FINAL SUBMITTAL

VOLUME II
APPENDIX G, PART 1

FEASIBILITY STUDY FOR EXPANSION OF ENERGY MONITORING AND CONTROL SYSTEM (EMCS) FORT DRUM, NEW YORK

Prepared for

NORFOLK DISTRICT
CORPS OF ENGINEERS, CENAO-EN-MC
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Under

U.S. ARMY ENGINEER DISTRICT, MOBILE
INDEFINITE DELIVERY A-E CONTRACT
CONTRACT NO. DACA01-94-D-0033
DELIVERY ORDER NO. 0006

EMC No. 1406-006
January 1997

By

E M C Engineers, Inc.
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DEPARTMENT OF THE ARMY
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EXECUTIVE SUMMARY

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LIST OF ABBREVIATIONS

AC	-	air conditioning
ACC	-	anticipated contract cost
ACCU	-	air cooled condensing unit
ACM	-	asbestos containing material
ACU(s)	-	auxiliary control unit(s)
AHU	-	air handling unit
AI	-	analog input
AO	-	analog output
ASCII	-	American Standard Code for Information Interchange
ASHRAE	-	American Society of Heating, Refrigeration, and Air conditioning Engineers
B/C	-	benefit-to-cost ratio
BCD	-	binary coded decimal
BLDG	-	building
BEACON	-	Building Energy Simulation Program
Btu	-	British thermal units
Btuh	-	British thermal units per hour
B/W	-	black and white
C	-	Celsius
CCC	-	central communications controller
ccf	-	one hundred (100) cubic feet
CCU	-	central control unit

cf	-	cubic foot, cubic feet
cfm	-	cubic feet per minute
CLM	-	command line mnemonic
CLMI	-	command line mnemonic interpreter
COE	-	Corps of Engineers
COS	-	central operator station
CPU	-	central processing unit
CRT	-	cathode ray tube
CU(s)	-	control unit(s)
CWE	-	current working estimate
d	-	day(s)
DCP	-	duty cycle program
DEH	-	Directorate of Engineering and Housing
DHW	-	direct memory access
DI	-	digital input
DO	-	digital output
DOD	-	Department of Defense
DPW	-	Department of Public Works
DTM	-	data transmission media
DX	-	direct expansion
E/C	-	energy-to-cost ratio
ECIP	-	Energy Conservation Investment Program
ECO	-	energy conservation opportunity

EEAP	-	energy engineering analysis program
eff	-	efficiency
elec.	-	electricity
EMC	-	EMC Engineers, Inc.
EMCS	-	energy monitoring and control system
EMI	-	electromagnetic interference
ESCO	-	energy service company
EZ-DOE	-	Building Energy Simulation Program
F	-	Fahrenheit
FO	-	fiber optic(s)
ft	-	foot, feet
ft^2	-	square feet
FY	-	fiscal year
gal	-	gallon(s)
hp	-	horsepower
hr	-	hours(s)
H & V	-	heating and ventilating
HVAC	-	heating, ventilation, and air conditioning
in.	-	inch(es)
I/O	-	input/output
kBtu	-	one thousand British thermal units
kcf	-	one thousand cubic feet

klb	-	one thousand pounds
kva	-	kilovolt - ampere
kW	-	kilowatt, one thousand watts
kWh	-	kilowatt-hour, one thousand watt-hours
1b	-	pound(s)
LCCA	-	life cycle cost analysis
LCCID	-	life cycle cost in design
LED	-	light emitting diode
LPG	-	liquefied petroleum gas
MAU	-	make-up air unit
MBtu	-	one million Btu
MCR	-	master control room
MHz	-	megahertz
Mh	-	man-hours(s)
mo	-	months(s)
MW	-	megawatt, one million watts
MWh	-	megawatt-hour, one million watt-hours
MZAHU	-	Multizone air handling unit
NA	-	Not active or Not applicable
NG	-	natural gas
NOAA	-	National Oceanic and Atmospheric Administration
no.	-	number
OA	-	outside air

O&M	-	operation and maintenance
PC	-	personal computer
PM	-	preventative maintenance
PROM	-	programmable read-only memory
psi(a)(g)	-	pounds per square inch (absolute) (gage)
RAM	-	random access memory
RCU(s)	-	remote control unit(s)
RTC	-	real-time clock
RTDOS/E	-	real-time disk operating system /executive
S&A	-	Supervision and Administration
scfm	-	sea-level cubic feet per minute
SES	-	shared energy savings
SIOH	-	supervision, inspection, and overhead
SIR	-	savings-to-investment ratio
SPW	-	single present worth
sq.ft.	-	square feet
st/sp	-	start/stop
stm	-	steam
SZAHU	-	single zone air handling unit
t	-	ton
temp	-	temperature
TRY	-	test reference year

UA	-	overall heat transfer coefficient (Btu/hr/ft^2/°F)
UCU(s)	-	unitary control unit(s)
UH	-	unit heater
UMCS	-	utility monitoring and control system
UPW	-	uniform present worth
VAV	-	variable air volume
wk	-	week(s)
yr	-	year(s)

APPENDIX G

ENERGY CALCULATIONS

APPENDIX G.1

ENERGY CONSTANT CALCULATIONS

E M C ENGINEERS, INC
DENVER • ATLANTA • GERMANY

JOB: FT. DRUM, NY (EMC #1406-006)
CALCULATED BY: BG
CHECKED BY: BC
DATE: 20-Apr-95
BUILDING NO.: 36
BLDG. TYPE: MEDICAL CENTER

ENERGY CONSTANT CALCULATIONS

	BASERUN	RUN1	RUN2	RUN3	RUN4	RUN5
HEATING (MBtu)	3217.0	1604.7	1604.7	1476.5	1476.5	
COOLING (kWH)	39966.4	32545.1	32545.1	20642.8	20642.8	

SUPPLY AIR FAN	24085	CFM
FLOOR AREA	26440	FT²
CFMI	7180	CFM
UA		BTU/HR • °F
BUILDING CONST	2	(1 FOR LIGHT) (2 FOR HEAVY)

EZDOE RUN DEFINITION:	
BASERUN	EXISTING OPERATION
RUN1	NIGHT SETBACK
RUN2	ECONOMIZER
RUN3	DDC
RUN4	FORCED VENTILATION
RUN5	

HOURS OF OCCUPANCY				ANNUAL HEATING & COOLING HOURS	
M-F	700	1630	46.5 HR	HR. ON HEATING	1488 HR/YR
SAT.	0	0	0 HR	HR. ON COOLING	930 HR/YR
SUN.	0	0	0 HR	HR. OFF HEATING	3888 HR/YR
	TOTAL OCCUPY HR.		46.5 HR/WK	HR. OFF COOLING	2430 HR/YR
	TOTAL UNOCC. HR.		121.5 HR/WK		
	ANNUAL OCCUPY HR.		2425 HR/YR		
	ANNUAL UNOCC. HR.		6335 HR/YR		

PRESENT HR. OF OPERATION FOR SYS. WITH HEATING AND COOLING 8760 HR/YR
PRESENT HR. OF OPERATION FOR SYS. WITH HEATING ONLY 5376 HR/YR
PRESENT HR. OF OPERATION FOR SYS. WITH COOLING ONLY 3360 HR/YR

HOUR SAVE (HEATING ONL	5376	-	1488	=	3888 HR/YR
HOUR SAVE (COOLING ONL	3360	-	930	=	2430 HR/YR

HOAUHC	3216.97 MBtu	-	1604.742 MBtu	=	0.00E+00 Btu/CFM-HR
	7180 CFM	*	6335 HR/YR		
HOAUH	3216.97 MBtu	-	1604.742 MBtu	=	0.00E+00 Btu/CFM-HR
	7180 CFM	*	3888 HR/YR		
COAUHC	39966.4 kWH	-	32545.12 kWH	=	1.63E-04 kWH/CFM-HR
	7180 CFM	*	6335 HR/YR		
COAUC	39966.4 kWH	-	32545.12 kWH	=	4.25E-04 kWH/CFM-HR
	7180 CFM	*	2430 HR/YR		
HOAOHC	3216.97 MBtu	-	1612.228 MBtu	=	9.22E+01 Btu/CFM-HR
	7180 CFM	*	2425 HR/YR		
HOAOH	3216.97 MBtu	-	1612.228 MBtu	=	1.50E+02 Btu/CFM-HR
	7180 CFM	*	1488 HR/YR		
COAOHC	39966.4 kWH		7421.278 kWH	=	1.87E-03 kWH/CFM-HR
	7180 CFM	*	2425 HR/YR		
COAOC	39966.4 kWH		7421.278 kWH	=	4.87E-03 kWH/CFM-HR
	7180 CFM	*	930 HR/YR		
DC	1 / 6 (10 MINUTES PER HOUR)			=	0.17
DC DEMAND	1 / 6 (10 MINUTES PER HOUR)			=	0.17

E M C ENGINEERS, INC
DENVER • ATLANTA • GERMANY

JOB: FT. DRUM, NY (EMC #1406-006)
CALCULATED BY: BG
CHECKED BY: BC
DATE: 20-Apr-95
BUILDING NO.: 36
BLDG. TYPE: MEDICAL CENTER

ENERGY CONSTANT CALCULATIONS

ECC	32545.12 kWH -	32545.12 kWH	=	0.00E+00 kWH/CFM-HR
	24085 CFM *	930 HR/YR		
ECHC	32545.12 kWH -	32545.12 kWH	=	0.00E+00 kWH/CFM-HR
	24085 CFM *	2425 HR/YR		
NSUCHC	39966.4 kWH -	32545.12 kWH	=	4.86E-05 kWH/CFM-HR
	24085 CFM *	6335 HR/YR		
NSUCC	39966.4 kWH -	32545.12 kWH	=	7.93E-05 kWH/CFM-HR
	24085 CFM *	3888 HR/YR		
DDCCHC	32545.12 kWH -	20642.84 kWH	=	2.04E-04 kWH/CFM-HR
	24085 CFM *	2425 HR/YR		
DDCCC	32545.12 kWH -	20642.84 kWH	=	5.31E-04 kWH/CFM-HR
	24085 CFM *	930 HR/YR		
NSC	3216.97 MBtu -	1604.742 MBtu	=	6.10E+04 Btu/ft^2
	26440 AREA			
DSC	1604.742 MBtu -	1476.506 MBtu	=	4.85E+03 Btu/ft^2
	26440 AREA			
FV	1476.506 MBtu -	1476.506 MBtu	=	0.00E+00 Btu/CFM-HR
	7180 CFM *	160 HR/YR		
CHWR	(0.915 kW X 0.012 Eff. X 436 HRS X 2 Degrees of Reset)		=	9.6 kWH/TON
OAR	740 HR/YR *	0.01	=	7.4 HR/YR

E M C ENGINEERS, INC
DENVER • ATLANTA • GERMANY

JOB: FT. DRUM, NY (EMC #1406-006)
CALCULATED BY: CSW
CHECKED BY: BC
DATE: 19-Apr-95
BUILDING NO.: 1750
BLDG. TYPE: MOTOR REPAIR SHOP

ENERGY CONSTANT CALCULATIONS

	BASERUN	RUN1	RUN2	RUN3	RUN4	RUN5
HEATING (MBtu)	5899.2	3657.2	3657.2	3579.0	3579.0	
COOLING (kWH)	0.0	0.0	0.0	0.0	0.0	

SUPPLY AIR FAN	13370	CFM
FLOOR AREA	38336	FT²
CFMI	10204	CFM
UA		BTU/HR • °F
BUILDING CONST	2	(1 FOR LIGHT) (2 FOR HEAVY)

EZDOE RUN DEFINITION:	
BASERUN	EXISTING OPERATION
RUN1	NIGHT SETBACK
RUN2	ECONOMIZER
RUN3	DDC
RUN4	FORCED VENTILATION
RUN5	

HOURS OF OCCUPANCY				ANNUAL HEATING & COOLING HOURS	
M-F	600	1730	56.5 HR	HR. ON HEATING	1808 HR/YR
SAT.	0	0	0 HR	HR. ON COOLING	1130 HR/YR
SUN.	0	0	0 HR	HR. OFF HEATING	3568 HR/YR
	TOTAL OCCUPY HR.		56.5 HR/WK	HR. OFF COOLING	2230 HR/YR
	TOTAL UNOCC. HR.		111.5 HR/WK		
	ANNUAL OCCUPY HR.		2946 HR/YR		
	ANNUAL UNOCC. HR.		5814 HR/YR		

PRESENT HR. OF OPERATION FOR SYS. WITH HEATING AND COOLING 8760 HR/YR
PRESENT HR. OF OPERATION FOR SYS. WITH HEATING ONLY 5376 HR/YR
PRESENT HR. OF OPERATION FOR SYS. WITH COOLING ONLY 3360 HR/YR

HOUR SAVE (HEATING ONL	5376	-	1808	=	3568 HR/YR
HOUR SAVE (COOLING ONL	3360	-	1130	=	2230 HR/YR

HOAUHC	5899.2 MBtu	-	3657.21 MBtu	=	0.00E+00 Btu/CFM-HR
	10204 CFM	*	5814 HR/YR		
HOAUH	5899.2 MBtu	-	3657.21 MBtu	=	0.00E+00 Btu/CFM-HR
	10204 CFM	*	3568 HR/YR		
COAUHC	0 kWH	-	0 kWH	=	0.00E+00 kWH/CFM-HR
	10204 CFM	*	5814 HR/YR		
COAUC	0 kWH	-	0 kWH	=	0.00E+00 kWH/CFM-HR
	10204 CFM	*	2230 HR/YR		
HOAOHC	5899.2 MBtu	-	2241.99 MBtu	=	1.22E+02 Btu/CFM-HR
	10204 CFM	*	2946 HR/YR		
HOAOH	5899.2 MBtu	-	2241.99 MBtu	=	1.98E+02 Btu/CFM-HR
	10204 CFM	*	1808 HR/YR		
COAOHC	0 kWH		0 kWH	=	0.00E+00 kWH/CFM-HR
	10204 CFM	*	2946 HR/YR		
COAOC	0 kWH		0 kWH	=	0.00E+00 kWH/CFM-HR
	10204 CFM	*	1130 HR/YR		
DC	1 / 6 (10 MINUTES PER HOUR)			=	0.17
DC DEMAND	1 / 6 (10 MINUTES PER HOUR)			=	0.17

E M C ENGINEERS, INC
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JOB: FT. DRUM, NY (EMC #1406-006)
CALCULATED BY: CSW
CHECKED BY: BC
DATE: 19-Apr-95
BUILDING NO.: 1750
BLDG. TYPE: MOTOR REPAIR SHOP

ENERGY CONSTANT CALCULATIONS

ECC	0 kWH -	0 kWH	=	0.00E+00 kWH/CFM-HR
	13370 CFM *	1130 HR/YR		
ECHC	0 kWH -	0 kWH	=	0.00E+00 kWH/CFM-HR
	13370 CFM *	2946 HR/YR		
NSUCHC	0 kWH -	0 kWH	=	0.00E+00 kWH/CFM-HR
	13370 CFM *	5814 HR/YR		
NSUCC	0 kWH -	0 kWH	=	0.00E+00 kWH/CFM-HR
	13370 CFM *	3568 HR/YR		
DDCCHC	0 kWH -	0 kWH	=	0.00E+00 kWH/CFM-HR
	13370 CFM *	2946 HR/YR		
DDCCC	0 kWH -	0 kWH	=	0.00E+00 kWH/CFM-HR
	13370 CFM *	1130 HR/YR		
NSC	5899.2 MBtu -	3657.21 MBtu	=	5.85E+04 Btu/ft^2
	38336 AREA			
DSC	3657.21 MBtu -	3579 MBtu	=	2.04E+03 Btu/ft^2
	38336 AREA			
FV	3579 MBtu -	3579 MBtu	=	0.00E+00 Btu/CFM-HR
	10204 CFM *	160 HR/YR		
CHWR	(0.915 kW X 0.012 Eff. X 436 HRS X 2 Degrees of Reset)		=	9.6 kWH/TON
OAR	740 HR/YR *	0.01	=	7.4 HR/YR

E M C ENGINEERS, INC
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JOB: FT. DRUM, NY (EMC #1406-006)
CALCULATED BY: IVB
CHECKED BY: BC
DATE: 19-Apr-95
BUILDING NO.: 2060A
BLDG. TYPE: MNT HANGAR AVUM

ENERGY CONSTANT CALCULATIONS

	BASERUN	RUN1	RUN2	RUN3	RUN4	RUN5
HEATING (MBtu)	6091.4	5845.9	5845.9	5710.1	5710.1	
COOLING (kWH)	0	0	0	0	0	

SUPPLY AIR FAN	55920	CFM
FLOOR AREA	37828	FT²
CFMI	55920	CFM
UA		BTU/HR • °F
BUILDING CONST	2	(1 FOR LIGHT) (2 FOR HEAVY)

EZDOE RUN DEFINITION:	
BASERUN	EXISTING OPERATION
RUN1	NIGHT SETBACK
RUN2	ECONOMIZER
RUN3	DDC
RUN4	FORCED VENTILATION
RUN5	

HOURS OF OCCUPANCY				ANNUAL HEATING & COOLING HOURS	
M-F	600	2200	80 HR	HR. ON HEATING	2080 HR/YR
SAT.	0	0	0 HR	HR. ON COOLING	1394 HR/YR
SUN.	0	0	0 HR	HR. OFF HEATING	2288 HR/YR
	TOTAL OCCUPY HR.		80 HR/WK	HR. OFF COOLING	1534 HR/YR
	TOTAL UNOCC. HR.		88 HR/WK		
	ANNUAL OCCUPY HR.		4171 HR/YR		
	ANNUAL UNOCC. HR.		4589 HR/YR		

PRESENT HR. OF OPERATION FOR SYS. WITH HEATING AND COOLING 8760 HR/YR
PRESENT HR. OF OPERATION FOR SYS. WITH HEATING ONLY 5376 HR/YR
PRESENT HR. OF OPERATION FOR SYS. WITH COOLING ONLY 3360 HR/YR

HOUR SAVE (HEATING ONL 5376 - 2080 = 3296 HR/YR
HOUR SAVE (COOLING ONL 3360 - 1394 = 1966 HR/YR

HOAUHC	6091.4 MBtu	-	5845.9 MBtu	=	0.00E+00 Btu/CFM-HR
	55920 CFM	*	4589 HR/YR		
HOAUH	6091.4 MBtu	-	5845.9 MBtu	=	0.00E+00 Btu/CFM-HR
	55920 CFM	*	3296 HR/YR		
COAUHC	0 kWH	-	0 kWH	=	0.00E+00 kWH/CFM-HR
	55920 CFM	*	4589 HR/YR		
COAUC	0 kWH	-	0 kWH	=	0.00E+00 kWH/CFM-HR
	55920 CFM	*	1966 HR/YR		
HOAOHC	6091.4 MBtu	-	245.5 MBtu	=	2.51E+01 Btu/CFM-HR
	55920 CFM	*	4171 HR/YR		
HOAOH	6091.4 MBtu	-	245.5 MBtu	=	5.03E+01 Btu/CFM-HR
	55920 CFM	*	2080 HR/YR		
COAOHC	0 kWH		0 kWH	=	0.00E+00 kWH/CFM-HR
	55920 CFM	*	4171 HR/YR		
COAOC	0 kWH		0 kWH	=	0.00E+00 kWH/CFM-HR
	55920 CFM	*	1394 HR/YR		
DC	1 / 6 (10 MINUTES PER HOUR)			=	0.17
DC DEMAND	1 / 6 (10 MINUTES PER HOUR)			=	0.17

E M C ENGINEERS, INC
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JOB: FT. DRUM, NY (EMC #1406-006)
CALCULATED BY: IVB
CHECKED BY: BC
DATE: 19-Apr-95
BUILDING NO.: 2060A
BLDG. TYPE: MNT HANGAR AVUM

ENERGY CONSTANT CALCULATIONS

ECC	0 kWH -	0 kWH	=	0.00E+00 kWH/CFM-HR
	55920 CFM *	1394 HR/YR		
ECHC	0 kWH -	0 kWH	=	0.00E+00 kWH/CFM-HR
	55920 CFM *	4171 HR/YR		
NSUCHC	0 kWH -	0 kWH	=	0.00E+00 kWH/CFM-HR
	55920 CFM *	4589 HR/YR		
NSUCC	0 kWH -	0 kWH	=	0.00E+00 kWH/CFM-HR
	55920 CFM *	3296 HR/YR		
DDCCHC	0 kWH -	0 kWH	=	0.00E+00 kWH/CFM-HR
	55920 CFM *	4171 HR/YR		
DDCCC	0 kWH -	0 kWH	=	0.00E+00 kWH/CFM-HR
	55920 CFM *	1394 HR/YR		
NSC	6091.4 MBtu -	5845.9 MBtu	=	6.49E+03 Btu/ft^2
	37828 AREA			
DSC	5845.9 MBtu -	5710.1 MBtu	=	3.59E+03 Btu/ft^2
	37828 AREA			
FV	5710.1 MBtu -	5710.1 MBtu	=	0.00E+00 Btu/CFM-HR
	55920 CFM *	160 HR/YR		
CHWR	(0.915 kW X 0.012 Eff. X 436 HRS X 2 Degrees of Reset)		=	9.6 kWH/TON
OAR	740 HR/YR *	0.01	=	7.4 HR/YR

E M C ENGINEERS, INC
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JOB: FT. DRUM, NY (EMC #1406-006)
CALCULATED BY: CSW
CHECKED BY: BC
DATE: 19-Apr-95
BUILDING NO.: 2060B
BLDG. TYPE: MNT HANGAR AVUM

ENERGY CONSTANT CALCULATIONS

	BASERUN	RUN1	RUN2	RUN3	RUN4	RUN5
HEATING (MBtu)	1076.4	1076.4	1076.4	831.6	831.6	
COOLING (kWH)	0	0	0	0	0	

SUPPLY AIR FAN	19600	CFM
FLOOR AREA	20642	FT²
CFMI	2940	CFM
UA		BTU/HR • °F
BUILDING CONST	2	(1 FOR LIGHT) (2 FOR HEAVY)

