL(MBTU)	104.317	0.000
JUL	PEAK(KBTU)	324.458	0.000
	DY/HR	13/16	31/ 1
	TOTAL(MBTU)	111.468	0.000
AUG	PEAK(KBTU)	333.558	0.000
	DY/HR	11/16	31/ 1
	TOTAL(MBTU)	92.989	0.000
SEP	PEAK(KBTU)	319.910	0.000
	DY/HR	7/16	30/ 1
	TOTAL(MBTU)	68.131	43.245
OCT	PEAK(KBTU)	207.437	126.396
	DY/HR	19/16	6/18
	TOTAL(MBTU)	66.352	35.669
NOV	PEAK(KBTU)	207.325	133.058
	DY/HR	18/16	13/ 6
	TOTAL(MBTU)	69.278	50.105
DEC	PEAK(KBTU)	219.797	199.824
	DY/HR	13/ 8	12/ 6
	ONE YEAR	972.187	345.818
	USE/PEAK	333.558	226.170

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
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.

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 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. EZDOE - 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

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-17.291	17	7	27.F	24.F	-281.390	19333.	63.387
FEB	0.00000					0.000	-10.768	7	7	26.F	25.F	-221.102	17843.	63.387
MAR	0.00000					0.000	-14.490	7	7	28.F	27.F	-87.943	20637.	59.657
APR	0.00000					0.000	-20.232	22	18	67.F	52.F	-70.345	19390.	59.657
MAY	38.86512	16	8	61.F	59.F	506.286	-12.508	13	18	80.F	66.F	-77.785	22588.	103.261
JUN	79.12955	27	7	72.F	71.F	362.677	0.000					0.000	26342.	96.688
JUL	83.60725	18	7	76.F	72.F	386.000	0.000					0.000	25604.	98.871
AUG	89.43966	22	7	76.F	72.F	398.339	0.000					0.000	28114.	101.894
SEP	65.87719	6	7	75.F	71.F	367.455	0.000					0.000	25031.	98.374
OCT	0.00001	1	15	82.F	67.F	0.002	-18.655	6	18	67.F	52.F	-65.151	19251.	59.657
NOV	0.00000					0.000	-13.481	14	7	32.F	32.F	-70.341	18928.	59.657
DEC	0.00000					0.000	-13.937	12	7	2.F	1.F	-283.187	19676.	63.387
TOTAL	356.919						-121.363						262730.	
MAX						506.286						-283.187		103.261

EMC ENGINEERS INC. EZDOE - 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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	687	0	57	744	0	703	472	0	16	-16.734	13.455
FEB	0	641	0	31	672	0	672	463	0	31	-18.064	13.455
MAR	0	740	0	4	744	0	744	491	0	4	-26.734	13.455
APR	0	720	0	0	720	0	720	489	0	0	-38.853	13.455
MAY	210	360	0	174	360	384	692	461	0	122	0.000	103.261
JUN	466	0	0	254	0	720	641	399	0	175	0.000	68.431
JUL	514	0	0	230	0	744	608	388	0	94	0.000	72.210
AUG	524	0	0	220	0	744	625	372	0	101	0.000	73.372
SEP	361	0	0	359	0	720	678	447	0	317	0.000	70.127
OCT	6	710	0	28	720	24	744	524	0	28	0.000	13.455
NOV	0	695	0	25	720	0	720	500	0	25	-26.309	13.455
DEC	0	725	0	19	744	0	741	510	0	16	-11.023	13.455
ANNUAL	2081	5278	0	1401	5424	3336	8288	5516	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-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	67.453	31.983
JAN	PEAK(KBTU)	222.724	378.401
	DY/HR	28/ 9	17/ 7
	TOTAL(MBTU)	61.984	21.619
FEB	PEAK(KBTU)	222.704	309.783
	DY/HR	3/ 8	7/ 7
	TOTAL(MBTU)	71.922	28.829
MAR	PEAK(KBTU)	205.681	148.719
	DY/HR	18/16	7/ 7
	TOTAL(MBTU)	68.166	38.723
APR	PEAK(KBTU)	207.542	126.454
	DY/HR	22/16	22/18
	TOTAL(MBTU)	78.315	23.514
MAY	PEAK(KBTU)	352.576	135.895
	DY/HR	16/ 8	13/18
	TOTAL(MBTU)	89.941	0.000
JUN	PEAK(KBTU)	330.134	0.000
	DY/HR	28/16	30/ 1
	TOTAL(MBTU)	87.424	0.000
JUL	PEAK(KBTU)	337.587	0.000
	DY/HR	22/16	31/ 1
	TOTAL(MBTU)	95.993	0.000
AUG	PEAK(KBTU)	347.908	0.000
	DY/HR	22/14	31/ 1
	TOTAL(MBTU)	85.465	0.000
SEP	PEAK(KBTU)	335.889	0.000
	DY/HR	6/16	30/ 1
	TOTAL(MBTU)	67.550	35.932
OCT	PEAK(KBTU)	207.206	118.203
	DY/HR	7/16	6/18
	TOTAL(MBTU)	65.988	26.861
NOV	PEAK(KBTU)	206.068	126.450
	DY/HR	18/16	14/ 7
	TOTAL(MBTU)	68.468	27.087
DEC	PEAK(KBTU)	222.724	380.405
	DY/HR	13/ 8	12/ 7
	ONE YEAR	908.669	234.548
	USE/PEAK	352.576	380.405

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.

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 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
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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
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                    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

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-20.952	16	3	4.F	2.F	-117.760	19885.	63.387
FEB	0.00000					0.000	-11.929	3	6	-1.F	-2.F	-66.572	17843.	63.387
MAR	0.00000					0.000	-14.538	18	18	60.F	43.F	-49.926	20637.	59.657
APR	0.00000					0.000	-20.232	22	18	67.F	52.F	-70.345	19390.	59.657
MAY	44.64120	16	5	59.F	58.F	503.196	-12.508	13	18	80.F	66.F	-77.785	24071.	95.493
JUN	89.20745	28	16	90.F	76.F	284.521	0.000					0.000	28880.	90.565
JUL	98.36989	7	16	83.F	73.F	296.148	0.000					0.000	29418.	92.645
AUG	102.36281	11	16	100.F	71.F	295.288	0.000					0.000	31552.	95.653
SEP	71.39226	7	16	93.F	76.F	282.667	0.000					0.000	26549.	91.423
OCT	0.77718	1	18	83.F	68.F	77.766	-18.518	6	18	67.F	52.F	-64.495	19333.	59.657
NOV	0.00000					0.000	-13.437	18	18	41.F	34.F	-58.939	18928.	59.657
DEC	0.00000					0.000	-15.454	12	6	3.F	2.F	-108.992	19717.	63.387
TOTAL	406.751						-127.568						276202.	
MAX						503.196						-117.760		95.653

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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	694	0	50	744	0	744	0	0	50	-19.080	13.455
FEB	0	626	0	46	672	0	672	0	0	46	-17.946	13.455
MAR	0	738	0	6	744	0	744	0	0	6	-26.734	13.455
APR	0	720	0	0	720	0	720	0	0	0	-38.853	13.455
MAY	384	360	0	0	360	384	744	0	0	0	0.000	56.825
JUN	720	0	0	0	0	720	720	0	0	0	0.000	90.565
JUL	744	0	0	0	0	744	744	0	0	0	0.000	89.336
AUG	744	0	0	0	0	744	744	0	0	0	0.000	95.653
SEP	697	0	0	23	0	720	720	0	0	23	0.000	91.423
OCT	18	708	0	18	720	24	744	0	0	18	0.000	22.155
NOV	0	693	0	27	720	0	720	0	0	27	-26.309	13.455
DEC	0	708	0	36	744	0	744	0	0	36	-47.574	13.455
ANNUAL	3307	5247	0	206	5424	3336	8760	0	0	206		

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	69.121	33.868
JAN	PEAK(KBTU)	217.733	158.187
	DY/HR	28/ 8	16/ 3
	TOTAL(MBTU)	61.914	21.344
FEB	PEAK(KBTU)	216.818	98.808
	DY/HR	3/ 8	3/ 6
	TOTAL(MBTU)	71.761	26.470
MAR	PEAK(KBTU)	205.533	78.496
	DY/HR	18/16	18/18
	TOTAL(MBTU)	67.795	35.208
APR	PEAK(KBTU)	206.313	103.343
	DY/HR	29/16	22/18
	TOTAL(MBTU)	83.053	20.973
MAY	PEAK(KBTU)	326.053	112.212
	DY/HR	16/ 8	13/18
	TOTAL(MBTU)	98.608	0.000
JUN	PEAK(KBTU)	309.228	0.000
	DY/HR	28/16	30/ 1
	TOTAL(MBTU)	100.447	0.000
JUL	PEAK(KBTU)	316.330	0.000
	DY/HR	13/16	31/ 1
	TOTAL(MBTU)	107.732	0.000
AUG	PEAK(KBTU)	326.600	0.000
	DY/HR	11/16	31/ 1
	TOTAL(MBTU)	90.649	0.000
SEP	PEAK(KBTU)	312.156	0.000
	DY/HR	7/16	30/ 1
	TOTAL(MBTU)	67.488	32.427
OCT	PEAK(KBTU)	206.313	96.301
	DY/HR	19/16	6/18
	TOTAL(MBTU)	65.810	24.390
NOV	PEAK(KBTU)	205.916	89.555
	DY/HR	18/16	18/18
	TOTAL(MBTU)	68.443	26.537
DEC	PEAK(KBTU)	217.160	148.346
	DY/HR	13/ 8	12/ 6
	ONE YEAR	952.822	221.218
	USE/PEAK	326.600	158.187

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
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  ..
```

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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   ..
```

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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  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, 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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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

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-53.952	31	7	24.F	21.F	-544.720	16978.	63.387
FEB	0.00000					0.000	-44.277	22	7	26.F	24.F	-537.696	15327.	63.387
MAR	0.00000					0.000	-64.302	18	18	60.F	43.F	-536.156	18390.	59.657
APR	0.00000					0.000	-50.168	5	18	56.F	41.F	-532.530	18502.	59.657
MAY	23.34469	31	7	75.F	69.F	356.461	-9.827	5	7	44.F	40.F	-393.744	21118.	95.253
JUN	66.11934	27	7	72.F	71.F	362.670	0.000					0.000	25224.	96.688
JUL	81.69007	18	7	76.F	72.F	385.971	0.000					0.000	25453.	98.871
AUG	86.00661	22	7	76.F	72.F	398.337	0.000					0.000	27826.	101.893
SEP	48.79244	6	7	75.F	71.F	367.179	0.000					0.000	23529.	98.375
OCT	0.00001	1	13	79.F	66.F	0.002	-19.246	6	18	67.F	52.F	-563.530	18350.	59.657
NOV	0.00000					0.000	-39.997	28	7	28.F	26.F	-540.462	16762.	59.657
DEC	0.00000					0.000	-49.815	5	7	21.F	18.F	-546.543	16864.	63.387
TOTAL	305.953						-331.583						244317.	
MAX						398.337						-563.530		101.893

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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	526	0	218	744	0	528	297	0	2	0.000	0.000
FEB	0	479	0	193	672	0	485	276	0	6	0.000	0.000
MAR	0	553	0	191	744	0	577	324	0	24	-99.492	13.455
APR	0	492	0	228	720	0	654	423	0	162	0.000	13.455
MAY	140	157	0	447	360	384	683	452	0	386	0.000	69.072
JUN	403	0	0	317	0	720	641	399	0	238	0.000	68.430
JUL	491	0	0	253	0	744	609	389	0	118	0.000	72.207
AUG	503	0	0	241	0	744	625	372	0	122	0.000	73.372
SEP	265	0	0	455	0	720	678	447	0	413	0.000	70.101
OCT	5	284	0	455	720	24	677	457	0	388	0.000	13.455
NOV	0	445	0	275	720	0	559	339	0	114	-98.255	13.455
DEC	0	532	0	212	744	0	532	301	0	0	-76.836	13.455
ANNUAL	1807	3468	0	3485	5424	3336	7248	4476	0	1973		

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	61.977	93.149
JAN	PEAK(KBTU)	228.954	735.959
	DY/HR	28/ 9	31/ 7
	TOTAL(MBTU)	55.585	76.557
FEB	PEAK(KBTU)	224.389	728.071
	DY/HR	3/ 8	22/ 7
	TOTAL(MBTU)	67.077	107.755
MAR	PEAK(KBTU)	216.218	726.340
	DY/HR	31/ 9	18/18
	TOTAL(MBTU)	66.513	84.521
APR	PEAK(KBTU)	216.218	722.259
	DY/HR	22/14	5/18
	TOTAL(MBTU)	72.818	17.326
MAY	PEAK(KBTU)	325.235	562.401
	DY/HR	31/16	5/ 7
	TOTAL(MBTU)	86.127	0.000
JUN	PEAK(KBTU)	330.134	0.000
	DY/HR	28/16	30/ 1
	TOTAL(MBTU)	86.907	0.000
JUL	PEAK(KBTU)	337.587	0.000
	DY/HR	22/16	31/ 1
	TOTAL(MBTU)	95.009	0.000
AUG	PEAK(KBTU)	347.908	0.000
	DY/HR	22/14	31/ 1
	TOTAL(MBTU)	80.339	0.000
SEP	PEAK(KBTU)	335.894	0.000
	DY/HR	6/16	30/ 1
	TOTAL(MBTU)	64.104	34.048
OCT	PEAK(KBTU)	216.218	756.989
	DY/HR	31/ 9	6/18
	TOTAL(MBTU)	60.172	69.318
NOV	PEAK(KBTU)	216.218	731.180
	DY/HR	30/ 9	28/ 7
	TOTAL(MBTU)	61.302	86.408
DEC	PEAK(KBTU)	227.787	738.002
	DY/HR	13/ 8	5/ 7
	ONE YEAR	857.931	569.081
	USE/PEAK	347.908	756.989

EMC ENGINEERS INC. EZDOE - 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.

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 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

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-151.545	19885.	63.387
FEB	0.00000					0.000	-7.344	3	6	-1.F	-2.F	-100.678	17843.	63.387
MAR	0.00000					0.000	-9.198	29	6	27.F	23.F	-58.060	20637.	59.657
APR	0.00000					0.000	-12.278	22	17	69.F	54.F	-89.868	19390.	59.657
MAY	48.73689	16	3	61.F	59.F	567.298	-7.460	13	17	82.F	65.F	-105.066	24443.	99.046
JUN	93.26552	28	16	90.F	76.F	304.380	0.000					0.000	29238.	92.743
JUL	100.51900	13	16	93.F	77.F	314.276	0.000					0.000	29589.	95.025
AUG	105.79280	22	16	96.F	77.F	313.245	0.000					0.000	31873.	97.690
SEP	77.55887	7	16	93.F	76.F	302.548	0.000					0.000	27114.	93.693
OCT	1.00734	1	18	83.F	68.F	79.598	-11.061	7	17	73.F	56.F	-77.097	19355.	59.657
NOV	0.00000					0.000	-8.256	18	17	44.F	36.F	-67.556	18928.	59.657
DEC	0.00000					0.000	-10.523	12	6	3.F	2.F	-144.877	19717.	63.387
TOTAL	426.881						-81.349						278012.	
MAX						567.298						-151.545		99.046

H10-40

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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	-3.594	13.455
FEB	0	672	0	0	672	0	672	0	0	0	-3.927	13.455
MAR	0	744	0	0	744	0	744	0	0	0	-4.619	13.455
APR	0	720	0	0	720	0	720	0	0	0	-5.180	13.455
MAY	384	358	0	2	360	384	744	0	0	2	0.000	62.083
JUN	720	0	0	0	0	720	720	0	0	0	0.000	92.743
JUL	744	0	0	0	0	744	744	0	0	0	0.000	95.025
AUG	744	0	0	0	0	744	744	0	0	0	0.000	96.160
SEP	719	0	0	1	0	720	720	0	0	1	0.000	93.693
OCT	24	720	0	0	720	24	744	0	0	0	0.000	22.388
NOV	0	720	0	0	720	0	720	0	0	0	-4.859	13.455
DEC	0	744	0	0	744	0	744	0	0	0	-29.735	13.455
ANNUAL	3335	5422	0	3	5424	3336	8760	0	0	3		

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- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	69.077	27.005
JAN	PEAK(KBTU)	219.799	203.570
	DY/HR	28/ 8	28/ 6
	TOTAL(MBTU)	61.628	14.370
FEB	PEAK(KBTU)	218.764	145.089
	DY/HR	3/ 8	3/ 6
	TOTAL(MBTU)	71.337	17.765
MAR	PEAK(KBTU)	207.063	93.345
	DY/HR	25/16	29/ 6
	TOTAL(MBTU)	67.193	22.210
APR	PEAK(KBTU)	207.063	132.202
	DY/HR	29/16	22/17
	TOTAL(MBTU)	83.955	12.763
MAY	PEAK(KBTU)	338.187	150.275
	DY/HR	16/ 8	13/17
	TOTAL(MBTU)	99.831	0.000
JUN	PEAK(KBTU)	316.664	0.000
	DY/HR	28/16	30/ 1
	TOTAL(MBTU)	101.031	0.000
JUL	PEAK(KBTU)	324.454	0.000
	DY/HR	13/16	31/ 1
	TOTAL(MBTU)	108.828	0.000
AUG	PEAK(KBTU)	333.554	0.000
	DY/HR	11/16	31/ 1
	TOTAL(MBTU)	92.579	0.000
SEP	PEAK(KBTU)	319.907	0.000
	DY/HR	7/16	30/ 1
	TOTAL(MBTU)	66.991	20.228
OCT	PEAK(KBTU)	207.063	116.769
	DY/HR	28/16	7/17
	TOTAL(MBTU)	65.406	16.006
NOV	PEAK(KBTU)	207.063	105.092
	DY/HR	25/16	18/17
	TOTAL(MBTU)	68.224	19.569
DEC	PEAK(KBTU)	219.760	196.108
	DY/HR	13/ 8	12/ 6
	ONE YEAR	956.081	149.916
	USE/PEAK	338.187	203.570

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
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 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.

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      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
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                    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 #5 DAY 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
```

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-30.868	16	3	4.F	2.F	-154.344	19885.	63.387
FEB	0.00000					0.000	-19.151	28	5	14.F	13.F	-111.937	17843.	63.387
MAR	0.00000					0.000	-18.459	6	7	19.F	18.F	-100.505	20637.	59.657
APR	0.00000					0.000	-22.664	22	18	67.F	52.F	-114.138	19390.	59.657
MAY	47.87705	16	5	59.F	58.F	468.583	-13.674	13	18	80.F	66.F	-122.542	24385.	96.902
JUN	94.97421	29	16	89.F	75.F	273.340	0.000					0.000	29460.	89.425
JUL	105.07058	7	16	83.F	73.F	287.904	0.000					0.000	30124.	91.273
AUG	108.14583	11	16	100.F	71.F	290.471	0.000					0.000	32172.	95.221
SEP	76.59960	7	16	93.F	76.F	270.663	0.000					0.000	27062.	90.273
OCT	0.96750	1	18	83.F	68.F	91.769	-20.627	7	18	71.F	55.F	-101.116	19352.	59.657
NOV	0.00000					0.000	-16.911	18	18	41.F	34.F	-95.491	18928.	59.657
DEC	0.00000					0.000	-23.781	12	5	4.F	3.F	-142.251	19717.	63.387
TOTAL	433.635						-166.133						278956.	
MAX						468.583						-154.344		96.902

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	-30.755	13.455
FEB	0	672	0	0	672	0	672	0	0	0	-27.730	13.455
MAR	0	744	0	0	744	0	744	0	0	0	-39.428	13.455
APR	0	697	0	23	720	0	720	0	0	23	-54.948	13.455
MAY	384	333	0	27	360	384	744	0	0	27	0.000	53.867
JUN	720	0	0	0	0	720	720	0	0	0	0.000	89.191
JUL	744	0	0	0	0	744	744	0	0	0	0.000	88.607
AUG	744	0	0	0	0	744	744	0	0	0	0.000	95.221
SEP	710	0	0	10	0	720	720	0	0	10	0.000	90.273
OCT	21	710	0	13	720	24	744	0	0	13	0.000	23.730
NOV	0	720	0	0	720	0	720	0	0	0	-37.985	13.455
DEC	0	744	0	0	744	0	744	0	0	0	-84.271	13.455
ANNUAL	3323	5364	0	73	5424	3336	8760	0	0	73		

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	69.544	48.920
JAN	PEAK(KBTU)	217.112	207.330
	DY/HR	28/ 8	16/ 3
	TOTAL(MBTU)	62.302	32.892
FEB	PEAK(KBTU)	216.684	158.846
	DY/HR	3/ 8	28/ 5
	TOTAL(MBTU)	71.976	32.920
MAR	PEAK(KBTU)	203.834	145.358
	DY/HR	30/16	6/ 7
	TOTAL(MBTU)	67.792	38.514
APR	PEAK(KBTU)	203.834	161.423
	DY/HR	11/11	22/18
	TOTAL(MBTU)	84.091	22.344
MAY	PEAK(KBTU)	330.865	171.199
	DY/HR	16/ 8	13/18
	TOTAL(MBTU)	100.590	0.000
JUN	PEAK(KBTU)	305.336	0.000
	DY/HR	28/16	30/ 1
	TOTAL(MBTU)	102.857	0.000
JUL	PEAK(KBTU)	311.644	0.000
	DY/HR	13/16	31/ 1
	TOTAL(MBTU)	109.851	0.000
AUG	PEAK(KBTU)	325.124	0.000
	DY/HR	11/16	31/ 1
	TOTAL(MBTU)	92.402	0.000
SEP	PEAK(KBTU)	308.232	0.000
	DY/HR	7/16	30/ 1
	TOTAL(MBTU)	67.584	35.547
OCT	PEAK(KBTU)	203.834	146.084
	DY/HR	31/14	7/18
	TOTAL(MBTU)	66.015	30.245
NOV	PEAK(KBTU)	203.834	139.387
	DY/HR	30/16	18/18
	TOTAL(MBTU)	68.897	39.838
DEC	PEAK(KBTU)	216.913	193.753
	DY/HR	13/ 8	12/ 5
	ONE YEAR	963.901	281.220
	USE/PEAK	330.865	207.330

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

EMC ENGINEERS, INC.

DENVER - ATLANTA

PROJECT:	FEASIBILITY STUDY FOR INSTALLATION OF UMCS	EMC NO:	1406-001
		CALC. BY:	AJN
LOCATION:	FORT RILEY, KANSAS	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 FT²
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	NIGHTIME 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

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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.)
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                          (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  ..

$ OPPERATIONS=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   ..
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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   ..


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. 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  ..
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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
```

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                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 ..
```

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	- - - - GLASS - - - - U-VALUE (BTU/HR-SQFT-F)	AREA (SQFT)	- - - - WALL - - - - U-VALUE (BTU/HR-SQFT-F)	AREA (SQFT)	- WALL + GLASS - U-VALUE (BTU/HR-SQFT-F)	AREA (SQFT)	AZIMUTH
	diningarea	1.021	192.00	0.082	722.78	0.279	914.78	NORTH-EAST
	dining-plm	0.000	0.00	0.082	690.40	0.082	690.40	NORTH-EAST
	diningarea	1.021	576.00	0.082	452.20	0.608	1028.20	SOUTH-EAST
	dining-plm	0.000	0.00	0.082	776.00	0.082	776.00	SOUTH-EAST
	diningarea	1.021	576.00	0.082	452.20	0.608	1028.20	NORTH-WEST
	dining-plm	0.000	0.00	0.082	776.00	0.082	776.00	NORTH-WEST
	dining-plm	0.000	0.00	0.838	7353.00	0.838	7353.00	ROOF
	diningarea	0.000	0.00	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

	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	1.021	0.082	0.194	192.00	1413.18	1605.18
SOUTH-EAST	1.021	0.082	0.382	576.00	1228.20	1804.20
NORTH-WEST	1.021	0.082	0.382	576.00	1228.20	1804.20
ROOF	0.000	0.838	0.838	0.00	7353.00	7353.00
ALL WALLS	1.021	0.082	0.324	1344.00	3869.58	5213.58
WALLS+ROOFS	1.021	0.577	0.625	1344.00	11222.58	12566.58
UNDERGRND	0.000	0.020	0.020	0.00	7353.00	7353.00
BUILDING	1.021	0.357	0.401	1344.00	18575.58	19919.58

*** 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				0F -18C	
WET-BULB TEMP	78F 26C				-2F -19C	
	SENSIBLE		LATENT		SENSIBLE	
	(KBTU/H)	(KW)	(KBTU/H)	(KW)	(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	-30.901 KW
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
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR VAV-SPEED TOPEKA, KS

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-176.577	15	3	-8.F	-9.F	-531.225	9564.	23.931
FEB	0.00000					0.000	-128.939	3	4	0.F	-1.F	-472.075	8675.	30.359
MAR	0.00000					0.000	-97.346	3	4	16.F	13.F	-368.587	10264.	33.155
APR	0.00000					0.000	-24.256	5	4	32.F	29.F	-241.324	13782.	33.155
MAY	46.51511	31	18	90.F	76.F	442.531	-4.302	5	4	45.F	41.F	-135.301	13048.	33.155
JUN	115.57044	28	18	89.F	76.F	454.860	0.000					0.000	10158.	29.107
JUL	146.65900	23	18	95.F	79.F	518.667	0.000					0.000	10661.	29.805
AUG	144.33791	21	19	95.F	76.F	475.771	0.000					0.000	10664.	29.440
SEP	75.50708	6	18	91.F	75.F	441.305	0.000					0.000	9779.	28.828
OCT	1.62142	1	18	83.F	68.F	220.962	-23.425	20	3	25.F	25.F	-276.908	13934.	33.155
NOV	0.00000					0.000	-80.243	3	4	13.F	12.F	-363.117	10742.	33.155
DEC	0.00000					0.000	-157.569	15	2	3.F	2.F	-450.325	9560.	22.956
TOTAL	530.210						-692.657						130833.	
MAX						518.667						-531.225		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
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR VAV-SPEED TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	742	0	2	744	0	744	0	0	2	-230.204	0.905
FEB	0	662	0	10	672	0	672	0	0	10	-231.760	0.905
MAR	0	662	0	82	744	0	744	0	0	82	-223.600	0.905
APR	0	455	0	265	720	0	720	0	0	265	-13.155	10.494
MAY	380	192	0	172	360	384	744	0	0	172	0.000	28.465
JUN	714	0	0	6	0	720	720	0	0	6	0.000	28.750
JUL	744	0	0	0	0	744	744	0	0	0	0.000	29.510
AUG	744	0	0	0	0	744	744	0	0	0	0.000	29.440
SEP	612	0	0	108	0	720	720	0	0	108	0.000	28.764
OCT	17	482	0	245	720	24	744	0	0	245	0.000	24.599
NOV	0	617	0	103	720	0	720	0	0	103	-277.368	0.905
DEC	0	742	0	2	744	0	744	0	0	2	-271.582	0.905
ANNUAL	3211	4554	0	995	5424	3336	8760	0	0	995		

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	40.835	269.527
JAN	PEAK(KBTU)	90.187	713.594
	DY/HR	31/ 7	15/ 3
	TOTAL(MBTU)	36.755	204.942
FEB	PEAK(KBTU)	103.659	646.978
	DY/HR	26/18	3/ 4
	TOTAL(MBTU)	41.200	160.197
MAR	PEAK(KBTU)	114.590	527.115
	DY/HR	7/19	3/ 4
	TOTAL(MBTU)	49.121	44.838
APR	PEAK(KBTU)	114.365	373.939
	DY/HR	3/19	5/ 4
	TOTAL(MBTU)	64.394	9.250
MAY	PEAK(KBTU)	245.846	241.462
	DY/HR	31/18	5/ 4
	TOTAL(MBTU)	81.558	0.000
JUN	PEAK(KBTU)	247.935	0.000
	DY/HR	28/19	30/ 1
	TOTAL(MBTU)	94.585	0.000
JUL	PEAK(KBTU)	269.717	0.000
	DY/HR	23/18	31/ 1
	TOTAL(MBTU)	95.336	0.000
AUG	PEAK(KBTU)	264.432	0.000
	DY/HR	21/19	31/ 1
	TOTAL(MBTU)	65.677	0.000
SEP	PEAK(KBTU)	248.220	0.000
	DY/HR	6/18	30/ 1
	TOTAL(MBTU)	50.466	44.248
OCT	PEAK(KBTU)	174.332	417.411
	DY/HR	1/18	20/ 3
	TOTAL(MBTU)	41.896	133.389
NOV	PEAK(KBTU)	113.933	520.663
	DY/HR	7/19	3/ 4
	TOTAL(MBTU)	40.646	245.676
DEC	PEAK(KBTU)	90.187	622.136
	DY/HR	31/19	15/ 2
	ONE YEAR	702.468	1112.067
	USE/PEAK	269.717	713.594

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     *

       LINE-4 *RUN #1 NIGHT SETBACK 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
                      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. EZDOE - 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
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR VAV-SPEED TOPEKA, KS

	COOLING						HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-112.867	15	5	-8.F	-9.F	-549.511	9337.	23.592
FEB	0.00000					0.000	-78.993	3	5	-1.F	-2.F	-472.811	8446.	25.186
MAR	0.00000					0.000	-52.957	3	5	15.F	13.F	-367.356	9981.	33.155
APR	0.00000					0.000	-8.426	5	5	31.F	29.F	-210.532	12260.	33.155
MAY	47.95139	31	18	90.F	76.F	465.510	-0.460	5	9	49.F	43.F	-48.461	12111.	33.155
JUN	115.30379	28	18	89.F	76.F	479.696	0.000					0.000	10453.	29.883
JUL	143.86469	23	18	95.F	79.F	544.548	0.000					0.000	11019.	30.665
AUG	140.15866	21	12	91.F	77.F	503.352	0.000					0.000	11009.	30.231
SEP	77.55123	6	18	91.F	75.F	463.169	0.000					0.000	9957.	29.645
OCT	1.67102	1	18	83.F	68.F	270.291	-8.338	20	8	23.F	22.F	-247.785	12525.	33.155
NOV	0.00000					0.000	-42.488	3	5	13.F	12.F	-345.743	10116.	33.155
DEC	0.00000					0.000	-99.660	13	5	5.F	4.F	-451.426	9336.	22.956
TOTAL	526.500						-404.189						126550.	
MAX						544.548						-549.511		33.155

EMC ENGINEERS INC. EZDOE - 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
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR VAV-SPEED TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	250	744	0	496	0	0	2	0.000	0.000
FEB	0	442	0	230	672	0	448	0	0	6	0.000	0.000
MAR	0	416	0	328	744	0	496	0	0	80	0.000	0.000
APR	0	190	0	530	720	0	480	0	0	290	0.000	0.000
MAY	254	56	0	434	360	384	496	0	0	186	0.000	29.241
JUN	478	0	0	242	0	720	480	0	0	2	0.000	29.607
JUL	496	0	0	248	0	744	496	0	0	0	0.000	30.440
AUG	496	0	0	248	0	744	496	0	0	0	0.000	29.956
SEP	411	0	0	309	0	720	480	0	0	69	0.000	29.545
OCT	10	202	0	532	720	24	496	0	0	284	0.000	25.889
NOV	0	368	0	352	720	0	480	0	0	112	0.000	0.000
DEC	0	496	0	248	744	0	496	0	0	0	0.000	0.000
ANNUAL	2145	2664	0	3951	5424	3336	5840	0	0	1031		

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- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	37.422	174.347
JAN	PEAK(KBTU)	90.593	738.159
	DY/HR	31/ 7	15/ 5
	TOTAL(MBTU)	33.601	128.154
FEB	PEAK(KBTU)	90.593	651.549
	DY/HR	28/ 7	3/ 5
	TOTAL(MBTU)	37.714	89.243
MAR	PEAK(KBTU)	114.596	528.818
	DY/HR	7/19	3/ 5
	TOTAL(MBTU)	42.651	16.226
APR	PEAK(KBTU)	114.384	338.480
	DY/HR	3/19	5/ 5
	TOTAL(MBTU)	60.196	1.336
MAY	PEAK(KBTU)	256.095	93.816
	DY/HR	31/18	5/ 9
	TOTAL(MBTU)	78.864	0.000
JUN	PEAK(KBTU)	258.493	0.000
	DY/HR	28/18	30/ 1
	TOTAL(MBTU)	89.645	0.000
JUL	PEAK(KBTU)	281.323	0.000
	DY/HR	23/18	31/ 1
	TOTAL(MBTU)	90.220	0.000
AUG	PEAK(KBTU)	274.738	0.000
	DY/HR	21/19	31/ 1
	TOTAL(MBTU)	64.824	0.000
SEP	PEAK(KBTU)	258.338	0.000
	DY/HR	6/18	30/ 1
	TOTAL(MBTU)	44.283	16.139
OCT	PEAK(KBTU)	192.449	384.542
	DY/HR	1/18	20/ 8
	TOTAL(MBTU)	37.570	72.508
NOV	PEAK(KBTU)	113.949	503.143
	DY/HR	7/19	3/ 5
	TOTAL(MBTU)	37.230	157.377
DEC	PEAK(KBTU)	90.593	627.004
	DY/HR	31/19	13/ 5
	ONE YEAR	654.220	655.330
	USE/PEAK	281.323	738.159

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.

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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   ..


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. 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  ..
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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
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                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     *
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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

	COOLING						HEATING						ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-155.512	15	3	-8.F	-9.F	-498.022	9594.	26.098
FEB	0.00000					0.000	-110.647	3	4	0.F	-1.F	-437.588	8769.	33.155
MAR	0.00000					0.000	-78.886	3	4	16.F	13.F	-335.806	10721.	33.155
APR	0.00000					0.000	-15.722	5	4	32.F	29.F	-211.839	14839.	33.155
MAY	34.24094	31	18	90.F	76.F	386.348	-1.914	5	4	45.F	41.F	-78.835	13190.	33.155
JUN	89.94861	28	18	89.F	76.F	397.577	0.000					0.000	9795.	26.776
JUL	117.22208	23	18	95.F	79.F	456.667	0.000					0.000	10224.	27.233
AUG	117.13194	21	19	95.F	76.F	419.616	0.000					0.000	10237.	26.965
SEP	55.42989	6	18	91.F	75.F	386.657	0.000					0.000	9570.	26.562
OCT	0.75739	1	18	83.F	68.F	169.403	-13.349	20	3	25.F	25.F	-245.398	14976.	33.155
NOV	0.00000					0.000	-63.977	3	4	13.F	12.F	-332.420	11304.	33.155
DEC	0.00000					0.000	-136.924	15	2	3.F	2.F	-417.250	9579.	26.410
TOTAL	414.731						-576.931						132799.	
MAX						456.667						-498.022		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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	737	0	7	744	0	744	0	0	7	-201.684	0.905
FEB	0	645	0	27	672	0	672	0	0	27	-202.409	0.905
MAR	0	629	0	115	744	0	744	0	0	115	-195.483	0.905
APR	0	423	0	297	720	0	720	0	0	297	-9.426	11.104
MAY	281	177	0	286	360	384	744	0	0	286	0.000	26.372
JUN	630	0	0	90	0	720	720	0	0	90	0.000	26.548
JUL	725	0	0	19	0	744	744	0	0	19	0.000	27.049
AUG	705	0	0	39	0	744	744	0	0	39	0.000	26.965
SEP	449	0	0	271	0	720	720	0	0	271	0.000	26.548
OCT	9	447	0	288	720	24	744	0	0	288	0.000	23.521
NOV	0	599	0	121	720	0	720	0	0	121	-248.608	0.905
DEC	0	728	0	16	744	0	744	0	0	16	-244.874	0.905
ANNUAL	2799	4385	0	1576	5424	3336	8760	0	0	1576		

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-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	40.170	238.847
JAN	PEAK(KBTU)	89.981	668.993
	DY/HR	18/18	15/ 3
	TOTAL(MBTU)	36.339	177.687
FEB	PEAK(KBTU)	114.294	600.867
	DY/HR	26/19	3/ 4
	TOTAL(MBTU)	41.774	131.201
MAR	PEAK(KBTU)	114.524	482.666
	DY/HR	7/19	3/ 4
	TOTAL(MBTU)	52.094	30.238
APR	PEAK(KBTU)	114.328	332.828
	DY/HR	3/19	5/ 4
	TOTAL(MBTU)	59.456	4.861
MAY	PEAK(KBTU)	220.263	145.732
	DY/HR	31/18	5/ 4
	TOTAL(MBTU)	69.878	0.000
JUN	PEAK(KBTU)	221.955	0.000
	DY/HR	28/19	30/ 1
	TOTAL(MBTU)	81.649	0.000
JUL	PEAK(KBTU)	241.116	0.000
	DY/HR	23/18	31/ 1
	TOTAL(MBTU)	82.798	0.000
AUG	PEAK(KBTU)	236.533	0.000
	DY/HR	21/19	31/ 1
	TOTAL(MBTU)	56.183	0.000
SEP	PEAK(KBTU)	222.332	0.000
	DY/HR	6/18	30/ 1
	TOTAL(MBTU)	52.768	26.515
OCT	PEAK(KBTU)	153.582	374.028
	DY/HR	1/18	20/ 3
	TOTAL(MBTU)	42.882	107.525
NOV	PEAK(KBTU)	113.882	478.659
	DY/HR	7/19	3/ 4
	TOTAL(MBTU)	39.917	215.241
DEC	PEAK(KBTU)	90.175	577.595
	DY/HR	28/18	15/ 2
	ONE YEAR	655.911	932.115
	USE/PEAK	241.116	668.993

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
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  ..
```

	COOLING						HEATING						ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-112.858	15	5	-8.F	-9.F	-549.511	9337.	23.592
FEB	0.00000					0.000	-79.024	3	5	-1.F	-2.F	-472.811	8435.	23.800
MAR	0.00000					0.000	-54.457	3	5	15.F	13.F	-367.356	9487.	33.155
APR	0.00000					0.000	-11.409	5	5	31.F	29.F	-218.186	10752.	33.155
MAY	43.22185	31	18	90.F	76.F	465.504	-1.830	5	5	44.F	40.F	-125.123	11386.	33.155
JUN	110.92410	28	18	89.F	76.F	479.669	0.000					0.000	10444.	29.882
JUL	141.68686	23	18	95.F	79.F	544.548	0.000					0.000	11014.	30.665
AUG	137.57155	21	12	91.F	77.F	503.351	0.000					0.000	11003.	30.231
SEP	74.55426	6	18	91.F	75.F	463.164	0.000					0.000	9953.	29.645
OCT	1.66097	1	18	83.F	68.F	270.254	-11.876	20	8	23.F	22.F	-250.028	11242.	33.155
NOV	0.00000					0.000	-44.361	3	5	13.F	12.F	-345.746	9494.	33.155
DEC	0.00000					0.000	-99.660	13	5	5.F	4.F	-451.426	9336.	22.956
TOTAL	509.620						-415.476						121881.	
MAX						544.548						-549.511		33.155

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	250	744	0	496	0	0	2	0.000	0.000
FEB	0	441	0	231	672	0	448	0	0	7	0.000	0.000
MAR	0	415	0	329	744	0	496	0	0	81	0.000	0.000
APR	0	155	0	565	720	0	480	0	0	325	0.000	0.000
MAY	251	48	0	445	360	384	496	0	0	197	0.000	29.241
JUN	478	0	0	242	0	720	480	0	0	2	0.000	29.606
JUL	496	0	0	248	0	744	496	0	0	0	0.000	30.440
AUG	496	0	0	248	0	744	496	0	0	0	0.000	29.956
SEP	410	0	0	310	0	720	480	0	0	70	0.000	29.544
OCT	10	173	0	561	720	24	496	0	0	313	0.000	25.888
NOV	0	356	0	364	720	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	5424	3336	5840	0	0	1121		

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	37.420	174.332
JAN	PEAK(KBTU)	90.593	738.159
	DY/HR	31/ 7	15/ 5
	TOTAL(MBTU)	33.564	128.187
FEB	PEAK(KBTU)	90.593	651.549
	DY/HR	28/ 7	3/ 5
	TOTAL(MBTU)	36.112	91.578
MAR	PEAK(KBTU)	113.205	528.818
	DY/HR	28/12	3/ 5
	TOTAL(MBTU)	37.715	20.909
APR	PEAK(KBTU)	113.205	347.987
	DY/HR	30/18	5/ 5
	TOTAL(MBTU)	56.308	3.640
MAY	PEAK(KBTU)	256.093	227.109
	DY/HR	31/18	5/ 5
	TOTAL(MBTU)	77.435	0.000
JUN	PEAK(KBTU)	258.484	0.000
	DY/HR	28/18	30/ 1
	TOTAL(MBTU)	89.047	0.000
JUL	PEAK(KBTU)	281.323	0.000
	DY/HR	23/18	31/ 1
	TOTAL(MBTU)	89.427	0.000
AUG	PEAK(KBTU)	274.738	0.000
	DY/HR	21/19	31/ 1
	TOTAL(MBTU)	63.754	0.000
SEP	PEAK(KBTU)	258.336	0.000
	DY/HR	6/18	30/ 1
	TOTAL(MBTU)	40.194	21.989
OCT	PEAK(KBTU)	192.437	387.298
	DY/HR	1/18	20/ 8
	TOTAL(MBTU)	35.592	75.572
NOV	PEAK(KBTU)	113.205	503.147
	DY/HR	23/12	3/ 5
	TOTAL(MBTU)	37.230	157.377
DEC	PEAK(KBTU)	90.593	627.004
	DY/HR	31/19	13/ 5
	ONE YEAR	633.797	673.584
	USE/PEAK	281.323	738.159

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
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  ..


              $---------------------------------------$
              $ 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. 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  ..
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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
```

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                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*
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EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 13:36:56 SDL RUN 1
DENVER, CO 80227 RUN #4 NIGHT INFILTRATION FOR BLDG. 7245DINING AREA
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR VAV-SPEED TOPEKA, KS

	COOLING						HEATING						ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-117.212	15	9	-5.F	-6.F	-476.353	9564.	23.958
FEB	0.00000					0.000	-81.886	3	8	-2.F	-3.F	-419.430	8689.	31.360
MAR	0.00000					0.000	-54.733	3	5	15.F	13.F	-320.985	10315.	33.155
APR	0.00000					0.000	-8.899	5	5	31.F	29.F	-195.922	12630.	33.155
MAY	48.70527	31	18	90.F	76.F	442.300	-0.754	5	9	49.F	43.F	-45.718	12155.	33.155
JUN	111.64474	28	18	89.F	76.F	454.716	0.000					0.000	10155.	29.102
JUL	137.07169	23	18	95.F	79.F	518.473	0.000					0.000	10652.	29.799
AUG	135.10039	21	19	95.F	76.F	475.576	0.000					0.000	10657.	29.433
SEP	78.45740	6	18	91.F	75.F	441.034	0.000					0.000	9787.	28.820
OCT	1.82346	1	18	83.F	68.F	234.327	-9.112	20	8	23.F	22.F	-235.089	12852.	33.155
NOV	0.00000					0.000	-44.366	3	5	13.F	12.F	-307.049	10475.	33.155
DEC	0.00000					0.000	-103.573	12	9	4.F	3.F	-405.050	9560.	22.956
TOTAL	512.803						-420.533						127494.	
MAX						518.473						-476.353		33.155

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/15/1995 13:36:56 SDL RUN 1
DENVER, CO 80227 RUN #4 NIGHT INFILTRATION FOR BLDG. 7245DINING AREA
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR VAV-SPEED TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	742	0	2	744	0	744	0	0	2	-40.446	0.905
FEB	0	659	0	13	672	0	672	0	0	13	-37.087	0.905
MAR	0	638	0	106	744	0	744	0	0	106	-34.075	0.905
APR	0	417	0	303	720	0	720	0	0	303	-1.432	0.905
MAY	380	177	0	187	360	384	744	0	0	187	0.000	28.458
JUN	717	0	0	3	0	720	720	0	0	3	0.000	28.745
JUL	744	0	0	0	0	744	744	0	0	0	0.000	29.504
AUG	744	0	0	0	0	744	744	0	0	0	0.000	29.433
SEP	664	0	0	56	0	720	720	0	0	56	0.000	28.755
OCT	20	448	0	276	720	24	744	0	0	276	0.000	24.884
NOV	0	600	0	120	720	0	720	0	0	120	-55.977	0.905
DEC	0	742	0	2	744	0	744	0	0	2	-63.014	0.905
ANNUAL	3269	4423	0	1068	5424	3336	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. 7245DINING AREA
REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	38.910	184.685
JAN	PEAK(KBTU)	88.968	639.885
	DY/HR	31/ 7	15/ 9
	TOTAL(MBTU)	34.836	134.878
FEB	PEAK(KBTU)	107.077	575.728
	DY/HR	26/18	3/ 8
	TOTAL(MBTU)	39.068	93.587
MAR	PEAK(KBTU)	114.543	461.417
	DY/HR	7/19	3/ 5
	TOTAL(MBTU)	44.021	18.606
APR	PEAK(KBTU)	114.322	310.065
	DY/HR	3/19	5/ 5
	TOTAL(MBTU)	61.805	2.776
MAY	PEAK(KBTU)	245.752	87.774
	DY/HR	31/18	5/ 9
	TOTAL(MBTU)	80.023	0.000
JUN	PEAK(KBTU)	247.874	0.000
	DY/HR	28/19	30/ 1
	TOTAL(MBTU)	90.753	0.000
JUL	PEAK(KBTU)	269.631	0.000
	DY/HR	23/18	31/ 1
	TOTAL(MBTU)	91.612	0.000
AUG	PEAK(KBTU)	264.343	0.000
	DY/HR	21/19	31/ 1
	TOTAL(MBTU)	67.091	0.000
SEP	PEAK(KBTU)	248.110	0.000
	DY/HR	6/18	30/ 1
	TOTAL(MBTU)	45.679	19.236
OCT	PEAK(KBTU)	178.548	358.203
	DY/HR	1/18	20/ 8
	TOTAL(MBTU)	39.033	77.199
NOV	PEAK(KBTU)	113.898	444.891
	DY/HR	7/19	3/ 5
	TOTAL(MBTU)	38.603	166.598
DEC	PEAK(KBTU)	88.968	559.295
	DY/HR	31/19	12/ 9
	ONE YEAR	671.435	697.566
	USE/PEAK	269.631	639.885

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.