EZDOE RUN DEFINITION:	
BASERUN	EXISTING OPERATION
RUN1	NIGHT SETBACK
RUN2	ECONOMIZER
RUN3	DDC
RUN4	FORCED VENTILATION
RUN5	

HOURS OF OCCUPANCY				ANNUAL HEATING & COOLING HOURS	
M-F	0	2400	120 HR	HR. ON HEATING	4368 HR/YR
SAT.	0	2400	24 HR	HR. ON COOLING	2928 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 5376 HR/YR
PRESENT HR. OF OPERATION FOR SYS. WITH COOLING ONLY 3360 HR/YR

HOUR SAVE (HEATING ONL 5376 - 4368 = 1008 HR/YR
HOUR SAVE (COOLING ONL 3360 - 2928 = 432 HR/YR

HOAUHC	1076.4 MBtu	-	1076.4 MBtu	=	0.00E+00	Btu/CFM-HR
	2940 CFM	*	0 HR/YR			
HOAUH	1076.4 MBtu	-	1076.4 MBtu	=	0.00E+00	Btu/CFM-HR
	2940 CFM	*	1008 HR/YR			
COAUHC	0 kWH	-	0 kWH	=	0.00E+00	kWH/CFM-HR
	2940 CFM	*	0 HR/YR			
COAUC	0 kWH	-	0 kWH	=	0.00E+00	kWH/CFM-HR
	2940 CFM	*	432 HR/YR			
HOAOHC	1076.4 MBtu	-	0 MBtu	=	0.00E+00	Btu/CFM-HR
	2940 CFM	*	8760 HR/YR			
HOAOH	1076.4 MBtu	-	0 MBtu	=	0.00E+00	Btu/CFM-HR
	2940 CFM	*	4368 HR/YR			
COAOHC	0 kWH		0 kWH	=	0.00E+00	kWH/CFM-HR
	2940 CFM	*	8760 HR/YR			
COAOC	0 kWH		0 kWH	=	0.00E+00	kWH/CFM-HR
	2940 CFM	*	2928 HR/YR			
DC	1 / 6 (10 MINUTES PER HOUR)			=	0.17	
DC DEMAND	1 / 6 (10 MINUTES PER HOUR)			=	0.17	

E M C ENGINEERS, INC
DENVER • ATLANTA • GERMANY

JOB: FT. DRUM, NY (EMC #1406-006)
CALCULATED BY: CSW
CHECKED BY: BC
DATE: 19-Apr-95
BUILDING NO.: 2060B
BLDG. TYPE: MNT HANGAR AVUM

ENERGY CONSTANT CALCULATIONS

ECC	0 kWH -	0 kWH	=	0.00E+00 kWH/CFM-HR
	19600 CFM *	2928 HR/YR		
ECHC	0 kWH -	0 kWH	=	0.00E+00 kWH/CFM-HR
	19600 CFM *	8760 HR/YR		
NSUCHC	0 kWH -	0 kWH	=	0.00E+00 kWH/CFM-HR
	19600 CFM *	0 HR/YR		
NSUCC	0 kWH -	0 kWH	=	0.00E+00 kWH/CFM-HR
	19600 CFM *	1008 HR/YR		
DDCCHC	0 kWH -	0 kWH	=	0.00E+00 kWH/CFM-HR
	19600 CFM *	8760 HR/YR		
DDCCC	0 kWH -	0 kWH	=	0.00E+00 kWH/CFM-HR
	19600 CFM *	2928 HR/YR		
NSC	1076.4 MBtu -	1076.4 MBtu	=	0.00E+00 Btu/ft^2
	20642 AREA			
DSC	1076.4 MBtu -	831.6 MBtu	=	1.19E+04 Btu/ft^2
	20642 AREA			
FV	831.6 MBtu -	831.6 MBtu	=	0.00E+00 Btu/CFM-HR
	2940 CFM *	0 HR/YR		
CHWR	(0.915 kW X 0.012 Eff. X 436 HRS X 2 Degrees of Reset)		=	9.6 kWH/TON
OAR	740 HR/YR *	0.01	=	7.4 HR/YR

E M C ENGINEERS, INC
DENVER • ATLANTA • GERMANY

JOB: FT. DRUM, NY (EMC #1406-006)
CALCULATED BY: CSW
CHECKED BY: BC
DATE: 19-Apr-95
BUILDING NO.: 2065A
BLDG. TYPE: AF OPS BUILDING

ENERGY CONSTANT CALCULATIONS

	BASERUN	RUN1	RUN2	RUN3	RUN4	RUN5
HEATING (MBtu)	5694.6	5694.6	5694.6	4575.8	0.0	
COOLING (kWH)	67524	67524	67524	38984	0	

SUPPLY AIR FAN	22705	CFM
FLOOR AREA	19308	FT²
CFMI	4592	CFM
UA		BTU/HR • °F
BUILDING CONST	2	(1 FOR LIGHT) (2 FOR HEAVY)

EZDOE RUN DEFINITION:	
BASERUN	EXISTING OPERATION
RUN1	NIGHT SETBACK
RUN2	ECONOMIZER
RUN3	DDC
RUN4	FORCED VENTILATION
RUN5	

HOURS OF OCCUPANCY				ANNUAL HEATING & COOLING HOURS	
M-F	0	2400	120 HR	HR. ON HEATING	4368 HR/YR
SAT.	0	2400	24 HR	HR. ON COOLING	2928 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				5376 HR/YR
PRESENT HR. OF OPERATION FOR SYS. WITH COOLING ONLY				3360 HR/YR
HOUR SAVE (HEATING ONL	5376	-	4368	= 1008 HR/YR
HOUR SAVE (COOLING ONL	3360	-	2928	= 432 HR/YR

HOAUHC	5694.6 MBtu	-	5694.6 MBtu	=	0.00E+00 Btu/CFM-HR
	4592 CFM	*	0 HR/YR		
HOAUH	5694.6 MBtu	-	5694.6 MBtu	=	0.00E+00 Btu/CFM-HR
	4592 CFM	*	1008 HR/YR		
COAUHC	67524.1 kWH	-	67524.1 kWH	=	0.00E+00 kWH/CFM-HR
	4592 CFM	*	0 HR/YR		
COAUC	67524.1 kWH	-	67524.1 kWH	=	0.00E+00 kWH/CFM-HR
	4592 CFM	*	432 HR/YR		
HOAOHC	5694.6 MBtu	-	0 MBtu	=	0.00E+00 Btu/CFM-HR
	4592 CFM	*	8760 HR/YR		
HOAOH	5694.6 MBtu	-	0 MBtu	=	0.00E+00 Btu/CFM-HR
	4592 CFM	*	4368 HR/YR		
COAOHC	67524.1 kWH		0 kWH	=	0.00E+00 kWH/CFM-HR
	4592 CFM	*	8760 HR/YR		
COAOC	67524.1 kWH		0 kWH	=	0.00E+00 kWH/CFM-HR
	4592 CFM	*	2928 HR/YR		
DC	1 / 6 (10 MINUTES PER HOUR)			=	0.17
DC DEMAND	1 / 6 (10 MINUTES PER HOUR)			=	0.17

E M C ENGINEERS, INC
DENVER • ATLANTA • GERMANY

JOB: FT. DRUM, NY (EMC #1406-006)
CALCULATED BY: CSW
CHECKED BY: BC
DATE: 19-Apr-95
BUILDING NO.: 2065A
BLDG. TYPE: AF OPS BUILDING

ENERGY CONSTANT CALCULATIONS

ECC	67524.1 kWH	-	67524.1 kWH	=	0.00E+00 kWH/CFM-HR
	22705 CFM	*	2928 HR/YR		
ECHC	67524.1 kWH	-	67524.1 kWH	=	0.00E+00 kWH/CFM-HR
	22705 CFM	*	8760 HR/YR		
NSUCHC	67524.1 kWH	-	67524.1 kWH	=	0.00E+00 kWH/CFM-HR
	22705 CFM	*	0 HR/YR		
NSUCC	67524.1 kWH	-	67524.1 kWH	=	0.00E+00 kWH/CFM-HR
	22705 CFM	*	1008 HR/YR		
DDCCHC	67524.1 kWH	-	38984.05 kWH	=	1.43E-04 kWH/CFM-HR
	22705 CFM	*	8760 HR/YR		
DDCCC	67524.1 kWH	-	38984.05 kWH	=	4.29E-04 kWH/CFM-HR
	22705 CFM	*	2928 HR/YR		
NSC	5694.6 MBtu	-	5694.6 MBtu	=	0.00E+00 Btu/ft^2
	19308 AREA				
DSC	5694.6 MBtu	-	4575.8 MBtu	=	5.79E+04 Btu/ft^2
	19308 AREA				
FV	4575.8 MBtu	-	0 MBtu	=	0.00E+00 Btu/CFM-HR
	4592 CFM	*	0 HR/YR		
CHWR	(0.915 kW X 0.012 Eff. X 436 HRS X 2 Degrees of Reset)			=	9.6 kWH/TON
OAR	740 HR/YR	*	0.01	=	7.4 HR/YR

E M C ENGINEERS, INC
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JOB: FT. DRUM, NY (EMC #1406-006)
CALCULATED BY: CSW
CHECKED BY: BC
DATE: 19-Apr-95
BUILDING NO.: 2065B
BLDG. TYPE: AF OPS BUILDING

ENERGY CONSTANT CALCULATIONS

	BASERUN	RUN1	RUN2	RUN3	RUN4	RUN5
HEATING (MBtu)	289.9	165.1	165.1	131.8	131.8	
COOLING (kWH)	0	0	0	0	0	

SUPPLY AIR FAN	9660	CFM
FLOOR AREA	4322	FT²
CFMI	4637	CFM
UA		BTU/HR • °F
BUILDING CONST	2	(1 FOR LIGHT) (2 FOR HEAVY)

EZDOE RUN DEFINITION:	
BASERUN	EXISTING OPERATION
RUN1	NIGHT SETBACK
RUN2	ECONOMIZER
RUN3	DDC
RUN4	FORCED VENTILATION
RUN5	

HOURS OF OCCUPANCY				ANNUAL HEATING & COOLING HOURS	
M-F	600	1700	55 HR	HR. ON HEATING	1430 HR/YR
SAT.	0	0	0 HR	HR. ON COOLING	959 HR/YR
SUN.	0	0	0 HR	HR. OFF HEATING	2938 HR/YR
	TOTAL OCCUPY HR.		55 HR/WK	HR. OFF COOLING	1969 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 5376 HR/YR
PRESENT HR. OF OPERATION FOR SYS. WITH COOLING ONLY 3360 HR/YR

HOUR SAVE (HEATING ONL	5376	-	1430	=	3946 HR/YR
HOUR SAVE (COOLING ONL	3360	-	959	=	2401 HR/YR

HOAUHC	289.9 MBtu	-	165.1 MBtu	=	0.00E+00 Btu/CFM-HR
	4637 CFM	*	5892 HR/YR		
HOAUH	289.9 MBtu	-	165.1 MBtu	=	0.00E+00 Btu/CFM-HR
	4637 CFM	*	3946 HR/YR		
COAUHC	0 kWH	-	0 kWH	=	0.00E+00 kWH/CFM-HR
	4637 CFM	*	5892 HR/YR		
COAUC	0 kWH	-	0 kWH	=	0.00E+00 kWH/CFM-HR
	4637 CFM	*	2401 HR/YR		
HOAOHC	289.9 MBtu	-	124.8 MBtu	=	1.24E+01 Btu/CFM-HR
	4637 CFM	*	2868 HR/YR		
HOAOH	289.9 MBtu	-	124.8 MBtu	=	2.49E+01 Btu/CFM-HR
	4637 CFM	*	1430 HR/YR		
COAOHC	0 kWH		0 kWH	=	0.00E+00 kWH/CFM-HR
	4637 CFM	*	2868 HR/YR		
COAOC	0 kWH		0 kWH	=	0.00E+00 kWH/CFM-HR
	4637 CFM	*	959 HR/YR		
DC	1 / 6 (10 MINUTES PER HOUR)			=	0.17
DC DEMAND	1 / 6 (10 MINUTES PER HOUR)			=	0.17

E M C ENGINEERS, INC
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JOB: FT. DRUM, NY (EMC #1406-006)
CALCULATED BY: CSW
CHECKED BY: BC
DATE: 19-Apr-95
BUILDING NO.: 2065B
BLDG. TYPE: AF OPS BUILDING

ENERGY CONSTANT CALCULATIONS

ECC	0 kWH	-	0 kWH	=	0.00E+00 kWH/CFM-HR
	9660 CFM	*	959 HR/YR		
ECHC	0 kWH	-	0 kWH	=	0.00E+00 kWH/CFM-HR
	9660 CFM	*	2868 HR/YR		
NSUCHC	0 kWH	-	0 kWH	=	0.00E+00 kWH/CFM-HR
	9660 CFM	*	5892 HR/YR		
NSUCC	0 kWH	-	0 kWH	=	0.00E+00 kWH/CFM-HR
	9660 CFM	*	3946 HR/YR		
DDCCHC	0 kWH	-	0 kWH	=	0.00E+00 kWH/CFM-HR
	9660 CFM	*	2868 HR/YR		
DDCCC	0 kWH	-	0 kWH	=	0.00E+00 kWH/CFM-HR
	9660 CFM	*	959 HR/YR		
NSC	289.9 MBtu	-	165.1 MBtu	=	2.89E+04 Btu/ft^2
	4322 AREA				
DSC	165.1 MBtu	-	131.8 MBtu	=	7.70E+03 Btu/ft^2
	4322 AREA				
FV	131.8 MBtu	-	131.8 MBtu	=	0.00E+00 Btu/CFM-HR
	4637 CFM	*	160 HR/YR		
CHWR	(0.915 kW X 0.012 Eff. X 436 HRS X 2 Degrees of Reset)			=	9.6 kWH/TON
OAR	740 HR/YR	*	0.01	=	7.4 HR/YR

E M C ENGINEERS, INC
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JOB: FT. DRUM, NY (EMC #1406-006)
CALCULATED BY: BG
CHECKED BY: BC
DATE: 19-Apr-95
BUILDING NO.: 4230
BLDG. TYPE: MINI MALL

ENERGY CONSTANT CALCULATIONS

	BASERUN	RUN1	RUN2	RUN3	RUN4	RUN5
HEATING (MBtu)	1077.5	1077.5	1079.3	848.0	848.0	
COOLING (kWH)	25747	25747	22538	16751	16751	

SUPPLY AIR FAN	9375	CFM
FLOOR AREA	10220	FT²
CFMI	2072.7	CFM
UA		BTU/HR • °F
BUILDING CONST	2	(1 FOR LIGHT) (2 FOR HEAVY)

EZDOE RUN DEFINITION:	
BASERUN	EXISTING OPERATION
RUN1	NIGHT SETBACK
RUN2	ECONOMIZER
RUN3	DDC
RUN4	FORCED VENTILATION
RUN5	

HOURS OF OCCUPANCY				ANNUAL HEATING & COOLING HOURS	
M-F	0	2400	120 HR	HR. ON HEATING	5376 HR/YR
SAT.	0	2400	24 HR	HR. ON COOLING	3360 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 5376 HR/YR
PRESENT HR. OF OPERATION FOR SYS. WITH COOLING ONLY 3360 HR/YR

HOUR SAVE (HEATING ONL	5376	-	5376	=	0 HR/YR
HOUR SAVE (COOLING ONL	3360	-	3360	=	0 HR/YR

HOAUHC	1077.519 MBtu	-	1077.519 MBtu	=	0.00E+00 Btu/CFM-HR
	2072.7 CFM	*	0 HR/YR		
HOAUH	1077.519 MBtu	-	1077.519 MBtu	=	0.00E+00 Btu/CFM-HR
	2072.7 CFM	*	0 HR/YR		
COAUHC	25747.16 kWH	-	25747.16 kWH	=	0.00E+00 kWH/CFM-HR
	2072.7 CFM	*	0 HR/YR		
COAUC	25747.16 kWH	-	25747.16 kWH	=	0.00E+00 kWH/CFM-HR
	2072.7 CFM	*	0 HR/YR		
HOAOHC	1077.519 MBtu	-	0 MBtu	=	0.00E+00 Btu/CFM-HR
	2072.7 CFM	*	8760 HR/YR		
HOAOH	1077.519 MBtu	-	0 MBtu	=	0.00E+00 Btu/CFM-HR
	2072.7 CFM	*	5376 HR/YR		
COAOHC	25747.16 kWH		0 kWH	=	0.00E+00 kWH/CFM-HR
	2072.7 CFM	*	8760 HR/YR		
COAOC	25747.16 kWH		0 kWH	=	0.00E+00 kWH/CFM-HR
	2072.7 CFM	*	3360 HR/YR		
DC	1 / 6 (10 MINUTES PER HOUR)			=	0.17
DC DEMAND	1 / 6 (10 MINUTES PER HOUR)			=	0.17

E M C ENGINEERS, INC
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JOB: FT. DRUM, NY (EMC #1406-006)
CALCULATED BY: BG
CHECKED BY: BC
DATE: 19-Apr-95
BUILDING NO.: 4230
BLDG. TYPE: MINI MALL

ENERGY CONSTANT CALCULATIONS

ECC	25747.16 kWH	-	22538.34 kWH	=	1.02E-04 kWH/CFM-HR
	9375 CFM	*	3360 HR/YR		
ECHC	25747.16 kWH	-	22538.34 kWH	=	3.91E-05 kWH/CFM-HR
	9375 CFM	*	8760 HR/YR		
NSUCHC	25747.16 kWH	-	25747.16 kWH	=	0.00E+00 kWH/CFM-HR
	9375 CFM	*	0 HR/YR		
NSUCC	25747.16 kWH	-	25747.16 kWH	=	0.00E+00 kWH/CFM-HR
	9375 CFM	*	0 HR/YR		
DDCCHC	22538.34 kWH	-	16750.61 kWH	=	7.05E-05 kWH/CFM-HR
	9375 CFM	*	8760 HR/YR		
DDCCC	22538.34 kWH	-	16750.61 kWH	=	1.84E-04 kWH/CFM-HR
	9375 CFM	*	3360 HR/YR		
NSC	1077.519 MBtu	-	1077.519 MBtu	=	0.00E+00 Btu/ft^2
	10220 AREA				
DSC	1079.306 MBtu	-	848.0195 MBtu	=	2.26E+04 Btu/ft^2
	10220 AREA				
FV	848.0195 MBtu	-	848.0195 MBtu	=	0.00E+00 Btu/CFM-HR
	2072.7 CFM	*	0 HR/YR		
CHWR	(0.915 kW X 0.012 Eff. X 436 HRS X 2 Degrees of Reset)			=	9.6 kWH/TON
OAR	740 HR/YR	*	0.01	=	7.4 HR/YR

E M C ENGINEERS, INC
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JOB: FT. DRUM, NY (EMC #1406-006)
CALCULATED BY: BG
CHECKED BY: BC
DATE: 19-Apr-95
BUILDING NO.: 4305
BLDG. TYPE: PHYS FIT CENTER

ENERGY CONSTANT CALCULATIONS

	BASERUN	RUN1	RUN2	RUN3	RUN4	RUN5
HEATING (MBtu)	4012.6	2273.6	2273.6	1959.7	1959.7	
COOLING (kWH)	0	0	0	0	0	

SUPPLY AIR FAN	67970	CFM
FLOOR AREA	32157	FT²
CFMI	8305.9	CFM
UA		BTU/HR • °F
BUILDING CONST	2	(1 FOR LIGHT) (2 FOR HEAVY)

EZDOE RUN DEFINITION:	
BASERUN	EXISTING OPERATION
RUN1	NIGHT SETBACK
RUN2	ECONOMIZER
RUN3	DDC
RUN4	FORCED VENTILATION
RUN5	

HOURS OF OCCUPANCY				ANNUAL HEATING & COOLING HOURS	
M-F	645	2000	67.75 HR	HR. ON HEATING	2168 HR/YR
SAT.	0	0	0 HR	HR. ON COOLING	1355 HR/YR
SUN.	0	0	0 HR	HR. OFF HEATING	3208 HR/YR
	TOTAL OCCUPY HR.		67.75 HR/WK	HR. OFF COOLING	2005 HR/YR
	TOTAL UNOCC. HR.		100.25 HR/WK		
	ANNUAL OCCUPY HR.		3533 HR/YR		
	ANNUAL UNOCC. HR.		5227 HR/YR		

PRESENT HR. OF OPERATION FOR SYS. WITH HEATING AND COOLING 8760 HR/YR
PRESENT HR. OF OPERATION FOR SYS. WITH HEATING ONLY 5376 HR/YR
PRESENT HR. OF OPERATION FOR SYS. WITH COOLING ONLY 3360 HR/YR

HOUR SAVE (HEATING ONL	5376	-	2168	=	3208 HR/YR
HOUR SAVE (COOLING ONL	3360	-	1355	=	2005 HR/YR

HOAUHC	4012.611 MBtu	-	2273.579 MBtu	=	0.00E+00 Btu/CFM-HR
	8305.9 CFM	*	5227 HR/YR		
HOAUH	4012.611 MBtu	-	2273.579 MBtu	=	0.00E+00 Btu/CFM-HR
	8305.9 CFM	*	3208 HR/YR		
COAUHC	0 kWH	-	0 kWH	=	0.00E+00 kWH/CFM-HR
	8305.9 CFM	*	5227 HR/YR		
COAUC	0 kWH	-	0 kWH	=	0.00E+00 kWH/CFM-HR
	8305.9 CFM	*	2005 HR/YR		
HOAOHC	4012.611 MBtu	-	1739.032 MBtu	=	7.75E+01 Btu/CFM-HR
	8305.9 CFM	*	3533 HR/YR		
HOAOH	4012.611 MBtu	-	1739.032 MBtu	=	1.26E+02 Btu/CFM-HR
	8305.9 CFM	*	2168 HR/YR		
COAOHC	0 kWH		0 kWH	=	0.00E+00 kWH/CFM-HR
	8305.9 CFM	*	3533 HR/YR		
COAOC	0 kWH		0 kWH	=	0.00E+00 kWH/CFM-HR
	8305.9 CFM	*	1355 HR/YR		
DC	1 / 6 (10 MINUTES PER HOUR)			=	0.17
DC DEMAND	1 / 6 (10 MINUTES PER HOUR)			=	0.17