```
          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 #5 DAY 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) (0.27)
                           (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  ..
```

```
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-2.1D 5/15/1995 13:43:13 SDL RUN 1
DENVER, CO 80227 RUN #5 DAY INFILTRATION FOR BLDG. 7245 DINING AREA
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR VAV-SPEED TOPEKA, KS

	COOLING						HEATING						ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELECTRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000					0.000	-69.555	15	3	-8.F	-9.F	-529.002	10302.	33.155
FEB	0.00000					0.000	-47.931	3	4	0.F	-1.F	-465.109	9391.	33.155
MAR	0.00000					0.000	-33.805	3	4	16.F	13.F	-352.820	10517.	33.155
APR	0.00000					0.000	-6.469	5	4	32.F	29.F	-192.750	11865.	33.155
MAY	54.52324	16	6	57.F	56.F	443.307	-0.743	5	4	45.F	41.F	-64.299	11673.	33.155
JUN	112.72626	28	19	89.F	75.F	354.799	0.000					0.000	10127.	28.934
JUL	127.59078	23	19	94.F	78.F	366.129	0.000					0.000	10614.	29.561
AUG	126.62223	21	19	95.F	76.F	360.590	0.000					0.000	10613.	29.229
SEP	89.28371	7	18	91.F	74.F	347.865	0.000					0.000	9777.	28.657
OCT	2.29905	1	18	83.F	68.F	262.367	-5.327	20	4	25.F	25.F	-226.390	12334.	33.155
NOV	0.00000					0.000	-28.134	3	4	13.F	12.F	-339.738	10549.	33.155
DEC	0.00000					0.000	-60.660	15	2	3.F	2.F	-443.608	10376.	33.155
TOTAL	513.046						-252.624						128140.	
MAX						443.307						-529.002		33.155

EMC ENGINEERS INC. EZDOE - 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
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR VAV-SPEED TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	570	0	174	744	0	744	0	0	174	-178.454	0.905
FEB	0	480	0	192	672	0	672	0	0	192	-173.815	0.905
MAR	0	453	0	291	744	0	744	0	0	291	-166.502	0.905
APR	0	334	0	386	720	0	720	0	0	386	-10.247	11.104
MAY	384	156	0	204	360	384	744	0	0	204	0.000	33.155
JUN	717	0	0	3	0	720	720	0	0	3	0.000	28.934
JUL	744	0	0	0	0	744	744	0	0	0	0.000	29.561
AUG	744	0	0	0	0	744	744	0	0	0	0.000	29.229
SEP	668	0	0	52	0	720	720	0	0	52	0.000	28.608
OCT	21	349	0	374	720	24	744	0	0	374	0.000	24.959
NOV	0	439	0	281	720	0	720	0	0	281	-242.182	0.905
DEC	0	551	0	193	744	0	744	0	0	193	-263.385	0.905
ANNUAL	3278	3332	0	2150	5424	3336	8760	0	0	2150		

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	38.580	108.846
JAN	PEAK(KBTU)	113.205	710.608
	DY/HR	21/18	15/ 3
	TOTAL(MBTU)	34.792	78.086
FEB	PEAK(KBTU)	113.204	638.587
	DY/HR	23/ 6	3/ 4
	TOTAL(MBTU)	38.153	57.675
MAR	PEAK(KBTU)	113.204	508.105
	DY/HR	21/ 6	3/ 4
	TOTAL(MBTU)	41.191	14.073
APR	PEAK(KBTU)	113.204	313.486
	DY/HR	21/ 6	5/ 4
	TOTAL(MBTU)	61.025	2.727
MAY	PEAK(KBTU)	222.687	120.996
	DY/HR	16/ 6	5/ 4
	TOTAL(MBTU)	79.042	0.000
JUN	PEAK(KBTU)	219.717	0.000
	DY/HR	28/19	30/ 1
	TOTAL(MBTU)	86.861	0.000
JUL	PEAK(KBTU)	231.010	0.000
	DY/HR	23/19	31/ 1
	TOTAL(MBTU)	87.800	0.000
AUG	PEAK(KBTU)	231.259	0.000
	DY/HR	11/18	31/ 1
	TOTAL(MBTU)	69.464	0.000
SEP	PEAK(KBTU)	219.735	0.000
	DY/HR	7/18	30/ 1
	TOTAL(MBTU)	43.686	12.315
OCT	PEAK(KBTU)	179.602	355.228
	DY/HR	1/18	20/ 4
	TOTAL(MBTU)	37.973	48.937
NOV	PEAK(KBTU)	113.205	492.579
	DY/HR	5/ 6	3/ 4
	TOTAL(MBTU)	38.657	97.019
DEC	PEAK(KBTU)	113.205	613.988
	DY/HR	13/18	15/ 2
	ONE YEAR	657.225	419.678
	USE/PEAK	231.259	710.608

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/SQFT-YR GROSS-AREA 146.4 KBTU/SQFT-YR NET-AREA
TOTAL SOURCE ENERGY 2393.33 MBTU 325.5 KBTU/SQFT-YR GROSS-AREA 325.5 KBTU/SQFT-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.

EMC ENGINEERS, INC.

DENVER - ATLANTA

PROJECT:	FEASIBILITY STUDY FOR INSTALLATION OF UMCS	EMC NO:	1406-001
		CALC. BY:	AJN
LOCATION:	FORT RILEY, KANSAS	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 FT²
CFM!	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	NIGHTIME 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& 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 & 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
```

```
                    LOAD-RANGE =     0.000
                    PLANT-EQUIPMENT = CHILLER-RC
                    NUMBER =     2  ..


END  ..
COMPUTE PLANT ..
STOP ..
```

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	GLASS U-VALUE (BTU/HR-SQFT-F)	GLASS AREA (SQFT)	WALL U-VALUE (BTU/HR-SQFT-F)	WALL AREA (SQFT)	WALL+GLASS U-VALUE (BTU/HR-SQFT-F)	WALL+GLASS AREA (SQFT)	AZIMUTH
	KITCHEN	1.021	42.40	0.082	371.00	0.178	413.40	SOUTH-EAST
	KIT-MEZZIN	0.000	0.00	0.082	351.00	0.082	351.00	SOUTH-EAST
	KIT-MEZZIN	0.000	0.00	0.082	776.70	0.082	776.70	SOUTH-WEST
	KITCHEN	1.021	115.20	0.082	799.58	0.200	914.78	SOUTH-WEST
	KITCHEN	1.021	16.00	0.082	397.40	0.118	413.40	NORTH-WEST
	KIT-MEZZIN	0.000	0.00	0.082	351.00	0.082	351.00	NORTH-WEST
	KIT-MEZZIN	0.000	0.00	0.077	3960.00	0.077	3960.00	ROOF
	KITCHEN	0.000	0.00	0.020	3960.00	0.020	3960.00	UNDERGRND

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 BULIDING 7245 KITCHEN AREA
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)
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

*** BUILDING ***

FLOOR AREA 3954 SQFT 367 SQMT
VOLUME 41917 CUFT 1187 CUMT

	COOLING LOAD				HEATING LOAD	
TIME	AUG 24 6PM				JAN 28 4AM	
DRY-BULB TEMP	93F	34C			0F	-18C
WET-BULB TEMP	76F	24C			-2F	-19C
	SENSIBLE		LATENT		SENSIBLE	
	(KBTU/H)	(KW)	(KBTU/H)	(KW)	(KBTU/H)	(KW)
WALLS	1.904	0.558	0.000	0.000	-8.554	-2.505
ROOFS	0.000	0.000	0.000	0.000	0.000	0.000
GLASS CONDUCTION	3.276	0.960	0.000	0.000	-13.951	-4.086
GLASS SOLAR	14.150	4.144	0.000	0.000	0.282	0.082
DOOR	0.019	0.005	0.000	0.000	-0.040	-0.012
INTERNAL SURFACES	0.000	0.000	0.000	0.000	0.000	0.000
UNDERGROUND SURFACES	-0.375	-0.110	0.000	0.000	-2.274	-0.666
OCCUPANTS TO SPACE	7.218	2.114	12.500	3.661	0.771	0.226
LIGHT TO SPACE	8.504	2.491	0.000	0.000	3.254	0.953
EQUIPMENT TO SPACE	72.879	21.344	0.000	0.000	7.136	2.090
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	107.575	31.506	12.500	3.661	-13.376	-3.918
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. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/12/1995 16:32:13 SDL RUN 1
DENVER, CO 80227 BASELINE SIMULATION FOR BULIDING 7245 KITCHEN AREA
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR KIT_H&VS TOPEKA, KS

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-122.144	16	10	19.F	16.F	-294.581	21944.	43.289
FEB	0.00000					0.000	-96.293	3	11	16.F	13.F	-277.715	19821.	43.289
MAR	0.00000					0.000	-74.915	3	4	16.F	13.F	-246.204	21944.	43.289
APR	0.00000					0.000	-24.267	5	4	32.F	29.F	-165.388	21236.	43.289
MAY	0.00000					0.000	-7.285	1	4	39.F	37.F	-116.566	21944.	43.289
JUN	0.00000					0.000	-2.499	23	4	67.F	66.F	-75.891	21236.	43.289
JUL	0.00000					0.000	-1.333	4	4	68.F	65.F	-59.244	21944.	43.289
AUG	0.00000					0.000	-0.844	26	10	69.F	67.F	-42.436	21944.	43.289
SEP	0.00000					0.000	-8.166	11	4	43.F	42.F	-91.949	21236.	43.289
OCT	0.00000					0.000	-20.983	20	4	25.F	25.F	-197.680	21944.	43.289
NOV	0.00000					0.000	-60.738	2	4	17.F	15.F	-240.878	21236.	43.289
DEC	0.00000					0.000	-113.182	15	9	16.F	14.F	-273.544	21944.	43.289
TOTAL	0.000						-532.649						258360.	
MAX						0.000						-294.581		43.289

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/12/1995 16:32:13 SDL RUN 1
DENVER, CO 80227 BASELINE SIMULATION FOR BULIDING 7245 KITCHEN AREA
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR KIT_H&VS TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	-152.729	23.485
FEB	0	669	0	3	672	0	672	0	0	3	-156.009	23.485
MAR	0	689	0	55	744	0	744	0	0	55	-149.142	23.485
APR	0	419	0	301	720	0	720	0	0	301	-58.487	16.222
MAY	0	218	0	526	744	0	744	0	0	526	0.000	16.222
JUN	0	105	0	615	720	0	720	0	0	615	0.000	16.222
JUL	0	52	0	692	744	0	744	0	0	692	-26.091	16.222
AUG	0	46	0	698	744	0	744	0	0	698	0.000	16.222
SEP	0	233	0	487	720	0	720	0	0	487	-68.662	16.222
OCT	0	430	0	314	744	0	744	0	0	314	-97.472	23.485
NOV	0	591	0	129	720	0	720	0	0	129	-183.677	23.485
DEC	0	744	0	0	744	0	744	0	0	0	-176.343	23.485
ANNUAL	0	4940	0	3820	8760	0	8760	0	0	3820		

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 BULIDING 7245 KITCHEN AREA
REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	79.674	176.135
JAN	PEAK(KBTU)	154.352	386.785
	DY/HR	31/18	16/10
	TOTAL(MBTU)	71.862	142.049
FEB	PEAK(KBTU)	154.352	368.311
	DY/HR	28/12	3/11
	TOTAL(MBTU)	78.796	114.596
MAR	PEAK(KBTU)	154.352	333.269
	DY/HR	31/12	3/ 4
	TOTAL(MBTU)	74.286	40.820
APR	PEAK(KBTU)	154.352	240.247
	DY/HR	24/ 7	5/ 4
	TOTAL(MBTU)	75.600	13.342
MAY	PEAK(KBTU)	154.352	181.858
	DY/HR	6/ 5	1/ 4
	TOTAL(MBTU)	72.756	4.769
JUN	PEAK(KBTU)	151.106	131.949
	DY/HR	2/ 5	23/ 4
	TOTAL(MBTU)	75.058	2.525
JUL	PEAK(KBTU)	150.371	105.691
	DY/HR	28/ 5	4/ 4
	TOTAL(MBTU)	75.013	1.665
AUG	PEAK(KBTU)	150.392	77.127
	DY/HR	27/ 5	26/10
	TOTAL(MBTU)	73.280	15.001
SEP	PEAK(KBTU)	154.352	151.789
	DY/HR	11/ 7	11/ 4
	TOTAL(MBTU)	76.663	36.615
OCT	PEAK(KBTU)	154.352	277.960
	DY/HR	27/ 7	20/ 4
	TOTAL(MBTU)	75.797	93.941
NOV	PEAK(KBTU)	154.352	327.277
	DY/HR	30/18	2/ 4
	TOTAL(MBTU)	79.562	164.888
DEC	PEAK(KBTU)	154.352	363.713
	DY/HR	31/18	15/ 9
	ONE YEAR	908.349	806.346
	USE/PEAK	154.352	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 BULIDING 7245 KITCHEN AREA
REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
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. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/12/1995 16:41: 0 SDL RUN 1
DENVER, CO 80227 RUN #2 DDC CONTROL FOR BULIDING 7245 KITCHEN AREA
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR KIT_H&VS TOPEKA, KS

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-121.405	15	4	-8.F	-9.F	-283.439	21944.	43.289
FEB	0.00000					0.000	-95.881	3	10	10.F	8.F	-260.050	19821.	43.289
MAR	0.00000					0.000	-74.701	3	2	19.F	16.F	-235.816	21944.	43.289
APR	0.00000					0.000	-24.263	5	4	32.F	29.F	-162.644	21236.	43.289
MAY	0.00000					0.000	-7.285	1	4	39.F	37.F	-116.566	21944.	43.289
JUN	0.00000					0.000	-2.499	23	4	67.F	66.F	-75.891	21236.	43.289
JUL	0.00000					0.000	-1.333	4	4	68.F	65.F	-59.244	21944.	43.289
AUG	0.00000					0.000	-0.844	26	10	69.F	67.F	-42.436	21944.	43.289
SEP	0.00000					0.000	-8.166	11	4	43.F	42.F	-91.949	21236.	43.289
OCT	0.00000					0.000	-20.986	20	4	25.F	25.F	-196.660	21944.	43.289
NOV	0.00000					0.000	-60.668	10	4	18.F	17.F	-235.831	21236.	43.289
DEC	0.00000					0.000	-112.579	15	10	20.F	17.F	-260.707	21944.	43.289
TOTAL	0.000						-530.608						258360.	
MAX						0.000						-283.439		43.289

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/12/1995 16:41: 0 SDL RUN 1
DENVER, CO 80227 RUN #2 DDC CONTROL FOR BULIDING 7245 KITCHEN AREA
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR KIT_H&VS TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	-153.076	23.485
FEB	0	669	0	3	672	0	672	0	0	3	-156.663	23.485
MAR	0	689	0	55	744	0	744	0	0	55	-149.267	23.485
APR	0	419	0	301	720	0	720	0	0	301	-58.487	16.222
MAY	0	218	0	526	744	0	744	0	0	526	0.000	16.222
JUN	0	105	0	615	720	0	720	0	0	615	0.000	16.222
JUL	0	52	0	692	744	0	744	0	0	692	-26.091	16.222
AUG	0	46	0	698	744	0	744	0	0	698	0.000	16.222
SEP	0	233	0	487	720	0	720	0	0	487	-68.662	16.222
OCT	0	430	0	314	744	0	744	0	0	314	-97.486	23.485
NOV	0	591	0	129	720	0	720	0	0	129	-183.738	23.485
DEC	0	744	0	0	744	0	744	0	0	0	-176.631	23.485
ANNUAL	0	4940	0	3820	8760	0	8760	0	0	3820		

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	79.507	174.077
JAN	PEAK(KBTU)	154.104	372.156
	DY/HR	31/18	15/ 4
	TOTAL(MBTU)	71.712	140.549
FEB	PEAK(KBTU)	154.104	346.477
	DY/HR	28/12	3/10
	TOTAL(MBTU)	78.681	113.557
MAR	PEAK(KBTU)	154.104	319.455
	DY/HR	31/12	3/ 2
	TOTAL(MBTU)	74.247	40.544
APR	PEAK(KBTU)	154.104	235.296
	DY/HR	24/ 7	5/ 4
	TOTAL(MBTU)	75.592	13.269
MAY	PEAK(KBTU)	154.104	180.320
	DY/HR	7/ 5	1/ 4
	TOTAL(MBTU)	72.755	4.747
JUN	PEAK(KBTU)	151.096	130.518
	DY/HR	2/ 5	23/ 4
	TOTAL(MBTU)	75.057	2.515
JUL	PEAK(KBTU)	150.361	105.502
	DY/HR	28/ 5	4/ 4
	TOTAL(MBTU)	75.013	1.656
AUG	PEAK(KBTU)	150.382	76.938
	DY/HR	27/ 5	26/10
	TOTAL(MBTU)	73.274	14.937
SEP	PEAK(KBTU)	154.104	150.321
	DY/HR	11/ 7	11/ 4
	TOTAL(MBTU)	76.633	36.398
OCT	PEAK(KBTU)	154.104	274.899
	DY/HR	31/ 7	20/ 4
	TOTAL(MBTU)	75.702	93.211
NOV	PEAK(KBTU)	154.104	319.472
	DY/HR	30/18	10/ 4
	TOTAL(MBTU)	79.401	163.047
DEC	PEAK(KBTU)	154.104	347.204
	DY/HR	31/18	15/10
	ONE YEAR	907.574	798.506
	USE/PEAK	154.104	372.156

ENERGY TYPE IN SITE MBTU - 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

EMC ENGINEERS, INC.

DENVER - ATLANTA

PROJECT:	FEASIBILITY STUDY FOR INSTALLATION OF UMCS	EMC NO:	1406-001
		CALC. BY:	AJN
LOCATION:	FORT RILEY, KANSAS	CHECKED BY:	CEL
		DATE:	05-Jul-95
BUILDING NO.:	8300		
BLDG. TYPE:	VEH MAINT SHOP (MAINT BAY DOORS CLOSED)		

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 FT²
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	NIGHTIME 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  ..
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```
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) ..
SYSTM-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  ..
```

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	- - - - G L A S S - - - - U-VALUE (BTU/HR-SQFT-F)	AREA (SQFT)	- - - - W A L L - - - - 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
	BAY-AREA	0.000	0.00	0.133	3600.00	0.133	3600.00	NORTH-EAST
	OFFICE-ARE	0.490	140.00	0.092	1210.00	0.133	1350.00	SOUTH-EAST
	BAY-AREA	0.490	56.00	0.133	3544.00	0.139	3600.00	SOUTH-WEST
	OFFICE-ARE	0.490	42.00	0.092	458.00	0.126	500.00	SOUTH-WEST
	BAY-AREA	0.490	266.00	0.133	1234.00	0.196	1500.00	NORTH-WEST
	BAY-AREA	0.000	0.00	0.092	7440.00	0.092	7440.00	ROOF
	OFFICE-ARE	0.000	0.00	0.092	3035.00	0.092	3035.00	ROOF
	BAY-AREA	0.000	0.00	0.020	7440.00	0.020	7440.00	UNDERGRND
	OFFICE-ARE	0.000	0.00	0.020	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

	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	0.133	0.133	0.00	3600.00	3600.00
SOUTH-EAST	0.490	0.092	0.133	140.00	1210.00	1350.00
SOUTH-WEST	0.490	0.128	0.137	98.00	4002.00	4100.00
NORTH-WEST	0.490	0.133	0.196	266.00	1234.00	1500.00
ROOF	0.000	0.092	0.092	0.00	10475.00	10475.00
ALL WALLS	0.490	0.126	0.144	504.00	10046.00	10550.00
WALLS+ROOFS	0.490	0.109	0.118	504.00	20521.00	21025.00
UNDERGRND	0.000	0.020	0.020	0.00	10475.00	10475.00
BUILDING	0.490	0.079	0.086	504.00	30996.00	31500.00

*** 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	
	SENSIBLE		LATENT		SENSIBLE	
	(KBTU/H)	(KW)	(KBTU/H)	(KW)	(KBTU/H)	(KW)
WALLS	37.634	11.022	0.000	0.000	-54.297	-15.902
ROOFS	80.424	23.554	0.000	0.000	-59.094	-17.307
GLASS CONDUCTION	3.393	0.994	0.000	0.000	-16.272	-4.766
GLASS SOLAR	17.880	5.237	0.000	0.000	1.171	0.343
DOOR	29.695	8.697	0.000	0.000	-39.883	-11.681
INTERNAL SURFACES	0.000	0.000	0.000	0.000	0.000	0.000
UNDERGROUND SURFACES	-0.396	-0.116	0.000	0.000	-5.420	-1.587
OCCUPANTS TO SPACE	13.030	3.816	25.000	7.322	1.154	0.338
LIGHT TO SPACE	48.479	14.198	0.000	0.000	7.114	2.083
EQUIPMENT TO SPACE	3.972	1.163	0.000	0.000	0.352	0.103
PROCESS TO SPACE	0.000	0.000	0.000	0.000	0.000	0.000
INFILTRATION	0.000	0.000	0.000	0.000	-141.538	-41.453
TOTAL	234.111	68.565	25.000	7.322	-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

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-91.468	4	3	8.F	7.F	-245.833	2843.	14.250
FEB	0.00000					0.000	-69.070	1	23	17.F	15.F	-202.830	2572.	14.250
MAR	0.00000					0.000	-55.642	3	4	16.F	13.F	-198.295	3114.	14.250
APR	0.00000					0.000	-18.540	4	4	33.F	31.F	-131.212	2843.	14.250
MAY	0.00000					0.000	-3.138	5	6	44.F	40.F	-76.715	2843.	14.250
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	-1.898	18	2	50.F	48.F	-56.745	2843.	14.250
OCT	0.00000					0.000	-15.435	20	6	24.F	23.F	-108.835	2708.	14.250
NOV	0.00000					0.000	-43.477	2	6	15.F	14.F	-150.000	2708.	14.250
DEC	0.00000					0.000	-82.656	11	24	10.F	9.F	-213.425	2843.	14.250
TOTAL	0.000						-381.325						34115.	
MAX						0.000						-245.833		14.250

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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	743	0	1	744	744	744	0	0	1	-108.973	0.000
FEB	0	667	0	5	672	672	672	0	0	5	-107.643	0.000
MAR	0	694	0	50	744	744	744	0	0	50	-108.664	0.000
APR	0	390	0	330	720	720	720	0	0	330	-18.920	0.000
MAY	0	114	0	630	744	744	744	0	0	630	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	71	0	649	720	720	720	0	0	649	-51.913	0.000
OCT	0	388	0	356	744	744	744	0	0	356	-81.250	0.000
NOV	0	630	0	90	720	720	720	0	0	90	-118.589	0.000
DEC	0	740	0	4	744	744	744	0	0	4	-120.358	0.000
ANNUAL	0	4437	0	4323	8760	8760	8760	0	0	4323		

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 RES-FURNCE TOPEKA, KS

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-15.017	16	6	10.F	8.F	-79.690	2063.	7.774
FEB	0.00000					0.000	-10.656	3	6	-1.F	-2.F	-71.008	1850.	7.774
MAR	0.00000					0.000	-7.591	3	5	15.F	13.F	-61.199	2086.	7.774
APR	0.00000					0.000	-1.828	5	6	31.F	28.F	-36.833	2367.	7.774
MAY	0.00000					0.000	-0.281	9	5	45.F	44.F	-8.097	1955.	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					0.000	-1.084	31	6	44.F	39.F	-27.989	2642.	7.774
NOV	0.00000					0.000	-5.524	2	5	16.F	15.F	-50.652	2089.	7.774
DEC	0.00000					0.000	-13.335	12	6	3.F	2.F	-76.487	2049.	7.774
TOTAL	0.000						-55.315						21105.	
MAX						0.000						-79.690		7.774

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 RES-FURNCE TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	359	0	385	744	0	361	361	0	2	-31.937	2.932
FEB	0	320	0	352	672	0	321	321	0	1	0.000	0.100
MAR	0	307	0	437	744	0	337	337	0	30	0.000	0.100
APR	0	331	0	389	720	0	476	476	0	145	-1.857	2.932
MAY	0	211	0	533	744	0	336	336	0	125	0.000	0.100
JUN	0	0	0	720	720	0	0	0	0	0	0.000	0.000
JUL	0	0	0	744	744	0	0	0	0	0	0.000	0.000
AUG	0	0	0	744	744	0	0	0	0	0	0.000	0.000
SEP	0	0	0	720	720	0	0	0	0	0	0.000	0.100
OCT	0	383	0	361	744	0	589	589	0	206	0.000	0.100
NOV	0	320	0	400	720	0	389	389	0	69	0.000	0.100
DEC	0	353	0	391	744	0	356	356	0	3	0.000	0.100
ANNUAL	0	2584	0	6176	8760	0	3165	3165	0	581		

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	18.854	156.494
JAN	PEAK(KBTU)	80.171	437.552
	DY/HR	14/ 8	4/ 4
	TOTAL(MBTU)	16.689	119.470
FEB	PEAK(KBTU)	78.914	376.972
	DY/HR	2/ 8	3/ 6
	TOTAL(MBTU)	19.032	96.734
MAR	PEAK(KBTU)	78.849	364.827
	DY/HR	3/ 9	3/ 5
	TOTAL(MBTU)	18.216	34.769
APR	PEAK(KBTU)	77.623	245.127
	DY/HR	4/ 8	4/ 6
	TOTAL(MBTU)	16.456	8.195
MAY	PEAK(KBTU)	75.615	116.652
	DY/HR	5/ 9	5/ 6
	TOTAL(MBTU)	13.667	1.152
JUN	PEAK(KBTU)	65.531	1.600
	DY/HR	22/ 8	30/ 1
	TOTAL(MBTU)	12.395	1.190
JUL	PEAK(KBTU)	65.531	1.600
	DY/HR	29/ 8	31/ 1
	TOTAL(MBTU)	14.262	1.190
AUG	PEAK(KBTU)	65.531	1.600
	DY/HR	4/ 8	31/ 1
	TOTAL(MBTU)	13.148	4.295
SEP	PEAK(KBTU)	65.970	88.804
	DY/HR	30/ 9	18/ 2
	TOTAL(MBTU)	18.620	29.690
OCT	PEAK(KBTU)	77.249	205.198
	DY/HR	20/ 8	31/ 6
	TOTAL(MBTU)	17.376	76.628
NOV	PEAK(KBTU)	77.704	290.292
	DY/HR	30/ 9	2/ 5
	TOTAL(MBTU)	18.603	142.564
DEC	PEAK(KBTU)	79.746	406.760
	DY/HR	14/ 8	11/24
	ONE YEAR	197.318	672.371
	USE/PEAK	80.171	437.552

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
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.

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          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.) ..
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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  ..
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$ 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
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                    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) ..
SYSTM-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

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-64.136	31	10	31.F	26.F	-258.259	2843.	14.250
FEB	0.00000					0.000	-45.328	28	10	33.F	30.F	-258.259	2572.	14.250
MAR	0.00000					0.000	-36.624	30	7	25.F	21.F	-258.259	3114.	14.250
APR	0.00000					0.000	-10.247	4	7	32.F	30.F	-236.739	2843.	14.250
MAY	0.00000					0.000	-0.952	9	7	43.F	43.F	-118.059	2843.	14.250
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	-0.359	30	7	46.F	45.F	-45.253	2843.	14.250
OCT	0.00000					0.000	-7.189	31	7	43.F	39.F	-247.797	2708.	14.250
NOV	0.00000					0.000	-25.857	28	8	30.F	28.F	-258.259	2708.	14.250
DEC	0.00000					0.000	-53.649	30	9	21.F	19.F	-258.259	2843.	14.250
TOTAL	0.000						-244.342						34115.	
MAX						0.000						-258.259		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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	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	583	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	-35.506	0.000
ANNUAL	0	2032	0	6728	8760	8760	8760	0	0	6728		

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 RES-FURNCE TOPEKA, KS

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-9.921	4	7	6.F	5.F	-107.166	1646.	7.774
FEB	0.00000					0.000	-6.420	22	7	26.F	24.F	-95.114	1426.	7.774
MAR	0.00000					0.000	-4.170	14	7	16.F	14.F	-88.608	1918.	7.774
APR	0.00000					0.000	-0.799	5	7	30.F	27.F	-49.018	2274.	7.774
MAY	0.00000					0.000	-0.122	1	13	67.F	53.F	-3.312	1715.	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					0.000	-0.442	31	7	43.F	39.F	-38.290	2356.	7.774
NOV	0.00000					0.000	-2.475	14	7	32.F	32.F	-76.769	1902.	7.774
DEC	0.00000					0.000	-8.017	12	7	2.F	1.F	-112.694	1700.	7.774
TOTAL	0.000						-32.365						18942.	
MAX						0.000						-112.694		7.774

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 RES-FURNCE TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	212	0	532	744	0	214	214	0	2	0.000	0.100
FEB	0	162	0	510	672	0	171	171	0	9	0.000	0.100
MAR	0	224	0	520	744	0	278	278	0	54	0.000	0.100
APR	0	250	0	470	720	0	443	443	0	193	-1.810	2.932
MAY	0	136	0	608	744	0	251	251	0	115	0.000	0.100
JUN	0	0	0	720	720	0	0	0	0	0	0.000	0.000
JUL	0	0	0	744	744	0	0	0	0	0	0.000	0.000
AUG	0	0	0	744	744	0	0	0	0	0	0.000	0.000
SEP	0	0	0	720	720	0	0	0	0	0	0.000	0.100
OCT	0	283	0	461	744	0	488	488	0	205	0.000	0.100
NOV	0	238	0	482	720	0	323	323	0	85	0.000	0.100
DEC	0	209	0	535	744	0	233	233	0	24	-21.020	2.932
ANNUAL	0	1714	0	7046	8760	0	2401	2401	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-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	16.804	107.321
JAN	PEAK(KBTU)	81.141	508.661
	DY/HR	31/ 9	4/ 7
	TOTAL(MBTU)	14.692	75.076
FEB	PEAK(KBTU)	81.141	492.096
	DY/HR	28/ 9	22/ 7
	TOTAL(MBTU)	18.024	60.790
MAR	PEAK(KBTU)	81.141	483.092
	DY/HR	14/11	14/ 7
	TOTAL(MBTU)	17.706	19.230
APR	PEAK(KBTU)	79.852	389.056
	DY/HR	4/ 9	4/ 7
	TOTAL(MBTU)	15.583	3.856
MAY	PEAK(KBTU)	75.201	173.464
	DY/HR	13/ 8	9/ 7
	TOTAL(MBTU)	13.667	1.152
JUN	PEAK(KBTU)	65.531	1.600
	DY/HR	22/ 8	30/ 1
	TOTAL(MBTU)	12.395	1.190
JUL	PEAK(KBTU)	65.531	1.600
	DY/HR	29/ 8	31/ 1
	TOTAL(MBTU)	14.262	1.190
AUG	PEAK(KBTU)	65.531	1.600
	DY/HR	4/ 8	31/ 1
	TOTAL(MBTU)	13.113	1.768
SEP	PEAK(KBTU)	66.245	72.928
	DY/HR	30/ 9	30/ 7
	TOTAL(MBTU)	17.454	14.571
OCT	PEAK(KBTU)	79.496	399.672
	DY/HR	31/ 9	31/ 7
	TOTAL(MBTU)	16.333	43.546
NOV	PEAK(KBTU)	81.141	466.596
	DY/HR	14/ 9	14/ 7
	TOTAL(MBTU)	16.746	89.136
DEC	PEAK(KBTU)	81.141	516.209
	DY/HR	30/ 9	12/ 7
	ONE YEAR	186.779	418.827
	USE/PEAK	81.141	516.209

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
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```
                        VARIABLE-LIST = (3,5,7) ..
R-FURN-BLK =REPORT-BLOCK VARIABLE-TYPE = RES-FURNCE
                        VARIABLE-LIST = (3,5,6,17) ..
SYSTM-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

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-81.750	4	3	8.F	7.F	-228.361	2843.	14.250
FEB	0.00000					0.000	-60.221	1	23	17.F	15.F	-185.508	2572.	14.250
MAR	0.00000					0.000	-45.777	3	4	16.F	13.F	-181.695	3114.	14.250
APR	0.00000					0.000	-11.943	4	6	32.F	31.F	-110.892	2843.	14.250
MAY	0.00000					0.000	-0.933	9	6	44.F	44.F	-49.704	2843.	14.250
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	-0.133	30	1	48.F	46.F	-17.161	2843.	14.250
OCT	0.00000					0.000	-8.461	20	6	24.F	23.F	-95.454	2708.	14.250
NOV	0.00000					0.000	-34.923	2	6	15.F	14.F	-137.527	2708.	14.250
DEC	0.00000					0.000	-72.835	11	24	10.F	9.F	-197.995	2843.	14.250
TOTAL	0.000						-316.976						34115.	
MAX						0.000						-228.361		14.250

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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	744	744	0	0	4	-95.989	0.000
FEB	0	665	0	7	672	672	672	0	0	7	-94.810	0.000
MAR	0	651	0	93	744	744	744	0	0	93	-95.065	0.000
APR	0	285	0	435	720	720	720	0	0	435	0.000	0.000
MAY	0	49	0	695	744	744	744	0	0	695	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	-17.161	0.000
OCT	0	257	0	487	744	744	744	0	0	487	-67.469	0.000
NOV	0	556	0	164	720	720	720	0	0	164	-106.039	0.000
DEC	0	732	0	12	744	744	744	0	0	12	-109.201	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 RES-FURNCE TOPEKA, KS

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-13.507	16	6	10.F	8.F	-74.676	1967.	7.774
FEB	0.00000					0.000	-9.293	3	6	-1.F	-2.F	-66.206	1712.	7.774
MAR	0.00000					0.000	-6.281	14	6	15.F	13.F	-57.859	1757.	7.774
APR	0.00000					0.000	-1.218	5	6	31.F	28.F	-35.124	1974.	7.774
MAY	0.00000					0.000	-0.256	3	18	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					0.000	-0.658	31	6	44.F	39.F	-25.191	2356.	7.774
NOV	0.00000					0.000	-4.451	2	6	15.F	14.F	-49.790	1655.	7.774
DEC	0.00000					0.000	-11.912	12	6	3.F	2.F	-71.516	1930.	7.774
TOTAL	0.000						-47.577						19236.	
MAX						0.000						-74.676		7.774

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 RES-FURNCE TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	327	0	417	744	0	327	327	0	0	-29.071	2.932
FEB	0	272	0	400	672	0	272	272	0	0	0.000	0.100
MAR	0	217	0	527	744	0	221	221	0	4	-29.223	2.932
APR	0	221	0	499	720	0	337	337	0	116	-1.855	2.932
MAY	0	197	0	547	744	0	310	310	0	113	0.000	0.100
JUN	0	0	0	720	720	0	0	0	0	0	0.000	0.000
JUL	0	0	0	744	744	0	0	0	0	0	0.000	0.000
AUG	0	0	0	744	744	0	0	0	0	0	0.000	0.000
SEP	0	0	0	720	720	0	0	0	0	0	0.000	0.100
OCT	0	310	0	434	744	0	488	488	0	178	0.000	0.100
NOV	0	204	0	516	720	0	236	236	0	32	0.000	0.100
DEC	0	314	0	430	744	0	314	314	0	0	-46.549	2.932
ANNUAL	0	2062	0	6698	8760	0	2505	2505	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-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	18.302	140.325
JAN	PEAK(KBTU)	79.824	406.830
	DY/HR	14/ 8	4/ 4
	TOTAL(MBTU)	16.011	104.566
FEB	PEAK(KBTU)	78.630	353.404
	DY/HR	3/ 8	3/ 6
	TOTAL(MBTU)	17.683	79.839
MAR	PEAK(KBTU)	78.476	336.286
	DY/HR	3/ 9	3/ 5
	TOTAL(MBTU)	16.720	23.003
APR	PEAK(KBTU)	77.161	216.490
	DY/HR	4/ 8	4/ 6
	TOTAL(MBTU)	16.153	4.498
MAY	PEAK(KBTU)	75.201	78.312
	DY/HR	13/ 8	9/ 6
	TOTAL(MBTU)	13.667	1.152
JUN	PEAK(KBTU)	65.531	1.600
	DY/HR	22/ 8	30/ 1
	TOTAL(MBTU)	12.395	1.190
JUL	PEAK(KBTU)	65.531	1.600
	DY/HR	29/ 8	31/ 1
	TOTAL(MBTU)	14.262	1.190
AUG	PEAK(KBTU)	65.531	1.600
	DY/HR	4/ 8	31/ 1
	TOTAL(MBTU)	13.108	1.427
SEP	PEAK(KBTU)	65.531	31.691
	DY/HR	30/16	30/ 1
	TOTAL(MBTU)	17.483	17.722
OCT	PEAK(KBTU)	76.510	176.225
	DY/HR	31/ 8	31/ 6
	TOTAL(MBTU)	15.700	61.520
NOV	PEAK(KBTU)	77.349	276.102
	DY/HR	30/ 9	2/ 6
	TOTAL(MBTU)	17.971	126.270
DEC	PEAK(KBTU)	79.383	378.298
	DY/HR	14/ 8	11/24
	ONE YEAR	189.456	562.703
	USE/PEAK	79.824	406.830

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.

EMC ENGINEERS, INC.

DENVER - ATLANTA

PROJECT:	FEASIBILITY STUDY FOR INSTALLATION OF UMCS	EMC NO:	1406-001
		CALC. BY:	AJN
LOCATION:	FORT RILEY, KANSAS	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 FT²
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	NIGHTIME 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			
COAUC	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			
COAOC	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-OF  =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 ..
```

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. EZDOE - 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/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)

*** BUILDING ***

FLOOR AREA	8640 SQFT	803 SQMT
VOLUME	216000 CUFT	6117 CUMT

	COOLING LOAD		HEATING LOAD
TIME	SEP 6 4PM		DEC 8 1PM
DRY-BULB TEMP	93F 34C		20F -7C
WET-BULB TEMP	76F 24C		17F -8C

	SENSIBLE		LATENT		SENSIBLE	
	(KBTU/H)	(KW)	(KBTU/H)	(KW)	(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	664.765	194.693	-1221.480	-357.741
TOTAL LOAD	1218.334 KBTU/H		356.820 KW		-1221.480 KBTU/H	-357.741 KW
TOTAL LOAD / AREA	141.01BTU/H.SQFT		444.534 W /SQMT		141.375BTU/H.SQFT	445.682 W /SQMT

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

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-1906.112	4841.	23.766
FEB	0.00000					0.000	-251.742	3	7	-5.F	-6.F	-1931.270	4532.	23.766
MAR	0.00000					0.000	-258.031	4	7	14.F	12.F	-1572.045	5483.	23.766
APR	0.00000					0.000	-182.210	5	7	30.F	27.F	-1272.371	5041.	23.766
MAY	0.00000					0.000	-76.496	9	7	43.F	43.F	-1044.233	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	-1400.185	4782.	23.766
NOV	0.00000					0.000	-213.533	2	7	19.F	17.F	-1470.481	4801.	23.766
DEC	0.00000					0.000	-277.214	13	8	0.F	-1.F	-1840.234	4917.	23.766
TOTAL	0.000						-1703.394						49930.	
MAX						0.000						-1931.270		23.766

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	210	0	534	744	0	210	210	0	0	0.000	0.000
FEB	0	206	0	466	672	0	206	206	0	0	0.000	0.000
MAR	0	249	0	495	744	0	249	249	0	0	0.000	0.000
APR	0	231	0	489	720	0	231	231	0	0	0.000	0.000
MAY	0	110	0	634	360	0	110	110	0	0	0.000	0.000
JUN	0	0	0	720	0	0	0	0	0	0	0.000	0.000
JUL	0	0	0	744	0	0	0	0	0	0	0.000	0.000
AUG	0	0	0	744	0	0	0	0	0	0	0.000	0.000
SEP	0	0	0	720	0	0	0	0	0	0	0.000	0.000
OCT	0	218	0	526	720	0	218	218	0	0	0.000	0.000
NOV	0	220	0	500	720	0	220	220	0	0	0.000	0.000
DEC	0	218	0	526	744	0	218	218	0	0	0.000	0.000
ANNUAL	0	1662	0	7098	5424	0	1662	1662	0	0		

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	16.530	388.412
JAN	PEAK(KBTU)	81.147	2590.039
	DY/HR	31/16	14/ 9
	TOTAL(MBTU)	15.476	359.130
FEB	PEAK(KBTU)	81.147	2619.850
	DY/HR	28/16	3/ 7
	TOTAL(MBTU)	18.722	373.408
MAR	PEAK(KBTU)	81.147	2185.045
	DY/HR	31/16	4/ 7
	TOTAL(MBTU)	17.212	270.243
APR	PEAK(KBTU)	81.147	1807.284
	DY/HR	29/16	5/ 7
	TOTAL(MBTU)	13.281	115.373
MAY	PEAK(KBTU)	81.147	1510.531
	DY/HR	13/16	9/ 7
	TOTAL(MBTU)	10.169	1.152
JUN	PEAK(KBTU)	48.656	1.600
	DY/HR	30/16	30/ 1
	TOTAL(MBTU)	9.245	1.190
JUL	PEAK(KBTU)	48.656	1.600
	DY/HR	29/16	31/ 1
	TOTAL(MBTU)	10.631	1.190
AUG	PEAK(KBTU)	48.656	1.600
	DY/HR	31/16	31/ 1
	TOTAL(MBTU)	9.707	1.152
SEP	PEAK(KBTU)	48.656	1.600
	DY/HR	30/16	30/ 1
	TOTAL(MBTU)	16.328	252.021
OCT	PEAK(KBTU)	81.147	1970.076
	DY/HR	31/16	20/ 8
	TOTAL(MBTU)	16.393	310.736
NOV	PEAK(KBTU)	81.147	2058.549
	DY/HR	30/16	2/ 7
	TOTAL(MBTU)	16.790	393.624
DEC	PEAK(KBTU)	81.147	2511.519
	DY/HR	30/16	13/ 8
	ONE YEAR	170.483	2467.633
	USE/PEAK	81.147	2619.850

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
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-OF  =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. EZDOE - ELITE SOFTWARE DEVELOPMENT 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

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-238.631	14	9	-3.F	-4.F	-1906.112	4613.	23.766
FEB	0.00000					0.000	-241.100	3	7	-5.F	-6.F	-1931.270	4456.	23.766
MAR	0.00000					0.000	-235.719	3	7	14.F	12.F	-1566.417	5302.	23.766
APR	0.00000					0.000	-177.816	5	7	30.F	27.F	-1272.371	5003.	23.766
MAY	0.00000					0.000	-76.496	9	7	43.F	43.F	-1044.233	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	-168.874	20	8	23.F	22.F	-1400.185	4772.	23.766
NOV	0.00000					0.000	-212.357	2	7	19.F	17.F	-1470.481	4792.	23.766
DEC	0.00000					0.000	-249.456	13	8	0.F	-1.F	-1840.234	4737.	23.766
TOTAL	0.000						-1600.447						49206.	
MAX						0.000						-1931.270		23.766

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT 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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	186	0	558	744	0	186	186	0	0	0.000	0.000
FEB	0	198	0	474	672	0	198	198	0	0	0.000	0.000
MAR	0	230	0	514	744	0	230	230	0	0	0.000	0.000
APR	0	227	0	493	720	0	227	227	0	0	0.000	0.000
MAY	0	110	0	634	360	0	110	110	0	0	0.000	0.000
JUN	0	0	0	720	0	0	0	0	0	0	0.000	0.000
JUL	0	0	0	744	0	0	0	0	0	0	0.000	0.000
AUG	0	0	0	744	0	0	0	0	0	0	0.000	0.000
SEP	0	0	0	720	0	0	0	0	0	0	0.000	0.000
OCT	0	217	0	527	720	0	217	217	0	0	0.000	0.000
NOV	0	219	0	501	720	0	219	219	0	0	0.000	0.000
DEC	0	199	0	545	744	0	199	199	0	0	0.000	0.000
ANNUAL	0	1586	0	7174	5424	0	1586	1586	0	0		

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-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	15.750	338.494
JAN	PEAK(KBTU)	81.147	2590.039
	DY/HR	31/16	14/ 9
	TOTAL(MBTU)	15.216	344.104
FEB	PEAK(KBTU)	81.147	2619.850
	DY/HR	28/16	3/ 7
	TOTAL(MBTU)	18.104	341.585
MAR	PEAK(KBTU)	81.147	2178.077
	DY/HR	31/16	3/ 7
	TOTAL(MBTU)	17.082	263.924
APR	PEAK(KBTU)	81.147	1807.284
	DY/HR	29/16	5/ 7
	TOTAL(MBTU)	13.281	115.373
MAY	PEAK(KBTU)	81.147	1510.531
	DY/HR	13/16	9/ 7
	TOTAL(MBTU)	10.169	1.152
JUN	PEAK(KBTU)	48.656	1.600
	DY/HR	30/16	30/ 1
	TOTAL(MBTU)	9.245	1.190
JUL	PEAK(KBTU)	48.656	1.600
	DY/HR	29/16	31/ 1
	TOTAL(MBTU)	10.631	1.190
AUG	PEAK(KBTU)	48.656	1.600
	DY/HR	31/16	31/ 1
	TOTAL(MBTU)	9.707	1.152
SEP	PEAK(KBTU)	48.656	1.600
	DY/HR	30/16	30/ 1
	TOTAL(MBTU)	16.295	250.754
OCT	PEAK(KBTU)	81.147	1970.076
	DY/HR	31/16	20/ 8
	TOTAL(MBTU)	16.360	309.055
NOV	PEAK(KBTU)	81.147	2058.549
	DY/HR	30/16	2/ 7
	TOTAL(MBTU)	16.173	354.799
DEC	PEAK(KBTU)	81.147	2511.519
	DY/HR	30/16	13/ 8
	ONE YEAR	168.014	2322.774
	USE/PEAK	81.147	2619.850

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
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

EMC ENGINEERS, INC.

DENVER - ATLANTA

PROJECT:	FEASIBILITY STUDY FOR INSTALLATION OF UMCS	EMC NO:	1406-001
		CALC. BY:	AJN
LOCATION:	FORT RILEY, KANSAS	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 FT²
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	NIGHTIME INFILTRATION (OA)
RUN5	DAYTIME INFILTRATION (OA)

HOURS OF OCCUPANCY			
M-F	600	2200	80 HR
SAT.	900	2000	11 HR
SUN.	900	2000	11 HR
	TOTAL OCCUPY HR.		102 HR/WK
	TOTAL UNOCC. HR.		66 HR/WK
	ANNUAL OCCUPY HR.		5319 HR/YR
	ANNUAL UNOCC. HR.		3441 HR/YR

ANNUAL HEATING & COOLING HOURS	
HR. ON HEATING	3308 HR/YR
HR. ON COOLING	2011 HR/YR
HR. OFF HEATING	2140 HR/YR
HR. OFF COOLING	1301 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& 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-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) (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 ..
```

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	GLASS U-VALUE (BTU/HR-SQFT-F)	GLASS AREA (SQFT)	WALL U-VALUE (BTU/HR-SQFT-F)	WALL AREA (SQFT)	WALL+GLASS U-VALUE (BTU/HR-SQFT-F)	WALL+GLASS AREA (SQFT)	AZIMUTH
	pool-area	0.490	1650.00	0.037	1870.00	0.249	3520.00	NORTH
	pool-area	0.490	600.00	0.037	1320.00	0.178	1920.00	EAST
	pool-area	0.490	600.00	0.037	1320.00	0.178	1920.00	WEST
	pool-area	0.000	0.00	0.084	6600.00	0.084	6600.00	ROOF
	pool-area	0.000	0.00	0.020	3152.10	0.020	3152.10	UNDERGRND

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- 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	0.490	0.037	0.249	1650.00	1870.00	3520.00
EAST	0.490	0.037	0.178	600.00	1320.00	1920.00
WEST	0.490	0.037	0.178	600.00	1320.00	1920.00
ROOF	0.000	0.084	0.084	0.00	6600.00	6600.00
ALL WALLS	0.490	0.037	0.212	2850.00	4510.00	7360.00
WALLS+ROOFS	0.490	0.065	0.152	2850.00	11110.00	13960.00
UNDERGRND	0.000	0.020	0.020	0.00	3152.10	3152.10
BUILDING	0.490	0.055	0.127	2850.00	14262.10	17112.10

*** BUILDING ***

FLOOR AREA 6600 SQFT 613 SQMT
VOLUME 211200 CUFT 5981 CUMT

	COOLING LOAD				HEATING LOAD	
TIME	JUL 23 6PM				JAN 4 3AM	
DRY-BULB TEMP	95F 35C				8F -13C	
WET-BULB TEMP	79F 26C				7F -14C	
	SENSIBLE		LATENT		SENSIBLE	
	(KBTU/H)	(KW)	(KBTU/H)	(KW)	(KBTU/H)	(KW)
WALLS	3.296	0.965	0.000	0.000	-9.624	-2.819
ROOFS	22.895	6.705	0.000	0.000	-35.393	-10.366
GLASS CONDUCTION	32.167	9.421	0.000	0.000	-97.286	-28.492
GLASS SOLAR	111.103	32.539	0.000	0.000	3.427	1.004
DOOR	0.050	0.015	0.000	0.000	-0.135	-0.040
INTERNAL SURFACES	0.000	0.000	0.000	0.000	0.000	0.000
UNDERGROUND SURFACES	-0.566	-0.166	0.000	0.000	-1.810	-0.530
OCCUPANTS TO SPACE	13.207	3.868	21.800	6.385	2.410	0.706
LIGHT TO SPACE	28.080	8.224	0.000	0.000	8.390	2.457
EQUIPMENT TO SPACE	0.000	0.000	0.000	0.000	0.000	0.000
PROCESS TO SPACE	0.000	0.000	198.828	58.232	0.000	0.000
INFILTRATION	20.942	6.133	38.824	11.371	-125.891	-36.870
TOTAL	231.174	67.705	259.452	75.987	-255.910	-74.950
TOTAL LOAD	490.626 KBTU/H		143.692	KW	-255.910 KBTU/H	-74.950 KW
TOTAL LOAD / AREA	74.34BTU/H.SQFT		234.347	W /SQMT	38.774BTU/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. 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- LS-D BUILDING MONTHLY LOADS SUMMARY TOPEKA, KS