E M C ENGINEERS, INC
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JOB: FT. DRUM, NY (EMC #1406-006)
CALCULATED BY: BG
CHECKED BY: BC
DATE: 19-Apr-95
BUILDING NO.: 4305
BLDG. TYPE: PHYS FIT CENTER

ENERGY CONSTANT CALCULATIONS

ECC	0 kWH -	0 kWH	=	0.00E+00 kWH/CFM-HR
	67970 CFM *	1355 HR/YR		
ECHC	0 kWH -	0 kWH	=	0.00E+00 kWH/CFM-HR
	67970 CFM *	3533 HR/YR		
NSUCHC	0 kWH -	0 kWH	=	0.00E+00 kWH/CFM-HR
	67970 CFM *	5227 HR/YR		
NSUCC	0 kWH -	0 kWH	=	0.00E+00 kWH/CFM-HR
	67970 CFM *	3208 HR/YR		
DDCCHC	0 kWH -	0 kWH	=	0.00E+00 kWH/CFM-HR
	67970 CFM *	3533 HR/YR		
DDCCC	0 kWH -	0 kWH	=	0.00E+00 kWH/CFM-HR
	67970 CFM *	1355 HR/YR		
NSC	4012.611 MBtu -	2273.579 MBtu	=	5.41E+04 Btu/ft^2
	32157 AREA			
DSC	2273.579 MBtu -	1959.736 MBtu	=	9.76E+03 Btu/ft^2
	32157 AREA			
FV	1959.736 MBtu -	1959.736 MBtu	=	0.00E+00 Btu/CFM-HR
	8305.9 CFM *	160 HR/YR		
CHWR	(0.915 kW X 0.012 Eff. X 436 HRS X 2 Degrees of Reset)		=	9.6 kWH/TON
OAR	740 HR/YR *	0.01	=	7.4 HR/YR

E M C ENGINEERS, INC
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JOB: FT. DRUM, NY (EMC #1406-006)
CALCULATED BY: BG
CHECKED BY: BC
DATE: 19-Apr-95
BUILDING NO.: 4530
BLDG. TYPE: SMA BLDNG

ENERGY CONSTANT CALCULATIONS

	BASERUN	RUN1	RUN2	RUN3	RUN4	RUN5
HEATING (MBtu)	55808.2	40021.3	40021.3	38893.5	38893.5	
COOLING (kWH)	0	0	0	0	0	

SUPPLY AIR FAN	135905	CFM
FLOOR AREA	195670	FT²
CFMI	81108.5	CFM
UA		BTU/HR • °F
BUILDING CONST	2	(1 FOR LIGHT) (2 FOR HEAVY)

EZDOE RUN DEFINITION:	
BASERUN	EXISTING OPERATION
RUN1	NIGHT SETBACK
RUN2	ECONOMIZER
RUN3	DDC
RUN4	FORCED VENTILATION
RUN5	

HOURS OF OCCUPANCY				ANNUAL HEATING & COOLING HOURS	
M-F	730	1630	45 HR	HR. ON HEATING	2016 HR/YR
SAT.	730	1630	9 HR	HR. ON COOLING	1260 HR/YR
SUN.	730	1630	9 HR	HR. OFF HEATING	3360 HR/YR
	TOTAL OCCUPY HR.		63 HR/WK	HR. OFF COOLING	2100 HR/YR
	TOTAL UNOCC. HR.		105 HR/WK		
	ANNUAL OCCUPY HR.		3285 HR/YR		
	ANNUAL UNOCC. HR.		5475 HR/YR		

PRESENT HR. OF OPERATION FOR SYS. WITH HEATING AND COOLING 8760 HR/YR
PRESENT HR. OF OPERATION FOR SYS. WITH HEATING ONLY 5376 HR/YR
PRESENT HR. OF OPERATION FOR SYS. WITH COOLING ONLY 3360 HR/YR

HOUR SAVE (HEATING ONL	5376	-	2016	=	3360 HR/YR
HOUR SAVE (COOLING ONL	3360	-	1260	=	2100 HR/YR

HOAUHC	55808.2 MBtu	-	40021.3 MBtu	=	0.00E+00 Btu/CFM-HR
	81108.5 CFM	*	5475 HR/YR		
HOAUH	55808.2 MBtu	-	40021.3 MBtu	=	0.00E+00 Btu/CFM-HR
	81108.5 CFM	*	3360 HR/YR		
COAUHC	0 kWH	-	0 kWH	=	0.00E+00 kWH/CFM-HR
	81108.5 CFM	*	5475 HR/YR		
COAUC	0 kWH	-	0 kWH	=	0.00E+00 kWH/CFM-HR
	81108.5 CFM	*	2100 HR/YR		
HOAOHC	55808.2 MBtu	-	15786.9 MBtu	=	1.50E+02 Btu/CFM-HR
	81108.5 CFM	*	3285 HR/YR		
HOAOH	55808.2 MBtu	-	15786.9 MBtu	=	2.45E+02 Btu/CFM-HR
	81108.5 CFM	*	2016 HR/YR		
COAOHC	0 kWH		0 kWH	=	0.00E+00 kWH/CFM-HR
	81108.5 CFM	*	3285 HR/YR		
COAOC	0 kWH		0 kWH	=	0.00E+00 kWH/CFM-HR
	81108.5 CFM	*	1260 HR/YR		
DC	1 / 6 (10 MINUTES PER HOUR)			=	0.17
DC DEMAND	1 / 6 (10 MINUTES PER HOUR)			=	0.17

E M C ENGINEERS, INC
DENVER • ATLANTA • GERMANY

JOB: FT. DRUM, NY (EMC #1406-006)
CALCULATED BY: BG
CHECKED BY: BC
DATE: 19-Apr-95
BUILDING NO.: 4530
BLDG. TYPE: SMA BLDNG

ENERGY CONSTANT CALCULATIONS

ECC	0 kWH -	0 kWH	=	0.00E+00 kWH/CFM-HR
	135905 CFM *	1260 HR/YR		
ECHC	0 kWH -	0 kWH	=	0.00E+00 kWH/CFM-HR
	135905 CFM *	3285 HR/YR		
NSUCHC	0 kWH -	0 kWH	=	0.00E+00 kWH/CFM-HR
	135905 CFM *	5475 HR/YR		
NSUCC	0 kWH -	0 kWH	=	0.00E+00 kWH/CFM-HR
	135905 CFM *	3360 HR/YR		
DDCCHC	0 kWH -	0 kWH	=	0.00E+00 kWH/CFM-HR
	135905 CFM *	3285 HR/YR		
DDCCC	0 kWH -	0 kWH	=	0.00E+00 kWH/CFM-HR
	135905 CFM *	1260 HR/YR		
NSC	55808.2 MBtu -	40021.3 MBtu	=	8.07E+04 Btu/ft^2
	195670 AREA			
DSC	40021.3 MBtu -	38893.5 MBtu	=	5.76E+03 Btu/ft^2
	195670 AREA			
FV	38893.5 MBtu -	38893.5 MBtu	=	0.00E+00 Btu/CFM-HR
	81108.5 CFM *	224 HR/YR		
CHWR	(0.915 kW X 0.012 Eff. X 436 HRS X 2 Degrees of Reset)		=	9.6 kWH/TON
OAR	740 HR/YR *	0.01	=	7.4 HR/YR

E M C ENGINEERS, INC
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JOB: FT. DRUM, NY (EMC #1406-006)
CALCULATED BY: BG
CHECKED BY: BC
DATE: 19-Apr-95
BUILDING NO.: 10000
BLDG. TYPE: DIV CMD/CNTRL BUILDING

ENERGY CONSTANT CALCULATIONS

	BASERUN	RUN1	RUN2	RUN3	RUN4	RUN5
HEATING (MBtu)	8226.9	3436.1	3436.1	2737.0	2617.8	
COOLING (kWH)	8726	3049	3049	3049	3049	

SUPPLY AIR FAN	130236	CFM
FLOOR AREA	80294	FT²
CFMI	121133	CFM
UA		BTU/HR • °F
BUILDING CONST	2	(1 FOR LIGHT) (2 FOR HEAVY)

EZDOE RUN DEFINITION:	
BASERUN	EXISTING OPERATION
RUN1	NIGHT SETBACK
RUN2	ECONOMIZER
RUN3	DDC
RUN4	FORCED VENTILATION
RUN5	

HOURS OF OCCUPANCY			
M-F	600	1800	60 HR
SAT.	0	0	0 HR
SUN.	0	0	0 HR
	TOTAL OCCUPY HR.		60 HR/WK
	TOTAL UNOCC. HR.		108 HR/WK
	ANNUAL OCCUPY HR.		3129 HR/YR
	ANNUAL UNOCC. HR.		5631 HR/YR

ANNUAL HEATING & COOLING HOURS	
HR. ON HEATING	1920 HR/YR
HR. ON COOLING	1200 HR/YR
HR. OFF HEATING	3456 HR/YR
HR. OFF COOLING	2160 HR/YR

PRESENT HR. OF OPERATION FOR SYS. WITH HEATING AND COOLING 8760 HR/YR
PRESENT HR. OF OPERATION FOR SYS. WITH HEATING ONLY 5376 HR/YR
PRESENT HR. OF OPERATION FOR SYS. WITH COOLING ONLY 3360 HR/YR

HOUR SAVE (HEATING ONL 5376 - 1920 = 3456 HR/YR
HOUR SAVE (COOLING ONL 3360 - 1200 = 2160 HR/YR

HOAUHC	8226.9 MBtu	-	3436.1 MBtu	=	0.00E+00 Btu/CFM-HR
	121133 CFM	*	5631 HR/YR		
HOAUH	8226.9 MBtu	-	3436.1 MBtu	=	0.00E+00 Btu/CFM-HR
	121133 CFM	*	3456 HR/YR		
COAUHC	8726.062 kWH	-	3048.668 kWH	=	8.32E-06 kWH/CFM-HR
	121133 CFM	*	5631 HR/YR		
COAUC	8726.062 kWH	-	3048.668 kWH	=	2.17E-05 kWH/CFM-HR
	121133 CFM	*	2160 HR/YR		
HOAOHC	8226.9 MBtu	-	4790.8 MBtu	=	9.07E+00 Btu/CFM-HR
	121133 CFM	*	3129 HR/YR		
HOAOH	8226.9 MBtu	-	4790.8 MBtu	=	1.48E+01 Btu/CFM-HR
	121133 CFM	*	1920 HR/YR		
COAOHC	8726.062 kWH		5677.394 kWH	=	8.04E-06 kWH/CFM-HR
	121133 CFM	*	3129 HR/YR		
COAOC	8726.062 kWH		5677.394 kWH	=	2.10E-05 kWH/CFM-HR
	121133 CFM	*	1200 HR/YR		
DC	1 / 6 (10 MINUTES PER HOUR)			=	0.17
DC DEMAND	1 / 6 (10 MINUTES PER HOUR)			=	0.17

E M C ENGINEERS, INC
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JOB: FT. DRUM, NY (EMC #1406-006)
CALCULATED BY: BG
CHECKED BY: BC
DATE: 19-Apr-95
BUILDING NO.: 10000
BLDG. TYPE: DIV CMD/CNTRL BUILDING

ENERGY CONSTANT CALCULATIONS

ECC	3048.668 kWH	-	3048.668 kWH	=	0.00E+00 kWH/CFM-HR
	130236 CFM	*	1200 HR/YR		
ECHC	3048.668 kWH	-	3048.668 kWH	=	0.00E+00 kWH/CFM-HR
	130236 CFM	*	3129 HR/YR		
NSUCHC	8726.062 kWH	-	3048.668 kWH	=	7.74E-06 kWH/CFM-HR
	130236 CFM	*	5631 HR/YR		
NSUCC	8726.062 kWH	-	3048.668 kWH	=	1.26E-05 kWH/CFM-HR
	130236 CFM	*	3456 HR/YR		
DDCCHC	3048.668 kWH	-	3048.668 kWH	=	0.00E+00 kWH/CFM-HR
	130236 CFM	*	3129 HR/YR		
DDCCC	3048.668 kWH	-	3048.668 kWH	=	0.00E+00 kWH/CFM-HR
	130236 CFM	*	1200 HR/YR		
NSC	8226.9 MBtu	-	3436.1 MBtu	=	5.97E+04 Btu/ft^2
	80294 AREA				
DSC	3436.1 MBtu	-	2737 MBtu	=	8.71E+03 Btu/ft^2
	80294 AREA				
FV	2737 MBtu	-	2617.8 MBtu	=	6.15E+00 Btu/CFM-HR
	121133 CFM	*	160 HR/YR		
CHWR	(0.915 kW X 0.012 Eff. X 436 HRS X 2 Degrees of Reset)			=	9.6 kWH/TON
OAR	740 HR/YR	*	0.01	=	7.4 HR/YR

E M C ENGINEERS, INC
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JOB: FT. DRUM, NY (EMC #1406-006)
CALCULATED BY: BG
CHECKED BY: BC
DATE: 19-Apr-95
BUILDING NO.: 10205
BLDG. TYPE: DENTAL CLINIC

ENERGY CONSTANT CALCULATIONS

	BASERUN	RUN1	RUN2	RUN3	RUN4	RUN5
HEATING (MBtu)	2048.8	1046.1	1046.1	965.3	965.3	
COOLING (kWH)	57394	23966	23966	21599	21599	

SUPPLY AIR FAN	10430 CFM
FLOOR AREA	18546 FT²
CFMI	3129 CFM
UA	BTU/HR • °F
BUILDING CONST	2 (1 FOR LIGHT) (2 FOR HEAVY)

EZDOE RUN DEFINITION:	
BASERUN	EXISTING OPERATION
RUN1	NIGHT SETBACK
RUN2	ECONOMIZER
RUN3	DDC
RUN4	FORCED VENTILATION
RUN5	

HOURS OF OCCUPANCY			
M-F	700	1600	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	1440 HR/YR
HR. ON COOLING	900 HR/YR
HR. OFF HEATING	3936 HR/YR
HR. OFF COOLING	2460 HR/YR

PRESENT HR. OF OPERATION FOR SYS. WITH HEATING AND COOLING 8760 HR/YR
PRESENT HR. OF OPERATION FOR SYS. WITH HEATING ONLY 5376 HR/YR
PRESENT HR. OF OPERATION FOR SYS. WITH COOLING ONLY 3360 HR/YR

HOUR SAVE (HEATING ONL 5376 - 1440 = 3936 HR/YR
HOUR SAVE (COOLING ONL 3360 - 900 = 2460 HR/YR

HOAUHC	2048.838 MBtu	-	1046.061 MBtu	=	0.00E+00 Btu/CFM-HR
	3129 CFM	*	6414 HR/YR		
HOAUH	2048.838 MBtu	-	1046.061 MBtu	=	0.00E+00 Btu/CFM-HR
	3129 CFM	*	3936 HR/YR		
COAUHC	57393.7 kWH	-	23965.64 kWH	=	1.67E-03 kWH/CFM-HR
	3129 CFM	*	6414 HR/YR		
COAUC	57393.7 kWH	-	23965.64 kWH	=	4.34E-03 kWH/CFM-HR
	3129 CFM	*	2460 HR/YR		
HOAOHC	2048.838 MBtu	-	1002.778 MBtu	=	1.42E+02 Btu/CFM-HR
	3129 CFM	*	2346 HR/YR		
HOAOH	2048.838 MBtu	-	1002.778 MBtu	=	2.32E+02 Btu/CFM-HR
	3129 CFM	*	1440 HR/YR		
COAOHC	57393.7 kWH		33428.06 kWH	=	3.26E-03 kWH/CFM-HR
	3129 CFM	*	2346 HR/YR		
COAOC	57393.7 kWH		33428.06 kWH	=	8.51E-03 kWH/CFM-HR
	3129 CFM	*	900 HR/YR		
DC	1 / 6 (10 MINUTES PER HOUR)			=	0.17
DC DEMAND	1 / 6 (10 MINUTES PER HOUR)			=	0.17

E M C ENGINEERS, INC
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JOB: FT. DRUM, NY (EMC #1406-006)
CALCULATED BY: BG
CHECKED BY: BC
DATE: 19-Apr-95
BUILDING NO.: 10205
BLDG. TYPE: DENTAL CLINIC

ENERGY CONSTANT CALCULATIONS

ECC	23965.64 kWH	-	23965.64 kWH	=	0.00E+00 kWH/CFM-HR
	10430 CFM	*	900 HR/YR		
ECHC	23965.64 kWH	-	23965.64 kWH	=	0.00E+00 kWH/CFM-HR
	10430 CFM	*	2346 HR/YR		
NSUCHC	57393.7 kWH	-	23965.64 kWH	=	5.00E-04 kWH/CFM-HR
	10430 CFM	*	6414 HR/YR		
NSUCC	57393.7 kWH	-	23965.64 kWH	=	8.14E-04 kWH/CFM-HR
	10430 CFM	*	3936 HR/YR		
DDCCHC	23965.64 kWH	-	21599.32 kWH	=	9.67E-05 kWH/CFM-HR
	10430 CFM	*	2346 HR/YR		
DDCCC	23965.64 kWH	-	21599.32 kWH	=	2.52E-04 kWH/CFM-HR
	10430 CFM	*	900 HR/YR		
NSC	2048.838 MBtu	-	1046.061 MBtu	=	5.41E+04 Btu/ft^2
	18546 AREA				
DSC	1046.061 MBtu	-	965.324 MBtu	=	4.35E+03 Btu/ft^2
	18546 AREA				
FV	965.324 MBtu	-	965.324 MBtu	=	0.00E+00 Btu/CFM-HR
	3129 CFM	*	160 HR/YR		
CHWR	(0.915 kW X 0.012 Eff. X 436 HRS X 2 Degrees of Reset)			=	9.6 kWH/TON
OAR	740 HR/YR	*	0.01	=	7.4 HR/YR

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JOB: FT. DRUM, NY (EMC #1406-006)
CALCULATED BY: BG
CHECKED BY: BC
DATE: 19-Apr-95
BUILDING NO.: 10207
BLDG. TYPE: EXCHANGE CLUB

ENERGY CONSTANT CALCULATIONS

	BASERUN	RUN1	RUN2	RUN3	RUN4	RUN5
HEATING (MBtu)	1760.6	1177.3	1173.4	957.9	872.4	
COOLING (kWH)	131939	91160	77614	77631	82302	

SUPPLY AIR FAN	17100	CFM
FLOOR AREA	18199	FT²
CFMI	5985	CFM
UA		BTU/HR • °F
BUILDING CONST	2	(1 FOR LIGHT) (2 FOR HEAVY)

EZDOE RUN DEFINITION:	
BASERUN	EXISTING OPERATION
RUN1	NIGHT SETBACK
RUN2	ECONOMIZER
RUN3	DDC
RUN4	FORCED VENTILATION
RUN5	

HOURS OF OCCUPANCY				ANNUAL HEATING & COOLING HOURS	
M-F	800	2700	95 HR	HR. ON HEATING	4256 HR/YR
SAT.	800	2700	19 HR	HR. ON COOLING	2660 HR/YR
SUN.	800	2700	19 HR	HR. OFF HEATING	1120 HR/YR
	TOTAL OCCUPY HR.		133 HR/WK	HR. OFF COOLING	700 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 5376 HR/YR
PRESENT HR. OF OPERATION FOR SYS. WITH COOLING ONLY 3360 HR/YR

HOUR SAVE (HEATING ONL	5376	-	4256	=	1120 HR/YR
HOUR SAVE (COOLING ONL	3360	-	2660	=	700 HR/YR

HOAUHC	1760.626 MBtu	-	1177.3 MBtu	=	0.00E+00 Btu/CFM-HR
	5985 CFM	*	1825 HR/YR		
HOAUH	1760.626 MBtu	-	1177.3 MBtu	=	0.00E+00 Btu/CFM-HR
	5985 CFM	*	1120 HR/YR		
COAUHC	131938.9 kWH	-	91159.89 kWH	=	3.73E-03 kWH/CFM-HR
	5985 CFM	*	1825 HR/YR		
COAUC	131938.9 kWH	-	91159.89 kWH	=	9.73E-03 kWH/CFM-HR
	5985 CFM	*	700 HR/YR		
HOAOHC	1760.626 MBtu	-	583.3258 MBtu	=	2.84E+01 Btu/CFM-HR
	5985 CFM	*	6935 HR/YR		
HOAOH	1760.626 MBtu	-	583.3258 MBtu	=	4.62E+01 Btu/CFM-HR
	5985 CFM	*	4256 HR/YR		
COAOHC	131938.9 kWH		40779.02 kWH	=	2.20E-03 kWH/CFM-HR
	5985 CFM	*	6935 HR/YR		
COAOC	131938.9 kWH		40779.02 kWH	=	5.73E-03 kWH/CFM-HR
	5985 CFM	*	2660 HR/YR		
DC	1 / 6 (10 MINUTES PER HOUR)			=	0.17
DC DEMAND	1 / 6 (10 MINUTES PER HOUR)			=	0.17

E M C ENGINEERS, INC
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JOB: FT. DRUM, NY (EMC #1406-006)
CALCULATED BY: BG
CHECKED BY: BC
DATE: 19-Apr-95
BUILDING NO.: 10207
BLDG. TYPE: EXCHANGE CLUB