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC-TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.24722	18	16	52.F	43.F	28.859	-73.182	4	3	8.F	7.F	-255.910	4199.	9.236
FEB	1.36480	13	16	58.F	48.F	59.207	-49.457	1	23	17.F	15.F	-204.686	3774.	9.236
MAR	9.20274	27	17	69.F	50.F	116.761	-35.871	3	8	15.F	12.F	-205.419	4239.	9.236
APR	30.67085	25	15	83.F	66.F	176.314	-10.922	4	4	33.F	31.F	-127.729	4088.	9.236
MAY	54.66166	31	17	90.F	76.F	216.780	-2.452	5	5	44.F	40.F	-81.912	4199.	9.236
JUN	70.07397	19	18	86.F	75.F	215.486	-0.435	2	5	50.F	49.F	-34.389	4082.	9.236
JUL	78.81918	23	17	95.F	79.F	231.174	-0.004	30	6	62.F	59.F	-4.167	4153.	9.236
AUG	76.94143	24	17	93.F	76.F	229.406	-0.080	4	6	54.F	53.F	-16.334	4291.	9.236
SEP	45.39871	6	16	93.F	75.F	218.245	-3.801	18	1	50.F	48.F	-70.688	4036.	9.236
OCT	23.49690	11	16	85.F	68.F	157.353	-12.606	20	7	23.F	22.F	-117.428	4153.	9.236
NOV	6.46319	7	15	73.F	58.F	92.995	-31.216	30	5	29.F	26.F	-150.566	4093.	9.236
DEC	0.33447	21	15	55.F	44.F	26.488	-67.893	15	5	8.F	7.F	-211.993	4147.	9.236
TOTAL	397.675						-287.917						49454.	
MAX						231.174						-255.910		9.236

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- SV-A SYSTEM DESIGN PARAMETERS POOL-H&V'S TOPEKA, KS

SYSTEM NAME: POOL-H&V'S
ALTITUDE MULTIPLIER: 1.040

SUPPLY FAN (CFM)	ELEC (KW)	DELTA-T (F)	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)
18720.	14.040	2.3	0.	0.000	0.0	0.021	0.000	0.000	-979.020	0.00	0.00

ZONE NAME	SUPPLY FLOW	EXHAUST FLOW	FAN (KW)	MINIMUM FLOW RATIO	OUTSIDE AIR FLOW	COOLING CAPACITY (KBTU/HR)	SENSIBLE (SHR)	EXTRACTION RATE (KBTU/HR)	HEATING CAPACITY (KBTU/HR)	ADDITION RATE (KBTU/HR)	MULTIPLIER
pool-area	18720.	0.	0.000	1.000	397.	0.00	0.00	0.00	0.00	-855.50	1.0

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

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-179.743	4	3	8.F	7.F	-457.224	14645.	23.276
FEB	0.00000					0.000	-133.462	3	6	-1.F	-2.F	-405.686	13209.	23.276
MAR	0.00000					0.000	-105.473	3	8	15.F	12.F	-386.559	14685.	23.276
APR	0.00000					0.000	-38.516	4	5	33.F	31.F	-252.302	14197.	23.276
MAY	0.00000					0.000	-9.581	5	6	44.F	40.F	-174.766	14645.	23.276
JUN	0.00000					0.000	0.000					0.000	14191.	23.276
JUL	0.00000					0.000	0.000					0.000	14598.	23.276
AUG	0.00000					0.000	0.000					0.000	14737.	23.276
SEP	0.00000					0.000	0.000					0.000	14145.	23.276
OCT	0.00000					0.000	-42.554	20	8	23.F	22.F	-263.787	14598.	23.276
NOV	0.00000					0.000	-92.569	2	5	16.F	15.F	-314.650	14202.	23.276
DEC	0.00000					0.000	-166.280	15	5	8.F	7.F	-409.753	14593.	23.276
TOTAL	0.000						-768.179						172450.	
MAX						0.000						-457.224		23.276

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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	-212.828	14.040
FEB	0	671	0	1	672	0	672	0	0	1	-204.907	14.040
MAR	0	694	0	50	744	0	744	0	0	50	-202.820	14.040
APR	0	435	0	285	720	0	720	0	0	285	-78.394	14.040
MAY	0	151	0	593	360	0	744	0	0	593	0.000	14.040
JUN	0	0	0	720	0	0	720	0	0	720	0.000	14.040
JUL	0	0	0	744	0	0	744	0	0	744	0.000	14.040
AUG	0	0	0	744	0	0	744	0	0	744	0.000	14.040
SEP	0	0	0	720	0	0	720	0	0	720	0.000	14.040
OCT	0	483	0	261	720	0	744	0	0	261	-166.305	14.040
NOV	0	656	0	64	720	0	720	0	0	64	-248.922	14.040
DEC	0	744	0	0	744	0	744	0	0	0	-238.269	14.040
ANNUAL	0	4578	0	4182	5424	0	8760	0	0	4182		

	AVERAGE SPACE TEMP					AVERAGE TEMPERATURE DIFFERENCE BETWEEN OUTDOOR& ROOM AIR			SUMMED TEMP DIFFERENCE BETWEEN OUTDOOR& ROOM AIR		
MONTH	ALL HOURS (F)	COOLING HOURS (F)	HEATING HOURS (F)	FAN ON HOURS (F)	FAN OFF HOURS (F)	ALL HOURS (F)	FAN ON HOURS (F)	FAN OFF HOURS (F)	HEATING HOURS (F)	ALL HOURS (F)	HUMIDITY RATIO DIFFERENCE BETWEEN OUTDOOR AND ROOM AIR (FRAC.OR MULT.)
JAN	81.65		81.65	81.65	0.00	-55.83	-55.83	0.00	1730.79	1730.79	-0.00453
FEB	81.89		81.89	81.89	0.00	-50.21	-50.21	0.00	1404.89	1405.92	-0.00454
MAR	82.13		82.08	82.13	0.00	-41.85	-41.85	0.00	1253.90	1297.42	-0.00452
APR	82.82		82.36	82.82	0.00	-26.05	-26.05	0.00	579.92	781.45	-0.00453
MAY	79.57		82.45	79.57	0.00	-13.49	-13.49	0.00	181.61	418.09	-0.00349
JUN	79.92			79.92	0.00	-6.28	-6.28	0.00			-0.00243
JUL	83.52			83.52	0.00	-6.34	-6.34	0.00			-0.00246
AUG	85.00			85.00	0.00	-5.87	-5.87	0.00			-0.00246
SEP	72.90			72.90	0.00	-5.36	-5.36	0.00			-0.00235
OCT	82.34		82.39	82.34	0.00	-24.45	-24.45	0.00	614.11	758.93	-0.00457
NOV	82.20		82.14	82.20	0.00	-38.09	-38.09	0.00	1100.72	1142.80	-0.00461
DEC	81.81		81.81	81.81	0.00	-51.77	-51.77	0.00	1604.97	1604.97	-0.00450
ANNUAL	81.33	0.00	82.02	81.33	0.00	-27.03	-27.03	0.00	8470.91	9868.12	-0.00374

TOTAL HOURS AT TEMPERATURE LEVEL AND TIME OF DAY

HOUR	1AM	2	3	4	5	6	7	8	9	10	11	12	1PM	2	3	4	5	6	7	8	9	10	11	12	TOTAL
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	1	0	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	4	5	7			135

HOURLY DATA FILE 1FROM 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

EQUIPMENT	SIZE (MBTU/H)	NUMBER INSTD	NUMBER AVAIL	SIZE (MBTU/H)	NUMBER INSTD	NUMBER AVAIL	SIZE (MBTU/H)	NUMBER INSTD	NUMBER AVAIL	SIZE (MBTU/H)	NUMBER INSTD	NUMBER AVAIL	SIZE (MBTU/H)	NUMBER INSTD	NUMBER AVAIL	SIZE (MBTU/H)	NUMBER INSTD	NUMBER AVAIL
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)	58.624	250.511
JAN	PEAK(KBTU)	91.241	575.402
	DY/HR	31/22	4/ 3
	TOTAL(MBTU)	52.702	192.678
FEB	PEAK(KBTU)	91.241	520.840
	DY/HR	28/22	3/ 6
	TOTAL(MBTU)	57.219	157.199
MAR	PEAK(KBTU)	91.241	500.300
	DY/HR	31/22	3/ 8
	TOTAL(MBTU)	52.007	61.585
APR	PEAK(KBTU)	91.241	351.685
	DY/HR	15/ 8	4/ 5
	TOTAL(MBTU)	51.088	16.187
MAY	PEAK(KBTU)	91.241	262.319
	DY/HR	9/ 6	5/ 6
	TOTAL(MBTU)	48.455	0.000
JUN	PEAK(KBTU)	79.475	0.000
	DY/HR	30/22	30/ 1
	TOTAL(MBTU)	49.845	0.000
JUL	PEAK(KBTU)	79.475	0.000
	DY/HR	31/20	31/ 1
	TOTAL(MBTU)	50.318	0.000
AUG	PEAK(KBTU)	79.475	0.000
	DY/HR	31/22	31/ 1
	TOTAL(MBTU)	48.297	0.000
SEP	PEAK(KBTU)	79.475	0.000
	DY/HR	30/22	30/ 1
	TOTAL(MBTU)	53.969	69.190
OCT	PEAK(KBTU)	91.241	364.703
	DY/HR	31/11	20/ 8
	TOTAL(MBTU)	55.132	140.138
NOV	PEAK(KBTU)	91.241	421.667
	DY/HR	30/22	2/ 5
	TOTAL(MBTU)	58.379	235.154
DEC	PEAK(KBTU)	91.241	525.187
	DY/HR	31/20	15/ 5
	ONE YEAR	636.035	1122.642
	USE/PEAK	91.241	575.402

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

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-154.729	16	7	12.F	9.F	-488.035	12890.	23.276
FEB	0.00000					0.000	-113.578	2	7	7.F	5.F	-439.676	11608.	23.276
MAR	0.00000					0.000	-85.679	3	8	15.F	12.F	-445.070	12663.	23.276
APR	0.00000					0.000	-27.135	4	6	32.F	31.F	-282.624	12063.	23.276
MAY	0.00000					0.000	-6.053	5	6	44.F	40.F	-220.153	13058.	23.276
JUN	0.00000					0.000	0.000					0.000	12801.	23.276
JUL	0.00000					0.000	0.000					0.000	13138.	23.276
AUG	0.00000					0.000	0.000					0.000	13333.	23.276
SEP	0.00000					0.000	0.000					0.000	13190.	23.276
OCT	0.00000					0.000	-31.096	20	8	23.F	22.F	-301.707	12282.	23.276
NOV	0.00000					0.000	-75.425	2	6	15.F	14.F	-356.580	12181.	23.276
DEC	0.00000					0.000	-143.377	15	7	11.F	9.F	-464.017	12824.	23.276
TOTAL	0.000						-637.071						152029.	
MAX						0.000						-488.035		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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	619	0	125	744	0	619	92	0	0	0.000	0.000
FEB	0	558	0	114	672	0	558	82	0	0	0.000	0.000
MAR	0	569	0	175	744	0	600	73	0	31	0.000	0.000
APR	0	297	0	423	720	0	568	58	0	271	0.000	14.040
MAY	0	88	0	656	360	0	631	104	0	543	0.000	0.000
JUN	0	0	0	720	0	0	621	111	0	621	0.000	14.040
JUL	0	0	0	744	0	0	640	113	0	640	0.000	14.040
AUG	0	0	0	744	0	0	644	117	0	644	0.000	14.040
SEP	0	0	0	720	0	0	652	142	0	652	0.000	14.040
OCT	0	332	0	412	720	0	579	52	0	247	0.000	0.000
NOV	0	529	0	191	720	0	576	66	0	47	0.000	0.000
DEC	0	618	0	126	744	0	618	91	0	0	0.000	0.000
ANNUAL	0	3610	0	5150	5424	0	7306	1101	0	3696		

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	51.690	216.995
JAN	PEAK(KBTU)	92.034	614.175
	DY/HR	31/22	16/ 7
	TOTAL(MBTU)	46.386	165.353
FEB	PEAK(KBTU)	92.034	563.045
	DY/HR	28/22	2/ 7
	TOTAL(MBTU)	49.217	128.666
MAR	PEAK(KBTU)	92.034	568.795
	DY/HR	31/22	3/ 8
	TOTAL(MBTU)	43.685	43.370
APR	PEAK(KBTU)	92.034	390.479
	DY/HR	16/ 9	4/ 6
	TOTAL(MBTU)	45.248	10.110
MAY	PEAK(KBTU)	92.034	319.067
	DY/HR	9/ 7	5/ 6
	TOTAL(MBTU)	43.709	0.000
JUN	PEAK(KBTU)	79.475	0.000
	DY/HR	30/22	30/ 1
	TOTAL(MBTU)	44.859	0.000
JUL	PEAK(KBTU)	79.475	0.000
	DY/HR	31/20	31/ 1
	TOTAL(MBTU)	45.524	0.000
AUG	PEAK(KBTU)	79.475	0.000
	DY/HR	31/22	31/ 1
	TOTAL(MBTU)	45.037	0.000
SEP	PEAK(KBTU)	79.475	0.000
	DY/HR	30/22	30/ 1
	TOTAL(MBTU)	44.852	50.043
OCT	PEAK(KBTU)	92.034	411.978
	DY/HR	31/12	20/ 8
	TOTAL(MBTU)	47.200	115.069
NOV	PEAK(KBTU)	92.034	472.981
	DY/HR	30/22	2/ 6
	TOTAL(MBTU)	51.381	203.845
DEC	PEAK(KBTU)	92.034	588.899
	DY/HR	31/20	15/ 7
	ONE YEAR	558.787	933.452
	USE/PEAK	92.034	614.175

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
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  ..
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```
$ 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. EZDOE - 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

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-171.558	4	3	8.F	7.F	-443.821	14645.	23.276
FEB	0.00000					0.000	-125.913	3	6	-1.F	-2.F	-395.191	13209.	23.276
MAR	0.00000					0.000	-97.555	3	8	15.F	12.F	-373.653	14685.	23.276
APR	0.00000					0.000	-33.360	4	5	33.F	31.F	-239.230	14197.	23.276
MAY	0.00000					0.000	-7.866	5	6	44.F	40.F	-162.716	14645.	23.276
JUN	0.00000					0.000	0.000					0.000	14191.	23.276
JUL	0.00000					0.000	0.000					0.000	14598.	23.276
AUG	0.00000					0.000	0.000					0.000	14737.	23.276
SEP	0.00000					0.000	0.000					0.000	14145.	23.276
OCT	0.00000					0.000	-36.894	20	8	23.F	22.F	-253.369	14598.	23.276
NOV	0.00000					0.000	-85.355	2	5	16.F	15.F	-303.817	14202.	23.276
DEC	0.00000					0.000	-157.838	15	5	8.F	7.F	-397.923	14593.	23.276
TOTAL	0.000						-716.337						172450.	
MAX						0.000						-443.821		23.276

EMC ENGINEERS INC. EZDOE - 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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	-201.530	14.040
FEB	0	665	0	7	672	0	672	0	0	7	-193.814	14.040
MAR	0	677	0	67	744	0	744	0	0	67	-191.316	14.040
APR	0	397	0	323	720	0	720	0	0	323	-65.193	14.040
MAY	0	135	0	609	360	0	744	0	0	609	0.000	14.040
JUN	0	0	0	720	0	0	720	0	0	720	0.000	14.040
JUL	0	0	0	744	0	0	744	0	0	744	0.000	14.040
AUG	0	0	0	744	0	0	744	0	0	744	0.000	14.040
SEP	0	0	0	720	0	0	720	0	0	720	0.000	14.040
OCT	0	452	0	292	720	0	744	0	0	292	-154.770	14.040
NOV	0	642	0	78	720	0	720	0	0	78	-238.024	14.040
DEC	0	744	0	0	744	0	744	0	0	0	-228.118	14.040
ANNUAL	0	4456	0	4304	5424	0	8760	0	0	4304		

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	58.322	239.504
JAN	PEAK(KBTU)	90.896	558.534
	DY/HR	31/22	4/ 3
	TOTAL(MBTU)	52.399	182.406
FEB	PEAK(KBTU)	90.896	507.067
	DY/HR	28/22	3/ 6
	TOTAL(MBTU)	56.770	145.759
MAR	PEAK(KBTU)	90.896	483.936
	DY/HR	31/22	3/ 8
	TOTAL(MBTU)	51.557	53.428
APR	PEAK(KBTU)	90.896	334.922
	DY/HR	15/ 8	4/ 5
	TOTAL(MBTU)	50.914	13.357
MAY	PEAK(KBTU)	90.407	246.518
	DY/HR	9/ 6	5/ 6
	TOTAL(MBTU)	48.455	0.000
JUN	PEAK(KBTU)	79.475	0.000
	DY/HR	30/22	30/ 1
	TOTAL(MBTU)	49.845	0.000
JUL	PEAK(KBTU)	79.475	0.000
	DY/HR	31/20	31/ 1
	TOTAL(MBTU)	50.318	0.000
AUG	PEAK(KBTU)	79.475	0.000
	DY/HR	31/22	31/ 1
	TOTAL(MBTU)	48.297	0.000
SEP	PEAK(KBTU)	79.475	0.000
	DY/HR	30/22	30/ 1
	TOTAL(MBTU)	53.496	60.281
OCT	PEAK(KBTU)	90.896	350.973
	DY/HR	31/11	20/ 8
	TOTAL(MBTU)	54.706	129.610
NOV	PEAK(KBTU)	90.896	407.520
	DY/HR	30/22	2/ 5
	TOTAL(MBTU)	58.069	223.818
DEC	PEAK(KBTU)	90.896	509.986
	DY/HR	31/20	15/ 5
	ONE YEAR	633.148	1048.161
	USE/PEAK	90.896	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 IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
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.

EMC ENGINEERS, INC.

DENVER - ATLANTA

PROJECT:	FEASIBILITY STUDY FOR INSTALLATION OF UMCS	EMC NO:	1406-001
		CALC. BY:	AJN
LOCATION:	FORT RILEY, KANSAS	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	FT²
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	NIGHTIME INFILTRATION (OA)
RUN5	DAYTIME INFILTRATION (OA)

HOURS OF OCCUPANCY				
M-F	600	2200	80	HR
SAT.	900	2000	11	HR
SUN.	900	2000	11	HR
	TOTAL OCCUPY HR.		102	HR/WK
	TOTAL UNOCC. HR.		66	HR/WK
	ANNUAL OCCUPY HR.		5319	HR/YR
	ANNUAL UNOCC. HR.		3441	HR/YR

ANNUAL HEATING & COOLING HOURS	
HR. ON HEATING	3308 HR/YR
HR. ON COOLING	2011 HR/YR
HR. OFF HEATING	2140 HR/YR
HR. OFF COOLING	1301 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  ..
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```
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& 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 ..
```

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	- - - - G L A S S - - - - U-VALUE (BTU/HR-SQFT-F)	AREA (SQFT)	- - - - W A L L - - - - 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
	B-BALL/1ST	0.490	288.00	0.037	496.00	0.203	784.00	EAST
	B-BALL/1ST	0.000	0.00	0.037	2275.00	0.037	2275.00	EAST
	H-BALL/2ND	0.490	406.00	0.037	658.00	0.210	1064.00	EAST
	B-BALL/1ST	0.490	60.00	0.037	2992.50	0.046	3052.50	SOUTH
	H-BALL/2ND	0.000	0.00	0.037	380.00	0.037	380.00	SOUTH
	B-BALL/1ST	0.000	0.00	0.037	784.00	0.037	784.00	WEST
	B-BALL/1ST	0.000	0.00	0.037	2275.00	0.037	2275.00	WEST
	H-BALL/2ND	0.000	0.00	0.037	779.00	0.037	779.00	WEST
	B-BALL/1ST	0.000	0.00	0.062	15129.00	0.062	15129.00	ROOF
	H-BALL/2ND	0.000	0.00	0.062	6724.00	0.062	6724.00	ROOF
	B-BALL/1ST	0.000	0.00	0.020	728.00	0.020	728.00	UNDERGRND
	B-BALL/1ST	0.000	0.00	0.020	720.00	0.020	720.00	UNDERGRND
	B-BALL/1ST	0.000	0.00	0.020	752.00	0.020	752.00	UNDERGRND
	B-BALL/1ST	0.000	0.00	0.020	15129.00	0.020	15129.00	UNDERGRND
	H-BALL/2ND	0.000	0.00	0.020	1681.00	0.020	1681.00	UNDERGRND
	H-BALL/2ND	0.000	0.00	0.020	72.00	0.020	72.00	UNDERGRND
	H-BALL/2ND	0.000	0.00	0.020	72.00	0.020	72.00	UNDERGRND

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- 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)
EAST	0.490	0.037	0.113	694.00	3429.00	4123.00
SOUTH	0.490	0.037	0.045	60.00	3372.50	3432.50
WEST	0.000	0.037	0.037	0.00	3838.00	3838.00
ROOF	0.000	0.062	0.062	0.00	21853.00	21853.00
ALL WALLS	0.490	0.037	0.067	754.00	10639.50	11393.50
WALLS+ROOFS	0.490	0.054	0.064	754.00	32492.50	33246.50
UNDERGRND	0.000	0.020	0.020	0.00	19154.00	19154.00
BUILDING	0.490	0.041	0.048	754.00	51646.50	52400.50

*** BUILDING ***

FLOOR AREA 21862 SQFT 2031 SQMT
VOLUME 489606 CUFT 13866 CUMT

	COOLING LOAD				HEATING LOAD	
TIME	AUG 4 5PM				JAN 16 6AM	
DRY-BULB TEMP	92F	33C			10F	-12C
WET-BULB TEMP	70F	21C			8F	-13C
	SENSIBLE		LATENT		SENSIBLE	
	(KBTU/H)	(KW)	(KBTU/H)	(KW)	(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	-56.404 KW
TOTAL LOAD / AREA	15.55BTU/H.SQFT		49.018 W /SQMT		8.809BTU/H.SQFT	27.771 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 5/17/1995 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

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-468.267	15	6	-8.F	-9.F	-1224.438	30702.	49.841
FEB	0.00000					0.000	-356.345	3	7	-5.F	-6.F	-1153.788	27700.	49.841
MAR	0.00000					0.000	-292.756	3	7	14.F	12.F	-853.747	30838.	49.841
APR	0.00000					0.000	-107.186	5	5	31.F	29.F	-559.830	29777.	49.841
MAY	0.00000					0.000	-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					0.000	-99.992	20	7	23.F	23.F	-681.072	30590.	49.841
NOV	0.00000					0.000	-240.469	3	6	13.F	12.F	-838.546	29754.	49.841
DEC	0.00000					0.000	-418.510	13	8	0.F	-1.F	-1047.523	30612.	49.841
TOTAL	0.000						-2012.813						361697.	
MAX						0.000						-1224.438		49.841

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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	-528.694	27.300
FEB	0	672	0	0	672	0	672	0	0	0	-542.644	27.300
MAR	0	732	0	12	744	0	744	0	0	12	-531.315	27.300
APR	0	593	0	127	720	0	720	0	0	127	-254.162	27.300
MAY	0	259	0	485	360	0	744	0	0	485	0.000	27.300
JUN	0	0	0	720	0	0	720	0	0	720	0.000	27.300
JUL	0	0	0	744	0	0	744	0	0	744	0.000	27.300
AUG	0	0	0	744	0	0	744	0	0	744	0.000	27.300
SEP	0	0	0	720	0	0	720	0	0	720	0.000	27.300
OCT	0	575	0	169	720	0	744	0	0	169	-380.771	27.300
NOV	0	681	0	39	720	0	720	0	0	39	-630.593	27.300
DEC	0	744	0	0	744	0	744	0	0	0	-602.493	27.300
ANNUAL	0	5000	0	3760	5424	0	8760	0	0	3760		

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-A SYSTEM MONTHLY LOADS SUMMARY FOR AHU'S_1&2 TOPEKA, KS

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-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						-115.709						111612.	
MAX						187.914						-102.496		31.586

H16-14

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 AHU'S_1&2 TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	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	0	744	744	0	0	0	0.000	30.433
AUG	743	0	0	1	0	744	744	0	0	1	0.000	30.811
SEP	632	0	0	88	0	635	720	0	0	88	0.000	29.640
OCT	15	384	0	345	720	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-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	154.560	705.446
JAN	PEAK(KBTU)	249.190	1668.341
	DY/HR	28/ 9	15/ 5
	TOTAL(MBTU)	139.172	551.450
FEB	PEAK(KBTU)	248.849	1593.961
	DY/HR	28/22	3/ 7
	TOTAL(MBTU)	151.987	462.732
MAR	PEAK(KBTU)	248.849	1254.135
	DY/HR	31/22	3/ 7
	TOTAL(MBTU)	137.229	179.667
APR	PEAK(KBTU)	248.849	872.121
	DY/HR	16/ 9	5/ 5
	TOTAL(MBTU)	141.993	51.878
MAY	PEAK(KBTU)	270.009	694.043
	DY/HR	31/18	1/ 6
	TOTAL(MBTU)	145.431	0.000
JUN	PEAK(KBTU)	270.822	0.000
	DY/HR	28/16	30/ 1
	TOTAL(MBTU)	152.864	0.000
JUL	PEAK(KBTU)	278.026	0.000
	DY/HR	23/16	31/ 1
	TOTAL(MBTU)	154.645	0.000
AUG	PEAK(KBTU)	275.378	0.000
	DY/HR	23/16	31/ 1
	TOTAL(MBTU)	138.814	0.000
SEP	PEAK(KBTU)	271.671	0.000
	DY/HR	7/16	30/ 1
	TOTAL(MBTU)	140.852	171.168
OCT	PEAK(KBTU)	248.958	1013.214
	DY/HR	1/17	20/ 7
	TOTAL(MBTU)	144.486	384.863
NOV	PEAK(KBTU)	248.849	1228.773
	DY/HR	30/22	3/ 6
	TOTAL(MBTU)	153.834	643.049
DEC	PEAK(KBTU)	249.190	1459.380
	DY/HR	13/ 8	13/ 8
	ONE YEAR	1755.867	3150.252
	USE/PEAK	278.026	1668.341

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
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.

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                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_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  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. EZDOE - 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

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-323.171	15	7	-7.F	-8.F	-1240.048	24778.	49.841
FEB	0.00000					0.000	-241.228	3	7	-5.F	-6.F	-1164.511	22349.	49.841
MAR	0.00000					0.000	-189.086	3	6	15.F	12.F	-890.203	24913.	49.841
APR	0.00000					0.000	-58.657	5	6	31.F	28.F	-568.303	24044.	49.841
MAY	0.00000					0.000	-14.101	1	6	37.F	37.F	-434.264	24778.	49.841
JUN	0.00000					0.000	0.000					0.000	24066.	49.841
JUL	0.00000					0.000	0.000					0.000	24666.	49.841
AUG	0.00000					0.000	0.000					0.000	25004.	49.841
SEP	0.00000					0.000	0.000					0.000	23954.	49.841
OCT	0.00000					0.000	-55.869	20	8	23.F	22.F	-680.747	24666.	49.841
NOV	0.00000					0.000	-152.014	3	6	13.F	12.F	-870.373	24021.	49.841
DEC	0.00000					0.000	-287.836	13	6	2.F	1.F	-1091.635	24688.	49.841
TOTAL	0.000						-1321.962						291938.	
MAX						0.000						-1240.048		49.841

EMC ENGINEERS INC. EZDOE - 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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	527	0	217	744	0	527	0	0	0	0.000	0.000
FEB	0	476	0	196	672	0	476	0	0	0	0.000	0.000
MAR	0	515	0	229	744	0	527	0	0	12	0.000	0.000
APR	0	388	0	332	720	0	510	0	0	122	0.000	0.000
MAY	0	151	0	593	360	0	527	0	0	376	0.000	0.000
JUN	0	0	0	720	0	0	510	0	0	510	0.000	0.000
JUL	0	0	0	744	0	0	527	0	0	527	0.000	0.000
AUG	0	0	0	744	0	0	527	0	0	527	0.000	0.000
SEP	0	0	0	720	0	0	510	0	0	510	0.000	0.000
OCT	0	365	0	379	720	0	527	0	0	162	0.000	0.000
NOV	0	468	0	252	720	0	510	0	0	42	0.000	0.000
DEC	0	527	0	217	744	0	527	0	0	0	0.000	0.000
ANNUAL	0	3417	0	5343	5424	0	6205	0	0	2788		

EMC ENGINEERS INC. EZDOE - 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

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-24.802	15	21	3.F	1.F	-104.144	6305.	13.149
FEB	0.00000					0.000	-15.524	3	7	-5.F	-6.F	-99.682	5679.	13.049
MAR	0.00000					0.000	-7.482	3	7	14.F	12.F	-98.368	6353.	13.049
APR	0.00000					0.000	-0.359	1	7	48.F	44.F	-19.926	6122.	13.049
MAY	25.99297	16	12	73.F	65.F	200.022	-0.156	1	6	37.F	37.F	-9.149	8643.	29.850
JUN	55.73210	28	12	87.F	76.F	168.496	0.000					0.000	11376.	30.041
JUL	65.26513	13	13	90.F	79.F	183.443	0.000					0.000	12515.	31.824
AUG	63.97572	23	13	93.F	77.F	174.924	0.000					0.000	12735.	31.330
SEP	40.22445	7	15	92.F	76.F	165.073	0.000					0.000	9804.	30.323
OCT	0.99082	1	18	83.F	68.F	101.682	-0.464	2	6	53.F	51.F	-41.302	6351.	23.410
NOV	0.00000					0.000	-6.148	3	7	19.F	17.F	-91.726	6114.	13.049
DEC	0.00000					0.000	-21.494	14	8	9.F	7.F	-99.727	6266.	13.149
TOTAL	252.181						-76.428						98259.	
MAX						200.022						-104.144		31.824

EMC ENGINEERS INC. EZDOE - 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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	509	0	235	744	0	527	0	0	18	0.000	0.000
FEB	0	437	0	235	672	0	476	0	0	39	0.000	0.000
MAR	0	341	0	403	744	0	527	0	0	186	0.000	0.000
APR	0	165	0	555	720	0	510	0	0	345	0.000	0.000
MAY	272	78	0	394	360	384	527	0	0	177	0.000	29.210
JUN	510	0	0	210	0	720	510	0	0	0	0.000	29.751
JUL	527	0	0	217	0	744	527	0	0	0	0.000	31.046
AUG	527	0	0	217	0	744	527	0	0	0	0.000	31.045
SEP	485	0	0	235	0	697	510	0	0	25	0.000	30.301
OCT	13	193	0	538	720	20	527	0	0	321	0.000	23.190
NOV	0	325	0	395	720	0	510	0	0	185	0.000	0.000
DEC	0	498	0	246	744	0	527	0	0	29	0.000	0.000
ANNUAL	2334	2546	0	3880	5424	3309	6205	0	0	1325		

EMC ENGINEERS INC. EZDOE - 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-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	123.961	490.876
JAN	PEAK(KBTU)	249.562	1686.519
	DY/HR	28/ 9	15/ 7
	TOTAL(MBTU)	111.523	376.822
FEB	PEAK(KBTU)	249.220	1606.538
	DY/HR	28/22	3/ 7
	TOTAL(MBTU)	121.608	300.879
MAR	PEAK(KBTU)	249.220	1300.684
	DY/HR	31/22	3/ 6
	TOTAL(MBTU)	109.848	99.545
APR	PEAK(KBTU)	249.220	847.009
	DY/HR	16/ 9	5/ 6
	TOTAL(MBTU)	116.189	25.412
MAY	PEAK(KBTU)	272.098	688.030
	DY/HR	16/16	1/ 6
	TOTAL(MBTU)	121.014	0.000
JUN	PEAK(KBTU)	272.751	0.000
	DY/HR	28/15	30/ 1
	TOTAL(MBTU)	126.952	0.000
JUL	PEAK(KBTU)	278.838	0.000
	DY/HR	23/16	31/ 1
	TOTAL(MBTU)	128.857	0.000
AUG	PEAK(KBTU)	277.149	0.000
	DY/HR	23/16	31/ 1
	TOTAL(MBTU)	115.261	0.000
SEP	PEAK(KBTU)	273.712	0.000
	DY/HR	7/16	30/ 1
	TOTAL(MBTU)	112.619	95.974
OCT	PEAK(KBTU)	250.108	975.021
	DY/HR	1/17	20/ 8
	TOTAL(MBTU)	115.579	245.322
NOV	PEAK(KBTU)	249.220	1279.169
	DY/HR	30/22	3/ 6
	TOTAL(MBTU)	123.229	445.796
DEC	PEAK(KBTU)	249.562	1517.083
	DY/HR	13/ 8	13/ 6
	ONE YEAR	1426.641	2080.626
	USE/PEAK	278.838	1686.519

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
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.

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                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 #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

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELECTRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000					0.000	-468.267	15	6	-8.F	-9.F	-1224.438	30702.	49.841
FEB	0.00000					0.000	-356.345	3	7	-5.F	-6.F	-1153.788	27700.	49.841
MAR	0.00000					0.000	-292.756	3	7	14.F	12.F	-853.747	30838.	49.841
APR	0.00000					0.000	-107.186	5	5	31.F	29.F	-559.830	29777.	49.841
MAY	0.00000					0.000	-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					0.000	-99.992	20	7	23.F	23.F	-681.072	30590.	49.841
NOV	0.00000					0.000	-240.469	3	6	13.F	12.F	-838.546	29754.	49.841
DEC	0.00000					0.000	-418.510	13	8	0.F	-1.F	-1047.523	30612.	49.841
TOTAL	0.000						-2012.812						361697.	
MAX						0.000						-1224.438		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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	-528.694	27.300
FEB	0	672	0	0	672	0	672	0	0	0	-542.645	27.300
MAR	0	732	0	12	744	0	744	0	0	12	-531.314	27.300
APR	0	593	0	127	720	0	720	0	0	127	-254.162	27.300
MAY	0	259	0	485	360	0	744	0	0	485	0.000	27.300
JUN	0	0	0	720	0	0	720	0	0	720	0.000	27.300
JUL	0	0	0	744	0	0	744	0	0	744	0.000	27.300
AUG	0	0	0	744	0	0	744	0	0	744	0.000	27.300
SEP	0	0	0	720	0	0	720	0	0	720	0.000	27.300
OCT	0	575	0	169	720	0	744	0	0	169	-380.771	27.300
NOV	0	681	0	39	720	0	720	0	0	39	-630.593	27.300
DEC	0	744	0	0	744	0	744	0	0	0	-602.493	27.300
ANNUAL	0	5000	0	3760	5424	0	8760	0	0	3760		

REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR AHU'S_1&2 TOPEKA, KS

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-29.509	15	2	-7.F	-8.F	-102.075	7242.	13.149
FEB	0.00000					0.000	-18.467	3	6	-1.F	-2.F	-101.131	6525.	13.049
MAR	0.00000					0.000	-9.447	3	7	14.F	12.F	-79.591	7290.	13.049
APR	0.00000					0.000	-0.798	1	2	34.F	30.F	-32.445	7029.	13.049
MAY	23.35393	16	6	57.F	56.F	181.265	-0.320	14	21	70.F	65.F	-6.851	9363.	28.077
JUN	53.01609	28	16	90.F	76.F	145.896	0.000					0.000	12074.	28.342
JUL	64.15292	13	13	90.F	79.F	158.834	0.000					0.000	13380.	30.637
AUG	62.56360	23	16	96.F	77.F	151.107	0.000					0.000	13573.	29.732
SEP	35.41990	7	15	92.F	76.F	143.518	0.000					0.000	10336.	28.488
OCT	0.72218	1	18	83.F	68.F	84.008	-0.677	20	7	23.F	23.F	-14.142	7263.	21.418
NOV	0.00000					0.000	-7.798	3	6	13.F	12.F	-72.923	7020.	13.049
DEC	0.00000					0.000	-25.009	12	5	4.F	3.F	-95.998	7202.	13.149
TOTAL	239.229						-92.024						108290.	
MAX						181.265						-102.075		30.637

REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR AHU'S_1&2 TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	744	0	744	0	0	55	-30.365	4.316
FEB	0	592	0	80	672	0	672	0	0	80	-22.300	4.316
MAR	0	505	0	239	744	0	744	0	0	239	-28.897	4.316
APR	0	344	0	376	720	0	720	0	0	376	-2.657	4.316
MAY	357	169	0	218	360	359	744	0	0	218	0.000	25.882
JUN	699	0	0	21	0	699	720	0	0	21	0.000	28.342
JUL	744	0	0	0	0	744	744	0	0	0	0.000	29.414
AUG	740	0	0	4	0	740	744	0	0	4	0.000	29.732
SEP	583	0	0	137	0	585	720	0	0	137	0.000	28.424
OCT	14	371	0	359	720	14	744	0	0	359	0.000	21.333
NOV	0	494	0	226	720	0	720	0	0	226	-47.170	4.316
DEC	0	674	0	70	744	0	744	0	0	70	-51.758	4.316
ANNUAL	3137	3838	0	1785	5424	3141	8760	0	0	1785		

EMC ENGINEERS INC. EZDOE - 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-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	154.552	699.678
JAN	PEAK(KBTU)	249.186	1668.132
	DY/HR	28/ 9	15/ 5
	TOTAL(MBTU)	139.168	546.205
FEB	PEAK(KBTU)	248.844	1593.714
	DY/HR	28/22	3/ 7
	TOTAL(MBTU)	151.980	458.050
MAR	PEAK(KBTU)	248.844	1245.860
	DY/HR	31/22	3/ 7
	TOTAL(MBTU)	137.225	178.840
APR	PEAK(KBTU)	248.844	843.301
	DY/HR	16/ 9	5/ 5
	TOTAL(MBTU)	140.782	51.877
MAY	PEAK(KBTU)	266.044	694.022
	DY/HR	31/18	1/ 6
	TOTAL(MBTU)	142.973	0.000
JUN	PEAK(KBTU)	266.949	0.000
	DY/HR	28/16	30/ 1
	TOTAL(MBTU)	150.130	0.000
JUL	PEAK(KBTU)	274.784	0.000
	DY/HR	23/16	31/ 1
	TOTAL(MBTU)	151.945	0.000
AUG	PEAK(KBTU)	271.694	0.000
	DY/HR	23/16	31/ 1
	TOTAL(MBTU)	136.654	0.000
SEP	PEAK(KBTU)	267.449	0.000
	DY/HR	7/16	30/ 1
	TOTAL(MBTU)	140.748	170.108
OCT	PEAK(KBTU)	248.844	978.312
	DY/HR	31/ 9	20/ 7
	TOTAL(MBTU)	144.469	380.596
NOV	PEAK(KBTU)	248.844	1221.640
	DY/HR	30/22	3/ 6
	TOTAL(MBTU)	153.823	637.134
DEC	PEAK(KBTU)	249.186	1452.347
	DY/HR	13/ 8	13/ 8
	ONE YEAR	1744.449	3122.488
	USE/PEAK	274.784	1668.132

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  ..


                $------------------------------------$
                $ 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 BLDG. 8069-REMAI      *
       LINE-5 *THE REMAINDER OF THE BLDG. (LESS POOL)  * ..

ABORT              ERRORS  ..
DIAGNOSTIC         WARNINGS ..
PLANT-REPORT       VERIFICATION=(PV-A)
```

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 H&VSYSTEMS TOPEKA, KS

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-323.171	15	7	-7.F	-8.F	-1240.048	24778.	49.841
FEB	0.00000					0.000	-241.228	3	7	-5.F	-6.F	-1164.511	22349.	49.841
MAR	0.00000					0.000	-189.086	3	6	15.F	12.F	-890.203	24913.	49.841
APR	0.00000					0.000	-58.657	5	6	31.F	28.F	-568.303	24044.	49.841
MAY	0.00000					0.000	-14.101	1	6	37.F	37.F	-434.264	24778.	49.841
JUN	0.00000					0.000	0.000					0.000	24066.	49.841
JUL	0.00000					0.000	0.000					0.000	24666.	49.841
AUG	0.00000					0.000	0.000					0.000	25004.	49.841
SEP	0.00000					0.000	0.000					0.000	23954.	49.841
OCT	0.00000					0.000	-55.869	20	8	23.F	22.F	-680.747	24666.	49.841
NOV	0.00000					0.000	-152.014	3	6	13.F	12.F	-870.373	24021.	49.841
DEC	0.00000					0.000	-287.836	13	6	2.F	1.F	-1091.635	24688.	49.841
TOTAL	0.000						-1321.962						291938.	
MAX						0.000						-1240.048		49.841

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 H&VSYSTEMS TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	527	0	217	744	0	527	0	0	0	0.000	0.000
FEB	0	476	0	196	672	0	476	0	0	0	0.000	0.000
MAR	0	515	0	229	744	0	527	0	0	12	0.000	0.000
APR	0	388	0	332	720	0	510	0	0	122	0.000	0.000
MAY	0	151	0	593	360	0	527	0	0	376	0.000	0.000
JUN	0	0	0	720	0	0	510	0	0	510	0.000	0.000
JUL	0	0	0	744	0	0	527	0	0	527	0.000	0.000
AUG	0	0	0	744	0	0	527	0	0	527	0.000	0.000
SEP	0	0	0	720	0	0	510	0	0	510	0.000	0.000
OCT	0	365	0	379	720	0	527	0	0	162	0.000	0.000
NOV	0	468	0	252	720	0	510	0	0	42	0.000	0.000
DEC	0	527	0	217	744	0	527	0	0	0	0.000	0.000
ANNUAL	0	3417	0	5343	5424	0	6205	0	0	2788		

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

	COOLING						HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-25.027	15	21	3.F	1.F	-105.120	6305.	13.149
FEB	0.00000					0.000	-15.417	3	7	-5.F	-6.F	-93.725	5679.	13.049
MAR	0.00000					0.000	-8.879	3	9	17.F	13.F	-89.219	6353.	13.049
APR	0.00000					0.000	-1.316	9	7	32.F	30.F	-51.924	6122.	13.049
MAY	19.97339	16	13	76.F	67.F	180.287	-0.205	1	7	38.F	36.F	-35.245	8165.	29.585
JUN	49.98787	28	12	87.F	76.F	168.496	0.000					0.000	10916.	30.041
JUL	63.78401	13	13	90.F	79.F	183.444	0.000					0.000	12391.	31.824
AUG	61.76687	23	13	93.F	77.F	174.924	0.000					0.000	12558.	31.330
SEP	32.39009	7	15	92.F	76.F	165.075	0.000					0.000	9175.	30.323
OCT	0.85751	1	18	83.F	68.F	101.588	-1.399	20	7	23.F	23.F	-72.452	6340.	23.399
NOV	0.00000					0.000	-7.481	10	7	20.F	18.F	-86.126	6114.	13.049
DEC	0.00000					0.000	-21.216	14	9	10.F	8.F	-95.436	6266.	13.149
TOTAL	228.760						-80.940						96380.	
MAX						183.444						-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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	505	0	239	744	0	527	0	0	22	0.000	0.000
FEB	0	430	0	242	672	0	476	0	0	46	0.000	0.000
MAR	0	302	0	442	744	0	527	0	0	225	0.000	0.000
APR	0	63	0	657	720	0	510	0	0	447	0.000	0.000
MAY	204	15	0	525	360	384	527	0	0	308	0.000	28.559
JUN	456	0	0	264	0	720	510	0	0	54	0.000	29.751
JUL	512	0	0	232	0	744	527	0	0	15	0.000	31.046
AUG	509	0	0	235	0	744	527	0	0	18	0.000	31.045
SEP	352	0	0	368	0	696	510	0	0	158	0.000	30.301
OCT	11	85	0	648	720	20	527	0	0	431	0.000	23.180
NOV	0	289	0	431	720	0	510	0	0	221	0.000	0.000
DEC	0	493	0	251	744	0	527	0	0	34	0.000	0.000
ANNUAL	2044	2182	0	4534	5424	3308	6205	0	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-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	123.906	490.887
JAN	PEAK(KBTU)	249.434	1680.285
	DY/HR	28/ 9	15/ 7
	TOTAL(MBTU)	111.472	376.478
FEB	PEAK(KBTU)	249.093	1599.241
	DY/HR	28/22	3/ 7
	TOTAL(MBTU)	121.584	302.430
MAR	PEAK(KBTU)	249.093	1266.990
	DY/HR	31/22	3/ 7
	TOTAL(MBTU)	109.831	100.606
APR	PEAK(KBTU)	249.093	870.371
	DY/HR	16/ 9	5/ 7
	TOTAL(MBTU)	114.551	25.441
MAY	PEAK(KBTU)	271.192	711.469
	DY/HR	31/18	1/ 7
	TOTAL(MBTU)	119.446	0.000
JUN	PEAK(KBTU)	272.751	0.000
	DY/HR	28/15	30/ 1
	TOTAL(MBTU)	126.526	0.000
JUL	PEAK(KBTU)	278.838	0.000
	DY/HR	23/16	31/ 1
	TOTAL(MBTU)	128.251	0.000
AUG	PEAK(KBTU)	277.149	0.000
	DY/HR	23/16	31/ 1
	TOTAL(MBTU)	113.116	0.000
SEP	PEAK(KBTU)	273.713	0.000
	DY/HR	7/16	30/ 1
	TOTAL(MBTU)	112.569	97.058
OCT	PEAK(KBTU)	250.072	1045.115
	DY/HR	1/17	20/ 7
	TOTAL(MBTU)	115.570	246.878
NOV	PEAK(KBTU)	249.093	1214.664
	DY/HR	30/22	3/ 6
	TOTAL(MBTU)	123.184	445.270
DEC	PEAK(KBTU)	249.434	1502.673
	DY/HR	13/ 8	13/ 8
	ONE YEAR	1420.008	2085.049
	USE/PEAK	278.838	1680.285

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/SQFT-YR GROSS-AREA 160.3 KBTU/SQFT-YR NET-AREA
TOTAL SOURCE ENERGY 6349.34 MBTU 290.4 KBTU/SQFT-YR GROSS-AREA 290.4 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.

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                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  ..
```

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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.) ..

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
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                    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
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                    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)
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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 H&VSYSTEMS TOPEKA, KS

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-312.632	15	6	-8.F	-9.F	-1212.085	30702.	49.841
FEB	0.00000					0.000	-231.814	3	7	-5.F	-6.F	-1146.739	27700.	49.841
MAR	0.00000					0.000	-179.106	3	7	14.F	12.F	-845.295	30838.	49.841
APR	0.00000					0.000	-52.533	5	7	30.F	27.F	-538.162	29777.	49.841
MAY	0.00000					0.000	-12.203	1	7	38.F	36.F	-410.682	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					0.000	-50.203	20	7	23.F	23.F	-664.061	30590.	49.841
NOV	0.00000					0.000	-143.263	3	6	13.F	12.F	-791.235	29754.	49.841
DEC	0.00000					0.000	-277.366	13	8	0.F	-1.F	-1039.518	30612.	49.841
TOTAL	0.000						-1259.121						361697.	
MAX						0.000						-1212.085		49.841

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 H&VSYSTEMS TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	631	0	113	744	0	744	0	0	113	0.000	27.300
FEB	0	550	0	122	672	0	672	0	0	122	0.000	27.300
MAR	0	575	0	169	744	0	744	0	0	169	0.000	27.300
APR	0	399	0	321	720	0	720	0	0	321	0.000	27.300
MAY	0	152	0	592	360	0	744	0	0	592	0.000	27.300
JUN	0	0	0	720	0	0	720	0	0	720	0.000	27.300
JUL	0	0	0	744	0	0	744	0	0	744	0.000	27.300
AUG	0	0	0	744	0	0	744	0	0	744	0.000	27.300
SEP	0	0	0	720	0	0	720	0	0	720	0.000	27.300
OCT	0	367	0	377	720	0	744	0	0	377	0.000	27.300
NOV	0	495	0	225	720	0	720	0	0	225	0.000	27.300
DEC	0	602	0	142	744	0	744	0	0	142	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

	COOLING						HEATING						ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-35.529	15	6	-8.F	-9.F	-121.121	7242.	13.149
FEB	0.00000					0.000	-23.585	3	6	-1.F	-2.F	-115.538	6525.	13.049
MAR	0.00000					0.000	-13.192	3	6	15.F	12.F	-107.928	7290.	13.049
APR	0.00000					0.000	-1.151	5	7	30.F	27.F	-46.546	7029.	13.049
MAY	28.05231	16	13	76.F	67.F	193.595	-0.310	1	6	37.F	37.F	-15.782	9771.	30.476
JUN	62.12816	28	16	90.F	76.F	175.043	0.000					0.000	12901.	30.628
JUL	74.27632	13	13	90.F	79.F	191.737	0.000					0.000	14302.	32.286
AUG	72.52496	23	13	93.F	77.F	180.770	0.000					0.000	14505.	31.734
SEP	43.45966	7	15	92.F	76.F	173.100	0.000					0.000	11037.	30.894
OCT	1.08288	1	17	85.F	68.F	107.587	-1.425	20	7	23.F	23.F	-63.189	7296.	24.031
NOV	0.00000					0.000	-11.167	3	6	13.F	12.F	-102.650	7020.	13.049
DEC	0.00000					0.000	-31.238	15	6	9.F	7.F	-111.369	7202.	13.149
TOTAL	281.524						-117.597						112113.	
MAX						193.595						-121.121		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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	735	0	9	744	0	744	0	0	9	-5.484	4.316
FEB	0	641	0	31	672	0	672	0	0	31	-2.088	4.316
MAR	0	579	0	165	744	0	744	0	0	165	-5.316	4.316
APR	0	367	0	353	720	0	720	0	0	353	-0.454	4.316
MAY	374	157	0	213	360	375	744	0	0	213	0.000	29.183
JUN	711	0	0	9	0	711	720	0	0	9	0.000	30.628
JUL	744	0	0	0	0	744	744	0	0	0	0.000	31.495
AUG	741	0	0	3	0	742	744	0	0	3	0.000	31.393
SEP	665	0	0	55	0	667	720	0	0	55	0.000	30.816
OCT	19	385	0	340	720	19	744	0	0	340	0.000	24.031
NOV	0	545	0	175	720	0	720	0	0	175	-15.127	4.316
DEC	0	721	0	23	744	0	744	0	0	23	-21.978	4.316
ANNUAL	3254	4130	0	1376	5424	3258	8760	0	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-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	148.920	496.204
JAN	PEAK(KBTU)	249.383	1677.795
	DY/HR	28/ 9	15/ 6
	TOTAL(MBTU)	133.849	378.767
FEB	PEAK(KBTU)	249.042	1592.294
	DY/HR	28/22	3/ 7
	TOTAL(MBTU)	145.764	297.271
MAR	PEAK(KBTU)	249.042	1263.417
	DY/HR	31/22	3/ 7
	TOTAL(MBTU)	132.898	93.307
APR	PEAK(KBTU)	249.042	852.298
	DY/HR	15/ 8	5/ 7
	TOTAL(MBTU)	140.462	23.512
MAY	PEAK(KBTU)	274.233	653.961
	DY/HR	31/18	1/ 7
	TOTAL(MBTU)	145.797	0.000
JUN	PEAK(KBTU)	274.755	0.000
	DY/HR	28/16	30/ 1
	TOTAL(MBTU)	153.278	0.000
JUL	PEAK(KBTU)	280.417	0.000
	DY/HR	23/15	31/ 1
	TOTAL(MBTU)	155.128	0.000
AUG	PEAK(KBTU)	278.531	0.000
	DY/HR	23/16	31/ 1
	TOTAL(MBTU)	139.048	0.000
SEP	PEAK(KBTU)	275.662	0.000
	DY/HR	7/16	30/ 1
	TOTAL(MBTU)	136.383	90.309
OCT	PEAK(KBTU)	252.230	1015.888
	DY/HR	1/17	20/ 7
	TOTAL(MBTU)	138.903	242.117
NOV	PEAK(KBTU)	249.042	1203.320
	DY/HR	30/22	3/ 6
	TOTAL(MBTU)	148.027	449.226
DEC	PEAK(KBTU)	249.383	1473.683
	DY/HR	13/ 8	13/ 8
	ONE YEAR	1718.458	2070.712
	USE/PEAK	280.417	1677.795

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 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.

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                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  ..
```

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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
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                    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
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                    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 #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)
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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

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELECTRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000					0.000	-135.359	15	5	-8.F	-9.F	-1183.851	30702.	49.841
FEB	0.00000					0.000	-103.026	3	5	-1.F	-2.F	-1037.317	27700.	49.841
MAR	0.00000					0.000	-85.492	4	5	14.F	12.F	-795.337	30838.	49.841
APR	0.00000					0.000	-32.170	5	5	31.F	29.F	-481.643	29777.	49.841
MAY	0.00000					0.000	-8.517	1	5	38.F	37.F	-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					0.000	-25.310	20	5	25.F	25.F	-550.208	30590.	49.841
NOV	0.00000					0.000	-69.119	3	5	13.F	12.F	-767.176	29754.	49.841
DEC	0.00000					0.000	-117.992	14	24	2.F	1.F	-983.318	30612.	49.841
TOTAL	0.000						-576.984						361697.	
MAX						0.000						-1183.851		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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	239	0	505	744	0	744	0	0	505	-460.432	27.300
FEB	0	217	0	455	672	0	672	0	0	455	-472.526	27.300
MAR	0	236	0	508	744	0	744	0	0	508	-463.483	27.300
APR	0	229	0	491	720	0	720	0	0	491	-84.461	27.300
MAY	0	115	0	629	360	0	744	0	0	629	0.000	27.300
JUN	0	0	0	720	0	0	720	0	0	720	0.000	27.300
JUL	0	0	0	744	0	0	744	0	0	744	0.000	27.300
AUG	0	0	0	744	0	0	744	0	0	744	0.000	27.300
SEP	0	0	0	720	0	0	720	0	0	720	0.000	27.300
OCT	0	229	0	515	720	0	744	0	0	515	-284.058	27.300
NOV	0	230	0	490	720	0	720	0	0	490	-546.565	27.300
DEC	0	242	0	502	744	0	744	0	0	502	-550.577	27.300
ANNUAL	0	1737	0	7023	5424	0	8760	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

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-16.187	14	23	-4.F	-5.F	-114.697	7242.	13.149
FEB	0.00000					0.000	-9.590	3	1	2.F	1.F	-103.316	6525.	13.049
MAR	0.00000					0.000	-4.653	4	5	14.F	12.F	-91.823	7290.	13.049
APR	0.00000					0.000	-1.147	1	3	36.F	32.F	-25.959	7029.	13.049
MAY	26.73633	16	6	57.F	56.F	220.978	-0.553	6	23	51.F	47.F	-18.790	9619.	29.573
JUN	53.74252	29	16	89.F	75.F	119.513	0.000					0.000	12106.	25.929
JUL	60.69129	13	13	90.F	79.F	122.046	0.000					0.000	13068.	27.359
AUG	60.19955	23	15	95.F	77.F	120.866	0.000					0.000	13349.	27.210
SEP	40.77584	7	15	92.F	76.F	117.034	0.000					0.000	10737.	26.184
OCT	0.80793	1	18	83.F	68.F	97.565	-1.186	2	5	55.F	53.F	-40.612	7271.	22.998
NOV	0.00000					0.000	-3.472	3	5	13.F	12.F	-73.940	7020.	13.049
DEC	0.00000					0.000	-13.121	14	23	3.F	2.F	-108.979	7202.	13.149
TOTAL	242.953						-49.909						108452.	
MAX						220.978						-114.697		29.573

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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	382	0	362	744	0	744	0	0	362	-15.635	4.316
FEB	0	269	0	403	672	0	672	0	0	403	-11.140	4.316
MAR	0	261	0	483	744	0	744	0	0	483	-11.300	4.316
APR	0	230	0	490	720	0	720	0	0	490	-4.196	4.316
MAY	359	118	0	267	360	370	744	0	0	267	0.000	27.902
JUN	709	0	0	11	0	709	720	0	0	11	0.000	25.910
JUL	744	0	0	0	0	744	744	0	0	0	0.000	26.299
AUG	743	0	0	1	0	743	744	0	0	1	0.000	26.923
SEP	600	0	0	120	0	630	720	0	0	120	0.000	26.058
OCT	13	245	0	486	720	16	744	0	0	486	0.000	22.808
NOV	0	241	0	479	720	0	720	0	0	479	-28.609	4.316
DEC	0	344	0	400	744	0	744	0	0	400	-66.422	4.316
ANNUAL	3168	2090	0	3502	5424	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-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	137.829	214.154
JAN	PEAK(KBTU)	224.556	1618.936
	DY/HR	15/ 9	15/ 5
	TOTAL(MBTU)	123.736	164.058
FEB	PEAK(KBTU)	220.812	1463.770
	DY/HR	2/ 7	3/ 5
	TOTAL(MBTU)	136.810	136.740
MAR	PEAK(KBTU)	220.389	1188.464
	DY/HR	7/22	4/ 5
	TOTAL(MBTU)	129.578	56.399
APR	PEAK(KBTU)	220.269	729.944
	DY/HR	7/22	5/ 5
	TOTAL(MBTU)	139.108	16.503
MAY	PEAK(KBTU)	271.153	521.474
	DY/HR	16/15	1/ 5
	TOTAL(MBTU)	143.083	0.000
JUN	PEAK(KBTU)	258.709	0.000
	DY/HR	28/15	30/ 1
	TOTAL(MBTU)	149.066	0.000
JUL	PEAK(KBTU)	263.592	0.000
	DY/HR	23/16	31/ 1
	TOTAL(MBTU)	151.181	0.000
AUG	PEAK(KBTU)	263.083	0.000
	DY/HR	11/16	31/ 1
	TOTAL(MBTU)	138.025	0.000
SEP	PEAK(KBTU)	259.582	0.000
	DY/HR	6/16	30/ 1
	TOTAL(MBTU)	132.825	46.291
OCT	PEAK(KBTU)	248.703	810.760
	DY/HR	1/17	20/ 5
	TOTAL(MBTU)	131.289	111.831
NOV	PEAK(KBTU)	220.147	1137.251
	DY/HR	11/18	3/ 5
	TOTAL(MBTU)	136.989	189.542
DEC	PEAK(KBTU)	222.817	1407.030
	DY/HR	12/ 6	14/24
	ONE YEAR	1649.519	935.518
	USE/PEAK	271.153	1618.936

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

EMC ENGINEERS, INC.

DENVER - ATLANTA

PROJECT:	FEASIBILITY STUDY FOR	EMC NO:	1406-001
	INSTALLATION OF UMCS	CALC. BY:	AJN
LOCATION:	FORT RILEY, KANSAS	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	FT²
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	NIGHTIME INFILTRATION (OA)
RUN5	DAYTIME INFILTRATION (OA)

HOURS OF OCCUPANCY				
M-F	800	2200	70	HR
SAT.	800	2200	14	HR
SUN.	800	2200	14	HR
	TOTAL OCCUPY HR.		98	HR/WK
	TOTAL UNOCC. HR.		70	HR/WK
	ANNUAL OCCUPY HR.		5110	HR/YR
	ANNUAL UNOCC. HR.		3650	HR/YR

ANNUAL HEATING & COOLING HOURS	
HR. ON HEATING	3178 HR/YR
HR. ON COOLING	1932 HR/YR
HR. OFF HEATING	2270 HR/YR
HR. OFF COOLING	1380 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
```

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                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.) ..
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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
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                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  ..
```

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

                             LOAD-RANGE =     0.000
                             PLANT-EQUIPMENT = CHILL-RECP
                             NUMBER =     4   ..


END   ..
COMPUTE PLANT ..
STOP ..
```

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	GLASS U-VALUE (BTU/HR-SQFT-F)	GLASS AREA (SQFT)	WALL U-VALUE (BTU/HR-SQFT-F)	WALL AREA (SQFT)	WALL+GLASS U-VALUE (BTU/HR-SQFT-F)	WALL+GLASS 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

	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	0.490	0.104	0.127	48.00	783.60	831.60
EAST	0.000	0.104	0.104	0.00	712.80	712.80
SOUTH	0.000	0.104	0.104	0.00	2732.40	2732.40
WEST	0.490	0.087	0.135	231.80	1728.20	1960.00
ROOF	0.000	0.048	0.048	0.00	26435.00	26435.00
ALL WALLS	0.490	0.099	0.117	279.80	5957.00	6236.80
WALLS+ROOFS	0.490	0.058	0.061	279.80	32392.00	32671.80
UNDERGRND	0.000	0.020	0.020	0.00	26435.00	26435.00
BUILDING	0.490	0.041	0.043	279.80	58827.00	59106.80

*** BUILDING ***

FLOOR AREA	26443 SQFT	2457 SQMT
VOLUME	522240 CUFT	14790 CUMT

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

	SENSIBLE (KBTU/H)	SENSIBLE (KW)	LATENT (KBTU/H)	LATENT (KW)	SENSIBLE (KBTU/H)	SENSIBLE (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	-44.346 KW
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                                          *
*                                                                    *
**********************************************************************
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EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/17/1995 14:31:25 SDL RUN 1
DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #6914 MAIN FLOOR OF MAIN POST EXCHANGE
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR LARG-SZ TOPEKA, KS

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-574.911	15	6	-8.F	-9.F	-1670.903	48299.	81.700
FEB	0.00000					0.000	-433.854	3	6	-1.F	-2.F	-1485.713	43532.	81.700
MAR	0.00000					0.000	-348.525	4	6	14.F	12.F	-1169.887	48480.	81.600
APR	0.00000					0.000	-117.813	5	6	31.F	28.F	-798.241	46892.	81.600
MAY	107.99516	31	18	90.F	76.F	1123.134	-29.812	1	6	37.F	37.F	-620.304	58468.	198.001
JUN	336.14935	27	16	89.F	77.F	1180.233	0.000					0.000	79274.	201.884
JUL	469.78516	23	17	97.F	79.F	1405.650	0.000					0.000	93225.	229.525
AUG	461.75812	20	14	93.F	78.F	1268.039	0.000					0.000	94624.	217.550
SEP	206.15425	5	18	90.F	77.F	1166.314	0.000					0.000	66734.	204.881
OCT	2.80517	1	18	83.F	68.F	446.117	-105.446	20	6	24.F	23.F	-929.636	48397.	127.598
NOV	0.00000					0.000	-284.563	3	6	13.F	12.F	-1166.867	46522.	81.600
DEC	0.00000					0.000	-508.530	13	6	2.F	1.F	-1421.705	48295.	81.700
TOTAL	1584.647						-2403.450						722768.	
MAX						1405.650						-1670.903		229.525

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/17/1995 14:31:25 SDL RUN 1
DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. #6914 MAIN FLOOR OF MAIN POST EXCHANGE
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR LARG-SZ TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	-579.138	81.600
FEB	0	672	0	0	672	0	672	0	0	0	-597.308	81.600
MAR	0	722	0	22	744	0	744	0	0	22	-577.443	81.600
APR	0	543	0	177	720	0	720	0	0	177	-338.336	19.830
MAY	294	226	0	224	360	298	744	0	0	224	0.000	198.001
JUN	637	0	0	83	0	641	720	0	0	83	0.000	201.884
JUL	729	0	0	15	0	729	744	0	0	15	0.000	228.583
AUG	712	0	0	32	0	714	744	0	0	32	0.000	214.036
SEP	485	0	0	235	0	489	720	0	0	235	0.000	201.690
OCT	11	539	0	194	720	11	744	0	0	194	0.000	127.426
NOV	0	657	0	63	720	0	720	0	0	63	-708.968	81.600
DEC	0	744	0	0	744	0	744	0	0	0	-675.307	81.600
ANNUAL	2868	4847	0	1045	5424	2882	8760	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-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	198.177	817.247
JAN	PEAK(KBTU)	324.894	2099.407
	DY/HR	28/ 9	15/ 6
	TOTAL(MBTU)	178.249	638.710
FEB	PEAK(KBTU)	324.894	1903.385
	DY/HR	3/ 8	3/ 6
	TOTAL(MBTU)	193.403	528.133
MAR	PEAK(KBTU)	324.553	1559.740
	DY/HR	31/24	4/ 6
	TOTAL(MBTU)	174.092	191.555
APR	PEAK(KBTU)	324.553	1140.267
	DY/HR	16/ 8	5/ 6
	TOTAL(MBTU)	204.294	51.048
MAY	PEAK(KBTU)	676.058	933.656
	DY/HR	31/18	1/ 6
	TOTAL(MBTU)	270.677	0.000
JUN	PEAK(KBTU)	689.318	0.000
	DY/HR	27/16	30/ 1
	TOTAL(MBTU)	318.310	0.000
JUL	PEAK(KBTU)	783.697	0.000
	DY/HR	23/16	31/ 1
	TOTAL(MBTU)	323.086	0.000
AUG	PEAK(KBTU)	742.807	0.000
	DY/HR	22/16	31/ 1
	TOTAL(MBTU)	227.861	0.000
SEP	PEAK(KBTU)	699.551	0.000
	DY/HR	7/16	30/ 1
	TOTAL(MBTU)	178.994	175.872
OCT	PEAK(KBTU)	435.673	1290.436
	DY/HR	1/17	20/ 6
	TOTAL(MBTU)	182.973	436.058
NOV	PEAK(KBTU)	324.553	1556.397
	DY/HR	30/24	3/ 6
	TOTAL(MBTU)	197.537	738.649
DEC	PEAK(KBTU)	324.894	1834.691
	DY/HR	13/ 8	13/ 6
	ONE YEAR	2647.650	3577.272
	USE/PEAK	783.697	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 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 $
                $----------------------------------------$

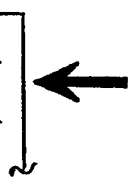
                   $ GENERAL PROJECT DATA

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

       LINE-4 *RUN #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.) ..
```



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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  ..


              $-------------------------------------$
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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

	COOLING						HEATING						ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-432.168	15	6	-8.F	-9.F	-1718.277	45730.	81.700
FEB	0.00000					0.000	-318.678	3	6	-1.F	-2.F	-1523.296	41211.	81.700
MAR	0.00000					0.000	-242.211	4	6	14.F	12.F	-1200.550	45910.	81.600
APR	0.00000					0.000	-64.192	5	6	31.F	28.F	-813.505	44406.	81.600
MAY	113.39243	31	18	90.F	76.F	1132.448	-12.768	1	6	37.F	37.F	-583.626	56324.	198.900
JUN	327.96432	27	16	89.F	77.F	1195.402	0.000					0.000	75879.	203.269
JUL	443.70926	23	16	98.F	79.F	1423.705	0.000					0.000	88026.	230.839
AUG	436.21201	20	14	93.F	78.F	1290.841	0.000					0.000	89457.	218.957
SEP	206.92751	5	18	90.F	77.F	1177.824	0.000					0.000	64210.	206.599
OCT	4.06273	1	18	83.F	68.F	528.518	-57.141	20	6	24.F	23.F	-941.457	45947.	135.608
NOV	0.00000					0.000	-193.521	3	6	13.F	12.F	-1193.552	44035.	81.600
DEC	0.00000					0.000	-379.402	13	6	2.F	1.F	-1459.493	45725.	81.700
TOTAL	1532.268						-1700.083						686890.	
MAX						1423.705						-1718.277		230.839

H17-20

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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	589	0	155	744	0	589	0	0	0	-583.235	81.600
FEB	0	532	0	140	672	0	532	0	0	0	-601.952	81.600
MAR	0	567	0	177	744	0	589	0	0	22	-581.086	81.600
APR	0	392	0	328	720	0	570	0	0	178	0.000	3.251
MAY	277	150	0	317	360	361	589	0	0	162	0.000	198.900
JUN	549	0	0	171	0	705	570	0	0	21	0.000	203.269
JUL	585	0	0	159	0	743	589	0	0	4	0.000	230.839
AUG	582	0	0	162	0	739	589	0	0	7	0.000	215.904
SEP	449	0	0	271	0	600	570	0	0	121	0.000	202.764
OCT	13	385	0	346	720	18	589	0	0	191	0.000	134.472
NOV	0	506	0	214	720	0	570	0	0	64	-711.071	81.600
DEC	0	589	0	155	744	0	589	0	0	0	-679.472	81.600
ANNUAL	2455	3710	0	2595	5424	3166	6935	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-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	183.049	623.390
JAN	PEAK(KBTU)	326.197	2158.930
	DY/HR	28/ 9	15/ 6
	TOTAL(MBTU)	164.572	478.678
FEB	PEAK(KBTU)	326.197	1952.494
	DY/HR	3/ 8	3/ 6
	TOTAL(MBTU)	178.207	375.152
MAR	PEAK(KBTU)	325.855	1601.188
	DY/HR	31/24	4/ 6
	TOTAL(MBTU)	160.649	107.777
APR	PEAK(KBTU)	325.855	1164.116
	DY/HR	16/ 8	5/ 6
	TOTAL(MBTU)	194.889	22.781
MAY	PEAK(KBTU)	679.131	896.378
	DY/HR	31/18	1/ 6
	TOTAL(MBTU)	259.083	0.000
JUN	PEAK(KBTU)	694.047	0.000
	DY/HR	27/16	30/ 1
	TOTAL(MBTU)	300.558	0.000
JUL	PEAK(KBTU)	788.183	0.000
	DY/HR	23/16	31/ 1
	TOTAL(MBTU)	305.445	0.000
AUG	PEAK(KBTU)	747.611	0.000
	DY/HR	22/16	31/ 1
	TOTAL(MBTU)	219.241	0.000
SEP	PEAK(KBTU)	705.417	0.000
	DY/HR	7/16	30/ 1
	TOTAL(MBTU)	165.486	97.511
OCT	PEAK(KBTU)	463.022	1310.511
	DY/HR	1/17	20/ 6
	TOTAL(MBTU)	168.567	303.453
NOV	PEAK(KBTU)	325.855	1593.438
	DY/HR	30/24	3/ 6
	TOTAL(MBTU)	182.382	559.734
DEC	PEAK(KBTU)	326.197	1883.994
	DY/HR	13/ 8	13/ 6
	ONE YEAR	2482.129	2568.475
	USE/PEAK	788.183	2158.930

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
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.

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                    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.) ..
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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  ..
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                    $ 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
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EMC ENGINEERS INC. EZDOE - 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

	COOLING						HEATING						ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-516.178	15	6	-8.F	-9.F	-1590.946	48299.	81.700
FEB	0.00000					0.000	-380.972	3	6	-1.F	-2.F	-1406.446	43532.	81.700
MAR	0.00000					0.000	-291.787	4	6	14.F	12.F	-1090.250	48480.	81.600
APR	0.00000					0.000	-82.176	5	6	31.F	28.F	-718.287	46892.	81.600
MAY	75.60682	31	18	90.F	76.F	1013.530	-16.567	1	6	37.F	37.F	-498.938	55574.	186.583
JUN	262.43298	27	17	89.F	77.F	1064.041	0.000					0.000	72445.	190.256
JUL	381.40594	23	17	97.F	79.F	1263.140	0.000					0.000	85096.	218.261
AUG	382.51929	22	16	96.F	77.F	1156.679	0.000					0.000	87094.	207.903
SEP	150.90594	7	16	93.F	76.F	1050.148	0.000					0.000	61620.	194.032
OCT	0.80208	1	18	83.F	68.F	232.966	-67.478	20	6	24.F	23.F	-850.363	48198.	107.246
NOV	0.00000					0.000	-234.187	3	6	13.F	12.F	-1088.312	46522.	81.600
DEC	0.00000					0.000	-449.568	13	6	2.F	1.F	-1342.147	48295.	81.700
TOTAL	1253.672						-2038.914						692072.	
MAX						1263.140						-1590.946		218.261

EMC ENGINEERS INC. EZDOE - 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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	-500.087	81.600
FEB	0	667	0	5	672	0	672	0	0	5	-518.481	81.600
MAR	0	703	0	41	744	0	744	0	0	41	-498.621	81.600
APR	0	495	0	225	720	0	720	0	0	225	-182.022	19.830
MAY	230	205	0	309	360	231	744	0	0	309	0.000	186.583
JUN	566	0	0	154	0	574	720	0	0	154	0.000	190.256
JUL	675	0	0	69	0	680	744	0	0	69	0.000	217.541
AUG	674	0	0	70	0	677	744	0	0	70	0.000	207.903
SEP	396	0	0	324	0	401	720	0	0	324	0.000	194.032
OCT	5	495	0	244	720	5	744	0	0	244	0.000	107.246
NOV	0	631	0	89	720	0	720	0	0	89	-629.462	81.600
DEC	0	742	0	2	744	0	744	0	0	2	-596.673	81.600
ANNUAL	2546	4682	0	1532	5424	2568	8760	0	0	1532		

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-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	195.922	738.405
JAN	PEAK(KBTU)	322.696	1998.945
	DY/HR	28/ 9	15/ 6
	TOTAL(MBTU)	176.055	566.719
FEB	PEAK(KBTU)	322.696	1803.560
	DY/HR	3/ 8	3/ 6
	TOTAL(MBTU)	189.934	445.429
MAR	PEAK(KBTU)	322.355	1458.888
	DY/HR	31/24	4/ 6
	TOTAL(MBTU)	170.843	135.342
APR	PEAK(KBTU)	322.355	1037.549
	DY/HR	16/ 7	5/ 6
	TOTAL(MBTU)	193.074	29.626
MAY	PEAK(KBTU)	637.073	781.036
	DY/HR	31/18	1/ 6
	TOTAL(MBTU)	247.360	0.000
JUN	PEAK(KBTU)	649.614	0.000
	DY/HR	27/17	30/ 1
	TOTAL(MBTU)	290.553	0.000
JUL	PEAK(KBTU)	745.237	0.000
	DY/HR	23/16	31/ 1
	TOTAL(MBTU)	297.375	0.000
AUG	PEAK(KBTU)	709.868	0.000
	DY/HR	22/16	31/ 1
	TOTAL(MBTU)	210.399	0.000
SEP	PEAK(KBTU)	662.509	0.000
	DY/HR	7/16	30/ 1
	TOTAL(MBTU)	174.705	114.876
OCT	PEAK(KBTU)	366.183	1189.122
	DY/HR	1/18	20/ 6
	TOTAL(MBTU)	179.679	361.790
NOV	PEAK(KBTU)	322.355	1456.738
	DY/HR	30/24	3/ 6
	TOTAL(MBTU)	195.040	658.156
DEC	PEAK(KBTU)	322.696	1734.475
	DY/HR	13/ 8	13/ 6
	ONE YEAR	2520.938	3050.342
	USE/PEAK	745.237	1998.945

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
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.

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                    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 $
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EMC ENGINEERS INC. EZDOE - 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

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-239.442	15	6	-8.F	-9.F	-1134.249	45730.	81.700
FEB	0.00000					0.000	-169.550	3	6	-1.F	-2.F	-1003.084	41211.	81.700
MAR	0.00000					0.000	-117.901	4	6	14.F	12.F	-790.575	45910.	81.600
APR	0.00000					0.000	-26.270	5	6	31.F	28.F	-526.755	44406.	81.600
MAY	92.24457	31	18	90.F	76.F	861.151	-4.455	1	7	38.F	36.F	-371.268	54464.	172.684
JUN	265.85046	27	16	89.F	77.F	895.840	0.000					0.000	70177.	175.220
JUL	358.83597	23	16	98.F	79.F	1037.712	0.000					0.000	80358.	200.200
AUG	350.76666	20	14	93.F	78.F	950.488	0.000					0.000	81321.	188.964
SEP	170.33578	7	16	93.F	76.F	882.136	0.000					0.000	60878.	178.368
OCT	4.24344	1	17	85.F	68.F	512.682	-22.109	20	6	24.F	23.F	-603.647	45965.	134.379
NOV	0.00000					0.000	-93.388	3	6	13.F	12.F	-780.966	44035.	81.600
DEC	0.00000					0.000	-204.026	13	6	2.F	1.F	-958.799	45725.	81.700
TOTAL	1242.276						-877.143						660210.	
MAX						1037.712						-1134.249		200.200

EMC ENGINEERS INC. EZDOE - 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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	586	0	158	744	0	589	0	0	3	-296.778	81.600
FEB	0	524	0	148	672	0	532	0	0	8	-309.860	81.600
MAR	0	489	0	255	744	0	589	0	0	100	-295.299	81.600
APR	0	180	0	540	720	0	570	0	0	390	0.000	3.251
MAY	234	46	0	464	360	376	589	0	0	309	0.000	172.684
JUN	518	0	0	202	0	713	570	0	0	52	0.000	175.220
JUL	576	0	0	168	0	744	589	0	0	13	0.000	200.200
AUG	573	0	0	171	0	743	589	0	0	16	0.000	185.189
SEP	399	0	0	321	0	664	570	0	0	171	0.000	178.368
OCT	14	162	0	568	720	19	589	0	0	413	0.000	134.379
NOV	0	404	0	316	720	0	570	0	0	166	-378.488	81.600
DEC	0	583	0	161	744	0	589	0	0	6	-363.913	81.600
ANNUAL	2314	2974	0	3472	5424	3259	6935	0	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-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	172.831	352.806
JAN	PEAK(KBTU)	310.141	1425.128
	DY/HR	28/ 9	15/ 6
	TOTAL(MBTU)	155.241	261.898
FEB	PEAK(KBTU)	310.141	1286.228
	DY/HR	3/ 8	3/ 6
	TOTAL(MBTU)	168.123	185.687
MAR	PEAK(KBTU)	309.800	1054.834
	DY/HR	31/24	4/ 6
	TOTAL(MBTU)	154.904	43.533
APR	PEAK(KBTU)	309.800	756.635
	DY/HR	16/ 7	5/ 6
	TOTAL(MBTU)	186.638	7.599
MAY	PEAK(KBTU)	589.618	575.212
	DY/HR	31/18	1/ 7
	TOTAL(MBTU)	239.615	0.000
JUN	PEAK(KBTU)	598.275	0.000
	DY/HR	27/16	30/ 1
	TOTAL(MBTU)	274.376	0.000
JUL	PEAK(KBTU)	683.570	0.000
	DY/HR	23/16	31/ 1
	TOTAL(MBTU)	277.666	0.000
AUG	PEAK(KBTU)	645.202	0.000
	DY/HR	22/16	31/ 1
	TOTAL(MBTU)	207.863	0.000
SEP	PEAK(KBTU)	609.025	0.000
	DY/HR	7/16	30/ 1
	TOTAL(MBTU)	159.863	37.174
OCT	PEAK(KBTU)	458.827	844.798
	DY/HR	1/17	20/ 6
	TOTAL(MBTU)	159.844	149.219
NOV	PEAK(KBTU)	309.800	1044.186
	DY/HR	30/24	3/ 6
	TOTAL(MBTU)	172.007	307.894
DEC	PEAK(KBTU)	310.141	1238.656
	DY/HR	13/ 8	13/ 6
	ONE YEAR	2328.971	1345.809
	USE/PEAK	683.570	1425.128

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.

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                    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 $
                $-------------------------------------$

                   $ 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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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

	COOLING						HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-1662.039	48299.	81.700
FEB	0.00000					0.000	-312.716	3	6	-1.F	-2.F	-1475.482	43532.	81.700
MAR	0.00000					0.000	-235.482	4	6	14.F	12.F	-1159.350	48480.	81.600
APR	0.00000					0.000	-60.082	5	6	31.F	28.F	-787.696	46892.	81.600
MAY	118.13782	31	18	90.F	76.F	1122.082	-11.403	1	6	37.F	37.F	-552.879	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	-917.909	48542.	137.128
NOV	0.00000					0.000	-187.634	3	6	13.F	12.F	-1155.383	46522.	81.600
DEC	0.00000					0.000	-372.827	13	6	2.F	1.F	-1411.192	48295.	81.700
TOTAL	1561.176						-1659.372						720163.	
MAX						1404.293						-1662.039		229.416

H17-38

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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	-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	197.898
JUN	694	0	0	26	0	696	720	0	0	26	0.000	201.855
JUL	737	0	0	7	0	738	744	0	0	7	0.000	228.499
AUG	733	0	0	11	0	735	744	0	0	11	0.000	213.897
SEP	575	0	0	145	0	579	720	0	0	145	0.000	201.752
OCT	14	400	0	330	720	14	744	0	0	330	0.000	137.128
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-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	193.087	617.723
JAN	PEAK(KBTU)	324.651	2088.270
	DY/HR	28/ 9	15/ 6
	TOTAL(MBTU)	173.424	472.210
FEB	PEAK(KBTU)	324.651	1890.775
	DY/HR	3/ 8	3/ 6
	TOTAL(MBTU)	187.475	366.388
MAR	PEAK(KBTU)	324.309	1546.672
	DY/HR	31/24	4/ 6
	TOTAL(MBTU)	169.089	101.626
APR	PEAK(KBTU)	324.309	1126.956
	DY/HR	16/ 8	5/ 6
	TOTAL(MBTU)	205.016	20.712
MAY	PEAK(KBTU)	675.710	853.315
	DY/HR	31/18	1/ 6
	TOTAL(MBTU)	269.783	0.000
JUN	PEAK(KBTU)	689.220	0.000
	DY/HR	27/16	30/ 1
	TOTAL(MBTU)	311.445	0.000
JUL	PEAK(KBTU)	783.325	0.000
	DY/HR	23/16	31/ 1
	TOTAL(MBTU)	316.702	0.000
AUG	PEAK(KBTU)	742.152	0.000
	DY/HR	22/16	31/ 1
	TOTAL(MBTU)	229.788	0.000
SEP	PEAK(KBTU)	699.097	0.000
	DY/HR	7/16	30/ 1
	TOTAL(MBTU)	174.055	91.443
OCT	PEAK(KBTU)	468.213	1275.874
	DY/HR	1/17	20/ 6
	TOTAL(MBTU)	177.313	295.269
NOV	PEAK(KBTU)	324.309	1542.278
	DY/HR	30/24	3/ 6
	TOTAL(MBTU)	192.164	552.639
DEC	PEAK(KBTU)	324.651	1821.758
	DY/HR	13/ 8	13/ 6
	ONE YEAR	2599.342	2518.011
	USE/PEAK	783.325	2088.270

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
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.

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                    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.) ..
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```
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      *
```

	COOLING						HEATING						ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELECTRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000					0.000	-87.542	15	5	-8.F	-9.F	-1370.868	48299.	81.700
FEB	0.00000					0.000	-60.402	3	5	-1.F	-2.F	-1168.006	43532.	81.700
MAR	0.00000					0.000	-38.419	4	5	14.F	12.F	-822.719	48480.	81.600
APR	0.00000					0.000	-6.920	5	5	31.F	29.F	-291.202	46892.	81.600
MAY	98.38956	16	2	62.F	59.F	866.233	-2.255	4	1	48.F	46.F	-118.532	57595.	153.561
JUN	194.03796	20	2	77.F	73.F	451.634	0.000					0.000	66665.	125.568
JUL	227.30663	13	2	80.F	74.F	584.505	0.000					0.000	71693.	130.552
AUG	229.09183	21	2	82.F	74.F	624.465	0.000					0.000	72884.	132.823
SEP	163.05345	6	2	79.F	72.F	475.836	0.000					0.000	62683.	126.440
OCT	4.00641	1	21	67.F	62.F	306.152	-6.084	2	5	55.F	53.F	-392.574	48512.	115.118
NOV	0.00000					0.000	-25.569	3	5	13.F	12.F	-747.002	46522.	81.600
DEC	0.00000					0.000	-68.034	13	5	5.F	4.F	-1080.630	48295.	81.700
TOTAL	915.886						-295.226						662078.	
MAX						866.233						-1370.868		153.561

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	165	0	579	744	0	744	0	0	579	0.000	81.600
FEB	0	150	0	522	672	0	672	0	0	522	0.000	81.600
MAR	0	163	0	581	744	0	744	0	0	581	0.000	81.600
APR	0	158	0	562	720	0	720	0	0	562	-119.667	19.830
MAY	319	81	0	344	360	324	744	0	0	344	0.000	87.425
JUN	664	0	0	56	0	667	720	0	0	56	0.000	63.469
JUL	731	0	0	13	0	733	744	0	0	13	0.000	75.129
AUG	720	0	0	24	0	721	744	0	0	24	0.000	79.853
SEP	601	0	0	119	0	605	720	0	0	119	0.000	66.063
OCT	17	164	0	563	720	18	744	0	0	563	0.000	109.824
NOV	0	162	0	558	720	0	720	0	0	558	0.000	81.600
DEC	0	165	0	579	744	0	744	0	0	579	0.000	81.600
ANNUAL	3052	1208	0	4500	5424	3068	8760	0	0	4500		

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- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	170.317	125.243
JAN	PEAK(KBTU)	278.960	1722.428
	DY/HR	28/ 9	15/ 5
	TOTAL(MBTU)	153.434	91.369
FEB	PEAK(KBTU)	278.960	1506.957
	DY/HR	3/ 8	3/ 5
	TOTAL(MBTU)	169.350	60.163
MAR	PEAK(KBTU)	278.619	1126.582
	DY/HR	31/24	4/ 5
	TOTAL(MBTU)	161.983	13.135
APR	PEAK(KBTU)	278.619	487.425
	DY/HR	30/24	5/ 5
	TOTAL(MBTU)	197.500	4.622
MAY	PEAK(KBTU)	524.321	205.259
	DY/HR	16/11	4/ 1
	TOTAL(MBTU)	227.622	0.000
JUN	PEAK(KBTU)	428.741	0.000
	DY/HR	28/17	30/ 1
	TOTAL(MBTU)	244.790	0.000
JUL	PEAK(KBTU)	445.760	0.000
	DY/HR	23/16	31/ 1
	TOTAL(MBTU)	248.858	0.000
AUG	PEAK(KBTU)	453.513	0.000
	DY/HR	11/16	31/ 1
	TOTAL(MBTU)	214.029	0.000
SEP	PEAK(KBTU)	431.721	0.000
	DY/HR	7/16	30/ 1
	TOTAL(MBTU)	167.477	11.791
OCT	PEAK(KBTU)	393.061	628.713
	DY/HR	1/18	2/ 5
	TOTAL(MBTU)	162.018	41.733
NOV	PEAK(KBTU)	278.619	1040.875
	DY/HR	30/24	3/ 5
	TOTAL(MBTU)	169.957	101.112
DEC	PEAK(KBTU)	278.960	1412.324
	DY/HR	13/ 8	13/ 5
	ONE YEAR	2287.335	449.168
	USE/PEAK	524.321	1722.428

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

EMC ENGINEERS, INC.

DENVER - ATLANTA

PROJECT:	FEASIBILITY STUDY FOR INSTALLATION OF UMCS	EMC NO:	1406-001
		CALC. BY:	AJN
LOCATION:	FORT RILEY, KANSAS	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	FT²
CFMI	1269	CFM
UA	790	BTU/HR-°F
BLDG CONSTR.	1	(1 FOR LIGHT) (2 FOR HEAVY)

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

HOURS OF OCCUPANCY				
M-F	600	1600	50	HR
SAT.	0	0	0	HR
SUN.	0	0	0	HR
	TOTAL OCCUPY HR.		50	HR/WK
	TOTAL UNOCC. HR.		118	HR/WK
	ANNUAL OCCUPY HR.		2607	HR/YR
	ANNUAL UNOCC. HR.		6153	HR/YR

ANNUAL HEATING & COOLING HOURS	
HR. ON HEATING	1621 HR/YR
HR. ON COOLING	986 HR/YR
HR. OFF HEATING	3827 HR/YR
HR. OFF COOLING	2326 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			
COAUC	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			
COAOC	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

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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 ..
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LW_OFF      =WEEK-SCHEDULE  (ALL) LD_OFF  ..


$ PEOPLE AND LIGHTING SCH
L_PEOP/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 ..
```

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	GLASS U-VALUE (BTU/HR-SQFT-F)	GLASS AREA (SQFT)	WALL U-VALUE (BTU/HR-SQFT-F)	WALL AREA (SQFT)	WALL+GLASS U-VALUE (BTU/HR-SQFT-F)	WALL+GLASS AREA (SQFT)	AZIMUTH
	ZONE_2	0.000	0.00	0.049	422.40	0.049	422.40	NORTH-EAST
	COMP_AREA	0.000	0.00	0.049	537.60	0.049	537.60	NORTH-EAST
	SIMUL_AREA	0.000	0.00	0.051	268.80	0.051	268.80	NORTH-EAST
	ZONE_2	0.000	0.00	0.051	72.00	0.051	72.00	SOUTH-EAST
	ZONE_2	0.000	0.00	0.049	1276.80	0.049	1276.80	SOUTH-EAST
	SIMUL_AREA	0.000	0.00	0.051	108.00	0.051	108.00	SOUTH-EAST
	ZONE_1	0.000	0.00	0.049	268.80	0.049	268.80	SOUTH-WEST
	ZONE_2	0.000	0.00	0.049	537.60	0.049	537.60	SOUTH-WEST
	ZONE_2	0.000	0.00	0.049	268.80	0.049	268.80	SOUTH-WEST
	SIMUL_AREA	0.000	0.00	0.051	268.80	0.051	268.80	SOUTH-WEST
	ZONE_1	0.000	0.00	0.049	537.60	0.049	537.60	SOUTH-WEST
	ZONE_1	0.000	0.00	0.049	691.20	0.049	691.20	NORTH-WEST
	ZONE_1	0.000	0.00	0.051	72.00	0.051	72.00	NORTH-WEST
	SIMUL_AREA	0.000	0.00	0.051	108.00	0.051	108.00	NORTH-WEST
	ZONE_1	0.000	0.00	0.029	2782.50	0.029	2782.50	ROOF
	ZONE_2	0.000	0.00	0.029	4489.00	0.029	4489.00	ROOF
	COMP_AREA	0.000	0.00	0.029	1360.00	0.029	1360.00	ROOF
	SIMUL_AREA	0.000	0.00	0.029	412.16	0.029	412.16	ROOF
	SIMUL_AREA	0.000	0.00	0.029	529.92	0.029	529.92	ROOF
	SIMUL_AREA	0.000	0.00	0.029	828.00	0.029	828.00	ROOF
	ZONE_2	0.000	0.00	0.020	4489.00	0.020	4489.00	UNDERGRND
	ZONE_1	0.000	0.00	0.020	2782.50	0.020	2782.50	UNDERGRND
	COMP_AREA	0.000	0.00	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
REPORT- LV-D DETAILS OF EXTERIOR SURFACES IN THE PROJECT TOPEKA, KS

SURFACE	SPACE	GLASS U-VALUE (BTU/HR-SQFT-F)	GLASS AREA (SQFT)	WALL U-VALUE (BTU/HR-SQFT-F)	WALL AREA (SQFT)	WALL+GLASS U-VALUE (BTU/HR-SQFT-F)	WALL+GLASS AREA (SQFT)	AZIMUTH
	SIMUL_AREA	0.000	0.00	0.020	1865.50	0.020	1865.50	UNDERGRND