ENERGY CONSTANT CALCULATIONS

ECC	91159.89 kWH	-	77614.48 kWH	=	2.98E-04	kWH/CFM-HR
	17100 CFM	*	2660 HR/YR			
ECHC	91159.89 kWH	-	77614.48 kWH	=	1.14E-04	kWH/CFM-HR
	17100 CFM	*	6935 HR/YR			
NSUCHC	131938.9 kWH	-	91159.89 kWH	=	1.31E-03	kWH/CFM-HR
	17100 CFM	*	1825 HR/YR			
NSUCC	131938.9 kWH	-	91159.89 kWH	=	2.13E-03	kWH/CFM-HR
	17100 CFM	*	1120 HR/YR			
DDCCHC	77614.48 kWH	-	77630.94 kWH	=	-1.39E-07	kWH/CFM-HR
	17100 CFM	*	6935 HR/YR			
DDCCC	77614.48 kWH	-	77630.94 kWH	=	-3.62E-07	kWH/CFM-HR
	17100 CFM	*	2660 HR/YR			
NSC	1760.626 MBtu	-	1177.3 MBtu	=	3.21E+04	Btu/ft^2
	18199 AREA					
DSC	1173.445 MBtu	-	957.8528 MBtu	=	1.18E+04	Btu/ft^2
	18199 AREA					
FV	957.8528 MBtu	-	872.4362 MBtu	=	6.37E+01	Btu/CFM-HR
	5985 CFM	*	224 HR/YR			
CHWR	(0.915 kW X 0.012 Eff. X 436 HRS X 2 Degrees of Reset)			=	9.6	kWH/TON
OAR	740 HR/YR	*	0.01	=	7.4	HR/YR

E M C ENGINEERS, INC
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JOB: FT. DRUM, NY (EMC #1406-006)
CALCULATED BY: BG
CHECKED BY: BC
DATE: 19-Apr-95
BUILDING NO.: 10506
BLDG. TYPE: CLINIC W/O BEDS

ENERGY CONSTANT CALCULATIONS

	BASERUN	RUN1	RUN2	RUN3	RUN4	RUN5
HEATING (MBtu)	1373.3	896.4	896.4	826.4	826.4	
COOLING (kWH)	16887	8247	8247	4216	4216	

SUPPLY AIR FAN	9300	CFM
FLOOR AREA	18386	FT²
CFMI	1953	CFM
UA		BTU/HR • °F
BUILDING CONST	2	(1 FOR LIGHT) (2 FOR HEAVY)

EZDOE RUN DEFINITION:	
BASERUN	EXISTING OPERATION
RUN1	NIGHT SETBACK
RUN2	ECONOMIZER
RUN3	DDC
RUN4	FORCED VENTILATION
RUN5	

HOURS OF OCCUPANCY				ANNUAL HEATING & COOLING HOURS	
M-F	700	1600	45 HR	HR. ON HEATING	2016 HR/YR
SAT.	700	1600	9 HR	HR. ON COOLING	1260 HR/YR
SUN.	700	1600	9 HR	HR. OFF HEATING	3360 HR/YR
	TOTAL OCCUPY HR.		63 HR/WK	HR. OFF COOLING	2100 HR/YR
	TOTAL UNOCC. HR.		105 HR/WK		
	ANNUAL OCCUPY HR.		3285 HR/YR		
	ANNUAL UNOCC. HR.		5475 HR/YR		

PRESENT HR. OF OPERATION FOR SYS. WITH HEATING AND COOLING	8760 HR/YR
PRESENT HR. OF OPERATION FOR SYS. WITH HEATING ONLY	5376 HR/YR
PRESENT HR. OF OPERATION FOR SYS. WITH COOLING ONLY	3360 HR/YR

HOUR SAVE (HEATING ONL	5376	-	2016	=	3360 HR/YR
HOUR SAVE (COOLING ONL	3360	-	1260	=	2100 HR/YR

HOAUHC	1373.334 MBtu	-	896.4166 MBtu	=	0.00E+00 Btu/CFM-HR
	1953 CFM	*	5475 HR/YR		
HOAUH	1373.334 MBtu	-	896.4166 MBtu	=	0.00E+00 Btu/CFM-HR
	1953 CFM	*	3360 HR/YR		
COAUHC	16887.43 kWH	-	8247.059 kWH	=	8.08E-04 kWH/CFM-HR
	1953 CFM	*	5475 HR/YR		
COAUC	16887.43 kWH	-	8247.059 kWH	=	2.11E-03 kWH/CFM-HR
	1953 CFM	*	2100 HR/YR		
HOAOHC	1373.334 MBtu	-	476.9169 MBtu	=	1.40E+02 Btu/CFM-HR
	1953 CFM	*	3285 HR/YR		
HOAOH	1373.334 MBtu	-	476.9169 MBtu	=	2.28E+02 Btu/CFM-HR
	1953 CFM	*	2016 HR/YR		
COAOHC	16887.43 kWH		8640.368 kWH	=	1.29E-03 kWH/CFM-HR
	1953 CFM	*	3285 HR/YR		
COAOC	16887.43 kWH		8640.368 kWH	=	3.35E-03 kWH/CFM-HR
	1953 CFM	*	1260 HR/YR		
DC	1 / 6 (10 MINUTES PER HOUR)			=	0.17
DC DEMAND	1 / 6 (10 MINUTES PER HOUR)			=	0.17

E M C ENGINEERS, INC
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JOB: FT. DRUM, NY (EMC #1406-006)
CALCULATED BY: BG
CHECKED BY: BC
DATE: 19-Apr-95
BUILDING NO.: 10506
BLDG. TYPE: CLINIC W/O BEDS

ENERGY CONSTANT CALCULATIONS

ECC	8247.059 kWH -	8247.059 kWH	=	0.00E+00	kWH/CFM-HR
	9300 CFM *	1260 HR/YR			
ECHC	8247.059 kWH -	8247.059 kWH	=	0.00E+00	kWH/CFM-HR
	9300 CFM *	3285 HR/YR			
NSUCHC	16887.43 kWH -	8247.059 kWH	=	1.70E-04	kWH/CFM-HR
	9300 CFM *	5475 HR/YR			
NSUCC	16887.43 kWH -	8247.059 kWH	=	2.77E-04	kWH/CFM-HR
	9300 CFM *	3360 HR/YR			
DDCCHC	8247.059 kWH -	4216.2 kWH	=	1.32E-04	kWH/CFM-HR
	9300 CFM *	3285 HR/YR			
DDCCC	8247.059 kWH -	4216.2 kWH	=	3.44E-04	kWH/CFM-HR
	9300 CFM *	1260 HR/YR			
NSC	1373.334 MBtu -	896.4166 MBtu	=	2.59E+04	Btu/ft^2
	18386 AREA				
DSC	896.4166 MBtu -	826.3546 MBtu	=	3.81E+03	Btu/ft^2
	18386 AREA				
FV	826.3546 MBtu -	826.3546 MBtu	=	0.00E+00	Btu/CFM-HR
	1953 CFM *	224 HR/YR			
CHWR	(0.915 kW X 0.012 Eff. X 436 HRS X 2 Degrees of Reset)		=	9.6	kWH/TON
OAR	740 HR/YR *	0.01	=	7.4	HR/YR

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JOB: FT. DRUM, NY (EMC #1406-006)
CALCULATED BY: CSW
CHECKED BY: BC
DATE: 19-Apr-95
BUILDING NO.: 10522A
BLDG. TYPE: ADM & SUPPLY, BRK W/O DI

ENERGY CONSTANT CALCULATIONS

	BASERUN	RUN1	RUN2	RUN3	RUN4	RUN5
HEATING (MBtu)	1444.8	729.2	729.2	643.3		
COOLING (kWH)	0	0	0	0		

SUPPLY AIR FAN	2310	CFM
FLOOR AREA	14710	FT²
CFMI	2310	CFM
UA		BTU/HR • °F
BUILDING CONST	2	(1 FOR LIGHT) (2 FOR HEAVY)

EZDOE RUN DEFINITION:	
BASERUN	EXISTING OPERATION
RUN1	NIGHT SETBACK
RUN2	ECONOMIZER
RUN3	DDC
RUN4	FORCED VENTILATION
RUN5	

HOURS OF OCCUPANCY				ANNUAL HEATING & COOLING HOURS	
M-F	600	1700	55 HR	HR. ON HEATING	1430 HR/YR
SAT.	0	0	0 HR	HR. ON COOLING	959 HR/YR
SUN.	0	0	0 HR	HR. OFF HEATING	2938 HR/YR
	TOTAL OCCUPY HR.		55 HR/WK	HR. OFF COOLING	1969 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 5376 HR/YR
PRESENT HR. OF OPERATION FOR SYS. WITH COOLING ONLY 3360 HR/YR

HOUR SAVE (HEATING ONL	5376	-	1430	=	3946 HR/YR
HOUR SAVE (COOLING ONL	3360	-	959	=	2401 HR/YR

HOAUHC	1444.8 MBtu	-	729.2 MBtu	=	0.00E+00 Btu/CFM-HR
	2310 CFM	*	5892 HR/YR		
HOAUH	1444.8 MBtu	-	729.2 MBtu	=	0.00E+00 Btu/CFM-HR
	2310 CFM	*	3946 HR/YR		
COAUHC	0 kWH	-	0 kWH	=	0.00E+00 kWH/CFM-HR
	2310 CFM	*	5892 HR/YR		
COAUC	0 kWH	-	0 kWH	=	0.00E+00 kWH/CFM-HR
	2310 CFM	*	2401 HR/YR		
HOAOHC	1444.8 MBtu	-	715.6 MBtu	=	1.10E+02 Btu/CFM-HR
	2310 CFM	*	2868 HR/YR		
HOAOH	1444.8 MBtu	-	715.6 MBtu	=	2.21E+02 Btu/CFM-HR
	2310 CFM	*	1430 HR/YR		
COAOHC	0 kWH		0 kWH	=	0.00E+00 kWH/CFM-HR
	2310 CFM	*	2868 HR/YR		
COAOC	0 kWH		0 kWH	=	0.00E+00 kWH/CFM-HR
	2310 CFM	*	959 HR/YR		
DC	1 / 6 (10 MINUTES PER HOUR)			=	0.17
DC DEMAND	1 / 6 (10 MINUTES PER HOUR)			=	0.17

E M C ENGINEERS, INC
DENVER • ATLANTA • GERMANY

JOB: FT. DRUM, NY (EMC #1406-006)
CALCULATED BY: CSW
CHECKED BY: BC
DATE: 19-Apr-95
BUILDING NO.: 10522A
BLDG. TYPE: ADM & SUPPLY, BRK W/O DI

ENERGY CONSTANT CALCULATIONS

ECC	0 kWH	-	0 kWH	=	0.00E+00 kWH/CFM-HR
	2310 CFM	*	959 HR/YR		
ECHC	0 kWH	-	0 kWH	=	0.00E+00 kWH/CFM-HR
	2310 CFM	*	2868 HR/YR		
NSUCHC	0 kWH	-	0 kWH	=	0.00E+00 kWH/CFM-HR
	2310 CFM	*	5892 HR/YR		
NSUCC	0 kWH	-	0 kWH	=	0.00E+00 kWH/CFM-HR
	2310 CFM	*	3946 HR/YR		
DDCCHC	0 kWH	-	0 kWH	=	0.00E+00 kWH/CFM-HR
	2310 CFM	*	2868 HR/YR		
DDCCC	0 kWH	-	0 kWH	=	0.00E+00 kWH/CFM-HR
	2310 CFM	*	959 HR/YR		
NSC	1444.8 MBtu	-	729.2 MBtu	=	4.86E+04 Btu/ft^2
	14710 AREA				
DSC	729.2 MBtu	-	643.3 MBtu	=	5.84E+03 Btu/ft^2
	14710 AREA				
FV	643.3 MBtu	-	0 MBtu	=	0.00E+00 Btu/CFM-HR
	2310 CFM	*	160 HR/YR		
CHWR	(0.915 kW X 0.012 Eff. X 436 HRS X 2 Degrees of Reset)			=	9.6 kWH/TON
OAR	740 HR/YR	*	0.01	=	7.4 HR/YR

E M C ENGINEERS, INC
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JOB: FT. DRUM, NY (EMC #1406-006)
CALCULATED BY: CSW
CHECKED BY: BC
DATE: 19-Apr-95
BUILDING NO.: 10522B
BLDG. TYPE: ADM & SUPPLY, BRK W/O DI

ENERGY CONSTANT CALCULATIONS

	BASERUN	RUN1	RUN2	RUN3	RUN4	RUN5
HEATING (MBtu)	2166.1	2166.1	2166.1	1757.2		
COOLING (kWH)	0	0	0	0		

SUPPLY AIR FAN	2360 CFM
FLOOR AREA	29176 FT²
CFMI	2360 CFM
UA	BTU/HR • °F
BUILDING CONST	2 (1 FOR LIGHT) (2 FOR HEAVY)

EZDOE RUN DEFINITION:	
BASERUN	EXISTING OPERATION
RUN1	NIGHT SETBACK
RUN2	ECONOMIZER
RUN3	DDC
RUN4	FORCED VENTILATION
RUN5	

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	4368 HR/YR
HR. ON COOLING	2928 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	5376 HR/YR
PRESENT HR. OF OPERATION FOR SYS. WITH COOLING ONLY	3360 HR/YR

HOUR SAVE (HEATING ONL	5376	-	4368	=	1008 HR/YR
HOUR SAVE (COOLING ONL	3360	-	2928	=	432 HR/YR

HOAUHC	2166.1 MBtu -	2166.1 MBtu	=	0.00E+00 Btu/CFM-HR
	2360 CFM *	0 HR/YR		
HOAUH	2166.1 MBtu -	2166.1 MBtu	=	0.00E+00 Btu/CFM-HR
	2360 CFM *	1008 HR/YR		
COAUHC	0 kWH -	0 kWH	=	0.00E+00 kWH/CFM-HR
	2360 CFM *	0 HR/YR		
COAUC	0 kWH -	0 kWH	=	0.00E+00 kWH/CFM-HR
	2360 CFM *	432 HR/YR		
HOAOHC	2166.1 MBtu -	0 MBtu	=	0.00E+00 Btu/CFM-HR
	2360 CFM *	8760 HR/YR		
HOAOH	2166.1 MBtu -	0 MBtu	=	0.00E+00 Btu/CFM-HR
	2360 CFM *	4368 HR/YR		
COAOHC	0 kWH	0 kWH	=	0.00E+00 kWH/CFM-HR
	2360 CFM *	8760 HR/YR		
COAOC	0 kWH	0 kWH	=	0.00E+00 kWH/CFM-HR
	2360 CFM *	2928 HR/YR		
DC	1 / 6 (10 MINUTES PER HOUR)		=	0.17
DC DEMAND	1 / 6 (10 MINUTES PER HOUR)		=	0.17

E M C ENGINEERS, INC
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JOB: FT. DRUM, NY (EMC #1406-006)
CALCULATED BY: CSW
CHECKED BY: BC
DATE: 19-Apr-95
BUILDING NO.: 10522B
BLDG. TYPE: ADM & SUPPLY, BRK W/O DI

ENERGY CONSTANT CALCULATIONS

ECC	0 kWH -	0 kWH	=	0.00E+00 kWH/CFM-HR
	2360 CFM *	2928 HR/YR		
ECHC	0 kWH -	0 kWH	=	0.00E+00 kWH/CFM-HR
	2360 CFM *	8760 HR/YR		
NSUCHC	0 kWH -	0 kWH	=	0.00E+00 kWH/CFM-HR
	2360 CFM *	0 HR/YR		
NSUCC	0 kWH -	0 kWH	=	0.00E+00 kWH/CFM-HR
	2360 CFM *	1008 HR/YR		
DDCCHC	0 kWH -	0 kWH	=	0.00E+00 kWH/CFM-HR
	2360 CFM *	8760 HR/YR		
DDCCC	0 kWH -	0 kWH	=	0.00E+00 kWH/CFM-HR
	2360 CFM *	2928 HR/YR		
NSC	2166.1 MBtu -	2166.1 MBtu	=	0.00E+00 Btu/ft^2
	29176 AREA			
DSC	2166.1 MBtu -	1757.2 MBtu	=	1.40E+04 Btu/ft^2
	29176 AREA			
FV	1757.2 MBtu -	0 MBtu	=	0.00E+00 Btu/CFM-HR
	2360 CFM *	0 HR/YR		
CHWR	(0.915 kW X 0.012 Eff. X 436 HRS X 2 Degrees of Reset)		=	9.6 kWH/TON
OAR	740 HR/YR *	0.01	=	7.4 HR/YR

E M C ENGINEERS, INC
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JOB: FT. DRUM, NY (EMC #1406-006)
CALCULATED BY: BG
CHECKED BY: BC
DATE: 19-Apr-95
BUILDING NO.: 10550
BLDG. TYPE: EN PER DIN

ENERGY CONSTANT CALCULATIONS

	BASERUN	RUN1	RUN2	RUN3	RUN4	RUN5
HEATING (MBtu)	4571.8	3110.5	3110.5	2582.6	2582.6	
COOLING (kWH)	0	0	0	0	0	

SUPPLY AIR FAN	29710	CFM
FLOOR AREA	15560	FT²
CFMI	17502.75	CFM
UA		BTU/HR • °F
BUILDING CONST	2	(1 FOR LIGHT) (2 FOR HEAVY)

EZDOE RUN DEFINITION:	
BASERUN	EXISTING OPERATION
RUN1	NIGHT SETBACK
RUN2	ECONOMIZER
RUN3	DDC
RUN4	FORCED VENTILATION
RUN5	

HOURS OF OCCUPANCY				ANNUAL HEATING & COOLING HOURS	
M-F	400	2400	100 HR	HR. ON HEATING	4480 HR/YR
SAT.	400	2400	20 HR	HR. ON COOLING	2800 HR/YR
SUN.	400	2400	20 HR	HR. OFF HEATING	896 HR/YR
	TOTAL OCCUPY HR.		140 HR/WK	HR. OFF COOLING	560 HR/YR
	TOTAL UNOCC. HR.		28 HR/WK		
	ANNUAL OCCUPY HR.		7300 HR/YR		
	ANNUAL UNOCC. HR.		1460 HR/YR		

PRESENT HR. OF OPERATION FOR SYS. WITH HEATING AND COOLING 8760 HR/YR
PRESENT HR. OF OPERATION FOR SYS. WITH HEATING ONLY 5376 HR/YR
PRESENT HR. OF OPERATION FOR SYS. WITH COOLING ONLY 3360 HR/YR

HOUR SAVE (HEATING ONL	5376	-	4480	=	896 HR/YR
HOUR SAVE (COOLING ONL	3360	-	2800	=	560 HR/YR

HOAUHC	4571.76 MBtu	-	3110.539 MBtu	=	0.00E+00	Btu/CFM-HR
	17502.75 CFM	*	1460 HR/YR			
HOAUH	4571.76 MBtu	-	3110.539 MBtu	=	0.00E+00	Btu/CFM-HR
	17502.75 CFM	*	896 HR/YR			
COAUHC	0 kWH	-	0 kWH	=	0.00E+00	kWH/CFM-HR
	17502.75 CFM	*	1460 HR/YR			
COAUC	0 kWH	-	0 kWH	=	0.00E+00	kWH/CFM-HR
	17502.75 CFM	*	560 HR/YR			
HOAOHC	4571.76 MBtu	-	1461.221 MBtu	=	2.43E+01	Btu/CFM-HR
	17502.75 CFM	*	7300 HR/YR			
HOAOH	4571.76 MBtu	-	1461.221 MBtu	=	3.97E+01	Btu/CFM-HR
	17502.75 CFM	*	4480 HR/YR			
COAOHC	0 kWH		0 kWH	=	0.00E+00	kWH/CFM-HR
	17502.75 CFM	*	7300 HR/YR			
COAOC	0 kWH		0 kWH	=	0.00E+00	kWH/CFM-HR
	17502.75 CFM	*	2800 HR/YR			
DC	1 / 6 (10 MINUTES PER HOUR)			=	0.17	
DC DEMAND	1 / 6 (10 MINUTES PER HOUR)			=	0.17	

E M C ENGINEERS, INC
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JOB: FT. DRUM, NY (EMC #1406-006)
CALCULATED BY: BG
CHECKED BY: BC
DATE: 19-Apr-95
BUILDING NO.: 10550
BLDG. TYPE: EN PER DIN

ENERGY CONSTANT CALCULATIONS

ECC	0 kWH	-	0 kWH	=	0.00E+00	kWH/CFM-HR
	29710 CFM	*	2800 HR/YR			
ECHC	0 kWH	-	0 kWH	=	0.00E+00	kWH/CFM-HR
	29710 CFM	*	7300 HR/YR			
NSUCHC	0 kWH	-	0 kWH	=	0.00E+00	kWH/CFM-HR
	29710 CFM	*	1460 HR/YR			
NSUCC	0 kWH	-	0 kWH	=	0.00E+00	kWH/CFM-HR
	29710 CFM	*	896 HR/YR			
DDCCHC	0 kWH	-	0 kWH	=	0.00E+00	kWH/CFM-HR
	29710 CFM	*	7300 HR/YR			
DDCCC	0 kWH	-	0 kWH	=	0.00E+00	kWH/CFM-HR
	29710 CFM	*	2800 HR/YR			
NSC	4571.76 MBtu	-	3110.539 MBtu	=	9.39E+04	Btu/ft^2
	15560 AREA					
DSC	3110.539 MBtu	-	2582.611 MBtu	=	3.39E+04	Btu/ft^2
	15560 AREA					
FV	2582.611 MBtu	-	2582.611 MBtu	=	0.00E+00	Btu/CFM-HR
	17502.75 CFM	*	224 HR/YR			
CHWR	(0.915 kW X 0.012 Eff. X 436 HRS X 2 Degrees of Reset)			=	9.6	kWH/TON
OAR	740 HR/YR	*	0.01	=	7.4	HR/YR

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JOB: FT. DRUM, NY (EMC #1406-006)
CALCULATED BY: BG
CHECKED BY: BC
DATE: 19-Apr-95
BUILDING NO.: 10630
BLDG. TYPE: BN HQ BLDG

ENERGY CONSTANT CALCULATIONS

	BASERUN	RUN1	RUN2	RUN3	RUN4	RUN5
HEATING (MBtu)	1429.0	651.2	651.2	590.9	2582.6	
COOLING (kWH)	0	0	0	0	0	

SUPPLY AIR FAN	1440	CFM
FLOOR AREA	12452	FT²
CFMI	1440	CFM
UA		BTU/HR • °F
BUILDING CONST	2	(1 FOR LIGHT) (2 FOR HEAVY)

EZDOE RUN DEFINITION:	
BASERUN	EXISTING OPERATION
RUN1	NIGHT SETBACK
RUN2	ECONOMIZER
RUN3	DDC
RUN4	FORCED VENTILATION
RUN5	