	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

*** BUILDING ***

FLOOR AREA 10506 SQFT 976 SQMT
VOLUME 151403 CUFT 4288 CUMT

	COOLING LOAD				HEATING LOAD	
TIME	AUG 11 3PM				JAN 4 3AM	
DRY-BULB TEMP	99F 37C				8F -13C	
WET-BULB TEMP	72F 22C				7F -14C	
	SENSIBLE		LATENT		SENSIBLE	
	(KBTU/H)	(KW)	(KBTU/H)	(KW)	(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 KBTU/H		80.419 KW		-60.617 KBTU/H	-17.753 KW
TOTAL LOAD / AREA	26.14BTU/H.SQFT		82.393 W /SQMT		5.770BTU/H.SQFT	18.189 W /SQMT

```
**********************************************************************
*                                                                    *
*  NOTE  1)THE ABOVE LOADS EXCLUDE OUTSIDE VENTILATION AIR           *
*  ----    LOADS                                                     *
*        2)TIMES GIVEN IN STANDARD TIME FOR THE LOCATION             *
*          IN CONSIDERATION                                          *
*                                                                    *
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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
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR MZ-PERIM TOPEKA, KS

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-10.486	5	4	0.F	0.F	-73.482	12153.	38.157
FEB	0.00000					0.000	-6.510	2	4	10.F	9.F	-68.129	11024.	38.157
MAR	0.00000					0.000	-3.734	2	4	25.F	22.F	-47.732	12153.	38.157
APR	0.00000					0.000	-0.748	6	4	35.F	30.F	-13.487	12022.	38.157
MAY	26.57586	16	2	62.F	59.F	279.550	-0.355	4	17	55.F	53.F	-10.519	11785.	38.157
JUN	56.74051	19	15	87.F	76.F	171.237	0.000					0.000	12022.	38.157
JUL	68.07877	16	15	89.F	80.F	181.710	0.000					0.000	12521.	38.157
AUG	63.90371	20	14	93.F	78.F	175.740	0.000					0.000	11785.	38.157
SEP	47.47175	7	15	92.F	76.F	169.794	0.000					0.000	12022.	38.157
OCT	1.56012	1	15	82.F	67.F	134.987	-0.830	2	2	64.F	59.F	-47.779	12153.	38.157
NOV	0.00000					0.000	-1.012	30	4	32.F	28.F	-30.236	10918.	38.157
DEC	0.00000					0.000	-7.863	13	6	2.F	1.F	-67.203	12521.	38.157
TOTAL	264.331						-31.539						143067.	
MAX						279.550						-73.482		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
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR MZ-PERIM TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	-33.270	5.456
FEB	0	672	0	0	672	0	672	0	0	0	-14.947	5.456
MAR	0	744	0	0	744	0	744	0	0	0	-1.379	5.456
APR	0	720	0	0	720	0	720	0	0	0	-1.964	5.456
MAY	384	351	0	9	360	384	744	0	0	9	0.000	5.456
JUN	720	0	0	0	0	720	720	0	0	0	0.000	38.157
JUL	744	0	0	0	0	744	744	0	0	0	0.000	38.157
AUG	744	0	0	0	0	744	744	0	0	0	0.000	38.157
SEP	713	0	0	7	0	720	720	0	0	7	0.000	38.157
OCT	24	720	0	0	720	24	744	0	0	0	0.000	38.157
NOV	0	720	0	0	720	0	720	0	0	0	-4.873	5.456
DEC	0	744	0	0	744	0	744	0	0	0	-3.901	5.456
ANNUAL	3329	5415	0	16	5424	3336	8760	0	0	16		

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
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR SING-ZN TOPEKA, KS

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-17.659	15	4	-8.F	-9.F	-51.623	3022.	5.188
FEB	0.02510	26	15	60.F	45.F	4.806	-12.967	3	4	0.F	-1.F	-44.652	2730.	5.492
MAR	0.32480	27	15	70.F	51.F	11.790	-9.848	4	4	14.F	12.F	-34.398	3046.	6.216
APR	3.02967	27	15	77.F	68.F	26.337	-2.722	5	7	30.F	27.F	-22.477	3216.	7.819
MAY	9.19698	31	18	90.F	76.F	42.493	-0.491	1	4	39.F	37.F	-13.904	3921.	9.130
JUN	18.38746	30	14	88.F	76.F	49.668	-0.007	2	4	50.F	49.F	-2.859	4840.	10.595
JUL	23.92714	23	15	97.F	79.F	58.590	0.000					0.000	5552.	11.970
AUG	23.18727	20	14	93.F	78.F	54.451	0.000					0.000	5531.	11.354
SEP	12.64664	7	15	92.F	76.F	51.068	-0.281	12	7	42.F	42.F	-9.033	4227.	10.945
OCT	3.95623	1	15	82.F	67.F	32.327	-2.226	20	4	25.F	25.F	-24.590	3401.	8.675
NOV	0.87103	23	14	74.F	62.F	19.840	-7.740	3	4	13.F	12.F	-33.926	2959.	7.084
DEC	0.01942	28	15	58.F	47.F	3.226	-15.171	13	8	0.F	-1.F	-45.201	3036.	5.352
TOTAL	95.572						-69.113						45479.	
MAX						58.590						-51.623		11.970

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
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR SING-ZN TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	744	744	0	0	0	-20.997	3.540
FEB	11	661	0	0	672	672	672	0	0	0	0.000	5.492
MAR	78	666	0	0	744	744	744	0	0	0	0.000	6.216
APR	384	335	0	1	720	720	720	0	0	1	0.000	7.819
MAY	646	98	0	0	744	744	744	0	0	0	0.000	8.583
JUN	715	5	0	0	720	720	720	0	0	0	0.000	10.595
JUL	744	0	0	0	744	744	744	0	0	0	0.000	11.970
AUG	744	0	0	0	744	744	744	0	0	0	0.000	11.300
SEP	623	97	0	0	720	720	720	0	0	0	0.000	10.945
OCT	394	350	0	0	744	744	744	0	0	0	0.000	8.675
NOV	158	562	0	0	720	720	720	0	0	0	0.000	7.084
DEC	14	730	0	0	744	744	744	0	0	0	0.000	5.352
ANNUAL	4511	4248	0	1	8760	8760	8760	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
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR CRU'S TOPEKA, KS

	COOLING						HEATING						ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	246.669	0.000					0.000	35818.	59.700
FEB	90.95567	3	10	10.F	8.F	241.575	0.000					0.000	32679.	61.377
MAR	101.75665	3	7	14.F	12.F	235.055	0.000					0.000	36961.	64.123
APR	99.73093	28	15	74.F	67.F	240.717	0.000					0.000	37284.	66.665
MAY	104.52082	16	3	61.F	59.F	240.751	0.000					0.000	39554.	68.457
JUN	102.29000	16	11	66.F	63.F	223.435	0.000					0.000	39226.	66.515
JUL	106.57320	30	6	63.F	60.F	218.749	0.000					0.000	41040.	67.627
AUG	106.44633	4	15	92.F	69.F	232.520	0.000					0.000	41181.	71.045
SEP	101.72897	15	6	46.F	45.F	225.422	0.000					0.000	38578.	68.542
OCT	103.31563	14	13	71.F	64.F	239.604	0.000					0.000	38648.	67.038
NOV	98.70152	3	7	19.F	17.F	236.852	0.000					0.000	36072.	64.627
DEC	101.00494	14	7	10.F	8.F	240.516	0.000					0.000	36148.	61.436
TOTAL	1217.413						0.000						453192.	
MAX						246.669						0.000		71.045

H18-18

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
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR CRU'S TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 CYCLE ON	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	530	0	0	0.000	54.234
FEB	483	0	0	189	672	672	483	483	0	0	0.000	54.921
MAR	546	0	0	198	744	744	546	546	0	0	0.000	55.087
APR	538	0	0	182	720	720	538	538	0	0	0.000	66.665
MAY	564	0	0	180	744	744	564	564	0	0	0.000	62.090
JUN	564	0	0	156	720	720	564	564	0	0	0.000	63.713
JUL	595	0	0	149	744	744	595	595	0	0	0.000	62.725
AUG	590	0	0	154	744	744	590	590	0	0	0.000	70.934
SEP	555	0	0	165	720	720	555	555	0	0	0.000	59.750
OCT	554	0	0	190	744	744	554	554	0	0	0.000	66.094
NOV	529	0	0	191	720	720	529	529	0	0	0.000	55.769
DEC	537	0	0	207	744	744	537	537	0	0	0.000	54.877
ANNUAL	6585	0	0	2175	8760	8760	6585	6585	0	0		

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
REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	176.209	41.590
JAN	PEAK(KBTU)	352.446	148.941
	DY/HR	9/14	5/ 4
	TOTAL(MBTU)	160.306	30.052
FEB	PEAK(KBTU)	358.995	134.871
	DY/HR	26/13	2/ 4
	TOTAL(MBTU)	179.652	21.894
MAR	PEAK(KBTU)	366.507	104.288
	DY/HR	27/15	15/ 7
	TOTAL(MBTU)	180.173	6.327
APR	PEAK(KBTU)	384.267	52.834
	DY/HR	28/15	6/ 3
	TOTAL(MBTU)	197.891	1.707
MAY	PEAK(KBTU)	437.114	26.324
	DY/HR	21/15	1/ 4
	TOTAL(MBTU)	210.611	0.017
JUN	PEAK(KBTU)	450.773	5.591
	DY/HR	29/15	2/ 4
	TOTAL(MBTU)	224.768	0.000
JUL	PEAK(KBTU)	463.212	0.000
	DY/HR	23/13	31/ 1
	TOTAL(MBTU)	222.157	0.000
AUG	PEAK(KBTU)	467.104	0.000
	DY/HR	12/15	31/ 1
	TOTAL(MBTU)	203.571	0.549
SEP	PEAK(KBTU)	458.539	15.680
	DY/HR	7/15	12/ 7
	TOTAL(MBTU)	186.401	5.634
OCT	PEAK(KBTU)	426.032	78.847
	DY/HR	1/14	2/ 2
	TOTAL(MBTU)	171.832	14.856
NOV	PEAK(KBTU)	375.562	78.912
	DY/HR	23/13	12/ 4
	TOTAL(MBTU)	178.473	34.800
DEC	PEAK(KBTU)	359.070	140.795
	DY/HR	28/15	13/ 6
	ONE YEAR	2292.044	157.426
	USE/PEAK	467.104	148.941

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 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 $
             $---------------------------------------$

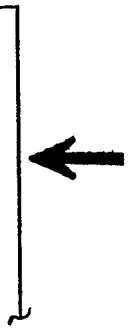
                $ GENERAL PROJECT DATA

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

       LINE-4 *RUN #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.
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                    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)  ..

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 $
                $-------------------------------------$
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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
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR MZ-PERIM TOPEKA, KS

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-6.760	5	7	4.F	3.F	-131.405	12054.	38.157
FEB	0.00000					0.000	-4.192	2	6	6.F	5.F	-123.479	10997.	38.157
MAR	0.00000					0.000	-2.327	16	5	21.F	19.F	-99.609	12153.	38.157
APR	0.00000					0.000	-0.710	6	5	36.F	31.F	-16.568	12022.	38.157
MAY	19.49583	16	2	62.F	59.F	267.713	-0.350	4	17	55.F	53.F	-10.357	11610.	38.157
JUN	41.99467	30	14	88.F	76.F	195.744	0.000					0.000	11754.	38.157
JUL	49.14065	13	13	90.F	79.F	208.795	0.000					0.000	12062.	38.157
AUG	44.24644	24	15	95.F	77.F	205.820	0.000					0.000	11016.	38.157
SEP	37.10414	7	15	92.F	76.F	201.064	0.000					0.000	11918.	38.157
OCT	1.26359	1	15	82.F	67.F	145.544	-0.688	28	17	61.F	56.F	-10.412	12153.	38.157
NOV	0.00000					0.000	-0.918	30	5	29.F	26.F	-44.486	10918.	38.157
DEC	0.00000					0.000	-4.868	14	7	10.F	8.F	-137.817	12401.	38.157
TOTAL	193.245						-20.812						141049.	
MAX						267.713						-137.817		38.157

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
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR MZ-PERIM TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	633	0	111	744	0	726	462	0	93	-1.320	5.456
FEB	0	564	0	108	672	0	667	427	0	103	-0.948	5.456
MAR	0	544	0	200	744	0	744	480	0	200	-1.300	5.456
APR	0	445	0	275	720	0	720	456	0	275	-2.005	5.456
MAY	156	221	0	367	360	384	712	460	0	335	0.000	5.456
JUN	385	0	0	335	0	720	671	407	0	286	0.000	38.157
JUL	500	0	0	244	0	744	660	384	0	160	0.000	38.157
AUG	442	0	0	302	0	744	603	351	0	161	0.000	38.157
SEP	322	0	0	398	0	720	701	437	0	379	0.000	38.157
OCT	13	438	0	293	720	24	744	480	0	293	0.000	38.157
NOV	0	499	0	221	720	0	720	492	0	221	-0.934	5.456
DEC	0	614	0	130	744	0	722	446	0	108	-0.855	5.456
ANNUAL	1818	3958	0	2984	5424	3336	8390	5282	0	2614		

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
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR SING-ZN TOPEKA, KS

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC-TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	6.53292	9	17	46.F	37.F	63.842	-3.660	5	5	1.F	0.F	-55.944	2328.	7.631
FEB	5.98487	13	17	54.F	46.F	65.146	-3.161	2	5	8.F	6.F	-55.500	2096.	8.142
MAR	6.92058	27	17	69.F	50.F	67.008	-3.139	16	5	21.F	19.F	-54.677	2372.	9.241
APR	8.49306	30	17	67.F	56.F	68.796	-2.390	6	5	36.F	31.F	-48.902	2726.	9.766
MAY	8.76491	15	17	79.F	69.F	70.820	-2.237	16	2	62.F	59.F	-43.120	2855.	10.672
JUN	9.36635	29	5	71.F	70.F	51.344	-1.828	10	17	62.F	60.F	-23.738	2871.	9.740
JUL	10.18854	13	5	78.F	74.F	52.045	-1.705	31	17	79.F	66.F	-20.818	3077.	10.145
AUG	9.33982	24	5	79.F	72.F	52.649	-1.537	25	17	68.F	66.F	-21.820	2841.	10.171
SEP	8.91153	7	5	75.F	71.F	51.880	-1.993	30	17	50.F	46.F	-25.700	2808.	9.899
OCT	9.74011	2	2	64.F	59.F	84.227	-2.141	19	5	46.F	45.F	-42.768	2937.	10.305
NOV	7.04817	17	17	60.F	51.F	67.123	-2.746	2	5	16.F	15.F	-50.359	2301.	9.100
DEC	6.81716	3	17	52.F	44.F	64.985	-3.452	14	5	11.F	10.F	-55.291	2400.	8.104
TOTAL	98.108						-29.989						31612.	
MAX						84.227						-55.944		10.672

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
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR SING-ZN TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 CYCLE ON	HOURS NIGHT VENTING	HOURS FLOATING WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)
JAN	213	234	0	297	744	744	447	183	0	0	0.000	7.631
FEB	197	198	0	277	672	672	395	155	0	0	0.000	8.142
MAR	230	203	0	311	744	744	433	169	0	0	0.000	9.241
APR	296	173	0	251	720	720	469	205	0	0	0.000	9.236
MAY	315	165	0	264	744	744	480	228	0	0	0.000	10.345
JUN	298	144	0	278	720	720	442	178	0	0	0.000	9.061
JUL	303	151	0	290	744	744	454	178	0	0	0.000	9.472
AUG	279	140	0	325	744	744	419	167	0	0	0.000	9.570
SEP	304	149	0	267	720	720	453	189	0	0	0.000	9.302
OCT	339	157	0	248	744	744	496	232	0	0	0.000	10.224
NOV	246	174	0	300	720	720	420	192	0	0	0.000	8.638
DEC	226	227	0	291	744	744	453	177	0	0	0.000	8.018
ANNUAL	3246	2115	0	3399	8760	8760	5361	2253	0	0		

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
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR CRU'S TOPEKA, KS

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	246.669	0.000					0.000	35818.	59.700
FEB	90.95567	3	10	10.F	8.F	241.575	0.000					0.000	32679.	61.377
MAR	101.75665	3	7	14.F	12.F	235.055	0.000					0.000	36961.	64.123
APR	99.73093	28	15	74.F	67.F	240.717	0.000					0.000	37284.	66.665
MAY	104.52082	16	3	61.F	59.F	240.751	0.000					0.000	39554.	68.457
JUN	102.29000	16	11	66.F	63.F	223.435	0.000					0.000	39226.	66.515
JUL	106.57320	30	6	63.F	60.F	218.749	0.000					0.000	41040.	67.627
AUG	106.44633	4	15	92.F	69.F	232.520	0.000					0.000	41181.	71.045
SEP	101.72897	15	6	46.F	45.F	225.422	0.000					0.000	38578.	68.542
OCT	103.31563	14	13	71.F	64.F	239.604	0.000					0.000	38648.	67.038
NOV	98.70152	3	7	19.F	17.F	236.852	0.000					0.000	36072.	64.627
DEC	101.00494	14	7	10.F	8.F	240.516	0.000					0.000	36148.	61.436
TOTAL	1217.413						0.000						453192.	
MAX						246.669						0.000		71.045

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
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR CRU'S TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 CYCLE ON	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	530	0	0	0.000	54.234
FEB	483	0	0	189	672	672	483	483	0	0	0.000	54.921
MAR	546	0	0	198	744	744	546	546	0	0	0.000	55.087
APR	538	0	0	182	720	720	538	538	0	0	0.000	66.665
MAY	564	0	0	180	744	744	564	564	0	0	0.000	62.090
JUN	564	0	0	156	720	720	564	564	0	0	0.000	63.713
JUL	595	0	0	149	744	744	595	595	0	0	0.000	62.725
AUG	590	0	0	154	744	744	590	590	0	0	0.000	70.934
SEP	555	0	0	165	720	720	555	555	0	0	0.000	59.750
OCT	554	0	0	190	744	744	554	554	0	0	0.000	66.094
NOV	529	0	0	191	720	720	529	529	0	0	0.000	55.769
DEC	537	0	0	207	744	744	537	537	0	0	0.000	54.877
ANNUAL	6585	0	0	2175	8760	8760	6585	6585	0	0		

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	172.799	16.331
JAN	PEAK(KBTU)	353.880	224.978
	DY/HR	12/12	5/ 6
	TOTAL(MBTU)	157.451	11.867
FEB	PEAK(KBTU)	357.718	218.364
	DY/HR	26/13	2/ 6
	TOTAL(MBTU)	176.938	9.413
MAR	PEAK(KBTU)	364.269	198.903
	DY/HR	27/15	16/ 5
	TOTAL(MBTU)	178.624	5.915
APR	PEAK(KBTU)	378.168	98.987
	DY/HR	28/15	6/ 5
	TOTAL(MBTU)	190.782	4.767
MAY	PEAK(KBTU)	443.986	71.865
	DY/HR	21/15	16/ 2
	TOTAL(MBTU)	196.984	3.188
JUN	PEAK(KBTU)	451.562	40.192
	DY/HR	29/15	10/17
	TOTAL(MBTU)	207.943	2.998
JUL	PEAK(KBTU)	469.365	35.420
	DY/HR	23/13	31/17
	TOTAL(MBTU)	202.809	2.708
AUG	PEAK(KBTU)	469.409	37.057
	DY/HR	21/15	25/17
	TOTAL(MBTU)	193.437	3.465
SEP	PEAK(KBTU)	465.583	43.398
	DY/HR	7/15	30/17
	TOTAL(MBTU)	184.807	5.457
OCT	PEAK(KBTU)	432.838	71.290
	DY/HR	1/14	19/ 5
	TOTAL(MBTU)	169.334	6.821
NOV	PEAK(KBTU)	369.628	132.031
	DY/HR	23/13	30/ 5
	TOTAL(MBTU)	175.264	13.444
DEC	PEAK(KBTU)	358.732	226.998
	DY/HR	28/15	14/ 7
	ONE YEAR	2207.171	86.375
	USE/PEAK	469.409	226.998

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
```

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-7.197	5	4	0.F	0.F	-68.035	12153.	38.157
FEB	0.00000					0.000	-4.329	2	4	10.F	9.F	-62.521	11024.	38.157
MAR	0.00000					0.000	-1.741	2	4	25.F	22.F	-38.033	12153.	38.157
APR	0.00000					0.000	-0.685	3	17	49.F	45.F	-10.455	12022.	38.157
MAY	23.09587	16	2	62.F	59.F	279.550	-0.350	4	17	55.F	53.F	-10.500	11785.	38.157
JUN	50.49344	19	15	87.F	76.F	174.734	0.000					0.000	12022.	38.157
JUL	60.92594	23	15	97.F	79.F	187.078	0.000					0.000	12521.	38.157
AUG	57.17864	21	15	94.F	77.F	180.994	0.000					0.000	11785.	38.157
SEP	41.65851	7	15	92.F	76.F	174.668	0.000					0.000	12022.	38.157
OCT	1.41983	1	15	82.F	67.F	135.397	-0.684	28	17	61.F	56.F	-10.478	12153.	38.157
NOV	0.00000					0.000	-0.712	20	17	51.F	46.F	-10.524	10918.	38.157
DEC	0.00000					0.000	-5.292	13	6	2.F	1.F	-61.138	12521.	38.157
TOTAL	234.772						-20.989						143067.	
MAX						279.550						-68.035		38.157

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	587	0	157	744	0	744	0	0	157	-22.330	5.456
FEB	0	477	0	195	672	0	672	0	0	195	-0.982	5.456
MAR	0	493	0	251	744	0	744	0	0	251	-1.282	5.456
APR	0	443	0	277	720	0	720	0	0	277	-1.949	5.456
MAY	376	223	0	145	360	384	744	0	0	145	0.000	5.456
JUN	720	0	0	0	0	720	720	0	0	0	0.000	38.157
JUL	744	0	0	0	0	744	744	0	0	0	0.000	38.157
AUG	744	0	0	0	0	744	744	0	0	0	0.000	38.157
SEP	691	0	0	29	0	720	720	0	0	29	0.000	38.157
OCT	21	438	0	285	720	24	744	0	0	285	0.000	38.157
NOV	0	471	0	249	720	0	720	0	0	249	-0.903	5.456
DEC	0	525	0	219	744	0	744	0	0	219	-0.838	5.456
ANNUAL	3296	3657	0	1807	5424	3336	8760	0	0	1807		

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
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR SING-ZN TOPEKA, KS

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	2.507	-15.505	15	4	-8.F	-9.F	-48.805	3022.	5.280
FEB	0.06809	26	15	60.F	45.F	7.703	-11.042	3	4	0.F	-1.F	-41.831	2733.	5.735
MAR	0.64169	27	15	70.F	51.F	14.719	-7.947	4	4	14.F	12.F	-31.508	3072.	6.496
APR	4.53813	27	15	77.F	68.F	31.532	-1.831	5	7	30.F	27.F	-19.539	3352.	8.372
MAY	8.53535	31	18	90.F	76.F	36.848	-0.347	1	4	39.F	37.F	-10.890	3852.	8.651
JUN	14.75157	30	14	88.F	76.F	43.866	-0.035	2	4	50.F	49.F	-5.949	4469.	10.148
JUL	19.72405	23	15	97.F	79.F	52.772	0.000					0.000	5120.	11.347
AUG	19.26447	20	14	93.F	78.F	48.581	-0.001	4	4	56.F	55.F	-0.603	5116.	10.814
SEP	9.90516	7	15	92.F	76.F	45.468	-0.661	12	7	42.F	42.F	-12.068	3955.	10.459
OCT	5.72662	5	15	83.F	68.F	35.018	-1.300	20	4	25.F	25.F	-21.672	3560.	9.016
NOV	1.49035	23	14	74.F	62.F	23.702	-6.130	3	4	13.F	12.F	-31.073	3013.	7.474
DEC	0.08632	28	15	58.F	47.F	6.138	-13.052	13	8	0.F	-1.F	-42.374	3041.	5.590
TOTAL	84.742						-57.851						44305.	
MAX						52.772						-48.805		11.347

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
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR SING-ZN TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 CYCLE ON	HOURS NIGHT VENTING	HOURS FLOATING WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)
JAN	8	736	0	0	744	744	744	0	0	0	0.000	5.280
FEB	21	651	0	0	672	672	672	0	0	0	0.000	5.735
MAR	128	616	0	0	744	744	744	0	0	0	0.000	6.496
APR	471	248	0	1	720	720	720	0	0	1	0.000	8.372
MAY	640	104	0	0	744	744	744	0	0	0	0.000	7.907
JUN	704	16	0	0	720	720	720	0	0	0	0.000	10.148
JUL	744	0	0	0	744	744	744	0	0	0	0.000	11.347
AUG	743	1	0	0	744	744	744	0	0	0	0.000	10.756
SEP	570	150	0	0	720	720	720	0	0	0	0.000	10.459
OCT	492	252	0	0	744	744	744	0	0	0	0.000	9.016
NOV	203	517	0	0	720	720	720	0	0	0	0.000	7.474
DEC	33	711	0	0	744	744	744	0	0	0	0.000	5.590
ANNUAL	4757	4002	0	1	8760	8760	8760	0	0	1		

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
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR CRU'S TOPEKA, KS

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	246.669	0.000					0.000	35818.	59.700
FEB	90.95567	3	10	10.F	8.F	241.575	0.000					0.000	32679.	61.377
MAR	101.75665	3	7	14.F	12.F	235.055	0.000					0.000	36961.	64.123
APR	99.73093	28	15	74.F	67.F	240.717	0.000					0.000	37284.	66.665
MAY	104.52082	16	3	61.F	59.F	240.751	0.000					0.000	39554.	68.457
JUN	102.29000	16	11	66.F	63.F	223.435	0.000					0.000	39226.	66.515
JUL	106.57320	30	6	63.F	60.F	218.749	0.000					0.000	41040.	67.627
AUG	106.44633	4	15	92.F	69.F	232.520	0.000					0.000	41181.	71.045
SEP	101.72897	15	6	46.F	45.F	225.422	0.000					0.000	38578.	68.542
OCT	103.31563	14	13	71.F	64.F	239.604	0.000					0.000	38648.	67.038
NOV	98.70152	3	7	19.F	17.F	236.852	0.000					0.000	36072.	64.627
DEC	101.00494	14	7	10.F	8.F	240.516	0.000					0.000	36148.	61.436
TOTAL	1217.413						0.000						453192.	
MAX						246.669						0.000		71.045

H18-38

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
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR CRU'S TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 CYCLE ON	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	530	0	0	0.000	54.234
FEB	483	0	0	189	672	672	483	483	0	0	0.000	54.921
MAR	546	0	0	198	744	744	546	546	0	0	0.000	55.087
APR	538	0	0	182	720	720	538	538	0	0	0.000	66.665
MAY	564	0	0	180	744	744	564	564	0	0	0.000	62.090
JUN	564	0	0	156	720	720	564	564	0	0	0.000	63.713
JUL	595	0	0	149	744	744	595	595	0	0	0.000	62.725
AUG	590	0	0	154	744	744	590	590	0	0	0.000	70.934
SEP	555	0	0	165	720	720	555	555	0	0	0.000	59.750
OCT	554	0	0	190	744	744	554	554	0	0	0.000	66.094
NOV	529	0	0	191	720	720	529	529	0	0	0.000	55.769
DEC	537	0	0	207	744	744	537	537	0	0	0.000	54.877
ANNUAL	6585	0	0	2175	8760	8760	6585	6585	0	0		

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	175.958	34.125
JAN	PEAK(KBTU)	351.853	138.571
	DY/HR	22/14	5/ 4
	TOTAL(MBTU)	160.082	24.200
FEB	PEAK(KBTU)	359.069	124.264
	DY/HR	26/13	2/ 4
	TOTAL(MBTU)	179.431	16.065
MAR	PEAK(KBTU)	366.720	84.034
	DY/HR	27/15	2/ 4
	TOTAL(MBTU)	180.373	4.551
APR	PEAK(KBTU)	385.337	35.059
	DY/HR	28/15	5/ 7
	TOTAL(MBTU)	196.690	1.381
MAY	PEAK(KBTU)	438.023	21.306
	DY/HR	27/15	1/ 4
	TOTAL(MBTU)	207.763	0.071
JUN	PEAK(KBTU)	450.155	10.576
	DY/HR	29/15	2/ 4
	TOTAL(MBTU)	221.429	0.000
JUL	PEAK(KBTU)	462.366	0.000
	DY/HR	23/13	31/ 1
	TOTAL(MBTU)	218.921	0.002
AUG	PEAK(KBTU)	467.200	1.841
	DY/HR	12/15	4/ 4
	TOTAL(MBTU)	201.057	1.208
SEP	PEAK(KBTU)	457.919	20.576
	DY/HR	7/15	12/ 7
	TOTAL(MBTU)	186.616	3.686
OCT	PEAK(KBTU)	424.126	39.197
	DY/HR	1/14	20/ 3
	TOTAL(MBTU)	171.765	11.702
NOV	PEAK(KBTU)	376.142	51.674
	DY/HR	23/13	3/ 3
	TOTAL(MBTU)	178.238	28.233
DEC	PEAK(KBTU)	359.139	129.733
	DY/HR	28/15	13/ 6
	ONE YEAR	2278.322	125.222
	USE/PEAK	467.200	138.571

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.

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                    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  ..
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$ 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.
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                    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)  ..

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 $
                $-------------------------------------$
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	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-17.183	19	5	29.F	28.F	-145.615	11154.	38.157
FEB	0.00000					0.000	-14.014	23	5	31.F	28.F	-145.383	10233.	38.157
MAR	0.00000					0.000	-12.567	2	5	24.F	21.F	-145.604	11252.	38.157
APR	0.00000					0.000	-5.638	6	5	36.F	31.F	-145.368	11825.	38.157
MAY	12.59915	22	14	79.F	69.F	162.194	-1.357	4	5	58.F	56.F	-84.711	11632.	38.157
JUN	37.73230	23	6	68.F	67.F	216.683	0.000					0.000	11760.	38.157
JUL	48.56630	13	13	90.F	79.F	208.747	0.000					0.000	12062.	38.157
AUG	42.63340	27	7	68.F	67.F	216.710	0.000					0.000	11026.	38.157
SEP	27.87341	23	11	68.F	67.F	221.253	0.000					0.000	11929.	38.157
OCT	0.82629	1	15	82.F	67.F	144.587	-3.995	19	5	46.F	45.F	-103.083	12120.	38.157
NOV	0.00000					0.000	-10.639	30	5	29.F	26.F	-145.670	10383.	38.157
DEC	0.00000					0.000	-16.470	14	5	11.F	10.F	-145.634	11719.	38.157
TOTAL	170.231						-81.863						137089.	
MAX						221.253						-145.670		38.157

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	364	0	380	744	0	561	297	0	197	0.000	0.000
FEB	0	349	0	323	672	0	527	287	0	178	0.000	0.000
MAR	0	345	0	399	744	0	579	315	0	234	0.000	0.000
APR	0	278	0	442	720	0	684	420	0	406	0.000	5.456
MAY	136	112	0	496	360	384	716	464	0	468	0.000	38.157
JUN	378	0	0	342	0	720	672	408	0	294	0.000	38.157
JUL	497	0	0	247	0	744	660	384	0	163	0.000	38.157
AUG	438	0	0	306	0	744	605	353	0	167	0.000	38.157
SEP	262	0	0	458	0	720	703	439	0	441	0.000	38.157
OCT	7	253	0	484	720	24	738	474	0	478	0.000	38.157
NOV	0	314	0	406	720	0	622	394	0	308	0.000	5.456
DEC	0	404	0	340	744	0	597	321	0	193	0.000	0.000
ANNUAL	1718	2419	0	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
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR SING-ZN TOPEKA, KS

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELECTRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000					0.000	-3.688	5	5	1.F	0.F	-55.946	1967.	5.188
FEB	0.00377	28	15	56.F	43.F	3.770	-3.161	2	5	8.F	6.F	-54.303	1744.	5.188
MAR	0.66329	24	17	64.F	64.F	113.100	-3.129	16	5	21.F	19.F	-52.947	1964.	12.628
APR	4.57602	20	17	65.F	62.F	75.983	-2.424	6	5	36.F	31.F	-47.094	2465.	9.748
MAY	5.37330	15	17	79.F	69.F	70.768	-2.135	16	2	62.F	59.F	-48.096	2622.	10.662
JUN	6.18788	29	5	71.F	70.F	51.344	-1.733	10	17	62.F	60.F	-22.988	2623.	9.740
JUL	9.24953	13	5	78.F	74.F	52.038	-1.681	31	17	79.F	66.F	-20.816	2996.	10.145
AUG	8.06227	24	5	79.F	72.F	52.649	-1.501	25	17	68.F	66.F	-21.820	2737.	10.171
SEP	4.38171	7	5	75.F	71.F	51.869	-1.908	30	17	50.F	46.F	-26.398	2575.	9.899
OCT	5.09613	14	23	62.F	60.F	75.014	-2.159	5	5	57.F	57.F	-40.835	2609.	10.298
NOV	1.43159	6	19	64.F	58.F	69.197	-2.740	2	5	16.F	15.F	-48.373	1938.	9.084
DEC	0.00000					0.000	-3.454	14	5	11.F	10.F	-54.673	2004.	5.088
TOTAL	45.026						-29.713						28245.	
MAX						113.100						-55.946		12.628

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 SING-ZN TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	237	0	507	744	744	446	182	0	209	0.000	0.000
FEB	1	201	0	470	672	672	394	154	0	192	0.000	3.840
MAR	25	205	0	514	744	744	431	167	0	201	0.000	12.628
APR	152	176	0	392	720	720	474	210	0	146	0.000	9.686
MAY	201	169	0	374	744	744	492	240	0	122	0.000	10.340
JUN	219	141	0	360	720	720	450	186	0	90	0.000	9.061
JUL	278	151	0	315	744	744	455	179	0	26	0.000	9.472
AUG	250	139	0	355	744	744	421	169	0	32	0.000	9.570
SEP	162	156	0	402	720	720	491	227	0	173	0.000	9.301
OCT	191	162	0	391	744	744	499	235	0	146	0.000	9.349
NOV	57	176	0	487	720	720	419	191	0	186	0.000	9.054
DEC	0	232	0	512	744	744	453	177	0	221	0.000	0.000
ANNUAL	1536	2145	0	5079	8760	8760	5425	2317	0	1744		

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	246.669	0.000					0.000	35818.	59.700
FEB	90.95567	3	10	10.F	8.F	241.575	0.000					0.000	32679.	61.377
MAR	101.75665	3	7	14.F	12.F	235.055	0.000					0.000	36961.	64.123
APR	99.73093	28	15	74.F	67.F	240.717	0.000					0.000	37284.	66.665
MAY	104.52082	16	3	61.F	59.F	240.751	0.000					0.000	39554.	68.457
JUN	102.29000	16	11	66.F	63.F	223.435	0.000					0.000	39226.	66.515
JUL	106.57320	30	6	63.F	60.F	218.749	0.000					0.000	41040.	67.627
AUG	106.44633	4	15	92.F	69.F	232.520	0.000					0.000	41181.	71.045
SEP	101.72897	15	6	46.F	45.F	225.422	0.000					0.000	38578.	68.542
OCT	103.31563	14	13	71.F	64.F	239.604	0.000					0.000	38648.	67.038
NOV	98.70152	3	7	19.F	17.F	236.852	0.000					0.000	36072.	64.627
DEC	101.00494	14	7	10.F	8.F	240.516	0.000					0.000	36148.	61.436
TOTAL	1217.413						0.000						453192.	
MAX						246.669						0.000		71.045

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 CYCLE ON	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	530	0	0	0.000	54.234
FEB	483	0	0	189	672	672	483	483	0	0	0.000	54.921
MAR	546	0	0	198	744	744	546	546	0	0	0.000	55.087
APR	538	0	0	182	720	720	538	538	0	0	0.000	66.665
MAY	564	0	0	180	744	744	564	564	0	0	0.000	62.090
JUN	564	0	0	156	720	720	564	564	0	0	0.000	63.713
JUL	595	0	0	149	744	744	595	595	0	0	0.000	62.725
AUG	590	0	0	154	744	744	590	590	0	0	0.000	70.934
SEP	555	0	0	165	720	720	555	555	0	0	0.000	59.750
OCT	554	0	0	190	744	744	554	554	0	0	0.000	66.094
NOV	529	0	0	191	720	720	529	529	0	0	0.000	55.769
DEC	537	0	0	207	744	744	537	537	0	0	0.000	54.877
ANNUAL	6585	0	0	2175	8760	8760	6585	6585	0	0		

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
REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	168.727	31.093
JAN	PEAK(KBTU)	356.480	251.339
	DY/HR	12/12	26/ 5
	TOTAL(MBTU)	153.923	25.927
FEB	PEAK(KBTU)	360.026	246.622
	DY/HR	26/13	23/ 5
	TOTAL(MBTU)	172.705	23.845
MAR	PEAK(KBTU)	366.463	249.676
	DY/HR	9/14	16/ 5
	TOTAL(MBTU)	177.038	12.903
APR	PEAK(KBTU)	378.164	243.323
	DY/HR	28/15	6/ 5
	TOTAL(MBTU)	188.145	5.918
MAY	PEAK(KBTU)	439.835	171.140
	DY/HR	21/15	4/ 5
	TOTAL(MBTU)	194.782	3.051
JUN	PEAK(KBTU)	453.047	39.119
	DY/HR	29/15	10/17
	TOTAL(MBTU)	206.944	2.981
JUL	PEAK(KBTU)	463.797	35.569
	DY/HR	23/13	31/17
	TOTAL(MBTU)	201.562	2.668
AUG	PEAK(KBTU)	467.694	37.209
	DY/HR	12/15	25/17
	TOTAL(MBTU)	189.943	3.360
SEP	PEAK(KBTU)	460.177	44.690
	DY/HR	7/15	30/17
	TOTAL(MBTU)	183.287	9.958
OCT	PEAK(KBTU)	427.911	189.480
	DY/HR	1/14	19/ 5
	TOTAL(MBTU)	166.440	20.380
NOV	PEAK(KBTU)	369.758	244.270
	DY/HR	23/13	30/ 5
	TOTAL(MBTU)	171.971	30.140
DEC	PEAK(KBTU)	361.265	251.571
	DY/HR	28/15	14/ 5
	ONE YEAR	2175.470	172.223
	USE/PEAK	467.694	251.571

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
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 = 62.0
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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                    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 #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.)
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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.)
                          (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
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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
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                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.
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                    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.) ..
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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

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	5	-1.F	-2.F	-9.897	12153.	38.157
FEB	0.00000					0.000	-0.466	2	5	8.F	6.F	-6.069	11024.	38.157
MAR	0.00000					0.000	-0.493	9	17	61.F	45.F	-5.483	12153.	38.157
APR	0.00000					0.000	-0.423	2	17	75.F	55.F	-5.785	12022.	38.157
MAY	27.35177	16	2	62.F	59.F	393.774	-0.203	11	17	82.F	62.F	-4.460	11785.	38.157
JUN	51.22044	19	15	87.F	76.F	171.050	0.000					0.000	12022.	38.157
JUL	59.86089	16	15	89.F	80.F	181.644	0.000					0.000	12521.	38.157
AUG	55.88170	20	14	93.F	78.F	175.549	0.000					0.000	11785.	38.157
SEP	45.78396	7	15	92.F	76.F	169.524	0.000					0.000	12022.	38.157
OCT	1.57378	1	15	82.F	67.F	135.400	-0.500	2	2	64.F	59.F	-44.104	12153.	38.157
NOV	0.00000					0.000	-0.419	23	17	67.F	55.F	-4.960	10918.	38.157
DEC	0.00000					0.000	-0.528	15	5	8.F	7.F	-9.735	12521.	38.157
TOTAL	241.672						-3.556						143067.	
MAX						393.774						-44.104		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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	-0.843	5.456
FEB	0	672	0	0	672	0	672	0	0	0	-0.835	5.456
MAR	0	744	0	0	744	0	744	0	0	0	-0.994	5.456
APR	0	675	0	45	720	0	720	0	0	45	-0.941	5.456
MAY	384	251	0	109	360	384	744	0	0	109	0.000	5.456
JUN	720	0	0	0	0	720	720	0	0	0	0.000	38.157
JUL	744	0	0	0	0	744	744	0	0	0	0.000	38.157
AUG	744	0	0	0	0	744	744	0	0	0	0.000	38.157
SEP	718	0	0	2	0	720	720	0	0	2	0.000	38.157
OCT	24	610	0	110	720	24	744	0	0	110	0.000	38.157
NOV	0	720	0	0	720	0	720	0	0	0	-0.262	5.456
DEC	0	744	0	0	744	0	744	0	0	0	-0.371	5.456
ANNUAL	3334	5160	0	266	5424	3336	8760	0	0	266		

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 SING-ZN TOPEKA, KS

	COOLING						HEATING						ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELECTRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	3.26103	12	17	43.F	35.F	9.804	-5.649	15	5	-8.F	-9.F	-48.578	3205.	5.188
FEB	3.15777	13	17	54.F	46.F	10.582	-3.862	3	7	-5.F	-6.F	-43.269	2914.	5.506
MAR	4.16496	27	15	70.F	51.F	11.962	-2.532	4	5	14.F	12.F	-31.787	3298.	6.232
APR	6.12366	27	15	77.F	68.F	26.392	-0.615	15	7	30.F	28.F	-17.188	3452.	7.824
MAY	9.47406	27	14	81.F	70.F	37.076	-0.128	1	5	38.F	37.F	-12.542	3904.	9.134
JUN	13.35523	30	14	88.F	76.F	49.555	-0.001	2	5	50.F	49.F	-0.837	4297.	10.586
JUL	16.54510	23	15	97.F	79.F	58.443	0.000					0.000	4776.	11.954
AUG	15.56999	20	14	93.F	78.F	54.324	0.000					0.000	4689.	11.334
SEP	10.93560	7	15	92.F	76.F	50.897	-0.047	11	5	41.F	40.F	-6.758	4002.	10.929
OCT	7.13214	1	15	82.F	67.F	32.500	-0.633	20	5	25.F	25.F	-22.207	3637.	8.694
NOV	4.88792	23	14	74.F	62.F	19.944	-2.005	3	5	13.F	12.F	-31.273	3235.	7.095
DEC	3.44106	3	17	52.F	44.F	10.454	-4.286	15	5	8.F	7.F	-36.242	3232.	5.369
TOTAL	98.048						-19.757						44641.	
MAX						58.443						-48.578		11.954

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 SING-ZN TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 CYCLE ON	HOURS NIGHT VENTING	HOURS FLOATING WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)
JAN	480	264	0	0	744	744	744	0	0	0	0.000	4.196
FEB	443	229	0	0	672	672	672	0	0	0	0.000	4.361
MAR	539	205	0	0	744	744	744	0	0	0	0.000	6.232
APR	632	88	0	0	720	720	720	0	0	0	0.000	7.824
MAY	720	24	0	0	744	744	744	0	0	0	0.000	9.134
JUN	719	1	0	0	720	720	720	0	0	0	0.000	10.586
JUL	744	0	0	0	744	744	744	0	0	0	0.000	11.954
AUG	744	0	0	0	744	744	744	0	0	0	0.000	11.288
SEP	696	24	0	0	720	720	720	0	0	0	0.000	10.929
OCT	645	99	0	0	744	744	744	0	0	0	0.000	8.694
NOV	550	170	0	0	720	720	720	0	0	0	0.000	7.095
DEC	483	261	0	0	744	744	744	0	0	0	0.000	4.329
ANNUAL	7395	1365	0	0	8760	8760	8760	0	0	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 CRU'S TOPEKA, KS

	COOLING						HEATING						ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	246.669	0.000					0.000	35818.	59.700
FEB	90.95567	3	10	10.F	8.F	241.575	0.000					0.000	32679.	61.377
MAR	101.75665	3	7	14.F	12.F	235.055	0.000					0.000	36961.	64.123
APR	99.73093	28	15	74.F	67.F	240.717	0.000					0.000	37284.	66.665
MAY	104.52082	16	3	61.F	59.F	240.751	0.000					0.000	39554.	68.457
JUN	102.29000	16	11	66.F	63.F	223.435	0.000					0.000	39226.	66.515
JUL	106.57320	30	6	63.F	60.F	218.749	0.000					0.000	41040.	67.627
AUG	106.44633	4	15	92.F	69.F	232.520	0.000					0.000	41181.	71.045
SEP	101.72897	15	6	46.F	45.F	225.422	0.000					0.000	38578.	68.542
OCT	103.31563	14	13	71.F	64.F	239.604	0.000					0.000	38648.	67.038
NOV	98.70152	3	7	19.F	17.F	236.852	0.000					0.000	36072.	64.627
DEC	101.00494	14	7	10.F	8.F	240.516	0.000					0.000	36148.	61.436
TOTAL	1217.413						0.000						453192.	
MAX						246.669						0.000		71.045

H18-58

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 CRU'S TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 CYCLE ON	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	530	0	0	0.000	54.234
FEB	483	0	0	189	672	672	483	483	0	0	0.000	54.921
MAR	546	0	0	198	744	744	546	546	0	0	0.000	55.087
APR	538	0	0	182	720	720	538	538	0	0	0.000	66.665
MAY	564	0	0	180	744	744	564	564	0	0	0.000	62.090
JUN	564	0	0	156	720	720	564	564	0	0	0.000	63.713
JUL	595	0	0	149	744	744	595	595	0	0	0.000	62.725
AUG	590	0	0	154	744	744	590	590	0	0	0.000	70.934
SEP	555	0	0	165	720	720	555	555	0	0	0.000	59.750
OCT	554	0	0	190	744	744	554	554	0	0	0.000	66.094
NOV	529	0	0	191	720	720	529	529	0	0	0.000	55.769
DEC	537	0	0	207	744	744	537	537	0	0	0.000	54.877
ANNUAL	6585	0	0	2175	8760	8760	6585	6585	0	0		

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	175.305	9.161
JAN	PEAK(KBTU)	352.024	68.122
	DY/HR	9/14	15/ 5
	TOTAL(MBTU)	159.675	6.792
FEB	PEAK(KBTU)	358.654	59.102
	DY/HR	26/13	3/ 5
	TOTAL(MBTU)	179.418	4.970
MAR	PEAK(KBTU)	366.159	46.772
	DY/HR	27/15	4/ 5
	TOTAL(MBTU)	180.456	1.968
APR	PEAK(KBTU)	383.538	28.587
	DY/HR	28/15	15/ 5
	TOTAL(MBTU)	198.847	0.646
MAY	PEAK(KBTU)	443.831	25.426
	DY/HR	21/15	1/ 5
	TOTAL(MBTU)	209.228	0.002
JUN	PEAK(KBTU)	450.826	1.788
	DY/HR	29/15	2/ 5
	TOTAL(MBTU)	221.847	0.000
JUL	PEAK(KBTU)	463.217	0.000
	DY/HR	23/13	31/ 1
	TOTAL(MBTU)	218.895	0.000
AUG	PEAK(KBTU)	467.201	0.000
	DY/HR	12/15	31/ 1
	TOTAL(MBTU)	204.078	0.087
SEP	PEAK(KBTU)	458.564	11.463
	DY/HR	7/15	11/ 5
	TOTAL(MBTU)	186.781	2.061
OCT	PEAK(KBTU)	432.472	58.753
	DY/HR	1/14	2/ 2
	TOTAL(MBTU)	171.908	4.064
NOV	PEAK(KBTU)	375.199	47.556
	DY/HR	23/13	3/ 5
	TOTAL(MBTU)	177.757	7.488
DEC	PEAK(KBTU)	358.725	59.341
	DY/HR	28/15	15/ 5
	ONE YEAR	2284.195	37.240
	USE/PEAK	467.201	68.122

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
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.

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                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) ..

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_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  ..
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$ 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   ..
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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. 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 MZ-PERIM TOPEKA, KS

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-4.705	5	4	0.F	0.F	-69.555	12153.	38.157
FEB	0.00000					0.000	-3.509	2	4	10.F	9.F	-66.566	11024.	38.157
MAR	0.00000					0.000	-1.556	2	4	25.F	22.F	-37.375	12153.	38.157
APR	0.00000					0.000	-0.923	3	17	49.F	45.F	-16.158	12022.	38.157
MAY	27.76151	16	2	62.F	59.F	324.761	-0.479	4	17	55.F	53.F	-16.650	11785.	38.157
JUN	54.07588	19	15	87.F	76.F	141.518	0.000					0.000	12022.	38.157
JUL	62.55460	23	17	97.F	79.F	163.118	0.000					0.000	12521.	38.157
AUG	59.68844	24	17	95.F	77.F	158.511	0.000					0.000	11785.	38.157
SEP	47.71723	7	15	92.F	76.F	140.093	0.000					0.000	12022.	38.157
OCT	1.69185	1	15	82.F	67.F	125.435	-1.041	2	2	64.F	59.F	-47.653	12153.	38.157
NOV	0.00000					0.000	-0.962	19	17	45.F	37.F	-17.355	10918.	38.157
DEC	0.00000					0.000	-4.260	14	4	14.F	12.F	-65.360	12521.	38.157
TOTAL	253.489						-17.434						143067.	
MAX						324.761						-69.555		38.157

H18-66

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 MZ-PERIM TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	-1.526	5.456
FEB	0	672	0	0	672	0	672	0	0	0	-1.306	5.456
MAR	0	744	0	0	744	0	744	0	0	0	-1.632	5.456
APR	0	663	0	57	720	0	720	0	0	57	-2.275	5.456
MAY	384	276	0	84	360	384	744	0	0	84	0.000	5.456
JUN	720	0	0	0	0	720	720	0	0	0	0.000	38.157
JUL	744	0	0	0	0	744	744	0	0	0	0.000	5.456
AUG	744	0	0	0	0	744	744	0	0	0	0.000	5.456
SEP	716	0	0	4	0	720	720	0	0	4	0.000	38.157
OCT	24	616	0	104	720	24	744	0	0	104	0.000	38.157
NOV	0	719	0	1	720	0	720	0	0	1	-1.143	5.456
DEC	0	744	0	0	744	0	744	0	0	0	-1.211	5.456
ANNUAL	3332	5178	0	250	5424	3336	8760	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

	COOLING						HEATING						ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	13.857	-11.737	15	4	-8.F	-9.F	-51.299	3175.	6.144
FEB	2.66934	24	15	52.F	45.F	14.570	-8.895	3	4	0.F	-1.F	-44.420	2888.	6.311
MAR	3.31709	18	12	58.F	52.F	16.558	-7.147	4	4	14.F	12.F	-34.187	3247.	6.561
APR	5.34210	27	17	75.F	67.F	20.134	-2.044	5	7	30.F	27.F	-22.475	3394.	7.090
MAY	9.92895	31	18	90.F	76.F	42.493	-0.347	1	4	39.F	37.F	-13.826	3964.	8.583
JUN	16.07705	19	17	87.F	76.F	44.863	-0.006	2	4	50.F	49.F	-2.828	4593.	8.616
JUL	19.35152	23	17	97.F	79.F	55.244	0.000					0.000	5079.	10.111
AUG	19.49169	24	17	95.F	77.F	50.409	0.000					0.000	5134.	9.526
SEP	12.23977	7	17	92.F	75.F	45.333	-0.219	12	7	42.F	42.F	-9.002	4154.	8.907
OCT	6.18177	1	17	85.F	68.F	29.720	-1.533	20	4	25.F	25.F	-24.443	3565.	7.372
NOV	3.45482	23	15	74.F	61.F	19.205	-5.593	3	4	13.F	12.F	-33.737	3133.	7.022
DEC	3.13769	3	15	54.F	45.F	14.534	-10.643	13	8	0.F	-1.F	-45.196	3225.	6.253
TOTAL	103.947						-48.163						45549.	
MAX						55.244						-51.299		10.111

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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	0	0	744	744	744	0	0	0	0.000	6.134
FEB	240	432	0	0	672	672	672	0	0	0	0.000	6.188
MAR	289	455	0	0	744	744	744	0	0	0	0.000	6.446
APR	476	244	0	0	720	720	720	0	0	0	0.000	5.584
MAY	670	74	0	0	744	744	744	0	0	0	0.000	8.583
JUN	716	4	0	0	720	720	720	0	0	0	0.000	8.616
JUL	744	0	0	0	744	744	744	0	0	0	0.000	10.111
AUG	744	0	0	0	744	744	744	0	0	0	0.000	9.524
SEP	649	71	0	0	720	720	720	0	0	0	0.000	8.907
OCT	495	249	0	0	744	744	744	0	0	0	0.000	6.961
NOV	330	390	0	0	720	720	720	0	0	0	0.000	7.022
DEC	276	468	0	0	744	744	744	0	0	0	0.000	6.215
ANNUAL	5893	2867	0	0	8760	8760	8760	0	0	0		

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 CRU'S TOPEKA, KS

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	246.669	0.000					0.000	35818.	59.700
FEB	90.95567	3	10	10.F	8.F	241.575	0.000					0.000	32679.	61.377
MAR	101.75665	3	7	14.F	12.F	235.055	0.000					0.000	36961.	64.123
APR	99.73093	28	15	74.F	67.F	240.717	0.000					0.000	37284.	66.665
MAY	104.52082	16	3	61.F	59.F	240.751	0.000					0.000	39554.	68.457
JUN	102.29000	16	11	66.F	63.F	223.435	0.000					0.000	39226.	66.515
JUL	106.57320	30	6	63.F	60.F	218.749	0.000					0.000	41040.	67.627
AUG	106.44633	4	15	92.F	69.F	232.520	0.000					0.000	41181.	71.045
SEP	101.72897	15	6	46.F	45.F	225.422	0.000					0.000	38578.	68.542
OCT	103.31563	14	13	71.F	64.F	239.604	0.000					0.000	38648.	67.038
NOV	98.70152	3	7	19.F	17.F	236.852	0.000					0.000	36072.	64.627
DEC	101.00494	14	7	10.F	8.F	240.516	0.000					0.000	36148.	61.436
TOTAL	1217.413						0.000						453192.	
MAX						246.669						0.000		71.045

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 CRU'S TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 CYCLE ON	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	530	0	0	0.000	54.234
FEB	483	0	0	189	672	672	483	483	0	0	0.000	54.921
MAR	546	0	0	198	744	744	546	546	0	0	0.000	55.087
APR	538	0	0	182	720	720	538	538	0	0	0.000	66.665
MAY	564	0	0	180	744	744	564	564	0	0	0.000	62.090
JUN	564	0	0	156	720	720	564	564	0	0	0.000	63.713
JUL	595	0	0	149	744	744	595	595	0	0	0.000	62.725
AUG	590	0	0	154	744	744	590	590	0	0	0.000	70.934
SEP	555	0	0	165	720	720	555	555	0	0	0.000	59.750
OCT	554	0	0	190	744	744	554	554	0	0	0.000	66.094
NOV	529	0	0	191	720	720	529	529	0	0	0.000	55.769
DEC	537	0	0	207	744	744	537	537	0	0	0.000	54.877
ANNUAL	6585	0	0	2175	8760	8760	6585	6585	0	0		

EMC ENGINEERS INC. EZDOE - 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- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	176.191	25.236
JAN	PEAK(KBTU)	355.618	144.009
	DY/HR	9/14	5/ 4
	TOTAL(MBTU)	160.430	19.659
FEB	PEAK(KBTU)	361.917	132.458
	DY/HR	26/13	2/ 4
	TOTAL(MBTU)	180.025	14.602
MAR	PEAK(KBTU)	368.052	88.517
	DY/HR	9/14	16/ 4
	TOTAL(MBTU)	180.678	5.439
APR	PEAK(KBTU)	381.870	40.235
	DY/HR	28/15	5/ 7
	TOTAL(MBTU)	198.745	1.596
MAY	PEAK(KBTU)	433.701	29.360
	DY/HR	21/15	4/17
	TOTAL(MBTU)	209.839	0.013
JUN	PEAK(KBTU)	431.874	5.509
	DY/HR	29/15	2/ 4
	TOTAL(MBTU)	222.305	0.000
JUL	PEAK(KBTU)	439.628	0.000
	DY/HR	22/15	31/ 1
	TOTAL(MBTU)	220.222	0.000
AUG	PEAK(KBTU)	448.766	0.000
	DY/HR	4/15	31/ 1
	TOTAL(MBTU)	204.083	0.421
SEP	PEAK(KBTU)	437.576	15.599
	DY/HR	7/15	12/ 7
	TOTAL(MBTU)	186.880	4.725
OCT	PEAK(KBTU)	423.429	78.164
	DY/HR	1/14	2/ 2
	TOTAL(MBTU)	172.226	11.306
NOV	PEAK(KBTU)	375.416	56.835
	DY/HR	23/13	30/17
	TOTAL(MBTU)	178.672	23.058
DEC	PEAK(KBTU)	362.124	134.076
	DY/HR	28/15	13/ 8
	ONE YEAR	2290.294	106.056
	USE/PEAK	448.766	144.009

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

EMC ENGINEERS, INC.

DENVER - ATLANTA

PROJECT:	FEASIBILITY STUDY FOR INSTALLATION OF UMCS	EMC NO:	1406-001
		CALC. BY:	AJN
LOCATION:	FORT RILEY, KANSAS	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	FT²
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	NIGHTIME 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  ..

                $-----------------------------------$
                $ 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. 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
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                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
                    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   ..

          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  ..
```

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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 *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 ..
```

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	- - - - G L A S S - - - - U-VALUE (BTU/HR-SQFT-F)	AREA (SQFT)	- - - - W A L L - - - - 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	NORTH
	N_NEW_SPAC	0.000	0.00	0.060	2332.00	0.060	2332.00	NORTH
	N_NEW_SPAC	0.000	0.00	0.060	660.00	0.060	660.00	EAST
	S_NEW_SPAC	0.000	0.00	0.060	660.00	0.060	660.00	EAST
	E_NEW_SPAC	0.000	0.00	0.060	2024.00	0.060	2024.00	EAST
	E_NEW_SPAC	0.000	0.00	0.236	2024.00	0.236	2024.00	EAST
	S_NEW_SPAC	1.021	167.62	0.060	1592.38	0.151	1760.00	SOUTH
	S_OLD_SPAC	1.021	174.24	0.236	2355.76	0.290	2530.00	SOUTH
	W_OLD_SPAC	0.000	0.00	0.236	2068.00	0.236	2068.00	WEST
	S_OLD_SPAC	0.000	0.00	0.236	660.00	0.236	660.00	WEST
	N_NEW_SPAC	0.000	0.00	0.060	198.00	0.060	198.00	WEST
	N_OLD_SPAC	0.000	0.00	0.236	352.00	0.236	352.00	WEST
	N_NEW_SPAC	0.000	0.00	0.028	3180.00	0.028	3180.00	ROOF
	CR_NEW_SPC	0.000	0.00	0.074	7728.00	0.074	7728.00	ROOF
	CR_NEW_SPC	0.000	0.00	0.028	7728.00	0.028	7728.00	ROOF
	S_NEW_SPAC	0.000	0.00	0.074	2520.00	0.074	2520.00	ROOF
	S_NEW_SPAC	0.000	0.00	0.028	2712.00	0.028	2712.00	ROOF
	W_OLD_SPAC	0.000	0.00	0.074	1504.00	0.074	1504.00	ROOF
	CR_OLD_SPA	0.000	0.00	0.074	11750.00	0.074	11750.00	ROOF
	S_OLD_SPAC	0.000	0.00	0.074	3765.00	0.074	3765.00	ROOF
	E_NEW_SPAC	0.000	0.00	0.028	2024.00	0.028	2024.00	ROOF
	E_NEW_SPAC	0.000	0.00	0.074	2024.00	0.074	2024.00	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

	N_OLD_SPAC	0.000	0.00	0.074	2256.00	0.074	2256.00	ROOF
	N_OLD_SPAC	0.000	0.00	0.020	2256.00	0.020	2256.00	UNDERGRND
	CR_OLD_SPA	0.000	0.00	0.020	11750.00	0.020	11750.00	UNDERGRND
	S_OLD_SPAC	0.000	0.00	0.020	3765.00	0.020	3765.00	UNDERGRND
	W_OLD_SPAC	0.000	0.00	0.020	1504.00	0.020	1504.00	UNDERGRND
	N_NEW_SPAC	0.000	0.00	0.020	3180.00	0.020	3180.00	UNDERGRND
	CR_NEW_SPC	0.000	0.00	0.020	7728.00	0.020	7728.00	UNDERGRND
	CR_NEW_SPC	0.000	0.00	0.020	7728.00	0.020	7728.00	UNDERGRND
	CR_NEW_SPC	0.000	0.00	0.020	7728.00	0.020	7728.00	UNDERGRND
	S_NEW_SPAC	0.000	0.00	0.020	2520.00	0.020	2520.00	UNDERGRND
	S_NEW_SPAC	0.000	0.00	0.020	2712.00	0.020	2712.00	UNDERGRND
	E_NEW_SPAC	0.000	0.00	0.020	2024.00	0.020	2024.00	UNDERGRND

	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
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

*** BUILDING ***

FLOOR AREA 34916 SQFT 3244 SQMT
VOLUME 768152 CUFT 21754 CUMT

	COOLING LOAD				HEATING LOAD	
TIME	JUL 23 8PM				JAN 15 7AM	
DRY-BULB TEMP	91F	33C			-7F	-22C
WET-BULB TEMP	77F	25C			-8F	-22C

	SENSIBLE (KBTU/H)	SENSIBLE (KW)	LATENT (KBTU/H)	LATENT (KW)	SENSIBLE (KBTU/H)	SENSIBLE (KW)
WALLS	57.468	16.831	0.000	0.000	-224.260	-65.680
ROOFS	104.978	30.745	0.000	0.000	-237.339	-69.511
GLASS CONDUCTION	5.365	1.571	0.000	0.000	-24.792	-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	-469.771 KBTU/H	-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

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DENVER, CO 80227 BASELINE SIMULATION FOR BLDG. 7485 BOWLING ALLEY
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR OLD_SYSTEM TOPEKA, KS

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-131.179	15	7	-7.F	-8.F	-431.251	25782.	45.178
FEB	0.00000					0.000	-92.958	3	7	-5.F	-6.F	-397.991	23218.	45.178
MAR	0.00000					0.000	-63.926	3	7	14.F	12.F	-298.153	25857.	45.178
APR	0.00000					0.000	-11.263	5	7	30.F	27.F	-190.202	25125.	45.178
MAY	59.01812	16	2	62.F	59.F	403.097	-0.884	5	7	44.F	40.F	-34.729	25601.	45.178
JUN	144.31564	24	20	83.F	74.F	408.129	0.000					0.000	25020.	45.178
JUL	188.20775	17	19	88.F	80.F	489.590	0.000					0.000	25707.	45.178
AUG	180.61736	20	20	90.F	75.F	437.978	0.000					0.000	25857.	45.178
SEP	99.56862	5	18	90.F	77.F	413.599	0.000					0.000	24945.	45.178
OCT	2.60230	1	18	83.F	68.F	251.500	-6.672	20	7	23.F	23.F	-198.304	25654.	45.178
NOV	0.00000					0.000	-47.621	3	6	13.F	12.F	-287.183	24711.	45.178
DEC	0.00000					0.000	-111.398	13	7	2.F	1.F	-370.444	25835.	45.178
TOTAL	674.330						-465.898						303316.	
MAX						489.590						-431.251		45.178

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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	-100.252	42.228
FEB	0	672	0	0	672	0	672	0	0	0	-95.981	42.228
MAR	0	744	0	0	744	0	744	0	0	0	-98.376	42.228
APR	0	720	0	0	720	0	720	0	0	0	-4.695	42.883
MAY	371	360	0	13	360	384	744	0	0	13	0.000	17.440
JUN	709	0	0	11	0	720	720	0	0	11	0.000	45.178
JUL	744	0	0	0	0	744	744	0	0	0	0.000	44.359
AUG	742	0	0	2	0	744	744	0	0	2	0.000	45.178
SEP	567	0	0	153	0	720	720	0	0	153	0.000	44.359
OCT	16	720	0	8	720	24	744	0	0	8	0.000	44.359
NOV	0	720	0	0	720	0	720	0	0	0	-144.346	42.228
DEC	0	744	0	0	744	0	744	0	0	0	-132.184	43.539
ANNUAL	3149	5424	0	187	5424	3336	8760	0	0	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

	COOLING						HEATING						ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-101.232	15	7	-7.F	-8.F	-326.302	17379.	29.532
FEB	0.00000					0.000	-74.024	3	7	-5.F	-6.F	-300.528	15644.	29.532
MAR	0.00000					0.000	-53.465	3	7	14.F	12.F	-230.062	17454.	29.532
APR	0.00000					0.000	-11.126	5	7	30.F	27.F	-156.843	16941.	29.532
MAY	43.52706	30	20	82.F	75.F	279.536	-0.982	5	7	44.F	40.F	-36.412	17249.	29.532
JUN	109.22501	24	20	83.F	74.F	290.725	0.000					0.000	16885.	29.532
JUL	141.67694	17	18	88.F	80.F	327.144	0.000					0.000	17305.	29.532
AUG	138.15678	20	21	87.F	75.F	300.411	0.000					0.000	17454.	29.532
SEP	80.76028	5	18	90.F	77.F	296.429	0.000					0.000	16810.	29.532
OCT	2.27719	1	18	83.F	68.F	224.986	-5.533	20	7	23.F	23.F	-156.662	17277.	29.532
NOV	0.00000					0.000	-37.089	3	6	13.F	12.F	-216.867	16652.	29.532
DEC	0.00000					0.000	-85.732	13	7	2.F	1.F	-277.992	17407.	29.532
TOTAL	515.623						-369.184						204455.	
MAX						327.144						-326.302		29.532

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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	-80.423	29.532
FEB	0	672	0	0	672	0	672	0	0	0	-81.837	29.532
MAR	0	732	0	12	744	0	744	0	0	12	-85.213	29.532
APR	0	490	0	230	720	0	720	0	0	230	-2.983	29.532
MAY	361	198	0	185	360	384	744	0	0	185	0.000	29.532
JUN	706	0	0	14	0	720	720	0	0	14	0.000	29.532
JUL	744	0	0	0	0	744	744	0	0	0	0.000	29.532
AUG	742	0	0	2	0	744	744	0	0	2	0.000	29.532
SEP	649	0	0	71	0	720	720	0	0	71	0.000	29.532
OCT	18	464	0	262	720	24	744	0	0	262	0.000	29.532
NOV	0	637	0	83	720	0	720	0	0	83	-109.433	29.532
DEC	0	744	0	0	744	0	744	0	0	0	-102.705	29.532
ANNUAL	3220	4681	0	859	5424	3336	8760	0	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

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-19.801	15	7	-7.F	-8.F	-68.725	1384.	2.823
FEB	0.00000					0.000	-13.271	3	7	-5.F	-6.F	-58.491	1235.	2.807
MAR	0.00000					0.000	-7.753	4	7	14.F	12.F	-38.918	1375.	2.773
APR	0.00000					0.000	-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	-0.404	20	8	23.F	22.F	-17.871	1337.	2.745
NOV	0.00000					0.000	-6.088	3	7	19.F	17.F	-34.461	1294.	2.769
DEC	0.00000					0.000	-16.079	15	7	11.F	9.F	-59.484	1382.	2.804
TOTAL	0.000						-64.113						15995.	
MAX						0.000						-68.725		2.823

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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	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	2.717
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		

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	166.035	363.651
JAN	PEAK(KBTU)	285.215	1040.591
	DY/HR	15/20	15/ 7
	TOTAL(MBTU)	149.055	271.667
FEB	PEAK(KBTU)	285.085	967.456
	DY/HR	4/20	3/ 7
	TOTAL(MBTU)	162.527	195.387
MAR	PEAK(KBTU)	284.090	755.268
	DY/HR	5/22	4/ 7
	TOTAL(MBTU)	152.063	44.129
APR	PEAK(KBTU)	276.110	530.174
	DY/HR	5/ 9	5/ 7
	TOTAL(MBTU)	184.288	6.693
MAY	PEAK(KBTU)	486.408	126.377
	DY/HR	31/18	5/ 7
	TOTAL(MBTU)	228.216	0.000
JUN	PEAK(KBTU)	485.616	0.000
	DY/HR	28/18	30/ 1
	TOTAL(MBTU)	254.864	0.000
JUL	PEAK(KBTU)	527.286	0.000
	DY/HR	23/18	31/ 1
	TOTAL(MBTU)	256.955	0.000
AUG	PEAK(KBTU)	513.824	0.000
	DY/HR	21/19	31/ 1
	TOTAL(MBTU)	204.836	0.000
SEP	PEAK(KBTU)	498.186	0.000
	DY/HR	5/18	30/ 1
	TOTAL(MBTU)	155.758	27.486
OCT	PEAK(KBTU)	411.121	540.833
	DY/HR	1/18	20/ 7
	TOTAL(MBTU)	153.740	145.535
NOV	PEAK(KBTU)	279.499	728.493
	DY/HR	12/11	3/ 6
	TOTAL(MBTU)	165.597	315.362
DEC	PEAK(KBTU)	285.127	911.539
	DY/HR	9/20	13/ 7
	ONE YEAR	2233.934	1369.911
	USE/PEAK	527.286	1040.591

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
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.

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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. 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
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```
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
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                    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  ..
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EMC ENGINEERS INC. EZDOE - 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
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR OLD_SYSTEM TOPEKA, KS

	COOLING						HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-78.270	15	8	-6.F	-7.F	-441.163	22311.	45.178
FEB	0.00000					0.000	-51.749	3	8	-2.F	-3.F	-433.768	20079.	45.178
MAR	0.00000					0.000	-30.424	3	8	15.F	12.F	-344.685	22351.	45.178
APR	0.00000					0.000	-3.176	1	8	49.F	44.F	-123.868	21812.	45.178
MAY	57.52285	16	8	61.F	59.F	444.611	-0.195	1	8	45.F	42.F	-8.647	22096.	45.178
JUN	129.11554	24	20	83.F	74.F	387.746	0.000					0.000	21636.	45.178
JUL	161.65105	17	19	88.F	80.F	451.008	0.000					0.000	22271.	45.178
AUG	157.09869	20	20	90.F	75.F	415.481	0.000					0.000	22351.	45.178
SEP	95.52588	5	18	90.F	77.F	384.845	0.000					0.000	21596.	45.178
OCT	2.77466	1	18	83.F	68.F	250.461	-1.642	20	8	23.F	22.F	-87.945	22183.	45.178
NOV	0.00000					0.000	-20.557	3	8	24.F	21.F	-307.950	21293.	45.178
DEC	0.00000					0.000	-64.393	13	8	0.F	-1.F	-420.592	22399.	45.178
TOTAL	603.690						-250.405						262392.	
MAX						451.008						-441.163		45.178

EMC ENGINEERS INC. EZDOE - 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
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR OLD_SYSTEM TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	545	0	199	744	0	545	0	0	0	-66.373	42.228
FEB	0	492	0	180	672	0	492	0	0	0	-63.686	42.228
MAR	0	543	0	201	744	0	543	0	0	0	-63.897	42.228
APR	0	530	0	190	720	0	530	0	0	0	-4.252	42.883
MAY	280	263	0	201	360	384	543	0	0	0	0.000	29.703
JUN	526	0	0	194	0	720	526	0	0	0	0.000	45.178
JUL	547	0	0	197	0	744	547	0	0	0	0.000	44.359
AUG	543	0	0	201	0	744	543	0	0	0	0.000	45.178
SEP	498	0	0	222	0	720	528	0	0	30	0.000	44.359
OCT	16	526	0	202	720	24	545	0	0	3	0.000	44.359
NOV	0	524	0	196	720	0	524	0	0	0	-101.788	42.228
DEC	0	547	0	197	744	0	547	0	0	0	-95.311	43.539
ANNUAL	2410	3970	0	2380	5424	3336	6413	0	0	33		

EMC ENGINEERS INC. EZDOE - 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
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR UNIT-HEATR TOPEKA, KS

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-19.801	15	7	-7.F	-8.F	-68.725	1384.	2.823
FEB	0.00000					0.000	-13.271	3	7	-5.F	-6.F	-58.491	1235.	2.807
MAR	0.00000					0.000	-7.753	4	7	14.F	12.F	-38.918	1375.	2.773
APR	0.00000					0.000	-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	-0.404	20	8	23.F	22.F	-17.871	1337.	2.745
NOV	0.00000					0.000	-6.088	3	7	19.F	17.F	-34.461	1294.	2.769
DEC	0.00000					0.000	-16.079	15	7	11.F	9.F	-59.484	1382.	2.804
TOTAL	0.000						-64.113						15995.	
MAX						0.000						-68.725		2.823

EMC ENGINEERS INC. EZDOE - 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
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR UNIT-HEATR TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	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	2.717
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 5/17/1995 16:55:40 PDL RUN 1
DENVER, CO 80227 RUN #1 NIGHT SETBACK FOR BLDG. 7485 BOWLING ALLEY
REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	145.192	270.125
JAN	PEAK(KBTU)	288.456	1204.209
	DY/HR	15/20	15/ 8
	TOTAL(MBTU)	129.863	194.903
FEB	PEAK(KBTU)	286.758	1186.046
	DY/HR	4/21	3/ 8
	TOTAL(MBTU)	141.078	128.845
MAR	PEAK(KBTU)	282.793	953.981
	DY/HR	4/11	3/ 8
	TOTAL(MBTU)	132.535	23.814
APR	PEAK(KBTU)	279.351	521.994
	DY/HR	5/ 9	5/ 8
	TOTAL(MBTU)	162.462	4.069
MAY	PEAK(KBTU)	476.635	53.756
	DY/HR	31/18	5/ 8
	TOTAL(MBTU)	199.632	0.000
JUN	PEAK(KBTU)	477.145	0.000
	DY/HR	28/18	30/ 1
	TOTAL(MBTU)	220.952	0.000
JUL	PEAK(KBTU)	515.354	0.000
	DY/HR	23/18	31/ 1
	TOTAL(MBTU)	223.532	0.000
AUG	PEAK(KBTU)	505.508	0.000
	DY/HR	21/19	31/ 1
	TOTAL(MBTU)	181.666	0.000
SEP	PEAK(KBTU)	488.107	0.000
	DY/HR	5/18	30/ 1
	TOTAL(MBTU)	135.743	14.829
OCT	PEAK(KBTU)	408.119	454.105
	DY/HR	1/18	20/ 8
	TOTAL(MBTU)	132.884	90.806
NOV	PEAK(KBTU)	282.740	869.880
	DY/HR	12/11	3/ 8
	TOTAL(MBTU)	144.830	230.175
DEC	PEAK(KBTU)	288.368	1142.743
	DY/HR	9/20	13/ 8
	ONE YEAR	1950.369	957.566
	USE/PEAK	515.354	1204.209

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
REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

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.

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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 #2 DDC CONTROL 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  (1,24) (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
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                    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
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                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
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                    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
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR OLD_SYSTEM TOPEKA, KS

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-81.214	15	7	-7.F	-8.F	-332.252	25782.	45.178
FEB	0.00000					0.000	-52.159	3	7	-5.F	-6.F	-299.281	23218.	45.178
MAR	0.00000					0.000	-29.387	3	7	14.F	12.F	-216.966	25857.	45.178
APR	0.00000					0.000	-2.730	5	7	30.F	27.F	-68.780	25125.	45.178
MAY	49.92852	16	2	62.F	59.F	460.111	-0.607	1	2	44.F	41.F	-13.237	25601.	45.178
JUN	118.02316	24	20	83.F	74.F	350.095	0.000					0.000	25020.	45.178
JUL	153.15526	17	19	88.F	80.F	410.541	0.000					0.000	25707.	45.178
AUG	148.44141	20	20	90.F	75.F	379.570	0.000					0.000	25857.	45.178
SEP	82.61338	5	18	90.F	77.F	345.086	0.000					0.000	24945.	45.178
OCT	2.16902	1	18	83.F	68.F	210.400	-1.689	20	8	23.F	22.F	-49.519	25654.	45.178
NOV	0.00000					0.000	-19.224	3	6	13.F	12.F	-204.167	24711.	45.178
DEC	0.00000					0.000	-65.118	13	7	2.F	1.F	-278.203	25835.	45.178
TOTAL	554.332						-252.125						303316.	
MAX						460.111						-332.252		45.178

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
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR OLD_SYSTEM TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	-35.582	42.228
FEB	0	672	0	0	672	0	672	0	0	0	-32.947	42.228
MAR	0	744	0	0	744	0	744	0	0	0	-33.921	42.228
APR	0	720	0	0	720	0	720	0	0	0	-4.213	42.883
MAY	370	360	0	14	360	384	744	0	0	14	0.000	17.440
JUN	710	0	0	10	0	720	720	0	0	10	0.000	45.178
JUL	744	0	0	0	0	744	744	0	0	0	0.000	44.359
AUG	743	0	0	1	0	744	744	0	0	1	0.000	45.178
SEP	588	0	0	132	0	720	720	0	0	132	0.000	44.359
OCT	15	720	0	9	720	24	744	0	0	9	0.000	44.359
NOV	0	720	0	0	720	0	720	0	0	0	-72.568	42.228
DEC	0	744	0	0	744	0	744	0	0	0	-66.344	43.539
ANNUAL	3170	5424	0	166	5424	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
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR NEW_SYSTEM TOPEKA, KS

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-85.047	15	7	-7.F	-8.F	-302.872	17379.	29.532
FEB	0.00000					0.000	-59.698	3	7	-5.F	-6.F	-277.525	15644.	29.532
MAR	0.00000					0.000	-39.295	3	7	14.F	12.F	-207.116	17454.	29.532
APR	0.00000					0.000	-5.702	5	7	30.F	27.F	-129.535	16941.	29.532
MAY	34.77984	31	18	90.F	76.F	274.922	-0.416	1	2	44.F	41.F	-8.718	17249.	29.532
JUN	90.68785	24	20	83.F	74.F	287.995	0.000					0.000	16885.	29.532
JUL	121.60986	17	18	88.F	80.F	337.082	0.000					0.000	17305.	29.532
AUG	119.48048	20	20	90.F	75.F	309.695	0.000					0.000	17454.	29.532
SEP	64.65318	5	18	90.F	77.F	306.608	0.000					0.000	16810.	29.532
OCT	1.72889	1	18	83.F	68.F	191.668	-2.469	20	7	23.F	23.F	-104.847	17277.	29.532
NOV	0.00000					0.000	-25.618	3	6	13.F	12.F	-194.825	16652.	29.532
DEC	0.00000					0.000	-69.916	13	7	2.F	1.F	-254.954	17407.	29.532
TOTAL	432.940						-288.160						204455.	
MAX						337.082						-302.872		29.532

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
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR NEW_SYSTEM TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	-55.393	29.532
FEB	0	671	0	1	672	0	672	0	0	1	-53.229	29.532
MAR	0	690	0	54	744	0	744	0	0	54	-60.482	29.532
APR	0	428	0	292	720	0	720	0	0	292	-2.964	29.532
MAY	331	177	0	236	360	384	744	0	0	236	0.000	29.532
JUN	684	0	0	36	0	720	720	0	0	36	0.000	29.532
JUL	741	0	0	3	0	744	744	0	0	3	0.000	29.532
AUG	738	0	0	6	0	744	744	0	0	6	0.000	29.532
SEP	623	0	0	97	0	720	720	0	0	97	0.000	29.532
OCT	18	422	0	304	720	24	744	0	0	304	0.000	29.532
NOV	0	602	0	118	720	0	720	0	0	118	-86.916	29.532
DEC	0	744	0	0	744	0	744	0	0	0	-81.059	29.532
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
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR UNIT-HEATR TOPEKA, KS

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-19.801	15	7	-7.F	-8.F	-68.725	1384.	2.823
FEB	0.00000					0.000	-13.271	3	7	-5.F	-6.F	-58.491	1235.	2.807
MAR	0.00000					0.000	-7.753	4	7	14.F	12.F	-38.918	1375.	2.773
APR	0.00000					0.000	-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	-0.404	20	8	23.F	22.F	-17.871	1337.	2.745
NOV	0.00000					0.000	-6.088	3	7	19.F	17.F	-34.461	1294.	2.769
DEC	0.00000					0.000	-16.079	15	7	11.F	9.F	-59.484	1382.	2.804
TOTAL	0.000						-64.113						15995.	
MAX						0.000						-68.725		2.823

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
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR UNIT-HEATR TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	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	2.717
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 8:13:58 PDL RUN 1
DENVER, CO 80227 RUN #2 DDC CONTROL FOR BLDG. 7485 BOWLING ALLEY
REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	163.102	271.749
JAN	PEAK(KBTU)	282.161	886.407
	DY/HR	15/20	15/ 7
	TOTAL(MBTU)	146.213	192.682
FEB	PEAK(KBTU)	279.751	813.937
	DY/HR	4/21	3/ 7
	TOTAL(MBTU)	159.519	123.014
MAR	PEAK(KBTU)	276.498	621.867
	DY/HR	4/11	4/ 7
	TOTAL(MBTU)	150.703	21.117
APR	PEAK(KBTU)	269.933	340.495
	DY/HR	5/ 9	5/ 7
	TOTAL(MBTU)	178.956	4.776
MAY	PEAK(KBTU)	464.890	44.500
	DY/HR	31/18	1/ 2
	TOTAL(MBTU)	214.506	0.000
JUN	PEAK(KBTU)	465.078	0.000
	DY/HR	28/18	30/ 1
	TOTAL(MBTU)	238.951	0.000
JUL	PEAK(KBTU)	504.647	0.000
	DY/HR	23/18	31/ 1
	TOTAL(MBTU)	241.447	0.000
AUG	PEAK(KBTU)	494.551	0.000
	DY/HR	21/19	31/ 1
	TOTAL(MBTU)	195.091	0.000
SEP	PEAK(KBTU)	478.460	0.000
	DY/HR	5/18	30/ 1
	TOTAL(MBTU)	154.578	13.661
OCT	PEAK(KBTU)	391.854	288.664
	DY/HR	1/18	20/ 7
	TOTAL(MBTU)	151.120	85.526
NOV	PEAK(KBTU)	275.484	592.143
	DY/HR	2/21	3/ 6
	TOTAL(MBTU)	162.683	228.001
DEC	PEAK(KBTU)	282.073	764.776
	DY/HR	9/20	13/ 7
	ONE YEAR	2156.869	940.526
	USE/PEAK	504.647	886.407

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.

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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 #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
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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
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                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_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. 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
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR OLD_SYSTEM TOPEKA, KS

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-78.270	15	8	-6.F	-7.F	-441.163	22311.	45.178
FEB	0.00000					0.000	-51.837	3	8	-2.F	-3.F	-433.768	20079.	45.178
MAR	0.00000					0.000	-34.956	3	8	15.F	12.F	-344.690	22351.	45.178
APR	0.00000					0.000	-11.451	5	8	34.F	30.F	-189.563	21812.	45.178
MAY	42.06223	31	19	84.F	76.F	369.523	-2.801	9	10	62.F	56.F	-94.896	22096.	45.178
JUN	117.46651	5	8	68.F	65.F	403.482	0.000					0.000	21636.	45.178
JUL	158.85899	17	19	88.F	80.F	451.006	0.000					0.000	22271.	45.178
AUG	153.06587	20	20	90.F	75.F	415.480	0.000					0.000	22351.	45.178
SEP	78.47227	5	18	90.F	77.F	384.726	0.000					0.000	21596.	45.178
OCT	1.72823	1	18	83.F	68.F	246.897	-5.721	2	10	64.F	53.F	-143.197	22183.	45.178
NOV	0.00000					0.000	-27.856	3	8	24.F	21.F	-310.552	21293.	45.178
DEC	0.00000					0.000	-64.397	13	8	0.F	-1.F	-420.592	22399.	45.178
TOTAL	551.654						-277.286						262392.	
MAX						451.006						-441.163		45.178

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
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR OLD_SYSTEM TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	545	0	199	744	0	545	0	0	0	-66.373	42.228
FEB	0	492	0	180	672	0	492	0	0	0	-63.889	42.228
MAR	0	543	0	201	744	0	543	0	0	0	-63.985	42.228
APR	0	530	0	190	720	0	530	0	0	0	-2.664	42.883
MAY	202	263	0	279	360	384	543	0	0	78	0.000	43.539
JUN	457	0	0	263	0	720	526	0	0	69	0.000	17.440
JUL	534	0	0	210	0	744	547	0	0	13	0.000	44.359
AUG	527	0	0	217	0	744	543	0	0	16	0.000	45.178
SEP	399	0	0	321	0	720	528	0	0	129	0.000	44.359
OCT	10	526	0	208	720	24	545	0	0	9	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
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR NEW_SYSTEM TOPEKA, KS

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELECTRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000					0.000	-81.085	15	8	-6.F	-7.F	-448.682	15210.	29.532
FEB	0.00000					0.000	-58.036	3	8	-2.F	-3.F	-447.128	13682.	29.532
MAR	0.00000					0.000	-41.151	3	8	15.F	12.F	-346.072	15263.	29.532
APR	0.00000					0.000	-11.031	5	8	34.F	30.F	-224.726	14870.	29.532
MAY	35.13863	30	20	82.F	75.F	277.398	-2.011	9	8	50.F	49.F	-101.034	15058.	29.532
JUN	94.22874	24	20	83.F	74.F	290.120	0.000					0.000	14770.	29.532
JUL	124.20753	17	18	88.F	80.F	328.197	0.000					0.000	15157.	29.532
AUG	120.34452	20	21	87.F	75.F	301.452	0.000					0.000	15263.	29.532
SEP	68.99541	5	18	90.F	77.F	296.025	0.000					0.000	14717.	29.532
OCT	1.95892	1	18	83.F	68.F	224.576	-5.883	20	8	23.F	22.F	-225.442	15108.	29.532
NOV	0.00000					0.000	-29.008	3	8	24.F	21.F	-304.499	14515.	29.532
DEC	0.00000					0.000	-67.884	13	8	0.F	-1.F	-421.684	15260.	29.532
TOTAL	444.874						-296.089						178868.	
MAX						328.197						-448.682		29.532

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
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR NEW_SYSTEM TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	545	0	199	744	0	545	0	0	0	-87.915	29.532
FEB	0	492	0	180	672	0	492	0	0	0	-94.261	29.532
MAR	0	543	0	201	744	0	543	0	0	0	-92.486	29.532
APR	0	389	0	331	720	0	530	0	0	141	-2.382	29.532
MAY	239	138	0	367	360	384	543	0	0	166	0.000	29.532
JUN	502	0	0	218	0	720	526	0	0	24	0.000	29.532
JUL	545	0	0	199	0	744	547	0	0	2	0.000	29.532
AUG	539	0	0	205	0	744	543	0	0	4	0.000	29.532
SEP	488	0	0	232	0	720	528	0	0	40	0.000	29.532
OCT	17	310	0	417	720	24	545	0	0	218	0.000	29.532
NOV	0	496	0	224	720	0	524	0	0	28	-113.084	29.532
DEC	0	547	0	197	744	0	547	0	0	0	-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
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR UNIT-HEATR TOPEKA, KS

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-19.801	15	7	-7.F	-8.F	-68.725	1384.	2.823
FEB	0.00000					0.000	-13.271	3	7	-5.F	-6.F	-58.491	1235.	2.807
MAR	0.00000					0.000	-7.753	4	7	14.F	12.F	-38.918	1375.	2.773
APR	0.00000					0.000	-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	-0.404	20	8	23.F	22.F	-17.871	1337.	2.745
NOV	0.00000					0.000	-6.088	3	7	19.F	17.F	-34.461	1294.	2.769
DEC	0.00000					0.000	-16.079	15	7	11.F	9.F	-59.484	1382.	2.804
TOTAL	0.000						-64.113						15995.	
MAX						0.000						-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
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR UNIT-HEATR TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	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	2.717
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		

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	145.192	270.125
JAN	PEAK(KBTU)	288.456	1204.209
	DY/HR	15/20	15/ 8
	TOTAL(MBTU)	129.870	195.082
FEB	PEAK(KBTU)	286.758	1186.046
	DY/HR	4/21	3/ 8
	TOTAL(MBTU)	141.531	138.500
MAR	PEAK(KBTU)	282.827	953.987
	DY/HR	13/12	3/ 8
	TOTAL(MBTU)	133.617	44.239
APR	PEAK(KBTU)	279.351	625.309
	DY/HR	5/10	5/ 8
	TOTAL(MBTU)	157.107	10.944
MAY	PEAK(KBTU)	476.609	270.853
	DY/HR	31/18	9/ 8
	TOTAL(MBTU)	195.620	0.000
JUN	PEAK(KBTU)	477.145	0.000
	DY/HR	28/18	30/ 1
	TOTAL(MBTU)	220.077	0.000
JUL	PEAK(KBTU)	515.352	0.000
	DY/HR	23/18	31/ 1
	TOTAL(MBTU)	222.174	0.000
AUG	PEAK(KBTU)	505.507	0.000
	DY/HR	21/19	31/ 1
	TOTAL(MBTU)	175.620	0.000
SEP	PEAK(KBTU)	488.083	0.000
	DY/HR	5/18	30/ 1
	TOTAL(MBTU)	135.951	25.844
OCT	PEAK(KBTU)	407.461	549.663
	DY/HR	1/18	20/ 8
	TOTAL(MBTU)	133.702	107.074
NOV	PEAK(KBTU)	282.740	872.909
	DY/HR	12/11	3/ 8
	TOTAL(MBTU)	144.831	230.181
DEC	PEAK(KBTU)	288.368	1142.743
	DY/HR	9/20	13/ 8
	ONE YEAR	1935.292	1021.989
	USE/PEAK	515.352	1204.209

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
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 $
                $----------------------------------------$

                   $ 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 ..
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
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```
                        (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 #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
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR OLD_SYSTEM TOPEKA, KS

	COOLING						HEATING						ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELECTRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000					0.000	-94.335	15	8	-6.F	-7.F	-411.901	25782.	45.178
FEB	0.00000					0.000	-62.096	3	8	-2.F	-3.F	-376.250	23218.	45.178
MAR	0.00000					0.000	-36.295	3	8	15.F	12.F	-279.901	25857.	45.178
APR	0.00000					0.000	-4.005	1	2	34.F	30.F	-116.423	25125.	45.178
MAY	63.06487	16	2	62.F	59.F	543.093	-0.610	1	8	45.F	42.F	-26.868	25601.	45.178
JUN	142.92651	24	20	83.F	74.F	408.123	0.000					0.000	25020.	45.178
JUL	180.65172	17	19	88.F	80.F	489.570	0.000					0.000	25707.	45.178
AUG	175.30405	20	20	90.F	75.F	437.937	0.000					0.000	25857.	45.178
SEP	103.13426	5	18	90.F	77.F	413.602	0.000					0.000	24945.	45.178
OCT	2.96771	1	18	83.F	68.F	265.200	-2.509	20	9	29.F	29.F	-82.495	25654.	45.178
NOV	0.00000					0.000	-25.384	3	8	24.F	21.F	-237.279	24711.	45.178
DEC	0.00000					0.000	-77.537	13	8	0.F	-1.F	-358.219	25835.	45.178
TOTAL	668.049						-302.769						303316.	
MAX						543.093						-411.901		45.178

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 OLD_SYSTEM TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	-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	744	0	0	0	0.000	17.440
JUN	719	0	0	1	0	720	720	0	0	1	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	0	77	0.000	44.359
OCT	21	720	0	3	720	24	744	0	0	3	0.000	44.359
NOV	0	720	0	0	720	0	720	0	0	0	-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

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-78.147	15	8	-6.F	-7.F	-302.202	17379.	29.532
FEB	0.00000					0.000	-54.905	3	8	-2.F	-3.F	-279.253	15644.	29.532
MAR	0.00000					0.000	-35.519	3	8	15.F	12.F	-212.495	17454.	29.532
APR	0.00000					0.000	-5.084	5	8	34.F	30.F	-129.209	16941.	29.532
MAY	45.54992	16	2	62.F	59.F	299.076	-0.389	1	8	45.F	42.F	-13.178	17249.	29.532
JUN	106.77282	24	20	83.F	74.F	290.722	0.000					0.000	16885.	29.532
JUL	134.64278	17	18	88.F	80.F	327.131	0.000					0.000	17305.	29.532
AUG	132.73920	20	21	87.F	75.F	300.395	0.000					0.000	17454.	29.532
SEP	81.98801	5	18	90.F	77.F	296.428	0.000					0.000	16810.	29.532
OCT	2.49712	1	18	83.F	68.F	232.115	-2.438	20	9	29.F	29.F	-71.204	17277.	29.532
NOV	0.00000					0.000	-22.886	3	8	24.F	21.F	-180.081	16652.	29.532
DEC	0.00000					0.000	-64.603	13	8	0.F	-1.F	-261.167	17407.	29.532
TOTAL	504.190						-263.970						204455.	
MAX						327.131						-302.202		29.532

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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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	-80.375	29.532
FEB	0	672	0	0	672	0	672	0	0	0	-81.733	29.532
MAR	0	733	0	11	744	0	744	0	0	11	-85.166	29.532
APR	0	470	0	250	720	0	720	0	0	250	-3.167	29.532
MAY	381	183	0	180	360	384	744	0	0	180	0.000	10.900
JUN	718	0	0	2	0	720	720	0	0	2	0.000	29.532
JUL	744	0	0	0	0	744	744	0	0	0	0.000	29.532
AUG	744	0	0	0	0	744	744	0	0	0	0.000	29.532
SEP	705	0	0	15	0	720	720	0	0	15	0.000	29.532
OCT	21	438	0	285	720	24	744	0	0	285	0.000	29.532
NOV	0	632	0	88	720	0	720	0	0	88	-109.374	29.532
DEC	0	744	0	0	744	0	744	0	0	0	-102.670	29.532
ANNUAL	3313	4616	0	831	5424	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

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-19.801	15	7	-7.F	-8.F	-68.725	1384.	2.823
FEB	0.00000					0.000	-13.271	3	7	-5.F	-6.F	-58.491	1235.	2.807
MAR	0.00000					0.000	-7.753	4	7	14.F	12.F	-38.918	1375.	2.773
APR	0.00000					0.000	-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	-0.404	20	8	23.F	22.F	-17.871	1337.	2.745
NOV	0.00000					0.000	-6.088	3	7	19.F	17.F	-34.461	1294.	2.769
DEC	0.00000					0.000	-16.079	15	7	11.F	9.F	-59.484	1382.	2.804
TOTAL	0.000						-64.113						15995.	
MAX						0.000						-68.725		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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	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	2.717
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: 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-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	164.447	286.002
JAN	PEAK(KBTU)	284.072	982.884
	DY/HR	15/20	15/ 8
	TOTAL(MBTU)	147.409	204.818
FEB	PEAK(KBTU)	283.942	912.175
	DY/HR	4/20	3/ 8
	TOTAL(MBTU)	160.300	130.520
MAR	PEAK(KBTU)	283.894	706.301
	DY/HR	5/22	3/ 8
	TOTAL(MBTU)	150.950	22.866
APR	PEAK(KBTU)	275.416	383.127
	DY/HR	1/ 1	5/ 8
	TOTAL(MBTU)	186.215	5.074
MAY	PEAK(KBTU)	489.249	75.002
	DY/HR	31/18	1/ 8
	TOTAL(MBTU)	227.119	0.000
JUN	PEAK(KBTU)	488.467	0.000
	DY/HR	28/18	30/ 1
	TOTAL(MBTU)	251.023	0.000
JUL	PEAK(KBTU)	532.616	0.000
	DY/HR	23/18	31/ 1
	TOTAL(MBTU)	254.099	0.000
AUG	PEAK(KBTU)	517.022	0.000
	DY/HR	21/19	31/ 1
	TOTAL(MBTU)	207.148	0.000
SEP	PEAK(KBTU)	501.212	0.000
	DY/HR	5/18	30/ 1
	TOTAL(MBTU)	155.326	15.627
OCT	PEAK(KBTU)	416.984	288.338
	DY/HR	1/18	20/ 9
	TOTAL(MBTU)	151.821	92.914
NOV	PEAK(KBTU)	278.356	624.646
	DY/HR	12/11	3/ 8
	TOTAL(MBTU)	163.781	241.896
DEC	PEAK(KBTU)	283.984	870.975
	DY/HR	9/20	13/ 8
	ONE YEAR	2219.639	999.717
	USE/PEAK	532.616	982.884

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
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 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.

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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 #5 DAY INFILTRATION 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) ..
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
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                        (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.
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                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
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                    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)
 ..
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```
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
```

REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR OLD_SYSTEM TOPEKA, KS

	COOLING						HEATING						ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-44.644	15	7	-7.F	-8.F	-397.178	25782.	45.178
FEB	0.00000					0.000	-28.158	3	7	-5.F	-6.F	-370.632	23218.	45.178
MAR	0.00000					0.000	-15.745	3	7	14.F	12.F	-254.469	25857.	45.178
APR	0.00000					0.000	-2.564	5	7	30.F	27.F	-66.765	25125.	45.178
MAY	61.04487	16	2	62.F	59.F	517.730	-1.072	1	2	44.F	41.F	-40.685	25601.	45.178
JUN	120.07435	24	20	83.F	74.F	305.924	0.000					0.000	25020.	45.178
JUL	143.32259	23	20	91.F	77.F	335.232	0.000					0.000	25707.	45.178
AUG	141.40668	12	20	92.F	72.F	324.988	0.000					0.000	25857.	45.178
SEP	101.57951	3	20	79.F	71.F	312.755	0.000					0.000	24945.	45.178
OCT	2.98430	1	20	70.F	64.F	255.736	-2.111	19	1	29.F	27.F	-45.173	25654.	45.178
NOV	0.00000					0.000	-8.982	3	6	13.F	12.F	-185.575	24711.	45.178
DEC	0.00000					0.000	-34.314	13	7	2.F	1.F	-348.819	25835.	45.178
TOTAL	570.413						-137.590						303316.	
MAX						517.730						-397.178		45.178

REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR OLD_SYSTEM TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	-2.748	42.228
FEB	0	672	0	0	672	0	672	0	0	0	-0.785	42.228
MAR	0	744	0	0	744	0	744	0	0	0	-0.609	42.228
APR	0	720	0	0	720	0	720	0	0	0	-1.412	42.883
MAY	372	360	0	12	360	384	744	0	0	12	0.000	17.440
JUN	711	0	0	9	0	720	720	0	0	9	0.000	45.178
JUL	744	0	0	0	0	744	744	0	0	0	0.000	45.178
AUG	742	0	0	2	0	744	744	0	0	2	0.000	45.178
SEP	644	0	0	76	0	720	720	0	0	76	0.000	45.178
OCT	19	720	0	5	720	24	744	0	0	5	0.000	45.178
NOV	0	720	0	0	720	0	720	0	0	0	-5.430	42.228
DEC	0	744	0	0	744	0	744	0	0	0	-10.937	43.539
ANNUAL	3232	5424	0	104	5424	3336	8760	0	0	104		

H19-70

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 NEW_SYSTEM TOPEKA, KS

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-45.354	15	7	-7.F	-8.F	-324.596	17379.	29.532
FEB	0.00000					0.000	-31.798	3	7	-5.F	-6.F	-296.073	15644.	29.532
MAR	0.00000					0.000	-20.370	3	7	14.F	12.F	-218.460	17454.	29.532
APR	0.00000					0.000	-2.954	5	7	30.F	27.F	-103.806	16941.	29.532
MAY	43.19068	16	2	62.F	59.F	272.124	-0.596	1	2	44.F	41.F	-20.937	17249.	29.532
JUN	90.50021	24	20	83.F	74.F	236.311	0.000					0.000	16885.	29.532
JUL	109.73031	23	20	91.F	77.F	244.324	0.000					0.000	17305.	29.532
AUG	110.16496	20	20	90.F	75.F	242.961	0.000					0.000	17454.	29.532
SEP	79.23198	3	20	79.F	71.F	239.772	0.000					0.000	16810.	29.532
OCT	2.39482	1	20	70.F	64.F	207.116	-1.585	2	6	53.F	51.F	-39.134	17277.	29.532
NOV	0.00000					0.000	-11.283	3	6	13.F	12.F	-183.299	16652.	29.532
DEC	0.00000					0.000	-35.769	13	7	2.F	1.F	-276.104	17407.	29.532
TOTAL	435.213						-149.709						204455.	
MAX						272.124						-324.596		29.532

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 NEW_SYSTEM TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	734	0	10	744	0	744	0	0	10	-6.431	29.532
FEB	0	653	0	19	672	0	672	0	0	19	-6.965	29.532
MAR	0	575	0	169	744	0	744	0	0	169	-8.236	29.532
APR	0	320	0	400	720	0	720	0	0	400	-1.561	29.532
MAY	362	145	0	237	360	384	744	0	0	237	0.000	10.900
JUN	705	0	0	15	0	720	720	0	0	15	0.000	29.532
JUL	744	0	0	0	0	744	744	0	0	0	0.000	29.532
AUG	742	0	0	2	0	744	744	0	0	2	0.000	29.532
SEP	655	0	0	65	0	720	720	0	0	65	0.000	29.532
OCT	19	296	0	429	720	24	744	0	0	429	0.000	29.532
NOV	0	481	0	239	720	0	720	0	0	239	-14.861	29.532
DEC	0	700	0	44	744	0	744	0	0	44	-21.003	29.532
ANNUAL	3227	3904	0	1629	5424	3336	8760	0	0	1629		

REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR UNIT-HEATR TOPEKA, KS

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-19.801	15	7	-7.F	-8.F	-68.725	1384.	2.823
FEB	0.00000					0.000	-13.271	3	7	-5.F	-6.F	-58.491	1235.	2.807
MAR	0.00000					0.000	-7.753	4	7	14.F	12.F	-38.918	1375.	2.773
APR	0.00000					0.000	-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	-0.404	20	8	23.F	22.F	-17.871	1337.	2.745
NOV	0.00000					0.000	-6.088	3	7	19.F	17.F	-34.461	1294.	2.769
DEC	0.00000					0.000	-16.079	15	7	11.F	9.F	-59.484	1382.	2.804
TOTAL	0.000						-64.113						15995.	
MAX						0.000						-68.725		2.823

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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	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	2.717
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		

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	160.733	169.971
JAN	PEAK(KBTU)	279.628	995.532
	DY/HR	14/22	15/ 7
	TOTAL(MBTU)	143.578	117.641
FEB	PEAK(KBTU)	275.443	926.592
	DY/HR	3/ 9	3/ 7
	TOTAL(MBTU)	157.708	74.958
MAR	PEAK(KBTU)	269.597	685.938
	DY/HR	3/ 9	3/ 7
	TOTAL(MBTU)	150.669	17.163
APR	PEAK(KBTU)	267.094	315.155
	DY/HR	1/20	5/ 7
	TOTAL(MBTU)	184.615	6.212
MAY	PEAK(KBTU)	452.387	110.384
	DY/HR	16/18	1/ 2
	TOTAL(MBTU)	215.288	0.000
JUN	PEAK(KBTU)	448.644	0.000
	DY/HR	24/20	30/ 1
	TOTAL(MBTU)	232.839	0.000
JUL	PEAK(KBTU)	473.041	0.000
	DY/HR	23/20	31/ 1
	TOTAL(MBTU)	235.991	0.000
AUG	PEAK(KBTU)	471.441	0.000
	DY/HR	12/20	31/ 1
	TOTAL(MBTU)	204.432	0.000
SEP	PEAK(KBTU)	443.494	0.000
	DY/HR	3/20	30/ 1
	TOTAL(MBTU)	155.155	13.673
OCT	PEAK(KBTU)	398.731	131.480
	DY/HR	1/18	19/ 1
	TOTAL(MBTU)	149.714	48.948
NOV	PEAK(KBTU)	268.129	570.489
	DY/HR	12/20	3/ 6
	TOTAL(MBTU)	159.970	137.232
DEC	PEAK(KBTU)	275.433	879.601
	DY/HR	15/ 9	13/ 7
	ONE YEAR	2150.691	585.798
	USE/PEAK	473.041	995.532

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
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 SIMUILATIONS

BLDG. 7866
THEATER BUILDINGS

ENGINEERS, INC.

DENVER - ATLANTA

PROJECT:	FEASIBILITY STUDY FOR INSTALLATION OF UMCS	EMC NO:	1406-001
		CALC. BY:	AJN
LOCATION:	FORT RILEY, KANSAS	CHECKED BY:	CEL
		DATE:	05-Jul-95
BUILDING NO.:	7866		
BLDG. TYPE:	THEATER		

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^2
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	NIGHTIME INFILTRATION (OA)
RUN5	DAYTIME INFILTRATION (OA)

HOURS OF OCCUPANCY				
TH-F	1700	2400	14	HR
SAT.	1700	2400	7	HR
SUN.	1700	2400	7	HR
	TOTAL OCCUPY HR.		28	HR/WK
	TOTAL UNOCC. HR.		140	HR/WK
	ANNUAL OCCUPY HR.		1460	HR/YR
	ANNUAL UNOCC. HR.		7300	HR/YR

ANNUAL HEATING & COOLING HOURS	
HR. ON HEATING	908 HR/YR
HR. ON COOLING	552 HR/YR
HR. OFF HEATING	4540 HR/YR
HR. OFF COOLING	2760 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

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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.) ..
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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  ..

$ LIGHING 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  ..
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$ LIGHT/EQUIP LOAD LOBBY
L_LIT-LOBB =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& 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_PEOP-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
```