HOURS OF OCCUPANCY				ANNUAL HEATING & COOLING HOURS	
M-F	600	1700	55 HR	HR. ON HEATING	1760 HR/YR
SAT.	0	0	0 HR	HR. ON COOLING	1100 HR/YR
SUN.	0	0	0 HR	HR. OFF HEATING	3616 HR/YR
	TOTAL OCCUPY HR.		55 HR/WK	HR. OFF COOLING	2260 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	5376 HR/YR
PRESENT HR. OF OPERATION FOR SYS. WITH COOLING ONLY	3360 HR/YR

HOUR SAVE (HEATING ONL	5376	-	1760	=	3616 HR/YR
HOUR SAVE (COOLING ONL	3360	-	1100	=	2260 HR/YR

HOAUHC	1429 MBtu	-	651.2 MBtu	=	0.00E+00 Btu/CFM-HR
	1440 CFM	*	5892 HR/YR		
HOAUH	1429 MBtu	-	651.2 MBtu	=	0.00E+00 Btu/CFM-HR
	1440 CFM	*	3616 HR/YR		
COAUHC	0 kWH	-	0 kWH	=	0.00E+00 kWH/CFM-HR
	1440 CFM	*	5892 HR/YR		
COAUC	0 kWH	-	0 kWH	=	0.00E+00 kWH/CFM-HR
	1440 CFM	*	2260 HR/YR		
HOAOHC	1429 MBtu	-	777.8 MBtu	=	1.58E+02 Btu/CFM-HR
	1440 CFM	*	2868 HR/YR		
HOAOH	1429 MBtu	-	777.8 MBtu	=	2.57E+02 Btu/CFM-HR
	1440 CFM	*	1760 HR/YR		
COAOHC	0 kWH		0 kWH	=	0.00E+00 kWH/CFM-HR
	1440 CFM	*	2868 HR/YR		
COAOC	0 kWH		0 kWH	=	0.00E+00 kWH/CFM-HR
	1440 CFM	*	1100 HR/YR		
DC	1 / 6 (10 MINUTES PER HOUR)			=	0.17
DC DEMAND	1 / 6 (10 MINUTES PER HOUR)			=	0.17

E M C ENGINEERS, INC
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JOB: FT. DRUM, NY (EMC #1406-006)
CALCULATED BY: BG
CHECKED BY: BC
DATE: 19-Apr-95
BUILDING NO.: 10630
BLDG. TYPE: BN HQ BLDG

ENERGY CONSTANT CALCULATIONS

ECC	0 kWH -	0 kWH	=	0.00E+00 kWH/CFM-HR
	1440 CFM *	1100 HR/YR		
ECHC	0 kWH -	0 kWH	=	0.00E+00 kWH/CFM-HR
	1440 CFM *	2868 HR/YR		
NSUCHC	0 kWH -	0 kWH	=	0.00E+00 kWH/CFM-HR
	1440 CFM *	5892 HR/YR		
NSUCC	0 kWH -	0 kWH	=	0.00E+00 kWH/CFM-HR
	1440 CFM *	3616 HR/YR		
DDCCHC	0 kWH -	0 kWH	=	0.00E+00 kWH/CFM-HR
	1440 CFM *	2868 HR/YR		
DDCCC	0 kWH -	0 kWH	=	0.00E+00 kWH/CFM-HR
	1440 CFM *	1100 HR/YR		
NSC	1429 MBtu -	651.2 MBtu	=	6.25E+04 Btu/ft^2
	12452 AREA			
DSC	651.2 MBtu -	590.9 MBtu	=	4.84E+03 Btu/ft^2
	12452 AREA			
FV	590.9 MBtu -	2582.611 MBtu	=	0.00E+00 Btu/CFM-HR
	1440 CFM *	160 HR/YR		
CHWR	(0.915 kW X 0.012 Eff. X 436 HRS X 2 Degrees of Reset)		=	9.6 kWH/TON
OAR	740 HR/YR *	0.01	=	7.4 HR/YR

E M C ENGINEERS, INC
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JOB: FT. DRUM, NY (EMC #1406-006)
CALCULATED BY: BG
CHECKED BY: BC
DATE: 19-Apr-95
BUILDING NO.: 10670
BLDG. TYPE: VEH MNT SHOP

ENERGY CONSTANT CALCULATIONS

	BASERUN	RUN1	RUN2	RUN3	RUN4	RUN5
HEATING (MBtu)	5907.6	5504.7	5504.7	5401.8	5401.8	
COOLING (kWH)	0	0	0	0	0	

SUPPLY AIR FAN	129865	CFM
FLOOR AREA	43519	FT²
CFMI	129865	CFM
UA		BTU/HR • °F
BUILDING CONST	2	(1 FOR LIGHT) (2 FOR HEAVY)

EZDOE RUN DEFINITION:	
BASERUN	EXISTING OPERATION
RUN1	NIGHT SETBACK
RUN2	ECONOMIZER
RUN3	DDC
RUN4	FORCED VENTILATION
RUN5	

HOURS OF OCCUPANCY			
M-F	700	1900	60 HR
SAT.	700	1900	12 HR
SUN.	700	1900	12 HR
	TOTAL OCCUPY HR.		84 HR/WK
	TOTAL UNOCC. HR.		84 HR/WK
	ANNUAL OCCUPY HR.		4380 HR/YR
	ANNUAL UNOCC. HR.		4380 HR/YR

ANNUAL HEATING & COOLING HOURS	
HR. ON HEATING	2688 HR/YR
HR. ON COOLING	1680 HR/YR
HR. OFF HEATING	2688 HR/YR
HR. OFF COOLING	1680 HR/YR

PRESENT HR. OF OPERATION FOR SYS. WITH HEATING AND COOLING 8760 HR/YR
PRESENT HR. OF OPERATION FOR SYS. WITH HEATING ONLY 5376 HR/YR
PRESENT HR. OF OPERATION FOR SYS. WITH COOLING ONLY 3360 HR/YR

HOUR SAVE (HEATING ONL 5376 - 2688 = 2688 HR/YR
HOUR SAVE (COOLING ONL 3360 - 1680 = 1680 HR/YR

HOAUHC	5907.612 MBtu	-	5504.704 MBtu	=	0.00E+00 Btu/CFM-HR
	129865 CFM	*	4380 HR/YR		
HOAUH	5907.612 MBtu	-	5504.704 MBtu	=	0.00E+00 Btu/CFM-HR
	129865 CFM	*	2688 HR/YR		
COAUHC	0 kWH	-	0 kWH	=	0.00E+00 kWH/CFM-HR
	129865 CFM	*	4380 HR/YR		
COAUC	0 kWH	-	0 kWH	=	0.00E+00 kWH/CFM-HR
	129865 CFM	*	1680 HR/YR		
HOAOHC	5907.612 MBtu	-	402.9081 MBtu	=	9.68E+00 Btu/CFM-HR
	129865 CFM	*	4380 HR/YR		
HOAOH	5907.612 MBtu	-	402.9081 MBtu	=	1.58E+01 Btu/CFM-HR
	129865 CFM	*	2688 HR/YR		
COAOHC	0 kWH		0 kWH	=	0.00E+00 kWH/CFM-HR
	129865 CFM	*	4380 HR/YR		
COAOC	0 kWH		0 kWH	=	0.00E+00 kWH/CFM-HR
	129865 CFM	*	1680 HR/YR		
DC	1 / 6 (10 MINUTES PER HOUR)			=	0.17
DC DEMAND	1 / 6 (10 MINUTES PER HOUR)			=	0.17

E M C ENGINEERS, INC
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JOB: FT. DRUM, NY (EMC #1406-006)
CALCULATED BY: BG
CHECKED BY: BC
DATE: 19-Apr-95
BUILDING NO.: 10670
BLDG. TYPE: VEH MNT SHOP

ENERGY CONSTANT CALCULATIONS

ECC	0 kWH -	0 kWH	=	0.00E+00 kWH/CFM-HR
	129865 CFM *	1680 HR/YR		
ECHC	0 kWH -	0 kWH	=	0.00E+00 kWH/CFM-HR
	129865 CFM *	4380 HR/YR		
NSUCHC	0 kWH -	0 kWH	=	0.00E+00 kWH/CFM-HR
	129865 CFM *	4380 HR/YR		
NSUCC	0 kWH -	0 kWH	=	0.00E+00 kWH/CFM-HR
	129865 CFM *	2688 HR/YR		
DDCCHC	0 kWH -	0 kWH	=	0.00E+00 kWH/CFM-HR
	129865 CFM *	4380 HR/YR		
DDCCC	0 kWH -	0 kWH	=	0.00E+00 kWH/CFM-HR
	129865 CFM *	1680 HR/YR		
NSC	5907.612 MBtu -	5504.704 MBtu	=	9.26E+03 Btu/ft^2
	43519 AREA			
DSC	5504.704 MBtu -	5401.799 MBtu	=	2.36E+03 Btu/ft^2
	43519 AREA			
FV	5401.799 MBtu -	5401.799 MBtu	=	0.00E+00 Btu/CFM-HR
	129865 CFM *	224 HR/YR		
CHWR	(0.915 kW X 0.012 Eff. X 436 HRS X 2 Degrees of Reset)		=	9.6 kWH/TON
OAR	740 HR/YR *	0.01	=	7.4 HR/YR

E M C ENGINEERS, INC
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JOB: FT. DRUM, NY (EMC #1406-006)
CALCULATED BY: CSW
CHECKED BY: BC
DATE: 19-Apr-95
BUILDING NO.: 10715A
BLDG. TYPE: POST SAFETY/LEA

ENERGY CONSTANT CALCULATIONS

	BASERUN	RUN1	RUN2	RUN3	RUN4	RUN5
HEATING (MBtu)	2145.3	2145.3	2145.3	2085.2	2085.2	
COOLING (kWH)	1280	1280	1262	350	0	

SUPPLY AIR FAN	17240	CFM
FLOOR AREA	14790	FT²
CFMI	5720	CFM
UA		BTU/HR • °F
BUILDING CONST	2	(1 FOR LIGHT) (2 FOR HEAVY)

EZDOE RUN DEFINITION:	
BASERUN	EXISTING OPERATION
RUN1	NIGHT SETBACK
RUN2	ECONOMIZER
RUN3	DDC
RUN4	FORCED VENTILATION
RUN5	

HOURS OF OCCUPANCY				ANNUAL HEATING & COOLING HOURS	
M-F	0	2400	120 HR	HR. ON HEATING	4368 HR/YR
SAT.	0	2400	24 HR	HR. ON COOLING	2928 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	5376	HR/YR
PRESENT HR. OF OPERATION FOR SYS. WITH COOLING ONLY	3360	HR/YR

HOUR SAVE (HEATING ONL	5376	-	4368	=	1008	HR/YR
HOUR SAVE (COOLING ONL	3360	-	2928	=	432	HR/YR

HOAUHC	2145.3	MBtu	-	2145.3	MBtu	=	0.00E+00 Btu/CFM-HR
	5720	CFM	*	0	HR/YR		
HOAUH	2145.3	MBtu	-	2145.3	MBtu	=	0.00E+00 Btu/CFM-HR
	5720	CFM	*	1008	HR/YR		
COAUHC	1280.443	kWH	-	1280.443	kWH	=	0.00E+00 kWH/CFM-HR
	5720	CFM	*	0	HR/YR		
COAUC	1280.443	kWH	-	1280.443	kWH	=	0.00E+00 kWH/CFM-HR
	5720	CFM	*	432	HR/YR		
HOAOHC	2145.3	MBtu	-	0	MBtu	=	0.00E+00 Btu/CFM-HR
	5720	CFM	*	8760	HR/YR		
HOAOH	2145.3	MBtu	-	0	MBtu	=	0.00E+00 Btu/CFM-HR
	5720	CFM	*	4368	HR/YR		
COAOHC	1280.443	kWH		0	kWH	=	0.00E+00 kWH/CFM-HR
	5720	CFM	*	8760	HR/YR		
COAOC	1280.443	kWH		0	kWH	=	0.00E+00 kWH/CFM-HR
	5720	CFM	*	2928	HR/YR		
DC	1 / 6 (10 MINUTES PER HOUR)					=	0.17
DC DEMAND	1 / 6 (10 MINUTES PER HOUR)					=	0.17

E M C ENGINEERS, INC
DENVER • ATLANTA • GERMANY

JOB: FT. DRUM, NY (EMC #1406-006)
CALCULATED BY: CSW
CHECKED BY: BC
DATE: 19-Apr-95
BUILDING NO.: 10715A
BLDG. TYPE: POST SAFETY/LEA

ENERGY CONSTANT CALCULATIONS

ECC	1280.443 kWH	-	1261.928 kWH	=	3.67E-07 kWH/CFM-HR
	17240 CFM	*	2928 HR/YR		
ECHC	1280.443 kWH	-	1261.928 kWH	=	1.23E-07 kWH/CFM-HR
	17240 CFM	*	8760 HR/YR		
NSUCHC	1280.443 kWH	-	1280.443 kWH	=	0.00E+00 kWH/CFM-HR
	17240 CFM	*	0 HR/YR		
NSUCC	1280.443 kWH	-	1280.443 kWH	=	0.00E+00 kWH/CFM-HR
	17240 CFM	*	1008 HR/YR		
DDCCHC	1261.928 kWH	-	349.7014 kWH	=	6.04E-06 kWH/CFM-HR
	17240 CFM	*	8760 HR/YR		
DDCCC	1261.928 kWH	-	349.7014 kWH	=	1.81E-05 kWH/CFM-HR
	17240 CFM	*	2928 HR/YR		
NSC	2145.3 MBtu	-	2145.3 MBtu	=	0.00E+00 Btu/ft^2
	14790 AREA				
DSC	2145.3 MBtu	-	2085.2 MBtu	=	4.06E+03 Btu/ft^2
	14790 AREA				
FV	2085.2 MBtu	-	2085.2 MBtu	=	0.00E+00 Btu/CFM-HR
	5720 CFM	*	0 HR/YR		
CHWR	(0.915 kW X 0.012 Eff. X 436 HRS X 2 Degrees of Reset)			=	9.6 kWH/TON
OAR	740 HR/YR	*	0.01	=	7.4 HR/YR

E M C ENGINEERS, INC
DENVER • ATLANTA • GERMANY

JOB: FT. DRUM, NY (EMC #1406-006)
CALCULATED BY: CSW
CHECKED BY: BC
DATE: 19-Apr-95
BUILDING NO.: 10715B
BLDG. TYPE: POST SAFETY/LEA

ENERGY CONSTANT CALCULATIONS

	BASERUN	RUN1	RUN2	RUN3	RUN4	RUN5
HEATING (MBtu)	540.5	280.8	280.8	266.6	215.3	
COOLING (kWH)	0	0	0	0	0	

SUPPLY AIR FAN	9040	CFM
FLOOR AREA	12020	FT²
CFMI	1000	CFM
UA		BTU/HR • °F
BUILDING CONST	2	(1 FOR LIGHT) (2 FOR HEAVY)

EZDOE RUN DEFINITION:	
BASERUN	EXISTING OPERATION
RUN1	NIGHT SETBACK
RUN2	ECONOMIZER
RUN3	DDC
RUN4	FORCED VENTILATION
RUN5	

HOURS OF OCCUPANCY				ANNUAL HEATING & COOLING HOURS	
M-F	600	1700	55 HR	HR. ON HEATING	1430 HR/YR
SAT.	0	0	0 HR	HR. ON COOLING	959 HR/YR
SUN.	0	0	0 HR	HR. OFF HEATING	2938 HR/YR
	TOTAL OCCUPY HR.		55 HR/WK	HR. OFF COOLING	1969 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				5376 HR/YR
PRESENT HR. OF OPERATION FOR SYS. WITH COOLING ONLY				3360 HR/YR
HOUR SAVE (HEATING ONL	5376	-	1430	= 3946 HR/YR
HOUR SAVE (COOLING ONL	3360	-	959	= 2401 HR/YR

HOAUHC	540.5 MBtu	-	280.8 MBtu	=	0.00E+00 Btu/CFM-HR
	1000 CFM	*	5892 HR/YR		
HOAUH	540.5 MBtu	-	280.8 MBtu	=	0.00E+00 Btu/CFM-HR
	1000 CFM	*	3946 HR/YR		
COAUHC	0 kWH	-	0 kWH	=	0.00E+00 kWH/CFM-HR
	1000 CFM	*	5892 HR/YR		
COAUC	0 kWH	-	0 kWH	=	0.00E+00 kWH/CFM-HR
	1000 CFM	*	2401 HR/YR		
HOAOHC	540.5 MBtu	-	259.7 MBtu	=	9.79E+01 Btu/CFM-HR
	1000 CFM	*	2868 HR/YR		
HOAOH	540.5 MBtu	-	259.7 MBtu	=	1.96E+02 Btu/CFM-HR
	1000 CFM	*	1430 HR/YR		
COAOHC	0 kWH		0 kWH	=	0.00E+00 kWH/CFM-HR
	1000 CFM	*	2868 HR/YR		
COAOC	0 kWH		0 kWH	=	0.00E+00 kWH/CFM-HR
	1000 CFM	*	959 HR/YR		
DC	1 / 6 (10 MINUTES PER HOUR)			=	0.17
DC DEMAND	1 / 6 (10 MINUTES PER HOUR)			=	0.17

E M C ENGINEERS, INC
DENVER • ATLANTA • GERMANY

JOB: FT. DRUM, NY (EMC #1406-006)
CALCULATED BY: CSW
CHECKED BY: BC
DATE: 19-Apr-95
BUILDING NO.: 10715B
BLDG. TYPE: POST SAFETY/LEA

ENERGY CONSTANT CALCULATIONS

ECC	0 kWH -	0 kWH	=	0.00E+00 kWH/CFM-HR
	9040 CFM *	959 HR/YR		
ECHC	0 kWH -	0 kWH	=	0.00E+00 kWH/CFM-HR
	9040 CFM *	2868 HR/YR		
NSUCHC	0 kWH -	0 kWH	=	0.00E+00 kWH/CFM-HR
	9040 CFM *	5892 HR/YR		
NSUCC	0 kWH -	0 kWH	=	0.00E+00 kWH/CFM-HR
	9040 CFM *	3946 HR/YR		
DDCCHC	0 kWH -	0 kWH	=	0.00E+00 kWH/CFM-HR
	9040 CFM *	2868 HR/YR		
DDCCC	0 kWH -	0 kWH	=	0.00E+00 kWH/CFM-HR
	9040 CFM *	959 HR/YR		
NSC	540.5 MBtu -	280.8 MBtu	=	2.16E+04 Btu/ft^2
	12020 AREA			
DSC	280.8 MBtu -	266.6 MBtu	=	1.18E+03 Btu/ft^2
	12020 AREA			
FV	266.6 MBtu -	215.3 MBtu	=	3.21E+02 Btu/CFM-HR
	1000 CFM *	160 HR/YR		
CHWR	(0.915 kW X 0.012 Eff. X 436 HRS X 2 Degrees of Reset)		=	9.6 kWH/TON
OAR	740 HR/YR *	0.01	=	7.4 HR/YR

E M C ENGINEERS, INC
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JOB: FT. DRUM, NY (EMC #1406-006)
CALCULATED BY: BG
CHECKED BY: BC
DATE: 19-Apr-95
BUILDING NO.: 10730
BLDG. TYPE: CLO SALES/RETAIL/FOOD

ENERGY CONSTANT CALCULATIONS

	BASERUN	RUN1	RUN2	RUN3	RUN4	RUN5
HEATING (MBtu)	6135.9	3835.6	3835.6	3053.7	2887.5	
COOLING (kWH)	95698	66920	62014	43662	65204	

SUPPLY AIR FAN	59604	CFM
FLOOR AREA	167600	FT²
CFMI	7994.53	CFM
UA		BTU/HR • °F
BUILDING CONST	2	(1 FOR LIGHT) (2 FOR HEAVY)

EZDOE RUN DEFINITION:	
BASERUN	EXISTING OPERATION
RUN1	NIGHT SETBACK
RUN2	ECONOMIZER
RUN3	DDC
RUN4	FORCED VENTILATION
RUN5	

HOURS OF OCCUPANCY				ANNUAL HEATING & COOLING HOURS	
M-F	1000	2000	50 HR	HR. ON HEATING	2240 HR/YR
SAT.	1000	2000	10 HR	HR. ON COOLING	1400 HR/YR
SUN.	1000	2000	10 HR	HR. OFF HEATING	3136 HR/YR
	TOTAL OCCUPY HR.		70 HR/WK	HR. OFF COOLING	1960 HR/YR
	TOTAL UNOCC. HR.		98 HR/WK		
	ANNUAL OCCUPY HR.		3650 HR/YR		
	ANNUAL UNOCC. HR.		5110 HR/YR		

PRESENT HR. OF OPERATION FOR SYS. WITH HEATING AND COOLING 8760 HR/YR
PRESENT HR. OF OPERATION FOR SYS. WITH HEATING ONLY 5376 HR/YR
PRESENT HR. OF OPERATION FOR SYS. WITH COOLING ONLY 3360 HR/YR

HOUR SAVE (HEATING ONL	5376	-	2240	=	3136 HR/YR
HOUR SAVE (COOLING ONL	3360	-	1400	=	1960 HR/YR

HOAUHC	6135.91 MBtu	-	3835.565 MBtu	=	0.00E+00 Btu/CFM-HR
	7994.53 CFM	*	5110 HR/YR		
HOAUH	6135.91 MBtu	-	3835.565 MBtu	=	0.00E+00 Btu/CFM-HR
	7994.53 CFM	*	3136 HR/YR		
COAUHC	95698.28 kWH	-	66920.03 kWH	=	7.04E-04 kWH/CFM-HR
	7994.53 CFM	*	5110 HR/YR		
COAUC	95698.28 kWH	-	66920.03 kWH	=	1.84E-03 kWH/CFM-HR
	7994.53 CFM	*	1960 HR/YR		
HOAOHC	6135.91 MBtu	-	2300.345 MBtu	=	1.31E+02 Btu/CFM-HR
	7994.53 CFM	*	3650 HR/YR		
HOAOH	6135.91 MBtu	-	2300.345 MBtu	=	2.14E+02 Btu/CFM-HR
	7994.53 CFM	*	2240 HR/YR		
COAOHC	95698.28 kWH		28778.24 kWH	=	2.29E-03 kWH/CFM-HR
	7994.53 CFM	*	3650 HR/YR		
COAOC	95698.28 kWH		28778.24 kWH	=	5.98E-03 kWH/CFM-HR
	7994.53 CFM	*	1400 HR/YR		
DC	1 / 6 (10 MINUTES PER HOUR)			=	0.17
DC DEMAND	1 / 6 (10 MINUTES PER HOUR)			=	0.17