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                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
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```
                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  ..
```

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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. #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 ..
```

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 - - - - U-VALUE (BTU/HR-SQFT-F)	AREA (SQFT)	- - - - W A L L - - - - 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
	LOBBY	0.490	159.00	0.236	878.00	0.275	1037.00	NORTH
	PROJ-ROOM	0.000	0.00	0.236	407.00	0.236	407.00	NORTH
	LOBBY	0.000	0.00	0.236	612.00	0.236	612.00	EAST
	PROJ-ROOM	0.000	0.00	0.236	176.00	0.236	176.00	EAST
	THEATER	0.000	0.00	0.220	2256.00	0.220	2256.00	EAST
	THEATER	0.000	0.00	0.220	1464.00	0.220	1464.00	SOUTH
	PROJ-ROOM	0.000	0.00	0.236	176.00	0.236	176.00	WEST
	THEATER	0.000	0.00	0.220	2256.00	0.220	2256.00	WEST
	LOBBY	0.000	0.00	0.236	612.00	0.236	612.00	WEST
	LOBBY	0.000	0.00	0.127	2196.00	0.127	2196.00	ROOF
	THEATER	0.000	0.00	0.127	5734.00	0.127	5734.00	ROOF
	PROJ-ROOM	0.000	0.00	0.127	592.00	0.127	592.00	ROOF
	THEATER	0.000	0.00	0.020	5734.00	0.020	5734.00	UNDERGRND
	LOBBY	0.000	0.00	0.020	2196.00	0.020	2196.00	UNDERGRND
	PROJ-ROOM	0.000	0.00	0.020	592.00	0.020	592.00	UNDERGRND

EMC ENGINEERS INC. EZDOE - 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

	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	0.490	0.236	0.264	159.00	1285.00	1444.00
EAST	0.000	0.224	0.224	0.00	3044.00	3044.00
SOUTH	0.000	0.220	0.220	0.00	1464.00	1464.00
WEST	0.000	0.224	0.224	0.00	3044.00	3044.00
ROOF	0.000	0.127	0.127	0.00	8522.00	8522.00
ALL WALLS	0.490	0.225	0.230	159.00	8837.00	8996.00
WALLS+ROOFS	0.490	0.177	0.180	159.00	17359.00	17518.00
UNDERGRND	0.000	0.020	0.020	0.00	8522.00	8522.00
BUILDING	0.490	0.125	0.128	159.00	25881.00	26040.00

*** BUILDING ***

FLOOR AREA 8449 SQFT 785 SQMT
VOLUME 184793 CUFT 5233 CUMT

	COOLING LOAD				HEATING LOAD	
TIME	JUL 23 9PM				JAN 15 9AM	
DRY-BULB TEMP	88F 31C				-5F -21C	
WET-BULB TEMP	76F 24C				-6F -21C	
	SENSIBLE		LATENT		SENSIBLE	
	(KBTU/H)	(KW)	(KBTU/H)	(KW)	(KBTU/H)	(KW)
WALLS	39.051	11.437	0.000	0.000	-149.588	-43.810
ROOFS	32.522	9.525	0.000	0.000	-90.887	-26.618
GLASS CONDUCTION	1.057	0.309	0.000	0.000	-6.114	-1.791
GLASS SOLAR	3.176	0.930	0.000	0.000	0.320	0.094
DOOR	0.533	0.156	0.000	0.000	-2.455	-0.719
INTERNAL SURFACES	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
OCCUPANTS TO SPACE	67.929	19.895	46.978	13.759	4.888	1.432
LIGHT TO SPACE	26.464	7.751	0.000	0.000	4.249	1.244
EQUIPMENT TO SPACE	20.221	5.922	0.000	0.000	1.772	0.519
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	189.421	55.477	46.978	13.759	-242.708	-71.083
TOTAL LOAD	236.399 KBTU/H		69.235 KW		-242.708 KBTU/H	-71.083 KW
TOTAL LOAD / AREA	27.98BTU/H.SQFT		88.205 W /SQMT		28.726BTU/H.SQFT	90.559 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 5/19/1995 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

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-161.166	15	7	-7.F	-8.F	-412.923	10128.	29.492
FEB	0.00000					0.000	-121.051	3	7	-5.F	-6.F	-380.777	9218.	29.492
MAR	0.00000					0.000	-98.088	3	8	15.F	12.F	-285.406	10032.	29.492
APR	0.00000					0.000	-29.829	5	7	30.F	27.F	-197.893	9856.	29.492
MAY	29.41631	30	21	80.F	74.F	295.406	-6.597	5	7	44.F	40.F	-118.576	10128.	29.492
JUN	86.51686	19	19	86.F	75.F	324.987	0.000					0.000	9761.	29.492
JUL	123.17043	17	19	88.F	80.F	405.203	0.000					0.000	10318.	29.492
AUG	115.33618	21	19	95.F	76.F	363.155	0.000					0.000	9937.	29.492
SEP	51.45018	5	19	87.F	76.F	322.658	0.000					0.000	9951.	29.492
OCT	0.65577	1	19	81.F	66.F	115.723	-26.120	20	8	23.F	22.F	-226.713	10223.	29.492
NOV	0.00000					0.000	-79.999	3	6	13.F	12.F	-288.265	9666.	29.492
DEC	0.00000					0.000	-142.480	13	8	0.F	-1.F	-368.429	10318.	29.492
TOTAL	406.545						-665.331						119543.	
MAX						405.203						-412.923		29.492

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT 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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	-186.288	11.310
FEB	0	672	0	0	672	0	672	0	0	0	-191.095	11.310
MAR	0	717	0	27	744	0	744	0	0	27	-76.927	29.492
APR	0	566	0	154	720	0	720	0	0	154	-20.192	11.310
MAY	314	232	0	198	360	314	744	0	0	198	0.000	23.505
JUN	676	0	0	44	0	676	720	0	0	44	0.000	23.505
JUL	744	0	0	0	0	744	744	0	0	0	0.000	23.505
AUG	735	0	0	9	0	735	744	0	0	9	0.000	23.505
SEP	474	0	0	246	0	474	720	0	0	246	0.000	23.505
OCT	7	538	0	199	720	7	744	0	0	199	0.000	23.505
NOV	0	689	0	31	720	0	720	0	0	31	-224.668	11.310
DEC	0	744	0	0	744	0	744	0	0	0	-127.474	29.492
ANNUAL	2950	4902	0	908	5424	2950	8760	0	0	908		

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT 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-2 TOPEKA, KS

	COOLING						HEATING						ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC-TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.01382	22	24	40.F	38.F	2.332	-14.732	15	1	-6.F	-7.F	-34.136	1890.	7.278
FEB	0.08504	26	18	52.F	41.F	5.909	-11.118	2	23	1.F	0.F	-31.827	1742.	7.278
MAR	0.61859	24	18	65.F	64.F	13.352	-9.280	3	7	14.F	12.F	-29.962	1843.	7.278
APR	2.09687	28	19	71.F	68.F	24.843	-2.951	5	7	30.F	27.F	-20.561	1857.	7.278
MAY	5.56339	30	23	78.F	74.F	37.665	-0.846	5	7	44.F	40.F	-12.274	1890.	7.278
JUN	10.54200	19	20	84.F	75.F	39.408	-0.066	2	7	50.F	49.F	-6.846	1810.	7.278
JUL	14.54958	17	19	88.F	80.F	47.173	0.000					0.000	1984.	7.278
AUG	13.45136	21	20	92.F	76.F	42.542	-0.013	4	7	54.F	53.F	-3.031	1796.	7.278
SEP	7.26632	5	18	90.F	77.F	39.197	-0.721	11	7	40.F	40.F	-9.519	1904.	7.278
OCT	2.63453	1	18	83.F	68.F	25.368	-2.787	20	8	23.F	22.F	-24.282	1937.	7.278
NOV	0.47483	6	24	59.F	55.F	13.274	-7.365	3	6	13.F	12.F	-30.542	1763.	7.278
DEC	0.12957	3	23	49.F	42.F	6.530	-13.002	13	6	2.F	1.F	-31.360	1984.	7.278
TOTAL	57.426						-62.881						22402.	
MAX						47.173						-34.136		7.278

H20-16

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT 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-2 TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 CYCLE ON	HOURS NIGHT VENTING	HOURS FLOATING WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)
JAN	16	728	0	0	744	744	744	0	0	0	0.000	7.278
FEB	30	642	0	0	672	672	672	0	0	0	0.000	7.278
MAR	92	652	0	0	744	744	744	0	0	0	0.000	7.278
APR	279	441	0	0	720	720	720	0	0	0	0.000	7.278
MAY	529	215	0	0	744	744	744	0	0	0	0.000	7.278
JUN	689	31	0	0	720	720	720	0	0	0	0.000	7.278
JUL	744	0	0	0	744	744	744	0	0	0	0.000	7.278
AUG	735	9	0	0	744	744	744	0	0	0	0.000	7.278
SEP	555	165	0	0	720	720	720	0	0	0	0.000	7.278
OCT	301	443	0	0	744	744	744	0	0	0	0.000	7.278
NOV	109	611	0	0	720	720	720	0	0	0	0.000	7.278
DEC	54	690	0	0	744	744	744	0	0	0	0.000	7.278
ANNUAL	4133	4627	0	0	8760	8760	8760	0	0	0		

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	48.858	245.745
JAN	PEAK(KBTU)	139.928	559.939
	DY/HR	8/17	15/ 7
	TOTAL(MBTU)	44.462	191.132
FEB	PEAK(KBTU)	139.399	526.553
	DY/HR	20/17	3/ 7
	TOTAL(MBTU)	47.949	161.473
MAR	PEAK(KBTU)	138.892	421.329
	DY/HR	24/17	3/ 8
	TOTAL(MBTU)	45.330	54.826
APR	PEAK(KBTU)	140.738	312.255
	DY/HR	28/17	5/ 7
	TOTAL(MBTU)	58.767	13.913
MAY	PEAK(KBTU)	229.335	210.030
	DY/HR	30/24	5/ 7
	TOTAL(MBTU)	80.733	0.302
JUN	PEAK(KBTU)	235.404	17.435
	DY/HR	19/17	2/ 7
	TOTAL(MBTU)	97.641	0.000
JUL	PEAK(KBTU)	265.514	0.000
	DY/HR	23/17	31/ 1
	TOTAL(MBTU)	94.553	0.078
AUG	PEAK(KBTU)	255.682	11.201
	DY/HR	21/17	4/ 7
	TOTAL(MBTU)	67.166	2.209
SEP	PEAK(KBTU)	238.327	21.804
	DY/HR	5/17	11/ 7
	TOTAL(MBTU)	47.328	49.255
OCT	PEAK(KBTU)	180.544	349.363
	DY/HR	1/24	20/ 8
	TOTAL(MBTU)	45.561	133.408
NOV	PEAK(KBTU)	139.746	425.181
	DY/HR	5/17	3/ 6
	TOTAL(MBTU)	49.849	221.470
DEC	PEAK(KBTU)	140.416	513.028
	DY/HR	16/17	13/ 8
	ONE YEAR	728.196	1073.813
	USE/PEAK	265.514	559.939

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.

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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 #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
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                          (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
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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  ..

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)  ..
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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
                      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 $
                $-------------------------------------$

                   $ 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                      * ..
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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

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-68.261	14	18	-1.F	-2.F	-421.309	8239.	29.492
FEB	0.00000					0.000	-46.591	3	18	21.F	18.F	-387.485	7589.	29.492
MAR	0.00000					0.000	-29.776	3	18	28.F	23.F	-352.398	8506.	29.492
APR	0.00000					0.000	-4.338	14	17	51.F	42.F	-194.999	8556.	29.492
MAY	16.35864	22	19	77.F	70.F	312.888	-0.421	5	17	65.F	52.F	-81.935	8883.	29.492
JUN	40.97293	30	17	88.F	73.F	401.125	0.000					0.000	8494.	29.492
JUL	58.98399	17	19	88.F	80.F	438.144	0.000					0.000	8870.	29.492
AUG	50.94439	11	17	98.F	71.F	415.223	0.000					0.000	8478.	29.492
SEP	29.03647	8	17	89.F	72.F	383.721	0.000					0.000	8572.	29.492
OCT	0.78622	1	19	81.F	66.F	128.539	-3.645	20	17	52.F	43.F	-281.855	8888.	29.492
NOV	0.00000					0.000	-22.794	3	18	44.F	35.F	-302.685	8162.	29.492
DEC	0.00000					0.000	-61.287	8	18	14.F	11.F	-385.112	8452.	29.492
TOTAL	197.083						-237.112						101693.	
MAX						438.144						-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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	540	0	204	744	0	577	433	0	37	0.000	0.000
FEB	0	483	0	189	672	0	528	392	0	45	-45.170	11.310
MAR	0	487	0	257	744	0	609	473	0	122	-142.147	29.492
APR	0	301	0	419	720	0	605	461	0	304	0.000	0.000
MAY	80	130	0	534	360	137	634	490	0	424	0.000	23.505
JUN	218	0	0	502	0	330	608	472	0	390	0.000	29.492
JUL	266	0	0	478	0	394	616	456	0	350	0.000	23.505
AUG	291	0	0	453	0	420	615	487	0	324	0.000	29.492
SEP	165	0	0	555	0	287	598	446	0	433	0.000	29.492
OCT	7	339	0	398	720	13	626	474	0	280	0.000	23.505
NOV	0	424	0	296	720	0	587	459	0	163	0.000	0.000
DEC	0	536	0	208	744	0	579	419	0	43	-175.869	29.492
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

	COOLING						HEATING						ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELECTRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.25016	24	1	36.F	35.F	12.954	-4.731	14	21	-3.F	-4.F	-29.260	1447.	7.278
FEB	0.28104	14	1	32.F	31.F	13.599	-2.929	3	10	10.F	8.F	-28.379	1325.	7.278
MAR	1.14126	28	1	46.F	42.F	17.928	-1.781	3	18	28.F	23.F	-25.095	1439.	7.278
APR	4.85503	29	7	62.F	61.F	22.679	-0.163	14	17	51.F	42.F	-12.316	1635.	7.278
MAY	5.74571	30	18	86.F	75.F	39.398	-0.833	19	7	50.F	49.F	-14.404	1539.	7.278
JUN	4.99110	30	18	86.F	73.F	44.615	-0.760	11	7	58.F	56.F	-15.704	1320.	7.278
JUL	6.69658	17	18	88.F	80.F	50.459	-0.379	29	7	59.F	58.F	-11.214	1485.	7.278
AUG	5.65014	21	17	95.F	77.F	46.942	-0.372	26	7	65.F	63.F	-10.626	1288.	7.278
SEP	4.28277	5	18	90.F	77.F	42.858	-1.685	11	8	43.F	42.F	-22.138	1423.	7.278
OCT	5.69723	1	18	83.F	68.F	29.233	-0.265	1	8	47.F	45.F	-23.422	1711.	7.278
NOV	1.96935	7	1	59.F	56.F	21.626	-1.414	3	8	24.F	21.F	-20.018	1407.	7.278
DEC	0.43146	19	1	42.F	37.F	16.357	-3.941	8	20	14.F	11.F	-27.080	1556.	7.278
TOTAL	41.992						-19.253						17576.	
MAX						50.459						-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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 CYCLE ON	HOURS NIGHT VENTING	HOURS FLOATING WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)
JAN	80	348	0	316	744	744	428	284	0	0	0.000	1.404
FEB	78	297	0	297	672	672	375	239	0	0	0.000	1.404
MAR	213	242	0	289	744	744	456	320	0	1	0.000	1.404
APR	513	49	0	158	720	720	562	418	0	0	0.000	1.404
MAY	368	126	0	250	744	744	494	350	0	0	0.000	7.278
JUN	213	158	0	349	720	720	371	235	0	0	0.000	7.278
JUL	260	128	0	356	744	744	388	228	0	0	0.000	7.278
AUG	274	108	0	362	744	744	382	254	0	0	0.000	7.278
SEP	179	199	0	342	720	720	378	226	0	0	0.000	7.278
OCT	540	43	0	161	744	744	583	431	0	0	0.000	7.278
NOV	281	186	0	253	720	720	467	339	0	0	0.000	1.404
DEC	107	332	0	305	744	744	439	279	0	0	0.000	1.404
ANNUAL	3106	2216	0	3438	8760	8760	5323	3603	0	1		

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- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	37.627	106.720
JAN	PEAK(KBTU)	136.184	564.963
	DY/HR	30/24	14/18
	TOTAL(MBTU)	34.241	75.502
FEB	PEAK(KBTU)	136.696	528.309
	DY/HR	26/24	3/18
	TOTAL(MBTU)	38.176	51.033
MAR	PEAK(KBTU)	139.127	489.891
	DY/HR	6/24	3/18
	TOTAL(MBTU)	40.374	9.169
APR	PEAK(KBTU)	137.726	299.988
	DY/HR	28/24	14/17
	TOTAL(MBTU)	45.896	3.644
MAY	PEAK(KBTU)	231.934	148.507
	DY/HR	30/24	5/17
	TOTAL(MBTU)	50.765	2.239
JUN	PEAK(KBTU)	270.808	31.966
	DY/HR	30/17	11/ 7
	TOTAL(MBTU)	58.651	1.426
JUL	PEAK(KBTU)	289.322	24.629
	DY/HR	23/17	29/ 7
	TOTAL(MBTU)	55.769	1.288
AUG	PEAK(KBTU)	290.235	23.668
	DY/HR	11/17	26/ 7
	TOTAL(MBTU)	47.161	4.008
SEP	PEAK(KBTU)	268.508	42.481
	DY/HR	8/17	11/ 8
	TOTAL(MBTU)	42.588	8.222
OCT	PEAK(KBTU)	187.094	398.007
	DY/HR	1/24	20/17
	TOTAL(MBTU)	37.069	39.471
NOV	PEAK(KBTU)	136.768	429.419
	DY/HR	20/24	3/18
	TOTAL(MBTU)	39.015	98.233
DEC	PEAK(KBTU)	137.210	523.764
	DY/HR	18/24	8/18
	ONE YEAR	527.331	400.954
	USE/PEAK	290.235	564.963

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.

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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 #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
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                    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
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                    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*
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EMC ENGINEERS INC. EZDOE - 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

	COOLING						HEATING						ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-111.924	15	8	-6.F	-7.F	-313.024	10128.	29.492
FEB	0.00000					0.000	-80.723	3	7	-5.F	-6.F	-283.665	9218.	29.492
MAR	0.00000					0.000	-60.581	3	8	15.F	12.F	-207.738	10032.	29.492
APR	0.00000					0.000	-12.501	5	7	30.F	27.F	-134.574	9856.	29.492
MAY	21.38521	30	21	80.F	74.F	241.300	-1.533	5	7	44.F	40.F	-68.468	10128.	29.492
JUN	62.46119	19	19	86.F	75.F	266.288	0.000					0.000	9761.	29.492
JUL	90.89182	17	19	88.F	80.F	327.345	0.000					0.000	10318.	29.492
AUG	85.14179	21	19	95.F	76.F	300.272	0.000					0.000	9937.	29.492
SEP	36.06384	5	19	87.F	76.F	260.594	0.000					0.000	9951.	29.492
OCT	0.26714	1	24	64.F	60.F	75.172	-9.539	20	8	23.F	22.F	-157.988	10223.	29.492
NOV	0.00000					0.000	-46.770	3	6	13.F	12.F	-210.248	9666.	29.492
DEC	0.00000					0.000	-96.368	13	8	0.F	-1.F	-276.082	10318.	29.492
TOTAL	296.211						-419.938						119543.	
MAX						327.345						-313.024		29.492

EMC ENGINEERS INC. EZDOE - 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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	-126.342	11.310
FEB	0	662	0	10	672	0	672	0	0	10	-130.280	11.310
MAR	0	681	0	63	744	0	744	0	0	63	-16.891	29.492
APR	0	471	0	249	720	0	720	0	0	249	-19.905	11.310
MAY	267	192	0	285	360	267	744	0	0	285	0.000	23.505
JUN	646	0	0	74	0	646	720	0	0	74	0.000	23.505
JUL	744	0	0	0	0	744	744	0	0	0	0.000	23.505
AUG	733	0	0	11	0	733	744	0	0	11	0.000	23.505
SEP	425	0	0	295	0	425	720	0	0	295	0.000	23.505
OCT	5	461	0	278	720	5	744	0	0	278	0.000	29.492
NOV	0	630	0	90	720	0	720	0	0	90	-158.619	11.310
DEC	0	731	0	13	744	0	744	0	0	13	-63.895	29.492
ANNUAL	2820	4572	0	1368	5424	2820	8760	0	0	1368		

EMC ENGINEERS INC. EZDOE - 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

	COOLING						HEATING						ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELECTRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.27998	22	24	40.F	38.F	7.642	-10.316	15	6	-8.F	-9.F	-30.921	1890.	7.278
FEB	0.47266	26	24	43.F	37.F	10.091	-7.389	3	7	-5.F	-6.F	-30.442	1742.	7.278
MAR	1.11419	24	18	65.F	64.F	15.782	-5.796	3	8	15.F	12.F	-21.892	1843.	7.278
APR	3.23906	28	19	71.F	68.F	25.646	-1.379	5	7	30.F	27.F	-14.150	1857.	7.278
MAY	5.32427	30	23	78.F	74.F	31.858	-0.394	5	7	44.F	40.F	-7.294	1890.	7.278
JUN	7.99071	19	20	84.F	75.F	33.165	-0.084	2	7	50.F	49.F	-6.584	1810.	7.278
JUL	11.12780	17	19	88.F	80.F	38.961	0.000					0.000	1984.	7.278
AUG	10.23586	21	20	92.F	76.F	35.832	-0.018	4	7	54.F	53.F	-3.149	1796.	7.278
SEP	5.58561	5	19	87.F	76.F	32.335	-0.726	13	7	44.F	44.F	-8.187	1904.	7.278
OCT	3.76598	10	19	74.F	67.F	25.445	-1.237	20	8	23.F	22.F	-17.154	1937.	7.278
NOV	1.22012	6	24	59.F	55.F	16.737	-4.525	3	6	13.F	12.F	-22.473	1763.	7.278
DEC	0.56648	3	23	49.F	42.F	10.933	-8.834	13	8	0.F	-1.F	-28.756	1984.	7.278
TOTAL	50.923						-40.697						22402.	
MAX						38.961						-30.921		7.278

EMC ENGINEERS INC. EZDOE - 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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 CYCLE ON	HOURS NIGHT VENTING	HOURS FLOATING WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)
JAN	84	660	0	0	744	744	744	0	0	0	0.000	7.278
FEB	102	570	0	0	672	672	672	0	0	0	0.000	7.278
MAR	137	607	0	0	744	744	744	0	0	0	0.000	7.278
APR	440	280	0	0	720	720	720	0	0	0	0.000	7.278
MAY	565	179	0	0	744	744	744	0	0	0	0.000	7.278
JUN	675	45	0	0	720	720	720	0	0	0	0.000	7.278
JUL	744	0	0	0	744	744	744	0	0	0	0.000	7.278
AUG	731	13	0	0	744	744	744	0	0	0	0.000	7.278
SEP	538	182	0	0	720	720	720	0	0	0	0.000	7.278
OCT	461	283	0	0	744	744	744	0	0	0	0.000	7.278
NOV	234	486	0	0	720	720	720	0	0	0	0.000	7.278
DEC	98	646	0	0	744	744	744	0	0	0	0.000	7.278
ANNUAL	4809	3951	0	0	8760	8760	8760	0	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-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	47.250	172.968
JAN	PEAK(KBTU)	138.256	433.470
	DY/HR	6/17	15/ 8
	TOTAL(MBTU)	43.010	129.719
FEB	PEAK(KBTU)	138.181	402.096
	DY/HR	18/17	3/ 7
	TOTAL(MBTU)	46.062	101.794
MAR	PEAK(KBTU)	137.777	310.124
	DY/HR	4/17	3/ 8
	TOTAL(MBTU)	44.686	24.455
APR	PEAK(KBTU)	140.466	218.214
	DY/HR	28/17	5/ 7
	TOTAL(MBTU)	54.408	4.576
MAY	PEAK(KBTU)	210.345	128.642
	DY/HR	30/24	5/ 7
	TOTAL(MBTU)	70.030	0.354
JUN	PEAK(KBTU)	214.368	15.596
	DY/HR	19/24	2/ 7
	TOTAL(MBTU)	84.104	0.000
JUL	PEAK(KBTU)	236.464	0.000
	DY/HR	23/17	31/ 1
	TOTAL(MBTU)	81.397	0.092
AUG	PEAK(KBTU)	229.059	9.984
	DY/HR	21/17	4/ 7
	TOTAL(MBTU)	59.615	2.067
SEP	PEAK(KBTU)	215.291	18.216
	DY/HR	5/24	13/ 7
	TOTAL(MBTU)	46.418	19.465
OCT	PEAK(KBTU)	168.883	248.637
	DY/HR	1/24	20/ 8
	TOTAL(MBTU)	44.060	79.338
NOV	PEAK(KBTU)	137.648	313.562
	DY/HR	3/17	3/ 6
	TOTAL(MBTU)	48.114	152.014
DEC	PEAK(KBTU)	137.344	392.204
	DY/HR	16/17	13/ 8
	ONE YEAR	669.153	686.842
	USE/PEAK	236.464	433.470

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.

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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 #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
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                          (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
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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  ..

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)  ..
```

```
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  ..


                $-------------------------------------$
                $ 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. #7866       *
       LINE-5 *THEATER W/DRESS RM                      * ..

ABORT              ERRORS  ..
```

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-1 TOPEKA, KS

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-69.561	14	20	-2.F	-3.F	-400.239	8137.	29.492
FEB	0.00000					0.000	-47.884	3	19	19.F	16.F	-367.491	7488.	29.492
MAR	0.00000					0.000	-33.029	3	19	24.F	20.F	-324.840	8268.	29.492
APR	0.00000					0.000	-6.979	14	17	51.F	42.F	-255.891	8510.	29.492
MAY	13.19868	22	19	77.F	70.F	312.844	-0.993	5	17	65.F	52.F	-189.644	8883.	29.492
JUN	38.60798	30	17	88.F	73.F	401.125	0.000					0.000	8494.	29.492
JUL	59.07546	17	19	88.F	80.F	438.143	0.000					0.000	8870.	29.492
AUG	50.45203	11	17	98.F	71.F	415.223	0.000					0.000	8478.	29.492
SEP	23.16676	8	17	89.F	72.F	383.721	0.000					0.000	8572.	29.492
OCT	0.36147	1	19	81.F	66.F	130.941	-5.384	20	18	51.F	42.F	-274.606	8752.	29.492
NOV	0.00000					0.000	-27.101	3	17	46.F	36.F	-296.323	7958.	29.492
DEC	0.00000					0.000	-63.400	8	19	14.F	11.F	-355.024	8429.	29.492
TOTAL	184.863						-254.330						100844.	
MAX						438.143						-400.239		29.492

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-1 TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	449	0	295	744	0	568	424	0	119	-47.129	11.310
FEB	0	379	0	293	672	0	519	383	0	140	-51.384	11.310
MAR	0	346	0	398	744	0	588	452	0	242	-142.207	29.492
APR	0	116	0	604	720	0	601	457	0	485	0.000	0.000
MAY	68	22	0	654	360	127	634	490	0	544	0.000	23.505
JUN	209	0	0	511	0	330	608	472	0	399	0.000	29.492
JUL	266	0	0	478	0	394	616	456	0	350	0.000	23.505
AUG	291	0	0	453	0	420	615	487	0	324	0.000	29.492
SEP	126	0	0	594	0	287	598	446	0	472	0.000	29.492
OCT	4	91	0	649	720	13	614	462	0	519	0.000	23.505
NOV	0	232	0	488	720	0	569	441	0	337	-106.852	11.310
DEC	0	443	0	301	744	0	577	417	0	134	-177.152	29.492
ANNUAL	964	2078	0	5718	5424	1571	7107	5387	0	4065		

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

	COOLING						HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC-TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.00587	18	15	56.F	46.F	2.831	-4.708	14	23	-4.F	-5.F	-28.135	1451.	7.278
FEB	0.06966	26	15	60.F	45.F	7.920	-2.908	3	9	3.F	1.F	-25.716	1325.	7.278
MAR	0.42636	12	11	68.F	48.F	13.380	-1.761	3	19	24.F	20.F	-23.480	1439.	7.278
APR	3.48912	29	7	62.F	61.F	29.521	-0.160	14	17	51.F	42.F	-12.061	1635.	7.278
MAY	4.78570	14	7	66.F	63.F	41.775	-0.781	19	8	58.F	55.F	-14.414	1573.	7.278
JUN	4.76349	30	18	86.F	73.F	44.615	-0.755	2	8	55.F	52.F	-16.028	1355.	7.278
JUL	6.73750	17	18	88.F	80.F	50.458	-0.372	29	8	64.F	61.F	-10.746	1496.	7.278
AUG	5.59883	21	17	95.F	77.F	46.942	-0.362	26	8	66.F	64.F	-10.482	1299.	7.278
SEP	3.34041	1	22	68.F	67.F	46.283	-1.681	30	10	47.F	45.F	-21.564	1481.	7.278
OCT	3.86041	1	18	83.F	68.F	29.184	-0.264	1	8	47.F	45.F	-19.644	1711.	7.278
NOV	1.26098	7	3	60.F	56.F	14.829	-1.401	3	7	19.F	17.F	-19.582	1407.	7.278
DEC	0.02959	18	16	55.F	44.F	4.957	-3.912	8	21	13.F	10.F	-25.768	1559.	7.278
TOTAL	34.368						-19.065						17732.	
MAX						50.458						-28.135		7.278

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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 CYCLE ON	HOURS NIGHT VENTING	HOURS FLOATING WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)
JAN	3	357	0	384	744	744	431	287	0	71	0.000	1.404
FEB	13	297	0	362	672	672	375	239	0	65	0.000	1.404
MAR	65	240	0	439	744	744	456	320	0	151	0.000	1.404
APR	335	46	0	339	720	720	562	418	0	181	0.000	1.404
MAY	304	130	0	310	744	744	518	374	0	84	0.000	1.404
JUN	207	173	0	340	720	720	396	260	0	16	0.000	7.278
JUL	263	132	0	349	744	744	396	236	0	1	0.000	7.278
AUG	272	112	0	360	744	744	390	262	0	6	0.000	7.278
SEP	144	209	0	367	720	720	419	267	0	66	0.000	7.278
OCT	347	44	0	353	744	744	583	431	0	192	0.000	7.278
NOV	140	185	0	395	720	720	467	339	0	142	0.000	1.404
DEC	10	332	0	402	744	744	441	281	0	99	0.000	1.404
ANNUAL	2103	2257	0	4400	8760	8760	5434	3714	0	1074		

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	36.581	106.994
JAN	PEAK(KBTU)	135.664	537.348
	DY/HR	30/24	14/20
	TOTAL(MBTU)	33.277	75.887
FEB	PEAK(KBTU)	135.664	500.254
	DY/HR	27/24	3/19
	TOTAL(MBTU)	36.214	54.370
MAR	PEAK(KBTU)	135.664	454.355
	DY/HR	31/24	3/19
	TOTAL(MBTU)	38.643	11.884
APR	PEAK(KBTU)	139.742	365.786
	DY/HR	24/17	14/17
	TOTAL(MBTU)	44.251	3.747
MAY	PEAK(KBTU)	231.930	281.766
	DY/HR	30/24	5/17
	TOTAL(MBTU)	49.992	2.272
JUN	PEAK(KBTU)	270.808	32.188
	DY/HR	30/17	2/ 8
	TOTAL(MBTU)	58.730	1.399
JUL	PEAK(KBTU)	289.321	23.556
	DY/HR	23/17	29/ 8
	TOTAL(MBTU)	55.695	1.264
AUG	PEAK(KBTU)	290.235	23.126
	DY/HR	11/17	26/ 8
	TOTAL(MBTU)	44.706	4.000
SEP	PEAK(KBTU)	268.508	41.234
	DY/HR	8/17	30/10
	TOTAL(MBTU)	39.988	9.278
OCT	PEAK(KBTU)	179.153	385.773
	DY/HR	1/19	20/18
	TOTAL(MBTU)	35.280	44.116
NOV	PEAK(KBTU)	135.664	411.013
	DY/HR	27/17	3/17
	TOTAL(MBTU)	38.068	99.511
DEC	PEAK(KBTU)	135.664	486.897
	DY/HR	31/24	8/19
	ONE YEAR	511.425	414.721
	USE/PEAK	290.235	537.348

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
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 $
                $----------------------------------------$

                   $ 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                     * ..
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) ..

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. EZDOE - 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-1 TOPEKA, KS

	COOLING						HEATING						ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-82.340	14	17	0.F	-2.F	-333.010	10128.	29.492
FEB	0.00000					0.000	-59.052	3	17	24.F	21.F	-221.883	9218.	29.492
MAR	0.00000					0.000	-41.592	3	22	20.F	17.F	-180.491	10032.	29.492
APR	0.00000					0.000	-7.715	5	8	34.F	30.F	-78.961	9856.	29.492
MAY	29.63481	16	2	62.F	59.F	364.419	-0.549	5	8	46.F	41.F	-26.960	10128.	29.492
JUN	66.87326	19	19	86.F	75.F	324.784	0.000					0.000	9761.	29.492
JUL	88.13656	17	19	88.F	80.F	405.016	0.000					0.000	10318.	29.492
AUG	81.26391	21	19	95.F	76.F	362.965	0.000					0.000	9937.	29.492
SEP	45.40338	5	19	87.F	76.F	322.482	0.000					0.000	9951.	29.492
OCT	0.98839	1	19	81.F	66.F	165.187	-5.214	20	9	29.F	29.F	-88.741	10223.	29.492
NOV	0.00000					0.000	-32.729	3	7	19.F	17.F	-125.058	9666.	29.492
DEC	0.00000					0.000	-71.032	9	17	20.F	16.F	-240.587	10318.	29.492
TOTAL	312.300						-300.222						119543.	
MAX						405.016						-333.010		29.492

EMC ENGINEERS INC. EZDOE - 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-1 TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	-72.280	11.310
FEB	0	672	0	0	672	0	672	0	0	0	-74.548	11.310
MAR	0	710	0	34	744	0	744	0	0	34	-76.707	29.492
APR	0	488	0	232	720	0	720	0	0	232	0.000	11.310
MAY	378	198	0	168	360	378	744	0	0	168	0.000	11.310
JUN	717	0	0	3	0	717	720	0	0	3	0.000	23.505
JUL	744	0	0	0	0	744	744	0	0	0	0.000	23.505
AUG	744	0	0	0	0	744	744	0	0	0	0.000	23.505
SEP	643	0	0	77	0	643	720	0	0	77	0.000	23.505
OCT	8	479	0	257	720	8	744	0	0	257	0.000	23.505
NOV	0	642	0	78	720	0	720	0	0	78	-93.619	11.310
DEC	0	744	0	0	744	0	744	0	0	0	-127.187	29.492
ANNUAL	3234	4677	0	849	5424	3234	8760	0	0	849		

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EMC ENGINEERS INC. EZDOE - 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

	COOLING						HEATING						ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELECTRICAL 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						22402.	
MAX						47.165						-25.736		7.278

EMC ENGINEERS INC. EZDOE - 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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 CYCLE ON	HOURS NIGHT VENTING	HOURS FLOATING WHEN FANS ON	HEATING LOAD AT COOLING PEAK (KBTU/HR)	ELECTRIC LOAD AT COOLING PEAK (KW)
JAN	17	727	0	0	744	744	744	0	0	0	0.000	7.278
FEB	38	634	0	0	672	672	672	0	0	0	0.000	7.278
MAR	176	568	0	0	744	744	744	0	0	0	0.000	7.278
APR	552	168	0	0	720	720	720	0	0	0	0.000	7.278
MAY	723	21	0	0	744	744	744	0	0	0	0.000	7.278
JUN	720	0	0	0	720	720	720	0	0	0	0.000	7.278
JUL	744	0	0	0	744	744	744	0	0	0	0.000	7.278
AUG	744	0	0	0	744	744	744	0	0	0	0.000	7.278
SEP	706	14	0	0	720	720	720	0	0	0	0.000	7.278
OCT	600	144	0	0	744	744	744	0	0	0	0.000	7.278
NOV	251	469	0	0	720	720	720	0	0	0	0.000	7.278
DEC	72	672	0	0	744	744	744	0	0	0	0.000	7.278
ANNUAL	5343	3417	0	0	8760	8760	8760	0	0	0		

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. #7866THEATER W/DRESS RM
REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	47.031	134.263
JAN	PEAK(KBTU)	139.273	452.293
	DY/HR	9/17	14/17
	TOTAL(MBTU)	42.812	101.019
FEB	PEAK(KBTU)	139.228	318.749
	DY/HR	20/17	3/17
	TOTAL(MBTU)	45.762	73.317
MAR	PEAK(KBTU)	138.675	268.117
	DY/HR	24/17	3/22
	TOTAL(MBTU)	45.061	15.696
APR	PEAK(KBTU)	140.539	143.786
	DY/HR	28/17	5/ 8
	TOTAL(MBTU)	59.251	1.935
MAY	PEAK(KBTU)	229.308	52.954
	DY/HR	30/24	5/ 8
	TOTAL(MBTU)	73.841	0.000
JUN	PEAK(KBTU)	234.722	0.000
	DY/HR	19/17	30/ 1
	TOTAL(MBTU)	85.000	0.000
JUL	PEAK(KBTU)	263.897	0.000
	DY/HR	23/17	31/ 1
	TOTAL(MBTU)	82.440	0.000
AUG	PEAK(KBTU)	254.129	0.000
	DY/HR	21/17	31/ 1
	TOTAL(MBTU)	65.455	0.076
SEP	PEAK(KBTU)	237.329	5.815
	DY/HR	5/17	29/ 9
	TOTAL(MBTU)	47.228	11.411
OCT	PEAK(KBTU)	185.917	158.045
	DY/HR	1/24	20/ 9
	TOTAL(MBTU)	43.967	58.696
NOV	PEAK(KBTU)	139.318	204.593
	DY/HR	5/17	3/ 7
	TOTAL(MBTU)	48.017	118.387
DEC	PEAK(KBTU)	139.360	341.199
	DY/HR	2/17	9/17
	ONE YEAR	685.868	514.799
	USE/PEAK	263.897	452.293

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 $
                $---------------------------------------$

                  $ 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 OR 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  (1,16) (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% ..


$ FULL ON SYSTEM
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
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                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)
  ..
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REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR AHU-1 TOPEKA, KS

	COOLING						HEATING						ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-142.652	15	7	-7.F	-8.F	-412.533	10128.	29.492
FEB	0.00000					0.000	-106.767	3	7	-5.F	-6.F	-380.777	9218.	29.492
MAR	0.00000					0.000	-88.288	3	8	15.F	12.F	-285.406	10032.	29.492
APR	0.00000					0.000	-25.427	5	7	30.F	27.F	-196.683	9856.	29.492
MAY	28.55549	16	2	62.F	59.F	296.117	-5.500	5	7	44.F	40.F	-118.566	10128.	29.492
JUN	80.37951	30	21	78.F	72.F	239.835	0.000					0.000	9761.	29.492
JUL	111.55617	23	16	98.F	79.F	265.692	0.000					0.000	10318.	29.492
AUG	107.28452	11	21	90.F	68.F	252.240	0.000					0.000	9937.	29.492
SEP	49.98956	8	21	81.F	70.F	226.611	0.000					0.000	9951.	29.492
OCT	0.72743	1	21	67.F	62.F	136.159	-22.445	20	8	23.F	22.F	-226.712	10223.	29.492
NOV	0.00000					0.000	-70.917	3	6	13.F	12.F	-288.266	9666.	29.492
DEC	0.00000					0.000	-125.518	13	8	0.F	-1.F	-368.423	10318.	29.492
TOTAL	378.493						-587.514						119543.	
MAX						296.117						-412.533		29.492

REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR AHU-1 TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	0	34	-186.243	11.310
FEB	0	614	0	58	672	0	672	0	0	58	-191.005	11.310
MAR	0	651	0	93	744	0	744	0	0	93	0.000	29.492
APR	0	513	0	207	720	0	720	0	0	207	-39.314	11.310
MAY	314	218	0	212	360	314	744	0	0	212	0.000	11.310
JUN	676	0	0	44	0	676	720	0	0	44	0.000	23.505
JUL	744	0	0	0	0	744	744	0	0	0	0.000	11.310
AUG	735	0	0	9	0	735	744	0	0	9	0.000	23.505
SEP	486	0	0	234	0	486	720	0	0	234	0.000	23.505
OCT	6	493	0	245	720	6	744	0	0	245	0.000	23.505
NOV	0	617	0	103	720	0	720	0	0	103	-224.668	11.310
DEC	0	687	0	57	744	0	744	0	0	57	-3.481	29.492
ANNUAL	2961	4503	0	1296	5424	2961	8760	0	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

	COOLING						HEATING						ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELECTRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	1.07572	22	24	40.F	38.F	13.524	-13.479	15	1	-6.F	-7.F	-34.682	1890.	7.278
FEB	1.39176	26	24	43.F	37.F	15.259	-10.567	2	23	1.F	0.F	-31.827	1742.	7.278
MAR	1.78635	27	24	46.F	41.F	17.246	-9.038	3	7	14.F	12.F	-29.962	1843.	7.278
APR	2.87264	28	24	65.F	64.F	21.415	-2.947	5	7	30.F	27.F	-20.560	1857.	7.278
MAY	5.45895	30	24	80.F	72.F	25.052	-0.846	5	7	44.F	40.F	-12.274	1890.	7.278
JUN	9.57069	30	22	77.F	73.F	26.467	-0.066	2	7	50.F	49.F	-6.846	1810.	7.278
JUL	12.90110	23	16	98.F	79.F	29.903	0.000					0.000	1984.	7.278
AUG	12.29024	11	24	85.F	68.F	28.168	-0.013	4	7	54.F	53.F	-3.031	1796.	7.278
SEP	7.00205	8	24	78.F	69.F	25.922	-0.720	11	7	40.F	40.F	-9.512	1904.	7.278
OCT	3.20798	1	24	64.F	60.F	22.132	-2.784	20	8	23.F	22.F	-24.282	1937.	7.278
NOV	1.72658	6	24	59.F	55.F	18.263	-7.293	3	6	13.F	12.F	-30.542	1763.	7.278
DEC	1.58083	3	24	46.F	42.F	15.096	-12.246	13	6	2.F	1.F	-31.361	1984.	7.278
TOTAL	60.865						-59.999						22402.	
MAX						29.903						-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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 CYCLE ON	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	0.000	7.278
FEB	135	537	0	0	672	672	672	0	0	0	0.000	7.278
MAR	136	608	0	0	744	744	744	0	0	0	0.000	7.278
APR	279	441	0	0	720	720	720	0	0	0	0.000	7.278
MAY	529	215	0	0	744	744	744	0	0	0	0.000	7.278
JUN	689	31	0	0	720	720	720	0	0	0	0.000	7.278
JUL	744	0	0	0	744	744	744	0	0	0	0.000	1.404
AUG	735	9	0	0	744	744	744	0	0	0	0.000	7.278
SEP	555	165	0	0	720	720	720	0	0	0	0.000	7.278
OCT	301	443	0	0	744	744	744	0	0	0	0.000	7.278
NOV	154	566	0	0	720	720	720	0	0	0	0.000	7.278
DEC	160	584	0	0	744	744	744	0	0	0	0.000	7.278
ANNUAL	4540	4220	0	0	8760	8760	8760	0	0	0		

EMC ENGINEERS INC. EZDOE - 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-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	48.711	217.718
JAN	PEAK(KBTU)	138.393	559.457
	DY/HR	16/17	15/ 7
	TOTAL(MBTU)	44.298	168.248
FEB	PEAK(KBTU)	137.685	526.478
	DY/HR	5/17	3/ 7
	TOTAL(MBTU)	47.739	145.856
MAR	PEAK(KBTU)	137.348	421.266
	DY/HR	3/17	3/ 8
	TOTAL(MBTU)	44.880	47.851
APR	PEAK(KBTU)	138.180	310.813
	DY/HR	28/24	5/ 7
	TOTAL(MBTU)	56.203	12.055
MAY	PEAK(KBTU)	197.894	209.971
	DY/HR	30/24	5/ 7
	TOTAL(MBTU)	73.579	0.302
JUN	PEAK(KBTU)	200.408	17.430
	DY/HR	19/24	2/ 7
	TOTAL(MBTU)	86.900	0.000
JUL	PEAK(KBTU)	211.818	0.000
	DY/HR	23/17	31/ 1
	TOTAL(MBTU)	84.750	0.078
AUG	PEAK(KBTU)	211.528	11.196
	DY/HR	12/24	4/ 7
	TOTAL(MBTU)	63.386	2.207
SEP	PEAK(KBTU)	200.896	21.787
	DY/HR	5/24	11/ 7
	TOTAL(MBTU)	46.689	43.115
OCT	PEAK(KBTU)	177.243	349.305
	DY/HR	1/24	20/ 8
	TOTAL(MBTU)	45.341	118.730
NOV	PEAK(KBTU)	136.810	425.118
	DY/HR	6/24	3/ 6
	TOTAL(MBTU)	49.675	194.997
DEC	PEAK(KBTU)	139.125	512.947
	DY/HR	9/17	13/ 8
	ONE YEAR	692.151	951.158
	USE/PEAK	211.818	559.457

EMC ENGINEERS INC. EZDOE - 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 IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
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

EMC ENGINEERS, INC.

DENVER - ATLANTA

PROJECT:	FEASIBILITY STUDY FOR INSTALLATION OF UMCS	EMC NO:	1406-001
		CALC. BY:	AJN
LOCATION:	FORT RILEY, KANSAS	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	FT²
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	NIGHTIME INFILTRATION (OA)
RUN5	DAYTIME INFILTRATION (OA)

HOURS OF OCCUPANCY			
M-F	700	2100	70 HR
SAT.	0	0	0 HR
SUN.	0	0	0 HR
	TOTAL OCCUPY HR.		70 HR/WK
	TOTAL UNOCC. HR.		98 HR/WK
	ANNUAL OCCUPY HR.		3650 HR/YR
	ANNUAL UNOCC. HR.		5110 HR/YR

ANNUAL HEATING & COOLING HOURS	
HR. ON HEATING	2270 HR/YR
HR. ON COOLING	1380 HR/YR
HR. OFF HEATING	3178 HR/YR
HR. OFF COOLING	1932 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

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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.) ..
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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
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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  ..
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          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
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                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 ..
```

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	- - - - G L A S S - - - - U-VALUE (BTU/HR-SQFT-F)	AREA (SQFT)	- - - - W A L L - - - - 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
	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
	CORE_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
	S-PER_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
	N-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
	S-PER_ZONE	0.000	0.00	0.020	1620.00	0.020	1620.00	UNDERGRND
	W-PER_ZONE	0.000	0.00	0.020	1069.50	0.020	1069.50	UNDERGRND
	E-PER_ZONE	0.000	0.00	0.020	1763.00	0.020	1763.00	UNDERGRND
	CORE_ZONE	0.000	0.00	0.020	5235.90	0.020	5235.90	UNDERGRND
	N-PER_ZONE	0.000	0.00	0.020	1620.00	0.020	1620.00	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
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	0.490	0.092	0.218	592.00	1274.00	1866.00
EAST	0.490	0.092	0.166	192.00	843.60	1035.60
SOUTH	0.490	0.092	0.224	618.40	1247.60	1866.00
WEST	0.490	0.092	0.122	115.20	1438.20	1553.40
ROOF	0.000	0.039	0.039	0.00	11308.40	11308.40
ALL WALLS	0.490	0.092	0.188	1517.60	4803.40	6321.00
WALLS+ROOFS	0.490	0.055	0.092	1517.60	16111.80	17629.40
UNDERGRND	0.000	0.020	0.020	0.00	11308.40	11308.40
BUILDING	0.490	0.041	0.064	1517.60	27420.20	28937.80

*** BUILDING ***

FLOOR AREA 11308 SQFT 1051 SQMT
VOLUME 155888 CUFT 4415 CUMT

	COOLING LOAD				HEATING LOAD	
TIME	AUG 11 5PM				JAN 15 8AM	
DRY-BULB TEMP	98F 37C				-6F -21C	
WET-BULB TEMP	71F 22C				-7F -22C	
	SENSIBLE		LATENT		SENSIBLE	
	(KBTU/H)	(KW)	(KBTU/H)	(KW)	(KBTU/H)	(KW)
WALLS	5.256	1.539	0.000	0.000	-31.361	-9.185
ROOFS	19.070	5.585	0.000	0.000	-37.338	-10.935
GLASS CONDUCTION	17.334	5.077	0.000	0.000	-58.329	-17.083
GLASS SOLAR	54.360	15.921	0.000	0.000	2.663	0.780
DOOR	0.905	0.265	0.000	0.000	-2.437	-0.714
INTERNAL SURFACES	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
OCCUPANTS TO SPACE	16.442	4.815	31.411	9.199	0.335	0.098
LIGHT TO SPACE	52.660	15.423	0.000	0.000	2.093	0.613
EQUIPMENT TO SPACE	13.404	3.926	0.000	0.000	0.350	0.103
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	178.361	52.238	31.411	9.199	-130.516	-38.225
TOTAL LOAD	209.772 KBTU/H		61.437 KW		-130.516 KBTU/H	-38.225 KW
TOTAL LOAD / AREA	18.55BTU/H.SQFT		58.482 W /SQMT		11.542BTU/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
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR MZ-SYSTEM TOPEKA, KS

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELECTRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000					0.000	-49.079	15	8	-6.F	-7.F	-215.482	15412.	33.457
FEB	0.00000					0.000	-29.981	3	6	-1.F	-2.F	-168.064	13870.	33.457
MAR	0.00000					0.000	-15.453	14	6	15.F	13.F	-139.597	16067.	33.457
APR	0.00000					0.000	-1.707	5	6	31.F	28.F	-40.777	14958.	33.457
MAY	47.26222	16	2	62.F	59.F	406.262	-0.692	10	23	60.F	56.F	-13.394	15412.	33.457
JUN	106.15520	27	17	89.F	77.F	307.181	0.000					0.000	15444.	33.457
JUL	122.71164	13	19	89.F	79.F	327.763	0.000					0.000	14926.	33.457
AUG	125.71970	24	17	95.F	77.F	325.113	0.000					0.000	16067.	33.457
SEP	79.92394	7	17	92.F	75.F	314.907	0.000					0.000	14958.	33.457
OCT	1.18942	1	17	85.F	68.F	129.887	-1.917	2	2	64.F	59.F	-42.585	15084.	33.457
NOV	0.00000					0.000	-11.673	13	6	25.F	24.F	-102.334	14947.	33.457
DEC	0.00000					0.000	-41.107	12	6	3.F	2.F	-180.300	15254.	33.457
TOTAL	482.962						-151.608						182382.	
MAX						406.262						-215.482		33.457

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
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR MZ-SYSTEM TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	-15.191	12.320
FEB	0	672	0	0	672	0	672	0	0	0	-11.925	12.320
MAR	0	744	0	0	744	0	744	0	0	0	-10.757	12.320
APR	0	720	0	0	720	0	720	0	0	0	-5.331	12.320
MAY	384	360	0	0	360	384	744	0	0	0	0.000	12.320
JUN	720	0	0	0	0	720	720	0	0	0	0.000	33.457
JUL	744	0	0	0	0	744	744	0	0	0	0.000	33.457
AUG	744	0	0	0	0	744	744	0	0	0	0.000	33.457
SEP	678	0	0	42	0	720	720	0	0	42	0.000	33.457
OCT	16	720	0	8	720	24	744	0	0	8	0.000	12.320
NOV	0	720	0	0	720	0	720	0	0	0	-36.541	12.320
DEC	0	744	0	0	744	0	744	0	0	0	-112.955	12.320
ANNUAL	3286	5424	0	50	5424	3336	8760	0	0	50		

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	55.507	72.409
JAN	PEAK(KBTU)	119.416	271.597
	DY/HR	31/ 8	15/ 8
	TOTAL(MBTU)	49.597	46.912
FEB	PEAK(KBTU)	119.416	220.897
	DY/HR	28/ 9	3/ 6
	TOTAL(MBTU)	56.300	25.685
MAR	PEAK(KBTU)	119.416	189.474
	DY/HR	30/ 8	14/ 6
	TOTAL(MBTU)	51.624	4.901
APR	PEAK(KBTU)	116.191	69.569
	DY/HR	5/ 8	5/ 6
	TOTAL(MBTU)	71.011	2.186
MAY	PEAK(KBTU)	227.276	24.822
	DY/HR	31/18	10/23
	TOTAL(MBTU)	92.810	0.000
JUN	PEAK(KBTU)	227.888	0.000
	DY/HR	28/17	30/ 1
	TOTAL(MBTU)	97.191	0.000
JUL	PEAK(KBTU)	233.983	0.000
	DY/HR	13/17	31/ 1
	TOTAL(MBTU)	103.481	0.000
AUG	PEAK(KBTU)	238.285	0.000
	DY/HR	23/16	31/ 1
	TOTAL(MBTU)	82.744	0.000
SEP	PEAK(KBTU)	233.372	0.000
	DY/HR	7/16	30/ 1
	TOTAL(MBTU)	52.643	5.244
OCT	PEAK(KBTU)	115.260	72.523
	DY/HR	26/19	2/ 2
	TOTAL(MBTU)	52.309	20.388
NOV	PEAK(KBTU)	119.416	147.223
	DY/HR	10/ 8	13/ 6
	TOTAL(MBTU)	54.843	62.624
DEC	PEAK(KBTU)	119.416	234.177
	DY/HR	30/14	12/ 6
	ONE YEAR	820.059	240.351
	USE/PEAK	238.285	271.597

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
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 ..
```

```
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 ..

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
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```
                    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  ..


                $-------------------------------------$
                $ 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.# 7656    *
       LINE-5 *GEN INST BLDG                            * ..
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EMC ENGINEERS INC. EZDOE - 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
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR MZ-SYSTEM TOPEKA, KS

	COOLING						HEATING						ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-33.258	17	7	27.F	24.F	-490.213	14870.	33.457
FEB	0.00000					0.000	-18.680	7	7	26.F	25.F	-457.155	13821.	33.457
MAR	0.00000					0.000	-9.303	7	7	28.F	27.F	-317.449	16067.	33.457
APR	0.00000					0.000	-1.561	5	7	30.F	27.F	-45.837	14958.	33.457
MAY	39.55154	16	2	62.F	59.F	395.356	-0.682	10	23	60.F	56.F	-13.373	15190.	33.457
JUN	87.87987	20	7	75.F	71.F	386.367	0.000					0.000	14877.	33.457
JUL	92.35793	18	7	76.F	72.F	394.740	0.000					0.000	13583.	33.457
AUG	104.54575	22	7	76.F	72.F	406.187	0.000					0.000	15008.	33.457
SEP	68.13030	6	7	75.F	71.F	390.646	0.000					0.000	14687.	33.457
OCT	0.04687	1	17	85.F	68.F	16.017	-1.580	31	7	43.F	39.F	-29.221	15084.	33.457
NOV	0.00000					0.000	-5.390	14	7	32.F	32.F	-257.420	14947.	33.457
DEC	0.00000					0.000	-25.837	12	7	2.F	1.F	-591.607	15081.	33.457
TOTAL	392.513						-96.291						178157.	
MAX						406.187						-591.607		33.457

EMC ENGINEERS INC. EZDOE - 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
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR MZ-SYSTEM TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	661	0	83	744	0	700	392	0	39	-8.581	12.320
FEB	0	602	0	70	672	0	668	392	0	66	-6.860	12.320
MAR	0	564	0	180	744	0	744	404	0	180	-6.380	12.320
APR	0	388	0	332	720	0	720	419	0	332	-5.298	12.320
MAY	245	189	0	310	360	384	726	418	0	292	0.000	12.320
JUN	480	0	0	240	0	720	674	350	0	194	0.000	22.888
JUL	492	0	0	252	0	744	635	350	0	143	0.000	22.888
AUG	510	0	0	234	0	744	658	318	0	148	0.000	22.888
SEP	378	0	0	342	0	720	698	397	0	320	0.000	22.888
OCT	7	421	0	316	720	24	744	452	0	316	0.000	12.320
NOV	0	537	0	183	720	0	720	421	0	183	-7.504	12.320
DEC	0	671	0	73	744	0	730	429	0	59	-16.195	12.320
ANNUAL	2112	4033	0	2615	5424	3336	8417	4742	0	2272		

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	54.208	57.021
JAN	PEAK(KBTU)	128.457	637.745
	DY/HR	31/11	17/ 7
	TOTAL(MBTU)	49.527	34.176
FEB	PEAK(KBTU)	128.457	601.818
	DY/HR	28/10	7/ 7
	TOTAL(MBTU)	56.480	19.423
MAR	PEAK(KBTU)	128.457	445.976
	DY/HR	21/ 8	7/ 7
	TOTAL(MBTU)	51.804	5.676
APR	PEAK(KBTU)	118.055	82.959
	DY/HR	5/ 8	5/ 7
	TOTAL(MBTU)	66.087	2.637
MAY	PEAK(KBTU)	237.860	29.907
	DY/HR	31/18	10/23
	TOTAL(MBTU)	82.098	0.000
JUN	PEAK(KBTU)	238.865	0.000
	DY/HR	27/17	30/ 1
	TOTAL(MBTU)	80.207	0.000
JUL	PEAK(KBTU)	237.721	0.000
	DY/HR	13/17	31/ 1
	TOTAL(MBTU)	89.976	0.000
AUG	PEAK(KBTU)	251.666	0.000
	DY/HR	22/16	31/ 1
	TOTAL(MBTU)	74.445	0.000
SEP	PEAK(KBTU)	245.989	0.000
	DY/HR	6/16	30/ 1
	TOTAL(MBTU)	52.371	5.973
OCT	PEAK(KBTU)	117.020	55.805
	DY/HR	31/ 8	31/ 7
	TOTAL(MBTU)	52.319	13.065
NOV	PEAK(KBTU)	128.457	377.019
	DY/HR	14/ 8	14/ 7
	TOTAL(MBTU)	54.455	45.825
DEC	PEAK(KBTU)	128.457	745.670
	DY/HR	27/11	12/ 7
	ONE YEAR	763.978	183.796
	USE/PEAK	251.666	745.670

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
REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE TOPEKA, KS

ENERGY TYPE IN SITE MBTU - CATEGORY OF USE	ELECTRICITY	NATURAL-GAS
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
```

```
                    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)  ..


                  $ 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 #2 DDC CONTROL 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  ..
```

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

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-40.297	15	8	-6.F	-7.F	-201.276	15412.	33.457
FEB	0.00000					0.000	-22.106	3	6	-1.F	-2.F	-151.352	13870.	33.457
MAR	0.00000					0.000	-9.938	14	6	15.F	13.F	-117.613	16067.	33.457
APR	0.00000					0.000	-1.381	5	23	37.F	32.F	-14.791	14958.	33.457
MAY	41.12622	16	2	62.F	59.F	416.303	-0.682	10	23	60.F	56.F	-13.373	15412.	33.457
JUN	94.90955	27	17	89.F	77.F	291.687	0.000					0.000	15444.	33.457
JUL	110.49636	13	19	89.F	79.F	312.273	0.000					0.000	14926.	33.457
AUG	114.16965	24	17	95.F	77.F	312.009	0.000					0.000	16067.	33.457
SEP	69.53050	7	17	92.F	75.F	303.175	0.000					0.000	14958.	33.457
OCT	0.83652	1	17	85.F	68.F	103.625	-1.521	19	23	32.F	29.F	-14.921	15084.	33.457
NOV	0.00000					0.000	-6.626	13	6	25.F	24.F	-86.719	14947.	33.457
DEC	0.00000					0.000	-32.000	12	6	3.F	2.F	-167.004	15254.	33.457
TOTAL	431.069						-114.551						182382.	
MAX						416.303						-201.276		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

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	678	0	66	744	0	744	0	0	66	-7.188	12.320
FEB	0	597	0	75	672	0	672	0	0	75	-6.182	12.320
MAR	0	516	0	228	744	0	744	0	0	228	-6.226	12.320
APR	0	374	0	346	720	0	720	0	0	346	-5.298	12.320
MAY	382	189	0	173	360	384	744	0	0	173	0.000	12.320
JUN	711	0	0	9	0	720	720	0	0	9	0.000	33.457
JUL	744	0	0	0	0	744	744	0	0	0	0.000	33.457
AUG	744	0	0	0	0	744	744	0	0	0	0.000	33.457
SEP	635	0	0	85	0	720	720	0	0	85	0.000	33.457
OCT	15	417	0	312	720	24	744	0	0	312	0.000	12.320
NOV	0	509	0	211	720	0	720	0	0	211	-15.541	12.320
DEC	0	670	0	74	744	0	744	0	0	74	-99.199	12.320
ANNUAL	3231	3950	0	1579	5424	3336	8760	0	0	1579		

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	55.058	59.809
JAN	PEAK(KBTU)	119.074	253.691
	DY/HR	28/11	15/ 8
	TOTAL(MBTU)	49.087	35.007
FEB	PEAK(KBTU)	119.074	200.174
	DY/HR	28/ 8	3/ 6
	TOTAL(MBTU)	55.815	16.675
MAR	PEAK(KBTU)	119.074	162.628
	DY/HR	14/ 8	14/ 6
	TOTAL(MBTU)	51.389	3.281
APR	PEAK(KBTU)	115.073	26.910
	DY/HR	5/22	5/23
	TOTAL(MBTU)	69.257	1.632
MAY	PEAK(KBTU)	225.344	24.593
	DY/HR	31/18	10/23
	TOTAL(MBTU)	89.919	0.000
JUN	PEAK(KBTU)	225.660	0.000
	DY/HR	28/17	30/ 1
	TOTAL(MBTU)	94.144	0.000
JUL	PEAK(KBTU)	231.947	0.000
	DY/HR	13/17	31/ 1
	TOTAL(MBTU)	100.745	0.000
AUG	PEAK(KBTU)	236.560	0.000
	DY/HR	24/17	31/ 1
	TOTAL(MBTU)	79.510	0.000
SEP	PEAK(KBTU)	231.542	0.000
	DY/HR	7/16	30/ 1
	TOTAL(MBTU)	52.319	3.628
OCT	PEAK(KBTU)	115.221	27.123
	DY/HR	26/19	19/23
	TOTAL(MBTU)	51.841	12.000
NOV	PEAK(KBTU)	117.540	127.272
	DY/HR	3/ 8	13/ 6
	TOTAL(MBTU)	54.306	49.151
DEC	PEAK(KBTU)	119.074	217.215
	DY/HR	30/ 8	12/ 6
	ONE YEAR	803.390	181.183
	USE/PEAK	236.560	253.691

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_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 ..

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. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 8/1995 15:42:13 SDL RUN 1
DENVER, CO 80227 RUN #3 ECONOMIZER FOR BLDG.# 7656 GEN INST BLDG
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR MZ-SYSTEM TOPEKA, KS

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-60.628	17	7	27.F	24.F	-590.278	13687.	33.457
FEB	0.00000					0.000	-46.420	28	7	14.F	12.F	-656.385	12428.	33.457
MAR	0.00000					0.000	-39.813	14	7	16.F	14.F	-603.191	14934.	33.457
APR	0.00000					0.000	-16.760	4	7	32.F	30.F	-446.584	14699.	33.457
MAY	28.36173	31	7	75.F	69.F	381.619	-4.464	9	7	43.F	43.F	-408.656	15129.	33.457
JUN	78.24092	20	7	75.F	71.F	386.863	0.000					0.000	14840.	33.457
JUL	88.67802	25	7	69.F	66.F	477.222	0.000					0.000	13534.	33.457
AUG	99.48522	15	7	68.F	67.F	527.760	0.000					0.000	15008.	33.457
SEP	56.37944	6	7	75.F	71.F	388.507	0.000					0.000	14675.	33.457
OCT	0.05201	1	17	85.F	68.F	16.944	-15.255	31	7	43.F	39.F	-483.980	14813.	33.457
NOV	0.00000					0.000	-33.655	28	7	28.F	26.F	-536.266	13851.	33.457
DEC	0.00000					0.000	-57.997	12	7	2.F	1.F	-670.260	13677.	33.457
TOTAL	351.197						-274.992						171260.	
MAX						527.760						-670.260		33.457

H21-40

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 8/1995 15:42:13 SDL RUN 1
DENVER, CO 80227 RUN #3 ECONOMIZER FOR BLDG.# 7656 GEN INST BLDG
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR MZ-SYSTEM TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	572	0	172	744	0	604	296	0	32	0.000	12.320
FEB	0	512	0	160	672	0	555	279	0	43	0.000	12.320
MAR	0	533	0	211	744	0	652	312	0	119	0.000	12.320
APR	0	304	0	416	720	0	699	398	0	395	0.000	12.320
MAY	212	126	0	406	360	384	721	413	0	383	0.000	22.888
JUN	454	0	0	266	0	720	671	347	0	217	0.000	22.888
JUL	473	0	0	271	0	744	631	346	0	158	0.000	22.888
AUG	506	0	0	238	0	744	658	318	0	152	0.000	22.888
SEP	330	0	0	390	0	720	697	396	0	367	0.000	22.888
OCT	5	293	0	446	720	24	722	430	0	424	0.000	12.320
NOV	0	487	0	233	720	0	631	332	0	144	0.000	12.320
DEC	0	586	0	158	744	0	616	315	0	30	-62.559	12.320
ANNUAL	1980	3413	0	3367	5424	3336	7857	4182	0	2464		

EMC ENGINEERS INC. EZDOE - 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-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	52.131	99.344
JAN	PEAK(KBTU)	130.348	760.081
	DY/HR	31/11	17/ 7
	TOTAL(MBTU)	46.713	76.815
FEB	PEAK(KBTU)	130.348	830.242
	DY/HR	28/11	28/ 7
	TOTAL(MBTU)	54.853	66.918
MAR	PEAK(KBTU)	130.348	773.887
	DY/HR	31/ 8	14/ 7
	TOTAL(MBTU)	52.006	29.193
APR	PEAK(KBTU)	130.348	603.149
	DY/HR	25/ 8	4/ 7
	TOTAL(MBTU)	63.498	8.197
MAY	PEAK(KBTU)	249.095	560.717
	DY/HR	31/18	9/ 7
	TOTAL(MBTU)	81.345	0.000
JUN	PEAK(KBTU)	250.101	0.000
	DY/HR	27/17	30/ 1
	TOTAL(MBTU)	80.890	0.000
JUL	PEAK(KBTU)	247.989	0.000
	DY/HR	13/17	31/ 1
	TOTAL(MBTU)	91.527	0.000
AUG	PEAK(KBTU)	264.051	0.000
	DY/HR	22/16	31/ 1
	TOTAL(MBTU)	71.837	0.000
SEP	PEAK(KBTU)	258.145	0.000
	DY/HR	6/16	30/ 1
	TOTAL(MBTU)	52.331	26.653
OCT	PEAK(KBTU)	130.348	644.574
	DY/HR	31/10	31/ 7
	TOTAL(MBTU)	50.676	57.200
NOV	PEAK(KBTU)	130.348	701.804
	DY/HR	30/ 9	28/ 7
	TOTAL(MBTU)	51.941	95.454
DEC	PEAK(KBTU)	130.348	844.805
	DY/HR	30/10	12/ 7
	ONE YEAR	749.748	459.774
	USE/PEAK	264.051	844.805

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_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  ..


                $-------------------------------------$
                $ 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. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 8/1995 16: 7:20 SDL RUN 1
DENVER, CO 80227 RUN #4 NIGHT INFILTRATION BLDG.# 7656 GEN INST BLDG
REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR MZ-SYSTEM TOPEKA, KS

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-18.525	28	7	-1.F	-3.F	-147.161	15412.	33.457
FEB	0.00000					0.000	-7.299	3	7	-5.F	-6.F	-133.682	13870.	33.457
MAR	0.00000					0.000	-2.156	3	8	15.F	12.F	-58.935	16067.	33.457
APR	0.00000					0.000	-1.068	15	7	30.F	28.F	-21.242	14958.	33.457
MAY	48.76165	16	2	62.F	59.F	535.740	-0.535	11	7	50.F	49.F	-17.334	15412.	33.457
JUN	97.44159	27	17	89.F	77.F	307.153	0.000					0.000	15444.	33.457
JUL	105.17020	13	19	89.F	79.F	327.740	0.000					0.000	14926.	33.457
AUG	112.84464	24	17	95.F	77.F	325.090	0.000					0.000	16067.	33.457
SEP	79.91335	7	17	92.F	75.F	314.887	0.000					0.000	14958.	33.457
OCT	1.29022	1	17	85.F	68.F	109.879	-1.288	2	2	64.F	59.F	-32.181	15084.	33.457
NOV	0.00000					0.000	-1.320	2	7	19.F	17.F	-22.443	14947.	33.457
DEC	0.00000					0.000	-14.232	12	7	2.F	1.F	-157.929	15254.	33.457
TOTAL	445.422						-46.424						182382.	
MAX						535.740						-157.929		33.457

EMC ENGINEERS INC. EZDOE - ELITE SOFTWARE DEVELOPMENT INC DOE-2.1D 5/ 8/1995 16: 7:20 SDL RUN 1
DENVER, CO 80227 RUN #4 NIGHT INFILTRATION BLDG.# 7656 GEN INST BLDG
REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR MZ-SYSTEM TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	-1.648	12.320
FEB	0	672	0	0	672	0	672	0	0	0	-0.832	12.320
MAR	0	744	0	0	744	0	744	0	0	0	-0.694	12.320
APR	0	720	0	0	720	0	720	0	0	0	-3.292	12.320
MAY	384	358	0	2	360	384	744	0	0	2	0.000	12.320
JUN	720	0	0	0	0	720	720	0	0	0	0.000	33.457
JUL	744	0	0	0	0	744	744	0	0	0	0.000	33.457
AUG	744	0	0	0	0	744	744	0	0	0	0.000	33.457
SEP	716	0	0	4	0	720	720	0	0	4	0.000	33.457
OCT	24	720	0	0	720	24	744	0	0	0	0.000	12.320
NOV	0	720	0	0	720	0	720	0	0	0	-0.192	12.320
DEC	0	744	0	0	744	0	744	0	0	0	-37.952	12.320
ANNUAL	3332	5422	0	6	5424	3336	8760	0	0	6		

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
REPORT- PS-B MONTHLY PEAK AND TOTAL ENERGY USE TOPEKA, KS

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	54.114	29.518
JAN	PEAK(KBTU)	118.032	187.704
	DY/HR	31/ 8	28/ 7
	TOTAL(MBTU)	48.189	12.920
FEB	PEAK(KBTU)	118.032	173.290
	DY/HR	28/ 8	3/ 7
	TOTAL(MBTU)	55.349	5.097
MAR	PEAK(KBTU)	118.032	89.249
	DY/HR	4/ 8	3/ 8
	TOTAL(MBTU)	51.461	3.293
APR	PEAK(KBTU)	115.030	36.862
	DY/HR	5/22	15/ 7
	TOTAL(MBTU)	73.272	1.644
MAY	PEAK(KBTU)	241.117	30.477
	DY/HR	16/16	11/ 7
	TOTAL(MBTU)	94.318	0.000
JUN	PEAK(KBTU)	241.723	0.000
	DY/HR	28/17	30/ 1
	TOTAL(MBTU)	95.939	0.000
JUL	PEAK(KBTU)	248.509	0.000
	DY/HR	13/17	31/ 1
	TOTAL(MBTU)	104.101	0.000
AUG	PEAK(KBTU)	253.222	0.000
	DY/HR	24/17	31/ 1
	TOTAL(MBTU)	86.596	0.000
SEP	PEAK(KBTU)	247.773	0.000
	DY/HR	7/16	30/ 1
	TOTAL(MBTU)	52.706	3.653
OCT	PEAK(KBTU)	115.179	54.739
	DY/HR	26/20	2/ 2
	TOTAL(MBTU)	51.447	3.706
NOV	PEAK(KBTU)	115.521	38.824
	DY/HR	10/ 8	2/ 7
	TOTAL(MBTU)	53.352	23.342
DEC	PEAK(KBTU)	118.032	199.056
	DY/HR	30/14	12/ 7
	ONE YEAR	820.844	83.173
	USE/PEAK	253.222	199.056

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.

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                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)
```

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                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 ..


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  ..


               $-------------------------------------$
               $ 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.# 7656 *
       LINE-5 *GEN INST BLDG                          * ..

ABORT              ERRORS  ..
DIAGNOSTIC         WARNINGS ..
PLANT-REPORT       VERIFICATION=(PV-A)
```

REPORT- SS-A SYSTEM MONTHLY LOADS SUMMARY FOR MZ-SYSTEM TOPEKA, KS

	COOLING					HEATING					ELEC	
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX HR	DRY-BULB TEMP	WET-BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY	TIME OF MAX 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	-31.318	15	9	-5.F	-6.F	-195.836	15412.	33.457
FEB	0.00000					0.000	-16.950	28	6	12.F	11.F	-151.127	13870.	33.457
MAR	0.00000					0.000	-7.857	6	7	19.F	18.F	-126.789	16067.	33.457
APR	0.00000					0.000	-1.946	14	23	41.F	35.F	-33.749	14958.	33.457
MAY	46.30294	16	2	62.F	59.F	424.404	-0.943	4	23	49.F	47.F	-31.053	15412.	33.457
JUN	97.04712	28	18	89.F	76.F	236.689	0.000					0.000	15444.	33.457
JUL	109.95313	13	18	90.F	78.F	241.956	0.000					0.000	14926.	33.457
AUG	112.14284	11	17	98.F	71.F	252.264	0.000					0.000	16067.	33.457
SEP	75.37170	7	17	92.F	75.F	251.151	0.000					0.000	14958.	33.457
OCT	1.19131	1	17	85.F	68.F	130.015	-2.272	2	2	64.F	59.F	-42.554	15084.	33.457
NOV	0.00000					0.000	-5.824	13	6	25.F	24.F	-95.343	14947.	33.457
DEC	0.00000					0.000	-23.534	12	6	3.F	2.F	-180.276	15254.	33.457
TOTAL	442.008						-90.643						182382.	
MAX						424.404						-195.836		33.457

REPORT- SS-C SYSTEM MONTHLY LOAD HOURS FOR MZ-SYSTEM TOPEKA, KS

	NUMBER OF HOURS										--COINCIDENT LOADS--	
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 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	-11.934	12.320
FEB	0	672	0	0	672	0	672	0	0	0	-10.760	12.320
MAR	0	744	0	0	744	0	744	0	0	0	-11.299	12.320
APR	0	720	0	0	720	0	720	0	0	0	-5.838	12.320
MAY	384	351	0	9	360	384	744	0	0	9	0.000	12.320
JUN	720	0	0	0	0	720	720	0	0	0	0.000	33.457
JUL	744	0	0	0	0	744	744	0	0	0	0.000	33.457
AUG	744	0	0	0	0	744	744	0	0	0	0.000	33.457
SEP	684	0	0	36	0	720	720	0	0	36	0.000	33.457
OCT	16	720	0	8	720	24	744	0	0	8	0.000	12.320
NOV	0	720	0	0	720	0	720	0	0	0	-12.346	12.320
DEC	0	744	0	0	744	0	744	0	0	0	-109.211	12.320
ANNUAL	3292	5415	0	53	5424	3336	8760	0	0	53		

MO	UTILITY-	ELECTRICITY	NATURAL-GAS
	TOTAL(MBTU)	54.503	46.379
JAN	PEAK(KBTU)	117.563	246.834
	DY/HR	28/ 8	15/ 9
	TOTAL(MBTU)	48.735	27.101
FEB	PEAK(KBTU)	116.255	198.996
	DY/HR	28/ 8	28/ 6
	TOTAL(MBTU)	55.781	14.046
MAR	PEAK(KBTU)	115.598	172.109
	DY/HR	14/ 8	6/ 7
	TOTAL(MBTU)	51.609	5.100
APR	PEAK(KBTU)	114.746	57.816
	DY/HR	4/ 8	14/23
	TOTAL(MBTU)	70.676	2.477
MAY	PEAK(KBTU)	218.005	53.410
	DY/HR	16/16	4/23
	TOTAL(MBTU)	90.046	0.000
JUN	PEAK(KBTU)	213.734	0.000
	DY/HR	28/17	30/ 1
	TOTAL(MBTU)	93.167	0.000
JUL	PEAK(KBTU)	217.082	0.000
	DY/HR	13/17	31/ 1
	TOTAL(MBTU)	99.799	0.000
AUG	PEAK(KBTU)	226.848	0.000
	DY/HR	11/16	31/ 1
	TOTAL(MBTU)	81.437	0.000
SEP	PEAK(KBTU)	219.574	0.000
	DY/HR	6/17	30/ 1
	TOTAL(MBTU)	52.650	5.633
OCT	PEAK(KBTU)	114.854	72.205
	DY/HR	26/20	2/ 2
	TOTAL(MBTU)	51.867	11.198
NOV	PEAK(KBTU)	114.952	136.490
	DY/HR	28/ 8	13/ 6
	TOTAL(MBTU)	53.741	36.238
DEC	PEAK(KBTU)	118.069	230.413
	DY/HR	12/ 8	12/ 6
	ONE YEAR	804.011	148.171
	USE/PEAK	226.848	246.834

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
		TOTAL NUMBER OF BUILDINGS FOR UA CALCULATIONS			**80**

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 BUILD	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 BUILD	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
				TOTAL INFILTRATION (CFM)		=	77

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
				TOTAL UA (BTU/HR°F)			2,020

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
				TOTAL UA (BTU/HR°F)			6,109

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
				TOTAL INFILTRATION (CFM)		=	311

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
				TOTAL UA (BTU/HR°F)			7,180

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
				TOTAL INFILTRATION (CFM)		=	217

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
				TOTAL UA (BTU/HR°F)			3,515

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:	1.	OUTSIDE AIR FILM	0.17
4" BRICK = 1.2	2.	COMPOSITE	1.00
PLYWOOD SHEATHING = .62	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:	1.	OUTSIDE AIR FILM	0.17
4" BRICK = 1.2	2.	COMPOSITE	1.00
PLYWOOD SHEATHING = .62	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:	1.	OUTSIDE AIR FILM	0.17
10" ARCH. CONCRETE = 1.39	2.	COMPOSITE	1.57
INSULATED GLASS = 1.75	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			4	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	0.680	=	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	1.	OUTSIDE AIR FILM	0.17
VERTICAL WOOD SIDING W/BATTENS = 1.17	2.	COMPOSITE WALL	1.18
4" BRICK = 1.2	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
				TOTAL INFILTRATION (CFM)		=	489

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
				TOTAL UA (BTU/HR°F)			4,410

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:	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.		DATE:	12-Jun-95
PROJECT: EEAP, FEASIBILITY STUDY FOR INSTALLATION OF UMCS		BY:	AMS
CLIENT CONTRACT NO.: DACA 01-94-D-0033		JOB:	1406.001
CLIENT: CORPS OF ENGINEERS, KANSAS CITY		CHK:	AJN
LOCATION: FT. RILEY, KANSAS		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
				TOTAL INFILTRATION (CFM)		=	36

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
				TOTAL UA (BTU/HR°F)			996

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
	1.	NE WALL	2.59
COMPONENTS:	2.	SW WALL	2.59
8" MASONRY UNITS = 1.11	3.	NW WALL	4.85
1" INSULATION = 4.0	4.	SE WALL	4.85
METAL SIDING = 0	5.		
CORRUGATED SIDING = 4.85	6.		
IA FILM = .68	7.		
OA FILM = .17		COMP. 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.	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
				TOTAL INFILTRATION (CFM)		=	1269

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
				TOTAL UA (BTU/HR°F)			9,771

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: 727	BLDG NAME: MNT HANGAR COMB		
BLDG FUNCTION:	MAINT		
FLOOR AREA: (SQ. FT)	32,758	# FLOORS:	1
SLAB PERIMETER: (FT)	881		

I. AREAS: ([ ] FIELD VERIFIED ELEVATION PLANS)

		NORTH	SOUTH	EAST	WEST	TOTAL
WALLS, GROSS	(SQ. FT)	6,630	6,630	8,443	8,443	30,145
GLASS	(SQ. FT)	161	93	0	0	255
PERSONNEL DOOR	(SQ. FT)	126	84	0	126	336
OVERHEAD DOOR	(SQ. FT)	0	95	4,257	4,257	8,609
WALLS, NET	(SQ. FT)	6,343	6,358	4,186	4,060	20,946
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)					(SQ. FT)	33,052
OVERHEAD DOOR	(SQ. FT)	8,609	PERSONNEL DOOR		(SQ. FT)	336
BASEMENT WALLS	(SQ. FT)					0

II. CONSTRUCTION: ([ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES)

WALLS: (SKETCH CROSS SECTION OF WALL)

COMPONENTS:
ADDITIONS:
4" RIGID INSULATION = 11.12
1/2" GWB = 0.45
10" CMU = 1.39
IA FILM = .68
OA FILM = .17

EXISTING:
8" CMU = 1.11
METAL SIDING = 0
OA FILM = .17
IA FILM = .68

	COMPOSITES	R-VALUE
1.	NORTH WALL	6.44
2.	SOUTH WALL	6.70
3.	EAST WALL	2.65
4.	WEST WALL	4.36
5.		
6.		
7.		
	COMP. R-WALL =	5.36
	U=1/R	0.187

ROOF: (SKETCH CROSS SECTION OF ROOF)

COMPONENTS:
ADDITIONS:
OA FILM = 0.17
BUR = 0.33
2" RIGID INSULATION = 5.56
METAL DECK = 0
IA FILM = .17
6.74 = R

EXISTING:
OA FILM = 0.17
BUR = 0.33
1" RIGID INSULATION = 2.78
WOOD DECK = .825
IA FILM = .68
4.785 = R

	COMPOSITE:	R-VALUE
1.	59.73% OF ROOF	4.79
2.	40.26% OF ROOF	6.74
3.		
4.		
5.		
6.		
7.		
	COMP. R-ROOF =	5.95
	U=1/R	0.168

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)	X 0.27 Sq.In./LF=	Sq.In.	0	X CFM/Sq.In.	1.530	=	0
PERSONNEL DOORS (SF)	336 X 0.16 Sq.In./SF=	Sq.In.	54	X CFM/Sq.In.	1.530	=	82
OVERHEAD DOORS (SF)			8609	X CFM/Sq.Ft.	0.228	=	1963
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)		=	2045

UA ODOOR	=	ODOOR AREA	8,609	X DOOR "U"	0.136	=	1,174
UA PDOOR	=	PDOOR AREA	336	X DOOR "U"	0.552	=	185
UA WALL	=	WALL AREA	20,946	X WALL "U"	0.187	=	3,908
UA ROOF	=	ROOF AREA	33,052	X ROOF "U"	0.168	=	5,555
UA GLASS	=	GLASS AREA	255	X GLASS "U"	1.111	=	283
UA SLAB	=	SLAB PERIM.	881	X SLF	0.680	=	599
UA BASEM.	=	B-WALL AREA	0	X BASE. "U"	0.000	=	0
INFILTRATION	=	CFM	2045	X A. T. F.	1.037	=	2,121
				TOTAL UA (BTU/HR°F)			13,826

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			2	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
				TOTAL INFILTRATION (CFM)		=	191

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
				TOTAL UA (BTU/HR°F)			4,538

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: 817	BLDG NAME:	MNT HANGAR AVUM	
BLDG FUNCTION:			
FLOOR AREA: (SQ. FT)	38,734	# FLOORS:	1
SLAB PERIMETER: (FT)	897		

I. AREAS: ([ ] FIELD VERIFIED ELEVATION PLANS)

		NORTH-W	NORTH-E	SOUTH-W	SOUTH-E	TOTAL
WALLS, GROSS	(SQ. FT)	4,698	13,253	16,683	4,698	39,332
GLASS	(SQ. FT)	117	664	332	117	1,229
PERSONNEL DOOR	(SQ. FT)	21	336	0	21	378
OVERHEAD DOOR	(SQ. FT)	0	0	7,920	0	7,920
WALLS, NET	(SQ. FT)	4,560	12,253	8,431	4,560	29,805
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)					(SQ. FT)	38,891
OVERHEAD DOOR	(SQ. FT)	7,920	PERSONNEL DOOR		(SQ. FT)	378
BASEMENT WALLS	(SQ. FT)					0

II. CONSTRUCTION: ([ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES)

WALLS: (SKETCH CROSS SECTION OF WALL)

COMPONENTS
4" FLUTED CMU = 1.17
1" AIR SPACE = 1.0
1" RIGID INSULATION = 4.0
6" CMU = 1.29
3" RIBBED METAL PANELS W/3" BATT INSUL. = 11.0
IA FILM = .68
OA FILM = .17

	COMPOSITES	R-VALUE
1.	SE WALL	10.71
2.	NW WALL	10.71
3.	SW WALL	11.85
4.	NE WALL	5.96
5.		
6.		
7.		
	TOTAL R-WALL =	10.31
	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)	1767 X 0.27 Sq.In./LF=	Sq.In.	477	X CFM/Sq.In.	1.530	=	730
PERSONNEL DOORS (SF)	378 X 0.16 Sq.In./SF=	Sq.In.	60	X CFM/Sq.In.	1.530	=	93
OVERHEAD DOORS (SF)			7920	X CFM/Sq.Ft.	0.114	=	903
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)		=	1737

UA ODOOR	=	ODOOR AREA	7,920	X DOOR "U"	0.136	=	1,080
UA PDOOR	=	PDOOR AREA	378	X DOOR "U"	0.552	=	209
UA WALL	=	WALL AREA	29,805	X WALL "U"	0.097	=	2,892
UA ROOF	=	ROOF AREA	38,891	X ROOF "U"	0.050	=	1,959
UA GLASS	=	GLASS AREA	1,229	X GLASS "U"	0.571	=	702
UA SLAB	=	SLAB PERIM.	897	X SLF	0.680	=	610
UA BASEM.	=	B-WALL AREA	0	X BASE. "U"	0.000	=	0
INFILTRATION	=	CFM	1737	X A. T. F.	1.037	=	1,802
				TOTAL UA (BTU/HR°F)			9,255

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
				TOTAL INFILTRATION (CFM)		=	741

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
				TOTAL UA (BTU/HR°F)			3,810

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	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.	6" 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:	1.	OUTSIDE AIR FILM	0.17
4" FACE BRICK = 1.2	2.	COMPOSITE	1.05
4" PRE-CAST CONCRETE PANELS = .72	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
				TOTAL UA (BTU/HR°F)			6,555

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

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: 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

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:	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
				TOTAL INFILTRATION (CFM)		=	67

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
				TOTAL UA (BTU/HR°F)			789

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: 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.
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: 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	1.385	=	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

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: 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
				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: 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
				TOTAL INFILTRATION (CFM)		=	158

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
				TOTAL UA (BTU/HR°F)			1,960

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
				TOTAL INFILTRATION (CFM)		=	389

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
				TOTAL UA (BTU/HR°F)			2,605

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
				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	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
				TOTAL UA (BTU/HR°F)			7,306

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			12	X CFM /OPENING /HR	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.
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: 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
				TOTAL INFILTRATION (CFM)		=	105

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
				TOTAL UA (BTU/HR°F)			3,545

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:	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.	0.852	=	1,511
				TOTAL UA (BTU/HR°F)			9,281

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: 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: 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
				TOTAL INFILTRATION (CFM)		=	54

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
				TOTAL UA (BTU/HR°F)			3,653

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		(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
				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	0	X BASE. "U"	0.100	=	0
INFILTRATION	=	CFM	4224	X A. T. F.	1.037	=	4,380
				TOTAL UA (BTU/HR°F)			15,201

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
				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	0	X BASE. "U"	0.100	=	0
INFILTRATION	=	CFM	4224	X A. T. F.	1.037	=	4,380
				TOTAL UA (BTU/HR°F)			15,201

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: 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	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)

		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			4	X CFM /OPENING /HR	1.600	=	6
DOOR OPENINGS / HR - DOUBLE DOORS			20	X CFM /OPENING /HR	1.385	=	28
				TOTAL INFILTRATION (CFM)		=	189

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
				TOTAL UA (BTU/HR°F)			3,640

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: 7739	BLDG NAME:	FLIGHT SIMULATOR	
BLDG FUNCTION:	SIMULATOR		
FLOOR AREA: (SQ. FT)	4,359	# FLOORS:	1
SLAB PERIMETER: (FT)	313		

I. AREAS: ([ ] FIELD VERIFIED ELEVATION PLANS)

		NORTH-W	NORTH-E	SOUTH-W	SOUTH-E	TOTAL
WALLS, GROSS	(SQ. FT)	2,014	2,243	2,181	2,048	8,485
GLASS	(SQ. FT)	0	0	0	72	72
PERSONNEL DOOR	(SQ. FT)	21	63	21	165	270
OVERHEAD DOOR	(SQ. FT)	0	0	0	0	0
WALLS, NET	(SQ. FT)	1,993	2,180	2,160	1,811	8,143
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)					(SQ. FT)	4,359
OVERHEAD DOOR	(SQ. FT)	0	PERSONNEL DOOR		(SQ. FT)	270
BASEMENT WALLS	(SQ. FT)					0

II. CONSTRUCTION: ([ ] FIELD VERIFIED WALL, ROOF, WINDOW, DOOR TYPES)

WALLS: (SKETCH CROSS SECTION OF WALL)

COMPONENTS:
PRE-FINISHED METAL PANELS = 0
4" CMU = .72
AIR SPACE = 1.0
2" RIGID INSULATION = 5.56
6" CMU = .92
IA FILM = .68
OA FILM = .17

	COMPOSITES	R-VALUE
1.	NORTH-W WALL	8.18
2.	NORTH-E WALL	7.13
3.	SOUTH-W WALL	8.18
4.	SOUTH-E WALL	8.17
5.		
6.		
7.		
	COMP. R-WALL =	7.90
	U=1/R	0.127

ROOF: (SKETCH CROSS SECTION OF ROOF)

COMPONENTS:

HIGH AREA ROOF:
BUR = .33
2" RIGID INSUL. = 5.56
METAL DECK = 0
O.A. FILM = .17
I.A. FILM = .68
COMPOSITE = 6.67

LOW AREA ROOF:
BUR = .33
STEEL DECK = 0
AIR SPACE = 1.0
6" BATT INSUL = 19
ACOUSTIC CEILING = 1.25
O.A. FILM = .17
I.A. FILM = .68
COMPOSITE = 22.36

	COMPOSITES	R-VALUE
1.	HIGH AREA ROOF	6.67
2.	LOW AREA ROOF	22.36
3.		
4.		
5.		
6.		
7.		
	COMP R-ROOF =	11.70
	U=1/R	0.085

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)	42 X 0.27 Sq.In./LF=	Sq.In.	11	X CFM/Sq.In.	1.530	=	17
PERSONNEL DOORS (SF)	270 X 0.16 Sq.In./SF=	Sq.In.	43	X CFM/Sq.In.	1.530	=	66
DOOR OPENINGS / HR - SINGLE DOOR			4	X CFM /OPENING /HR	1.600	=	6
DOOR OPENINGS / HR - DOUBLE DOORS			1	X CFM /OPENING /HR	1.385	=	1
				TOTAL INFILTRATION (CFM)		=	91

UA ODOOR	=	ODOOR AREA	0	X DOOR "U"	0.000	=	0
UA PDOOR	=	PDOOR AREA	270	X DOOR "U"	0.552	=	149
UA WALL	=	WALL AREA	8,143	X WALL "U"	0.127	=	1,031
UA ROOF	=	ROOF AREA	4,359	X ROOF "U"	0.085	=	373
UA GLASS	=	GLASS AREA	72	X GLASS "U"	0.571	=	41
UA SLAB	=	SLAB PERIM.	313	X SLF	0.680	=	213
UA BASEM.	=	B-WALL AREA	0	X BASE. "U"	0.000	=	0
INFILTRATION	=	CFM	91	X A. T. F.	1.037	=	95
				TOTAL UA (BTU/HR°F)			1,901

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: 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
				TOTAL UA (BTU/HR°F)			5,730

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)

		NORTH-E	NORTH-W	SOUTH-E	SOUTH-W	TOTAL
WALLS, GROSS	(SQ. FT)	1,690	1,090	1,263	1,690	5,734
GLASS	(SQ. FT)	326	39	0	117	482
PERSONNEL DOOR	(SQ. FT)	42	84	0	21	147
OVERHEAD DOOR	(SQ. FT)	0	0	0	0	0
WALLS, NET	(SQ. FT)	1,322	967	1,263	1,552	5,105
ROOF AREA (OR CEILING AREA IF ATTIC IS UNCONDITIONED)					(SQ. FT)	6,888
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.	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
				TOTAL INFILTRATION (CFM)		=	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
				TOTAL UA (BTU/HR°F)			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)

COMPOSITE:
12" CONCRETE = 3.7
INSULATED METAL PANELS = 7.33
O'HEAD INSULATED METAL DOORS = 7.33
COMPOSITE = 4.8

	COMPONENTS	R-VALUE
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	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:
12" MASONRY UNITS = 3.7
INSULATED METAL PANELS = 7.33
BAY DOORS = .07
OA FILM = .17
IA FILM = .68

	COMPONENTS	R-VALUE
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
				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)

*COMPOSITE= JUMBO BRICK - 1.8
1/4" ASBESTOS CEMENT - .034
PRE-FAB FASCIA PANELS - 1.17

	COMPONENTS	R-VALUE
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)

*COMPOSITE= JUMBO BRICK - 1.8
1/4" ASBESTOS CEMENT - .034
PRE-FAB FASCIA PANELS - 1.17

	COMPONENTS	R-VALUE
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.
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: 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		(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.	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
				TOTAL INFILTRATION (CFM)		=	111

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
				TOTAL UA (BTU/HR°F)			665

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: 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
				TOTAL INFILTRATION (CFM)		=	105

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
				TOTAL UA (BTU/HR°F)			5,496

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)

*COMPOSITE= JUMBO BRICK - 1.8
1/4" ASBESTOS CEMENT - .034
PRE-FAB FASCIA PANELS - 1.17

	COMPONENTS	R-VALUE
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: 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)

COMPOSITE
6" JUMBO BRICK = 1.8
CEMENT ASBESTOS PANELS = .034
PRE-FAB FASCIA = 1.17
COMPOSITE = 1.41

	COMPONENTS	R-VALUE
1.	OUTSIDE AIR FILM	0.17
2.	8" REINF. CMU	1.11
3.	COMPOSITE	1.41
4.	2" RIGID INSUL.	5.56
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)

COMPOSITE:
JUMBO BRICK (6") = 1.8
PRE-FAB FASCIA = 1.17

	COMPONENTS	R-VALUE
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.: 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: 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	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 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	1.385	=	0
				TOTAL INFILTRATION (CFM)		=	72

UA ODOOR	=	ODOOR AREA	20,782	X DOOR "U"	0.000	=	0
UA PDOOR	=	PDOOR 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:	8380	BLDG NAME:	VEH MNT SHOP ORG
BLDG FUNCTION:		MAINT	
FLOOR AREA: (SQ. FT)		82,472	# 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
				TOTAL INFILTRATION (CFM)		=	375

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
				TOTAL UA (BTU/HR°F)			15,834

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
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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
				TOTAL INFILTRATION (CFM)		=	375

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
				TOTAL UA (BTU/HR°F)			15,834