E M C ENGINEERS, INC
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JOB: FT. DRUM, NY (EMC #1406-006)
CALCULATED BY: BG
CHECKED BY: BC
DATE: 19-Apr-95
BUILDING NO.: 10730
BLDG. TYPE: CLO SALES/RETAIL/FOOD

ENERGY CONSTANT CALCULATIONS

ECC	66920.03 kWH -	62014.12 kWH	=	5.88E-05 kWH/CFM-HR
	59604 CFM *	1400 HR/YR		
ECHC	66920.03 kWH -	62014.12 kWH	=	2.26E-05 kWH/CFM-HR
	59604 CFM *	3650 HR/YR		
NSUCHC	95698.28 kWH -	66920.03 kWH	=	9.45E-05 kWH/CFM-HR
	59604 CFM *	5110 HR/YR		
NSUCC	95698.28 kWH -	66920.03 kWH	=	1.54E-04 kWH/CFM-HR
	59604 CFM *	3136 HR/YR		
DDCCHC	62014.12 kWH -	43661.56 kWH	=	8.44E-05 kWH/CFM-HR
	59604 CFM *	3650 HR/YR		
DDCCC	62014.12 kWH -	43661.56 kWH	=	2.20E-04 kWH/CFM-HR
	59604 CFM *	1400 HR/YR		
NSC	6135.91 MBtu -	3835.565 MBtu	=	1.37E+04 Btu/ft^2
	167600 AREA			
DSC	3835.565 MBtu -	3053.733 MBtu	=	4.66E+03 Btu/ft^2
	167600 AREA			
FV	3053.733 MBtu -	2887.493 MBtu	=	9.28E+01 Btu/CFM-HR
	7994.53 CFM *	224 HR/YR		
CHWR	(0.915 kW X 0.012 Eff. X 436 HRS X 2 Degrees of Reset)		=	9.6 kWH/TON
OAR	740 HR/YR *	0.01	=	7.4 HR/YR

E M C ENGINEERS, INC
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JOB: FT. DRUM, NY (EMC #1406-006)
CALCULATED BY: BG
CHECKED BY: BC
DATE: 19-Apr-95
BUILDING NO.: 10745
BLDG. TYPE: CHILD SUPPORT CENTER

ENERGY CONSTANT CALCULATIONS

	BASERUN	RUN1	RUN2	RUN3	RUN4	RUN5
HEATING (MBtu)	3182.7	1861.1	1861.1	1517.1	1636.9	
COOLING (kWH)	0	0	0	0	0	

SUPPLY AIR FAN	10563	CFM
FLOOR AREA	13500	FT²
CFMI	10563	CFM
UA		BTU/HR • °F
BUILDING CONST	2	(1 FOR LIGHT) (2 FOR HEAVY)

EZDOE RUN DEFINITION:	
BASERUN	EXISTING OPERATION
RUN1	NIGHT SETBACK
RUN2	ECONOMIZER
RUN3	DDC
RUN4	FORCED VENTILATION
RUN5	

HOURS OF OCCUPANCY			
M-F	700	1900	60 HR
SAT.	0	0	0 HR
SUN.	0	0	0 HR
	TOTAL OCCUPY HR.		60 HR/WK
	TOTAL UNOCC. HR.		108 HR/WK
	ANNUAL OCCUPY HR.		3129 HR/YR
	ANNUAL UNOCC. HR.		5631 HR/YR

ANNUAL HEATING & COOLING HOURS	
HR. ON HEATING	1920 HR/YR
HR. ON COOLING	1200 HR/YR
HR. OFF HEATING	3456 HR/YR
HR. OFF COOLING	2160 HR/YR

PRESENT HR. OF OPERATION FOR SYS. WITH HEATING AND COOLING 8760 HR/YR
PRESENT HR. OF OPERATION FOR SYS. WITH HEATING ONLY 5376 HR/YR
PRESENT HR. OF OPERATION FOR SYS. WITH COOLING ONLY 3360 HR/YR

HOUR SAVE (HEATING ONL	5376	-	1920	=	3456 HR/YR
HOUR SAVE (COOLING ONL	3360	-	1200	=	2160 HR/YR

HOAUHC	3182.7 MBtu	-	1861.095 MBtu	=	0.00E+00 Btu/CFM-HR
	10563 CFM	*	5631 HR/YR		
HOAUH	3182.7 MBtu	-	1861.095 MBtu	=	0.00E+00 Btu/CFM-HR
	10563 CFM	*	3456 HR/YR		
COAUHC	0 kWH	-	0 kWH	=	0.00E+00 kWH/CFM-HR
	10563 CFM	*	5631 HR/YR		
COAUC	0 kWH	-	0 kWH	=	0.00E+00 kWH/CFM-HR
	10563 CFM	*	2160 HR/YR		
HOAOHC	3182.7 MBtu	-	1321.605 MBtu	=	5.63E+01 Btu/CFM-HR
	10563 CFM	*	3129 HR/YR		
HOAOH	3182.7 MBtu	-	1321.605 MBtu	=	9.18E+01 Btu/CFM-HR
	10563 CFM	*	1920 HR/YR		
COAOHC	0 kWH		0 kWH	=	0.00E+00 kWH/CFM-HR
	10563 CFM	*	3129 HR/YR		
COAOC	0 kWH		0 kWH	=	0.00E+00 kWH/CFM-HR
	10563 CFM	*	1200 HR/YR		
DC	1 / 6 (10 MINUTES PER HOUR)			=	0.17
DC DEMAND	1 / 6 (10 MINUTES PER HOUR)			=	0.17

E M C ENGINEERS, INC
DENVER • ATLANTA • GERMANY

JOB: FT. DRUM, NY (EMC #1406-006)
CALCULATED BY: BG
CHECKED BY: BC
DATE: 19-Apr-95
BUILDING NO.: 10745
BLDG. TYPE: CHILD SUPPORT CENTER

ENERGY CONSTANT CALCULATIONS

ECC	0 kWH	-	0 kWH	=	0.00E+00 kWH/CFM-HR
	10563 CFM	*	1200 HR/YR		
ECHC	0 kWH	-	0 kWH	=	0.00E+00 kWH/CFM-HR
	10563 CFM	*	3129 HR/YR		
NSUCHC	0 kWH	-	0 kWH	=	0.00E+00 kWH/CFM-HR
	10563 CFM	*	5631 HR/YR		
NSUCC	0 kWH	-	0 kWH	=	0.00E+00 kWH/CFM-HR
	10563 CFM	*	3456 HR/YR		
DDCCHC	0 kWH	-	0 kWH	=	0.00E+00 kWH/CFM-HR
	10563 CFM	*	3129 HR/YR		
DDCCC	0 kWH	-	0 kWH	=	0.00E+00 kWH/CFM-HR
	10563 CFM	*	1200 HR/YR		
NSC	3182.7 MBtu	-	1861.095 MBtu	=	9.79E+04 Btu/ft^2
	13500 AREA				
DSC	1861.095 MBtu	-	1517.129 MBtu	=	2.55E+04 Btu/ft^2
	13500 AREA				
FV	1517.129 MBtu	-	1636.91 MBtu	=	0.00E+00 Btu/CFM-HR
	10563 CFM	*	160 HR/YR		
CHWR	(0.915 kW X 0.012 Eff. X 436 HRS X 2 Degrees of Reset)			=	9.6 kWH/TON
OAR	740 HR/YR	*	0.01	=	7.4 HR/YR

E M C ENGINEERS, INC
DENVER • ATLANTA • GERMANY

JOB: FT. DRUM, NY (EMC #1406-006)
CALCULATED BY: CSW
CHECKED BY: BC
DATE: 19-Apr-95
BUILDING NO.: 10785A
BLDG. TYPE: CHAPEL\CHILD CARE\REL E

ENERGY CONSTANT CALCULATIONS

	BASERUN	RUN1	RUN2	RUN3	RUN4	RUN5
HEATING (MBtu)	2051.0	1820.2	1820.2	1417.6	1417.6	
COOLING (kWH)	0	0	0	0	0	

SUPPLY AIR FAN	18800	CFM
FLOOR AREA	40519	FT²
CFMI	5050	CFM
UA		BTU/HR • °F
BUILDING CONST	2	(1 FOR LIGHT) (2 FOR HEAVY)

EZDOE RUN DEFINITION:	
BASERUN	EXISTING OPERATION
RUN1	NIGHT SETBACK
RUN2	ECONOMIZER
RUN3	DDC
RUN4	FORCED VENTILATION
RUN5	

HOURS OF OCCUPANCY			
M-F	600	1800	60 HR
SAT.	0	0	0 HR
SUN.	0	0	0 HR
	TOTAL OCCUPY HR.		60 HR/WK
	TOTAL UNOCC. HR.		108 HR/WK
	ANNUAL OCCUPY HR.		3129 HR/YR
	ANNUAL UNOCC. HR.		5631 HR/YR

ANNUAL HEATING & COOLING HOURS	
HR. ON HEATING	1560 HR/YR
HR. ON COOLING	1046 HR/YR
HR. OFF HEATING	2808 HR/YR
HR. OFF COOLING	1882 HR/YR

PRESENT HR. OF OPERATION FOR SYS. WITH HEATING AND COOLING 8760 HR/YR
PRESENT HR. OF OPERATION FOR SYS. WITH HEATING ONLY 5376 HR/YR
PRESENT HR. OF OPERATION FOR SYS. WITH COOLING ONLY 3360 HR/YR

HOUR SAVE (HEATING ONL 5376 - 1560 = 3816 HR/YR
HOUR SAVE (COOLING ONL 3360 - 1046 = 2314 HR/YR

HOAUHC	2051 MBtu	-	1820.2 MBtu	=	0.00E+00 Btu/CFM-HR
	5050 CFM	*	5631 HR/YR		
HOAUH	2051 MBtu	-	1820.2 MBtu	=	0.00E+00 Btu/CFM-HR
	5050 CFM	*	3816 HR/YR		
COAUHC	0 kWH	-	0 kWH	=	0.00E+00 kWH/CFM-HR
	5050 CFM	*	5631 HR/YR		
COAUC	0 kWH	-	0 kWH	=	0.00E+00 kWH/CFM-HR
	5050 CFM	*	2314 HR/YR		
HOAOHC	2051 MBtu	-	230.8 MBtu	=	1.15E+02 Btu/CFM-HR
	5050 CFM	*	3129 HR/YR		
HOAOH	2051 MBtu	-	230.8 MBtu	=	2.31E+02 Btu/CFM-HR
	5050 CFM	*	1560 HR/YR		
COAOHC	0 kWH		0 kWH	=	0.00E+00 kWH/CFM-HR
	5050 CFM	*	3129 HR/YR		
COAOC	0 kWH		0 kWH	=	0.00E+00 kWH/CFM-HR
	5050 CFM	*	1046 HR/YR		
DC	1 / 6 (10 MINUTES PER HOUR)			=	0.17
DC DEMAND	1 / 6 (10 MINUTES PER HOUR)			=	0.17

E M C ENGINEERS, INC
DENVER • ATLANTA • GERMANY

JOB: FT. DRUM, NY (EMC #1406-006)
CALCULATED BY: CSW
CHECKED BY: BC
DATE: 19-Apr-95
BUILDING NO.: 10785A
BLDG. TYPE: CHAPEL\CHILD CARE\REL E

ENERGY CONSTANT CALCULATIONS

ECC	0 kWH	-	0 kWH	=	0.00E+00 kWH/CFM-HR
	18800 CFM	*	1046 HR/YR		
ECHC	0 kWH	-	0 kWH	=	0.00E+00 kWH/CFM-HR
	18800 CFM	*	3129 HR/YR		
NSUCHC	0 kWH	-	0 kWH	=	0.00E+00 kWH/CFM-HR
	18800 CFM	*	5631 HR/YR		
NSUCC	0 kWH	-	0 kWH	=	0.00E+00 kWH/CFM-HR
	18800 CFM	*	3816 HR/YR		
DDCCHC	0 kWH	-	0 kWH	=	0.00E+00 kWH/CFM-HR
	18800 CFM	*	3129 HR/YR		
DDCCC	0 kWH	-	0 kWH	=	0.00E+00 kWH/CFM-HR
	18800 CFM	*	1046 HR/YR		
NSC	2051 MBtu	-	1820.2 MBtu	=	5.70E+03 Btu/ft^2
	40519 AREA				
DSC	1820.2 MBtu	-	1417.6 MBtu	=	9.94E+03 Btu/ft^2
	40519 AREA				
FV	1417.6 MBtu	-	1417.6 MBtu	=	0.00E+00 Btu/CFM-HR
	5050 CFM	*	160 HR/YR		
CHWR	(0.915 kW X 0.012 Eff. X 436 HRS X 2 Degrees of Reset)			=	9.6 kWH/TON
OAR	740 HR/YR	*	0.01	=	7.4 HR/YR

E M C ENGINEERS, INC
DENVER • ATLANTA • GERMANY

JOB: FT. DRUM, NY (EMC #1406-006)
CALCULATED BY: CSW
CHECKED BY: BC
DATE: 19-Apr-95
BUILDING NO.: 10785B
BLDG. TYPE: CHAPEL\CHILD CARE\REL E

ENERGY CONSTANT CALCULATIONS

	BASERUN	RUN1	RUN2	RUN3	RUN4	RUN5
HEATING (MBtu)	876.7	116.3	116.3	95.1	85.7	
COOLING (kWH)	0	0	0	0	0	

SUPPLY AIR FAN	4100	CFM
FLOOR AREA	3024	FT²
CFMI	2000	CFM
UA		BTU/HR • °F
BUILDING CONST	2	(1 FOR LIGHT) (2 FOR HEAVY)

EZDOE RUN DEFINITION:	
BASERUN	EXISTING OPERATION
RUN1	NIGHT SETBACK
RUN2	ECONOMIZER
RUN3	DDC
RUN4	FORCED VENTILATION
RUN5	

HOURS OF OCCUPANCY			
M-F	0	0	0 HR
SAT.	0	0	0 HR
SUN.	800	1400	6 HR
	TOTAL OCCUPY HR.		6 HR/WK
	TOTAL UNOCC. HR.		162 HR/WK
	ANNUAL OCCUPY HR.		313 HR/YR
	ANNUAL UNOCC. HR.		8447 HR/YR

ANNUAL HEATING & COOLING HOURS	
HR. ON HEATING	156 HR/YR
HR. ON COOLING	105 HR/YR
HR. OFF HEATING	4212 HR/YR
HR. OFF COOLING	2823 HR/YR

PRESENT HR. OF OPERATION FOR SYS. WITH HEATING AND COOLING 8760 HR/YR
PRESENT HR. OF OPERATION FOR SYS. WITH HEATING ONLY 5376 HR/YR
PRESENT HR. OF OPERATION FOR SYS. WITH COOLING ONLY 3360 HR/YR

HOUR SAVE (HEATING ONL	5376	-	156	=	5220 HR/YR
HOUR SAVE (COOLING ONL	3360	-	105	=	3255 HR/YR

HOAUHC	876.7 MBtu	-	116.3 MBtu	=	0.00E+00 Btu/CFM-HR
	2000 CFM	*	8447 HR/YR		
HOAUH	876.7 MBtu	-	116.3 MBtu	=	0.00E+00 Btu/CFM-HR
	2000 CFM	*	5220 HR/YR		
COAUHC	0 kWH	-	0 kWH	=	0.00E+00 kWH/CFM-HR
	2000 CFM	*	8447 HR/YR		
COAUC	0 kWH	-	0 kWH	=	0.00E+00 kWH/CFM-HR
	2000 CFM	*	3255 HR/YR		
HOAOHC	876.7 MBtu	-	760.4 MBtu	=	1.86E+02 Btu/CFM-HR
	2000 CFM	*	313 HR/YR		
HOAOH	876.7 MBtu	-	760.4 MBtu	=	3.73E+02 Btu/CFM-HR
	2000 CFM	*	156 HR/YR		
COAOHC	0 kWH		0 kWH	=	0.00E+00 kWH/CFM-HR
	2000 CFM	*	313 HR/YR		
COAOC	0 kWH		0 kWH	=	0.00E+00 kWH/CFM-HR
	2000 CFM	*	105 HR/YR		
DC	1 / 6 (10 MINUTES PER HOUR)			=	0.17
DC DEMAND	1 / 6 (10 MINUTES PER HOUR)			=	0.17

E M C ENGINEERS, INC
DENVER • ATLANTA • GERMANY

JOB: FT. DRUM, NY (EMC #1406-006)
CALCULATED BY: CSW
CHECKED BY: BC
DATE: 19-Apr-95
BUILDING NO.: 10785B
BLDG. TYPE: CHAPEL\CHILD CARE\REL E

ENERGY CONSTANT CALCULATIONS

ECC	0 kWH -	0 kWH	=	0.00E+00 kWH/CFM-HR
	4100 CFM *	105 HR/YR		
ECHC	0 kWH -	0 kWH	=	0.00E+00 kWH/CFM-HR
	4100 CFM *	313 HR/YR		
NSUCHC	0 kWH -	0 kWH	=	0.00E+00 kWH/CFM-HR
	4100 CFM *	8447 HR/YR		
NSUCC	0 kWH -	0 kWH	=	0.00E+00 kWH/CFM-HR
	4100 CFM *	5220 HR/YR		
DDCCHC	0 kWH -	0 kWH	=	0.00E+00 kWH/CFM-HR
	4100 CFM *	313 HR/YR		
DDCCC	0 kWH -	0 kWH	=	0.00E+00 kWH/CFM-HR
	4100 CFM *	105 HR/YR		
NSC	876.7 MBtu -	116.3 MBtu	=	2.51E+05 Btu/ft^2
	3024 AREA			
DSC	116.3 MBtu -	95.1 MBtu	=	7.01E+03 Btu/ft^2
	3024 AREA			
FV	95.1 MBtu -	85.7 MBtu	=	1.47E+02 Btu/CFM-HR
	2000 CFM *	32 HR/YR		
CHWR	(0.915 kW X 0.012 Eff. X 436 HRS X 2 Degrees of Reset)		=	9.6 kWH/TON
OAR	740 HR/YR *	0.01	=	7.4 HR/YR

E M C ENGINEERS, INC
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JOB: FT. DRUM, NY (EMC #1406-006)
CALCULATED BY: CSW
CHECKED BY: BC
DATE: 19-Apr-95
BUILDING NO.: 10785C
BLDG. TYPE: CHAPEL\CHILD CARE\REL E

ENERGY CONSTANT CALCULATIONS

	BASERUN	RUN1	RUN2	RUN3	RUN4	RUN5
HEATING (MBtu)	679.9	447.6	447.6	358.8	351.3	
COOLING (kWH)	0	0	0	0	0	

SUPPLY AIR FAN	2900	CFM
FLOOR AREA	7048	FT²
CFMI	900	CFM
UA		BTU/HR • °F
BUILDING CONST	2	(1 FOR LIGHT) (2 FOR HEAVY)

EZDOE RUN DEFINITION:	
BASERUN	EXISTING OPERATION
RUN1	NIGHT SETBACK
RUN2	ECONOMIZER
RUN3	DDC
RUN4	FORCED VENTILATION
RUN5	

HOURS OF OCCUPANCY				ANNUAL HEATING & COOLING HOURS	
M-F	600	1700	55 HR	HR. ON HEATING	1430 HR/YR
SAT.	0	0	0 HR	HR. ON COOLING	959 HR/YR
SUN.	0	0	0 HR	HR. OFF HEATING	2938 HR/YR
	TOTAL OCCUPY HR.		55 HR/WK	HR. OFF COOLING	1969 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 5376 HR/YR
PRESENT HR. OF OPERATION FOR SYS. WITH COOLING ONLY 3360 HR/YR

HOUR SAVE (HEATING ONL	5376	-	1430	=	3946 HR/YR
HOUR SAVE (COOLING ONL	3360	-	959	=	2401 HR/YR

HOAUHC	679.9 MBtu	-	447.6 MBtu	=	4.38E+01 Btu/CFM-HR
	900 CFM	*	5892 HR/YR		
HOAUH	679.9 MBtu	-	447.6 MBtu	=	6.54E+01 Btu/CFM-HR
	900 CFM	*	3946 HR/YR		
COAUHC	0 kWH	-	0 kWH	=	0.00E+00 kWH/CFM-HR
	900 CFM	*	5892 HR/YR		
COAUC	0 kWH	-	0 kWH	=	0.00E+00 kWH/CFM-HR
	900 CFM	*	2401 HR/YR		
HOAOHC	679.9 MBtu	-	232.3 MBtu	=	1.73E+02 Btu/CFM-HR
	900 CFM	*	2868 HR/YR		
HOAOH	679.9 MBtu	-	232.3 MBtu	=	3.48E+02 Btu/CFM-HR
	900 CFM	*	1430 HR/YR		
COAOHC	0 kWH		0 kWH	=	0.00E+00 kWH/CFM-HR
	900 CFM	*	2868 HR/YR		
COAOC	0 kWH		0 kWH	=	0.00E+00 kWH/CFM-HR
	900 CFM	*	959 HR/YR		
DC	1 / 6 (10 MINUTES PER HOUR)			=	0.17
DC DEMAND	1 / 6 (10 MINUTES PER HOUR)			=	0.17

E M C ENGINEERS, INC
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JOB: FT. DRUM, NY (EMC #1406-006)
CALCULATED BY: CSW
CHECKED BY: BC
DATE: 19-Apr-95
BUILDING NO.: 10785C
BLDG. TYPE: CHAPEL\CHILD CARE\REL E

ENERGY CONSTANT CALCULATIONS

ECC	0 kWH	-	0 kWH	=	0.00E+00 kWH/CFM-HR
	2900 CFM	*	959 HR/YR		
ECHC	0 kWH	-	0 kWH	=	0.00E+00 kWH/CFM-HR
	2900 CFM	*	2868 HR/YR		
NSUCHC	0 kWH	-	0 kWH	=	0.00E+00 kWH/CFM-HR
	2900 CFM	*	5892 HR/YR		
NSUCC	0 kWH	-	0 kWH	=	0.00E+00 kWH/CFM-HR
	2900 CFM	*	3946 HR/YR		
DDCCHC	0 kWH	-	0 kWH	=	0.00E+00 kWH/CFM-HR
	2900 CFM	*	2868 HR/YR		
DDCCC	0 kWH	-	0 kWH	=	0.00E+00 kWH/CFM-HR
	2900 CFM	*	959 HR/YR		
NSC	679.9 MBtu	-	447.6 MBtu	=	3.30E+04 Btu/ft^2
	7048 AREA				
DSC	447.6 MBtu	-	358.8 MBtu	=	1.26E+04 Btu/ft^2
	7048 AREA				
FV	358.8 MBtu	-	351.27 MBtu	=	5.23E+01 Btu/CFM-HR
	900 CFM	*	160 HR/YR		
CHWR	(0.915 kW X 0.012 Eff. X 436 HRS X 2 Degrees of Reset)			=	9.6 kWH/TON
OAR	740 HR/YR	*	0.01	=	7.4 HR/YR

E M C ENGINEERS, INC
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JOB: FT. DRUM, NY (EMC #1406-006)
CALCULATED BY: CSW
CHECKED BY: BC
DATE: 19-Apr-95
BUILDING NO.: 11050A
BLDG. TYPE: CLINIC W/O BEDS/SUPPLY/IN

ENERGY CONSTANT CALCULATIONS

	BASERUN	RUN1	RUN2	RUN3	RUN4	RUN5
HEATING (MBtu)	5589.3	2746.9	2746.9	2454.7	2033.3	
COOLING (kWH)	130152	87137	87137	85702	85702	

SUPPLY AIR FAN	52876	CFM
FLOOR AREA	58017	FT²
CFMI	13545	CFM
UA		BTU/HR • °F
BUILDING CONST	2	(1 FOR LIGHT) (2 FOR HEAVY)

EZDOE RUN DEFINITION:	
BASERUN	EXISTING OPERATION
RUN1	NIGHT SETBACK
RUN2	ECONOMIZER
RUN3	DDC
RUN4	FORCED VENTILATION
RUN5	

HOURS OF OCCUPANCY			
M-F	700	1900	60 HR
SAT.	0	0	0 HR
SUN.	0	0	0 HR
	TOTAL OCCUPY HR.		60 HR/WK
	TOTAL UNOCC. HR.		108 HR/WK
	ANNUAL OCCUPY HR.		3129 HR/YR
	ANNUAL UNOCC. HR.		5631 HR/YR

ANNUAL HEATING & COOLING HOURS	
HR. ON HEATING	1560 HR/YR
HR. ON COOLING	1046 HR/YR
HR. OFF HEATING	2808 HR/YR
HR. OFF COOLING	1882 HR/YR

PRESENT HR. OF OPERATION FOR SYS. WITH HEATING AND COOLING 8760 HR/YR
PRESENT HR. OF OPERATION FOR SYS. WITH HEATING ONLY 5376 HR/YR
PRESENT HR. OF OPERATION FOR SYS. WITH COOLING ONLY 3360 HR/YR

HOUR SAVE (HEATING ONL	5376	-	1560	=	3816 HR/YR
HOUR SAVE (COOLING ONL	3360	-	1046	=	2314 HR/YR

HOAUHC	5589.282 MBtu	- 2746.895 MBtu	=	0.00E+00 Btu/CFM-HR
	13545 CFM	* 5631 HR/YR		
HOAUH	5589.282 MBtu	- 2746.895 MBtu	=	0.00E+00 Btu/CFM-HR
	13545 CFM	* 3816 HR/YR		
COAUHC	130152 kWH	- 87137 kWH	=	5.64E-04 kWH/CFM-HR
	13545 CFM	* 5631 HR/YR		
COAUC	130152 kWH	- 87137 kWH	=	1.37E-03 kWH/CFM-HR
	13545 CFM	* 2314 HR/YR		
HOAOHC	5589.282 MBtu	- 2842.387 MBtu	=	6.48E+01 Btu/CFM-HR
	13545 CFM	* 3129 HR/YR		
HOAOH	5589.282 MBtu	- 2842.387 MBtu	=	1.30E+02 Btu/CFM-HR
	13545 CFM	* 1560 HR/YR		
COAOHC	130152 kWH	43015 kWH	=	2.06E-03 kWH/CFM-HR
	13545 CFM	* 3129 HR/YR		
COAOC	130152 kWH	43015 kWH	=	6.15E-03 kWH/CFM-HR
	13545 CFM	* 1046 HR/YR		
DC	1 / 6 (10 MINUTES PER HOUR)		=	0.17
DC DEMAND	1 / 6 (10 MINUTES PER HOUR)		=	0.17

E M C ENGINEERS, INC
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JOB: FT. DRUM, NY (EMC #1406-006)
CALCULATED BY: CSW
CHECKED BY: BC
DATE: 19-Apr-95
BUILDING NO.: 11050A
BLDG. TYPE: CLINIC W/O BEDS/SUPPLY/IN

ENERGY CONSTANT CALCULATIONS

ECC	87137 kWH -	87137 kWH	=	0.00E+00 kWH/CFM-HR
	52876 CFM *	1046 HR/YR		
ECHC	87137 kWH -	87137 kWH	=	0.00E+00 kWH/CFM-HR
	52876 CFM *	3129 HR/YR		
NSUCHC	130152 kWH -	87137 kWH	=	1.44E-04 kWH/CFM-HR
	52876 CFM *	5631 HR/YR		
NSUCC	130152 kWH -	87137 kWH	=	2.13E-04 kWH/CFM-HR
	52876 CFM *	3816 HR/YR		
DDCCHC	87137 kWH -	85701.7 kWH	=	8.68E-06 kWH/CFM-HR
	52876 CFM *	3129 HR/YR		
DDCCC	87137 kWH -	85701.7 kWH	=	2.60E-05 kWH/CFM-HR
	52876 CFM *	1046 HR/YR		
NSC	5589.282 MBtu -	2746.895 MBtu	=	4.90E+04 Btu/ft^2
	58017 AREA			
DSC	2746.895 MBtu -	2454.694 MBtu	=	5.04E+03 Btu/ft^2
	58017 AREA			
FV	2454.694 MBtu -	2033.336 MBtu	=	1.94E+02 Btu/CFM-HR
	13545 CFM *	160 HR/YR		
CHWR	(0.915 kW X 0.012 Eff. X 436 HRS X 2 Degrees of Reset)		=	9.6 kWH/TON
OAR	740 HR/YR *	0.01	=	7.4 HR/YR

E M C ENGINEERS, INC
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JOB: FT. DRUM, NY (EMC #1406-006)
CALCULATED BY: CSW
CHECKED BY: BC
DATE: 19-Apr-95
BUILDING NO.: 11050B
BLDG. TYPE: CLINIC W/O BEDS/SUPPLY/IN

ENERGY CONSTANT CALCULATIONS

	BASERUN	RUN1	RUN2	RUN3	RUN4	RUN5
HEATING (MBtu)	1475.1	1475.1	1475.1	891.7	891.7	
COOLING (kWH)	93145	93145	93145	74890	74890	

SUPPLY AIR FAN	9295	CFM
FLOOR AREA	9278	FT²
CFMI	2190	CFM
UA		BTU/HR • °F
BUILDING CONST	2	(1 FOR LIGHT) (2 FOR HEAVY)

EZDOE RUN DEFINITION:	
BASERUN	EXISTING OPERATION
RUN1	NIGHT SETBACK
RUN2	ECONOMIZER
RUN3	DDC
RUN4	FORCED VENTILATION
RUN5	

HOURS OF OCCUPANCY				ANNUAL HEATING & COOLING HOURS	
M-F	0	2400	120 HR	HR. ON HEATING	4368 HR/YR
SAT.	0	2400	24 HR	HR. ON COOLING	2928 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 5376 HR/YR
PRESENT HR. OF OPERATION FOR SYS. WITH COOLING ONLY 3360 HR/YR

HOUR SAVE (HEATING ONL	5376	-	4368	=	1008 HR/YR
HOUR SAVE (COOLING ONL	3360	-	2928	=	432 HR/YR

HOAUHC	1475.1 MBtu	-	1475.1 MBtu	=	0.00E+00 Btu/CFM-HR
	2190 CFM	*	0 HR/YR		
HOAUH	1475.1 MBtu	-	1475.1 MBtu	=	0.00E+00 Btu/CFM-HR
	2190 CFM	*	1008 HR/YR		
COAUHC	93144.7 kWH	-	93144.7 kWH	=	0.00E+00 kWH/CFM-HR
	2190 CFM	*	0 HR/YR		
COAUC	93144.7 kWH	-	93144.7 kWH	=	0.00E+00 kWH/CFM-HR
	2190 CFM	*	432 HR/YR		
HOAOHC	1475.1 MBtu	-	0 MBtu	=	0.00E+00 Btu/CFM-HR
	2190 CFM	*	8760 HR/YR		
HOAOH	1475.1 MBtu	-	0 MBtu	=	0.00E+00 Btu/CFM-HR
	2190 CFM	*	4368 HR/YR		
COAOHC	93144.7 kWH		0 kWH	=	0.00E+00 kWH/CFM-HR
	2190 CFM	*	8760 HR/YR		
COAOC	93144.7 kWH		0 kWH	=	0.00E+00 kWH/CFM-HR
	2190 CFM	*	2928 HR/YR		
DC	1 / 6 (10 MINUTES PER HOUR)			=	0.17
DC DEMAND	1 / 6 (10 MINUTES PER HOUR)			=	0.17

E M C ENGINEERS, INC
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JOB: FT. DRUM, NY (EMC #1406-006)
CALCULATED BY: CSW
CHECKED BY: BC
DATE: 19-Apr-95
BUILDING NO.: 11050B
BLDG. TYPE: CLINIC W/O BEDS/SUPPLY/IN

ENERGY CONSTANT CALCULATIONS

ECC	93144.7 kWH	-	93144.7 kWH	=	0.00E+00	kWH/CFM-HR
	9295 CFM	*	2928 HR/YR			
ECHC	93144.7 kWH	-	93144.7 kWH	=	0.00E+00	kWH/CFM-HR
	9295 CFM	*	8760 HR/YR			
NSUCHC	93144.7 kWH	-	93144.7 kWH	=	0.00E+00	kWH/CFM-HR
	9295 CFM	*	0 HR/YR			
NSUCC	93144.7 kWH	-	93144.7 kWH	=	0.00E+00	kWH/CFM-HR
	9295 CFM	*	1008 HR/YR			
DDCCHC	93144.7 kWH	-	74890.1 kWH	=	2.24E-04	kWH/CFM-HR
	9295 CFM	*	8760 HR/YR			
DDCCC	93144.7 kWH	-	74890.1 kWH	=	6.71E-04	kWH/CFM-HR
	9295 CFM	*	2928 HR/YR			
NSC	1475.1 MBtu	-	1475.1 MBtu	=	0.00E+00	Btu/ft^2
	9278 AREA					
DSC	1475.1 MBtu	-	891.7 MBtu	=	6.29E+04	Btu/ft^2
	9278 AREA					
FV	891.7 MBtu	-	891.7 MBtu	=	0.00E+00	Btu/CFM-HR
	2190 CFM	*	0 HR/YR			
CHWR	(0.915 kW X 0.012 Eff. X 436 HRS X 2 Degrees of Reset)			=	9.6	kWH/TON
OAR	740 HR/YR	*	0.01	=	7.4	HR/YR

APPENDIX G.2

ENERGY SAVINGS CALCULATIONS

ENERGY CALCULATIONS

BUILDING 30

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG:** **30**
Building Sq.Ft.: **12,578**

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU1**

Typical Building Information

Category	Construction	Use	Occ.	Day
16	BRICK	ENK PERS DINNING	0400-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	400	400	400	400	400	400	400
Stop Time	2000	2000	2000	2000	2000	2000	2000

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		7.5
Load Factor		0.8
CFM - HTG		8000
CFM - CLG		0
% OA		100.00%
% Area		17.60%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	83.10%	83.10%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,520	3,360
Heating HRSON	4,032	5,376
C/H HRSON	6,570	8,760
Cooling HRSAV	840	
Heating HRSAV	1,344	
C/H HRSAV	2,190	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	39.67	39.67
HOAOHC	24.34	24.34
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	3.39E+04	3.39E+04
NSC	9.39E+04	9.39E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 30
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	11,789.6	0.0	
Optimum ST/SP	0.0	1,012.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	174.4	
Sub Total	**0.0**	**12,801.7**	**174.4**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	63.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**12,801.7**	**237.4**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 30**
Building Sq.Ft.: 12,578

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**AHU2**

Typical Building Information

Category	Construction	Use	Occ.	Day
16	BRICK	ENK PERS DINNING	0400-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	400	400	400	400	400	400	400
Stop Time	1930	1930	1930	1930	1930	1930	1930

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		8
Load Factor		0.8
CFM - HTG		5265
CFM - CLG		0
% OA		25.00%
% Area		17.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	83.10%	83.10%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,422	3,360
Heating HRSON	3,875	5,376
C/H HRSON	6,314	8,760
Cooling HRSAV	938	
Heating HRSAV	1,501	
C/H HRSAV	2,445	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	39.67	39.67
HOAOHC	24.34	24.34
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	3.39E+04	3.39E+04
NSC	9.39E+04	9.39E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 30
System Type 2
System Name: H&V UNIT
System Number: AHU2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	14,042.8	0.0	
Optimum ST/SP	0.0	1,079.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	200.8	
Sub Total	**0.0**	**15,122.3**	**200.8**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	72.5	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**15,122.3**	**273.3**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG:** **30**
Building Sq.Ft.: **12,578**

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**AHU3**

Typical Building Information

Category	Construction	Use	Occ.	Day
16	BRICK	ENK PERS DINNING	0400-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	400	400	400	400	400	400	400
Stop Time	1930	1930	1930	1930	1930	1930	1930

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		10
Load Factor		0.8
CFM - HTG		4670
CFM - CLG		0
% OA		100.00%
% Area		15.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	85.80%	85.80%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,422	3,360
Heating HRSON	3,875	5,376
C/H HRSON	6,314	8,760
Cooling HRSAV	938	
Heating HRSAV	1,501	
C/H HRSAV	2,445	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	39.67	39.67
HOAOHC	24.34	24.34
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	3.39E+04	3.39E+04
NSC	9.39E+04	9.39E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 30
System Type 2
System Name: H&V UNIT
System Number: AHU3

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	17,001.1	0.0	
Optimum ST/SP	0.0	1,307.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	177.2	
Sub Total	**0.0**	**18,308.0**	**177.2**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	64.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**18,308.0**	**241.2**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 30**
Building Sq.Ft.: 12,578

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**AHU4**

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

Typical Building Information

Category	Construction	Use	Occ.	Day
16	BRICK	ENK PERS DINNING	0400-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	400	400	400	400	400	400	400
Stop Time	1930	1930	1930	1930	1930	1930	1930

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		7430
CFM - CLG		0
% OA		5.00%
% Area		24.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,422	3,360
Heating HRSON	3,875	5,376
C/H HRSON	6,314	8,760
Cooling HRSAV	938	
Heating HRSAV	1,501	
C/H HRSAV	2,445	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	39.67	39.67
HOAOHC	24.34	24.34
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	3.39E+04	3.39E+04
NSC	9.39E+04	9.39E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 30
System Type 2
System Name: H&V UNIT
System Number: AHU4

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	25,236.9	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	283.5	
Sub Total	**0.0**	**27,177.0**	**283.5**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	102.4	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**27,177.0**	**385.9**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG:** **30**
Building Sq.Ft.: **12,578**

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**AHU5**

Typical Building Information

Category	Construction	Use	Occ.	Day
16	BRICK	ENK PERS DINNING	0400-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	400	400	400	400	400	400	400
Stop Time	1930	1930	1930	1930	1930	1930	1930

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		6
Load Factor		0.8
CFM - HTG		3145
CFM - CLG		0
% OA		5.00%
% Area		10.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,422	3,360
Heating HRSON	3,875	5,376
C/H HRSON	6,314	8,760
Cooling HRSAV	938	
Heating HRSAV	1,501	
C/H HRSAV	2,445	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	39.67	39.67
HOAOHC	24.34	24.34
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	3.39E+04	3.39E+04
NSC	9.39E+04	9.39E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 30
System Type 2
System Name: H&V UNIT
System Number: AHU5

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	10,725.7	0.0	
Optimum ST/SP	0.0	824.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	118.1	
Sub Total	**0.0**	**11,550.2**	**118.1**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	42.7	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**11,550.2**	**160.8**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG:** **30**
Building Sq.Ft.: **12,578**

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU6**

Typical Building Information

Category	Construction	Use	Occ.	Day
16	BRICK	ENK PERS DINNING	0400-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	400	400	400	400	400	400	400
Stop Time	2000	2000	2000	2000	2000	2000	2000

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		4
Load Factor		0.8
CFM - HTG		600
CFM - CLG		0
% OA		0.00%
% Area		1.60%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	79.00%	79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,520	3,360
Heating HRSON	4,032	5,376
C/H HRSON	6,570	8,760
Cooling HRSAV	840	
Heating HRSAV	1,344	
C/H HRSAV	2,190	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	39.67	39.67
HOAOHC	24.34	24.34
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	3.39E+04	3.39E+04
NSC	9.39E+04	9.39E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 30
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU6

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	6,614.1	0.0	
Optimum ST/SP	0.0	567.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	18.9	
Sub Total	**0.0**	**7,181.9**	**18.9**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	6.8	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**7,181.9**	**25.7**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG:** **30**
Building Sq.Ft.: **12,578**

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**9**
System Name:	**CONVERTER AND PUMPS**
System Number:	**HE1**

Typical Building Information

Category	Construction	Use	Occ.	Day
16	BRICK	ENK PERS DINNING	0400-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	400	400	400	400	400	400	400
Stop Time	2000	2000	2000	2000	2000	2000	2000

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		7.40%
TON CAPC.		0
MBTU CAPC.		1.5064
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,520	3,360
Heating HRSON	4,032	5,376
C/H HRSON	6,570	8,760
Cooling HRSAV	840	
Heating HRSAV	1,344	
C/H HRSAV	2,190	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	39.67	39.67
HOAOHC	24.34	24.34
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	3.39E+04	3.39E+04
NSC	9.39E+04	9.39E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 30
System Type 9
System Name: CONVERTER AND PUMPS
System Number: HE1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	3,349.5	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	87.4	
Sub Total	**0.0**	**3,637.0**	**87.4**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	31.6	
HW OA Reset	0.0	0.0	11.1	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**3,637.0**	**130.1**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 30**
Building Sq.Ft.: 10,868

System Type	**12**
System Name:	**BASEBOARD RADIATION**
System Number:	**FTR-1**

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

Typical Building Information

Category	Construction	Use	Occ.	Day
15	BRICK	ADM & SUPPLY, ENL BRK	0000-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		100.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.40E+04	0.00E+00
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 30
System Type 12
System Name: BASEBOARD RADIATION
System Number: FTR-1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**0.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 30**
Building Sq.Ft.: 10,868

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**9**
System Name:	**CONVERTER AND PUMPS**
System Number:	**HE1A**

Typical Building Information

Category	Construction	Use	Occ.	Day
15	BRICK	ADM & SUPPLY, ENL BRK	0000-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		1.5064
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	0.00%	0.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.40E+04	1.40E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 30
System Type 9
System Name: CONVERTER AND PUMPS
System Number: HE1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	11.1	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**11.1**	**3**

ENERGY CALCULATIONS

BUILDING 36

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 36**
Building Sq.Ft.: 26,440

EMC NO.: 1406-006
DATE: 20-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**3**
System Name:	**SINGLE ZONE AHU WITHOUT RETURN FAN**
System Number:	**AC1M**

Typical Building Information

Category	Construction	Use	Occ.	Day
1	BRICK	MEDICAL CENTER	0700-1600	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	0
Stop Time	0	1600	1600	1600	1600	1600	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		760
CFM - CLG		760
% OA		33.55%
% Area		8.30%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,100	3,360
Heating HRSON	1,760	5,376
C/H HRSON	2,868	8,760
Cooling HRSAV	2,260	
Heating HRSAV	3,616	
C/H HRSAV	5,892	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	4.25E-04	4.25E-04
COAUHC	1.63E-04	1.63E-04
HOAOH	150.00	150.00
HOAOHC	92.20	92.20
COAOC	4.87E-03	4.87E-03
COAOHC	1.87E-03	1.87E-03
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	7.93E-05	7.93E-05
NSUCHC	4.86E-05	4.86E-05
DDCCHC	2.04E-04	2.04E-04
DDCCC	5.31E-04	5.31E-04
DSC	4.85E+03	4.85E+03
NSC	6.10E+04	6.10E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 20-Apr-95

Bldg Number: 36
System Type 3
System Name: SINGLE ZONE AHU WITHOUT RETURN FAN
System Number: AC1M

HEATING AND COOLING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	9,256.6	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	3.1	0.0	0.0	
Night Setback	0.0	0.0	133.9	
Sub Total	**3.1**	**9,544.1**	**133.9**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	7.8	0.0	
DDC Control	0.0	1,157.4	10.6	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**3.1**	**10,709.3**	**144.5**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 36**
Building Sq.Ft.: 26,440

EMC NO.: 1406-006
DATE: 20-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**6**
System Name:	**MULTI-ZONE AHU**
System Number:	**AC2M**

Typical Building Information

Category	Construction	Use	Occ.	Day
1	BRICK	MEDICAL CENTER	0700-1600	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	0
Stop Time	0	1600	1600	1600	1600	1600	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		5
Load Factor		0.8
CFM - HTG		4255
CFM - CLG		4255
% OA		33.61%
% Area		8.30%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,100	3,360
Heating HRSON	1,760	5,376
C/H HRSON	2,868	8,760
Cooling HRSAV	2,260	
Heating HRSAV	3,616	
C/H HRSAV	5,892	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	4.25E-04	4.25E-04
COAUHC	1.63E-04	1.63E-04
HOAOH	150.00	150.00
HOAOHC	92.20	92.20
COAOC	4.87E-03	4.87E-03
COAOHC	1.87E-03	1.87E-03
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	7.93E-05	7.93E-05
NSUCHC	4.86E-05	4.86E-05
DDCCHC	2.04E-04	2.04E-04
DDCCC	5.31E-04	5.31E-04
DSC	4.85E+03	4.85E+03
NSC	6.10E+04	6.10E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 20-Apr-95

Bldg Number: 36
System Type 6
System Name: MULTI-ZONE AHU
System Number: AC2M

HEATING AND COOLING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	22,908.6	0.0	
Optimum ST/SP	0.0	687.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	7.3	0.0	0.0	
Night Setback	0.0	0.0	133.9	
Sub Total	**7.3**	**23,595.7**	**133.9**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	43.8	0.0	
DDC Control	0.0	6,479.7	10.6	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				6
TOTAL	**7.3**	**30,119.2**	**144.5**	**6**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 36**
Building Sq.Ft.: 26,440

EMC NO.: 1406-006
DATE: 20-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**6**
System Name:	**MULTI-ZONE AHU**
System Number:	**AC3M**

Typical Building Information

Category	Construction	Use	Occ.	Day
1	BRICK	MEDICAL CENTER	0700-1600	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	0
Stop Time	0	1600	1600	1600	1600	1600	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		10
Load Factor		0.8
CFM - HTG		4630
CFM - CLG		4630
% OA		33.61%
% Area		8.30%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	85.80%	85.80%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,100	3,360
Heating HRSON	1,760	5,376
C/H HRSON	2,868	8,760
Cooling HRSAV	2,260	
Heating HRSAV	3,616	
C/H HRSAV	5,892	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	4.25E-04	4.25E-04
COAUHC	1.63E-04	1.63E-04
HOAOH	150.00	150.00
HOAOHC	92.20	92.20
COAOC	4.87E-03	4.87E-03
COAOHC	1.87E-03	1.87E-03
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	7.93E-05	7.93E-05
NSUCHC	4.86E-05	4.86E-05
DDCCHC	2.04E-04	2.04E-04
DDCCC	5.31E-04	5.31E-04
DSC	4.85E+03	4.85E+03
NSC	6.10E+04	6.10E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 20-Apr-95

Bldg Number: 36
System Type 6
System Name: MULTI-ZONE AHU
System Number: AC3M

HEATING AND COOLING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	42,456.5	0.0	
Optimum ST/SP	0.0	1,307.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	13.9	0.0	0.0	
Night Setback	0.0	0.0	133.9	
Sub Total	**13.9**	**43,763.5**	**133.9**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	47.7	0.0	
DDC Control	0.0	7,050.7	10.6	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				6
TOTAL	**13.9**	**50,861.9**	**144.5**	**6**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 36**
Building Sq.Ft.: 26,440

EMC NO.: 1406-006
DATE: 20-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**6**
System Name:	**MULTI-ZONE AHU**
System Number:	**AC4M**

Typical Building Information

Category	Construction	Use	Occ.	Day
1	BRICK	MEDICAL CENTER	0700-1600	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	0
Stop Time	0	1600	1600	1600	1600	1600	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		10
Load Factor		0.8
CFM - HTG		7490
CFM - CLG		7490
% OA		33.61%
% Area		8.30%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	85.80%	85.80%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,100	3,360
Heating HRSON	1,760	5,376
C/H HRSON	2,868	8,760
Cooling HRSAV	2,260	
Heating HRSAV	3,616	
C/H HRSAV	5,892	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	4.25E-04	4.25E-04
COAUHC	1.63E-04	1.63E-04
HOAOH	150.00	150.00
HOAOHC	92.20	92.20
COAOC	4.87E-03	4.87E-03
COAOHC	1.87E-03	1.87E-03
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	7.93E-05	7.93E-05
NSUCHC	4.86E-05	4.86E-05
DDCCHC	2.04E-04	2.04E-04
DDCCC	5.31E-04	5.31E-04
DSC	4.85E+03	4.85E+03
NSC	6.10E+04	6.10E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 20-Apr-95

Bldg Number: 36
System Type 6
System Name: MULTI-ZONE AHU
System Number: AC4M

HEATING AND COOLING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	43,379.6	0.0	
Optimum ST/SP	0.0	1,307.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	13.9	0.0	0.0	
Night Setback	0.0	0.0	133.9	
Sub Total	**13.9**	**44,686.6**	**133.9**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	77.1	0.0	
DDC Control	0.0	11,406.0	10.6	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				6
TOTAL	**13.9**	**56,169.8**	**144.5**	**6**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 36**
Building Sq.Ft.: 26,440

EMC NO.: 1406-006
DATE: 20-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**8**
System Name:	**CHILLER AND PUMPS**
System Number:	**ACC1M**

Typical Building Information

Category	Construction	Use	Occ.	Day
1	BRICK	MEDICAL CENTER	0700-1600	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	0
Stop Time	0	1600	1600	1600	1600	1600	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		1.5
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		20.8
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	69.20%	69.20%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,100	3,360
Heating HRSON	1,760	5,376
C/H HRSON	2,868	8,760
Cooling HRSAV	2,260	
Heating HRSAV	3,616	
C/H HRSAV	5,892	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	4.25E-04	4.25E-04
COAUHC	1.63E-04	1.63E-04
HOAOH	150.00	150.00
HOAOHC	92.20	92.20
COAOC	4.87E-03	4.87E-03
COAOHC	1.87E-03	1.87E-03
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	7.93E-05	7.93E-05
NSUCHC	4.86E-05	4.86E-05
DDCCHC	2.04E-04	2.04E-04
DDCCC	5.31E-04	5.31E-04
DSC	4.85E+03	4.85E+03
NSC	6.10E+04	6.10E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 20-Apr-95

Bldg Number: 36
System Type 8
System Name: CHILLER AND PUMPS
System Number: ACC1M

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	2,922.1	0.0	
Optimum ST/SP	0.0	243.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	2.6	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**2.6**	**3,165.1**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	199.1	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**2.6**	**3,364.2**	**0.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 36**
Building Sq.Ft.: 26,440

EMC NO.: 1406-006
DATE: 20-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**8**
System Name:	**CHILLER AND PUMPS**
System Number:	**ACC2M**

Typical Building Information

Category	Construction	Use	Occ.	Day
1	BRICK	MEDICAL CENTER	0700-1600	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	0
Stop Time	0	1600	1600	1600	1600	1600	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		1.5
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		20.8
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	69.20%	69.20%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,100	3,360
Heating HRSON	1,760	5,376
C/H HRSON	2,868	8,760
Cooling HRSAV	2,260	
Heating HRSAV	3,616	
C/H HRSAV	5,892	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	4.25E-04	4.25E-04
COAUHC	1.63E-04	1.63E-04
HOAOH	150.00	150.00
HOAOHC	92.20	92.20
COAOC	4.87E-03	4.87E-03
COAOHC	1.87E-03	1.87E-03
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	7.93E-05	7.93E-05
NSUCHC	4.86E-05	4.86E-05
DDCCHC	2.04E-04	2.04E-04
DDCCC	5.31E-04	5.31E-04
DSC	4.85E+03	4.85E+03
NSC	6.10E+04	6.10E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 20-Apr-95

Bldg Number: 36
System Type 8
System Name: CHILLER AND PUMPS
System Number: ACC2M

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	2,922.1	0.0	
Optimum ST/SP	0.0	243.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	2.6	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**2.6**	**3,165.1**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	199.1	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**2.6**	**3,364.2**	**0.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 36**
Building Sq.Ft.: 26,440

EMC NO.: 1406-006
DATE: 20-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**6**
System Name:	**MULTI-ZONE AHU**
System Number:	**AHU1A**

Typical Building Information

Category	Construction	Use	Occ.	Day
1	BRICK	MEDICAL CENTER	0700-1600	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	0
Stop Time	0	1600	1600	1600	1600	1600	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		7.5
Load Factor		0.8
CFM - HTG		6950
CFM - CLG		6950
% OA		23.02%
% Area		15.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	83.10%	83.10%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,100	3,360
Heating HRSON	1,760	5,376
C/H HRSON	2,868	8,760
Cooling HRSAV	2,260	
Heating HRSAV	3,616	
C/H HRSAV	5,892	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	4.25E-04	4.25E-04
COAUHC	1.63E-04	1.63E-04
HOAOH	150.00	150.00
HOAOHC	92.20	92.20
COAOC	4.87E-03	4.87E-03
COAOHC	1.87E-03	1.87E-03
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	7.93E-05	7.93E-05
NSUCHC	4.86E-05	4.86E-05
DDCCHC	2.04E-04	2.04E-04
DDCCC	5.31E-04	5.31E-04
DSC	4.85E+03	4.85E+03
NSC	6.10E+04	6.10E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 20-Apr-95

Bldg Number: 36
System Type 6
System Name: MULTI-ZONE AHU
System Number: AHU1A

HEATING AND COOLING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	33,256.4	0.0	
Optimum ST/SP	0.0	1,012.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	10.8	0.0	0.0	
Night Setback	0.0	0.0	241.9	
Sub Total	**10.8**	**34,268.5**	**241.9**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	49.0	0.0	
DDC Control	0.0	10,583.7	19.2	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				6
TOTAL	**10.8**	**44,901.2**	**261.2**	**6**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 36**
Building Sq.Ft.: 26,440

EMC NO.: 1406-006
DATE: 20-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**10**
System Name:	**HOT WATER BOILER AND PUMPS**
System Number:	**B1**

Typical Building Information

Category	Construction	Use	Occ.	Day
1	BRICK	MEDICAL CENTER	0700-1600	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	0
Stop Time	0	1600	1600	1600	1600	1600	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.333333
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		25.00%
TON CAPC.		0
MBTU CAPC.		2.008
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,100	3,360
Heating HRSON	1,760	5,376
C/H HRSON	2,868	8,760
Cooling HRSAV	2,260	
Heating HRSAV	3,616	
C/H HRSAV	5,892	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	4.25E-04	4.25E-04
COAUHC	1.63E-04	1.63E-04
HOAOH	150.00	150.00
HOAOHC	92.20	92.20
COAOC	4.87E-03	4.87E-03
COAOHC	1.87E-03	1.87E-03
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	7.93E-05	7.93E-05
NSUCHC	4.86E-05	4.86E-05
DDCCHC	2.04E-04	2.04E-04
DDCCC	5.31E-04	5.31E-04
DSC	4.85E+03	4.85E+03
NSC	6.10E+04	6.10E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 20-Apr-95

Bldg Number: 36
System Type 10
System Name: HOT WATER BOILER AND PUMPS
System Number: B1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,106.1	0.0	
Optimum ST/SP	0.0	57.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	403.2	
Sub Total	**0.0**	**1,163.6**	**403.2**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	32.1	
HW OA Reset	0.0	0.0	14.9	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**1,163.6**	**450.1**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 36**
Building Sq.Ft.: 26,440

EMC NO.: 1406-006
DATE: 20-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**10**
System Name:	**HOT WATER BOILER AND PUMPS**
System Number:	**B2**

Typical Building Information

Category	Construction	Use	Occ.	Day
1	BRICK	MEDICAL CENTER	0700-1600	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	0
Stop Time	0	1600	1600	1600	1600	1600	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.333333
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		25.00%
TON CAPC.		0
MBTU CAPC.		2.008
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,100	3,360
Heating HRSON	1,760	5,376
C/H HRSON	2,868	8,760
Cooling HRSAV	2,260	
Heating HRSAV	3,616	
C/H HRSAV	5,892	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	4.25E-04	4.25E-04
COAUHC	1.63E-04	1.63E-04
HOAOH	150.00	150.00
HOAOHC	92.20	92.20
COAOC	4.87E-03	4.87E-03
COAOHC	1.87E-03	1.87E-03
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	7.93E-05	7.93E-05
NSUCHC	4.86E-05	4.86E-05
DDCCHC	2.04E-04	2.04E-04
DDCCC	5.31E-04	5.31E-04
DSC	4.85E+03	4.85E+03
NSC	6.10E+04	6.10E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 20-Apr-95

Bldg Number: 36
System Type 10
System Name: HOT WATER BOILER AND PUMPS
System Number: B2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,106.1	0.0	
Optimum ST/SP	0.0	57.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	403.2	
Sub Total	**0.0**	**1,163.6**	**403.2**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	32.1	
HW OA Reset	0.0	0.0	14.9	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**1,163.6**	**450.1**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 36**
Building Sq.Ft.: 26,440

EMC NO.: 1406-006
DATE: 20-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**HV1**

Typical Building Information

Category	Construction	Use	Occ.	Day
1	BRICK	MEDICAL CENTER	0700-1600	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	0
Stop Time	0	1600	1600	1600	1600	1600	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		1
Load Factor		0.8
CFM - HTG		600
CFM - CLG		0
% OA		100.00%
% Area		5.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	69.20%	69.20%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,100	3,360
Heating HRSON	1,760	5,376
C/H HRSON	2,868	8,760
Cooling HRSAV	2,260	
Heating HRSAV	3,616	
C/H HRSAV	5,892	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	4.25E-04	4.25E-04
COAUHC	1.63E-04	1.63E-04
HOAOH	150.00	150.00
HOAOHC	92.20	92.20
COAOC	4.87E-03	4.87E-03
COAOHC	1.87E-03	1.87E-03
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	7.93E-05	7.93E-05
NSUCHC	4.86E-05	4.86E-05
DDCCHC	2.04E-04	2.04E-04
DDCCC	5.31E-04	5.31E-04
DSC	4.85E+03	4.85E+03
NSC	6.10E+04	6.10E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 20-Apr-95

Bldg Number: 36
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: HV1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	5,078.8	0.0	
Optimum ST/SP	0.0	162.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	80.6	
Sub Total	**0.0**	**5,240.9**	**80.6**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	6.4	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**5,240.9**	**87.1**	**3**

ENERGY CALCULATIONS

BUILDING 119

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG:** **119**
Building Sq.Ft.: **14,954**

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU1**

Typical Building Information

Category	Construction	Use	Occ.	Day
17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		1230
CFM - CLG		0
% OA		100.00%
% Area		21.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 119
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	8,214.2	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	196.2	
Sub Total	**0.0**	**8,501.7**	**196.2**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	15.2	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**8,501.7**	**211.4**	**3**

E M C ENGINEERS, INC.

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM BLDG: 119
Building Sq.Ft.: 14,954

System Type	1
System Name:	H&V UNIT WITHOUT RETURN FAN
System Number:	AHU-2

Typical Building Information

Category	Construction	Use	Occ.	Day
17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		1
Load Factor		0.8
CFM - HTG		210
CFM - CLG		0
% OA		100.00%
% Area		4.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	69.20%	69.20%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 119
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU-2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,629.4	0.0	
Optimum ST/SP	0.0	162.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	37.4	
Sub Total	**0.0**	**4,791.4**	**37.4**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	2.9	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**4,791.4**	**40.3**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG:** **119**
Building Sq.Ft.: **14,954**

EMC NO.: 1406-006
DATE: 04-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**9**
System Name:	**CONVERTER AND PUMPS**
System Number:	**HE1**

Typical Building Information

Category	Construction	Use	Occ.	Day
17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.2602
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 04-Apr-95

Bldg Number: 119
System Type 9
System Name: CONVERTER AND PUMPS
System Number: HE1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	5,041.0	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**5,328.6**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	1.9	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**5,328.6**	**1.9**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 119**
Building Sq.Ft.: 14,954

EMC NO.: 1406-006
DATE: 04-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**12**
System Name:	**BASEBOARD RADIATION**
System Number:	**HE2**

Typical Building Information

Category	Construction	Use	Occ.	Day
17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.75
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		75.00%
TON CAPC.		0
MBTU CAPC.		0.1117
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 04-Apr-95

Bldg Number: 119
System Type 12
System Name: BASEBOARD RADIATION
System Number: HE2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	2,268.5	0.0	
Optimum ST/SP	0.0	129.4	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	700.6	
Sub Total	**0.0**	**2,397.8**	**700.6**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	54.3	
HW OA Reset	0.0	0.0	0.8	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**2,397.8**	**755.7**	**3**

ENERGY CALCULATIONS

BUILDING 173

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 173**
Building Sq.Ft.: 65,700

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**12**
System Name:	**BASEBOARD RADIATION**
System Number:	**FTR-1**

Typical Building Information

Category	Construction	Use	Occ.	Day
15	BRICK	ADM & SUPPLY, ENL BRK	0000-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		3
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		100.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	79.00%	79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.40E+04	0.00E+00
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 173
System Type 12
System Name: BASEBOARD RADIATION
System Number: FTR-1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**0.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 173**
Building Sq.Ft.: 65,700

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**10**
System Name:	**HOT WATER BOILER AND PUMPS**
System Number:	**B3**

Typical Building Information

Category	Construction	Use	Occ.	Day
15	BRICK	ADM & SUPPLY, ENL BRK	0000-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		5.976
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	0.00%	0.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.40E+04	1.40E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 173
System Type 10
System Name: HOT WATER BOILER AND PUMPS
System Number: B3

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	44.2	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**44.2**	**3**

ENERGY CALCULATIONS

BUILDING 174

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 174**
Building Sq.Ft.: 26,161

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU1**

Typical Building Information

Category	Construction	Use	Occ.	Day
17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		1230
CFM - CLG		0
% OA		100.00%
% Area		21.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 174
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	8,214.2	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	343.2	
Sub Total	**0.0**	**8,501.7**	**343.2**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	26.6	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**8,501.7**	**369.8**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 174**
Building Sq.Ft.: 26,161

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU2**

Typical Building Information

Category	Construction	Use	Occ.	Day
17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		1
Load Factor		0.8
CFM - HTG		210
CFM - CLG		0
% OA		100.00%
% Area		4.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	69.20%	69.20%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 174
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,629.4	0.0	
Optimum ST/SP	0.0	162.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	65.4	
Sub Total	**0.0**	**4,791.4**	**65.4**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	5.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**4,791.4**	**70.4**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 174**
Building Sq.Ft.: 26,161

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**9**
System Name:	**CONVERTER AND PUMPS**
System Number:	**HE1**

Typical Building Information

Category	Construction	Use	Occ.	Day
17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		20.00%
TON CAPC.		0
MBTU CAPC.		0.2602
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 174
System Type 9
System Name: CONVERTER AND PUMPS
System Number: HE1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	5,041.0	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	326.8	
Sub Total	**0.0**	**5,328.6**	**326.8**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	25.3	
HW OA Reset	0.0	0.0	1.9	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**5,328.6**	**354.1**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 174**
Building Sq.Ft.: 26,161

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**12**
System Name:	**BASEBOARD RADIATION**
System Number:	**HE2**

Typical Building Information

Category	Construction	Use	Occ.	Day
17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.75
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		75.00%
TON CAPC.		0
MBTU CAPC.		0.1117
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 174
System Type 12
System Name: BASEBOARD RADIATION
System Number: HE2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	2,268.5	0.0	
Optimum ST/SP	0.0	129.4	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	1,225.6	
Sub Total	**0.0**	**2,397.8**	**1,225.6**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	95.0	
HW OA Reset	0.0	0.0	0.8	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**2,397.8**	**1,321.4**	**3**

ENERGY CALCULATIONS

BUILDING 175

E M C ENGINEERS, INC.

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM BLDG: 175
Building Sq.Ft.: 65,700

System Type	12
System Name:	BASEBOARD RADIATION
System Number:	FTR-1

Typical Building Information

Category	Construction	Use	Occ.	Day
15	BRICK	ADM & SUPPLY, ENL BRK	0000-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		3
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		100.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	79.00%	79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.40E+04	0.00E+00
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 175
System Type 12
System Name: BASEBOARD RADIATION
System Number: FTR-1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**0.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG:** **175**
Building Sq.Ft.: **19,439**

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU1**

Typical Building Information

Category	Construction	Use	Occ.	Day
16	BRICK	ENK PERS DINNING	0400-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	400	400	400	400	400	400	400
Stop Time	2000	2000	2000	2000	2000	2000	2000

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		7.5
Load Factor		0.8
CFM - HTG		8000
CFM - CLG		0
% OA		100.00%
% Area		17.60%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	83.10%	83.10%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,520	3,360
Heating HRSON	4,032	5,376
C/H HRSON	6,570	8,760
Cooling HRSAV	840	
Heating HRSAV	1,344	
C/H HRSAV	2,190	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	39.67	39.67
HOAOHC	24.34	24.34
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	3.39E+04	3.39E+04
NSC	9.39E+04	9.39E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 175
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	11,789.6	0.0	
Optimum ST/SP	0.0	1,012.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	174.4	
Sub Total	**0.0**	**12,801.7**	**174.4**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	63.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**12,801.7**	**237.4**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG:** **175**
Building Sq.Ft.: **19,439**

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**AHU2**

Typical Building Information

Category	Construction	Use	Occ.	Day
16	BRICK	ENK PERS DINNING	0400-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	400	400	400	400	400	400	400
Stop Time	1930	1930	1930	1930	1930	1930	1930

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		8
Load Factor		0.8
CFM - HTG		5265
CFM - CLG		0
% OA		25.00%
% Area		17.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	83.10%	83.10%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,422	3,360
Heating HRSON	3,875	5,376
C/H HRSON	6,314	8,760
Cooling HRSAV	938	
Heating HRSAV	1,501	
C/H HRSAV	2,445	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	39.67	39.67
HOAOHC	24.34	24.34
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	3.39E+04	3.39E+04
NSC	9.39E+04	9.39E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 175
System Type 2
System Name: H&V UNIT
System Number: AHU2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	14,042.8	0.0	
Optimum ST/SP	0.0	1,079.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	310.3	
Sub Total	**0.0**	**15,122.3**	**310.3**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	112.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**15,122.3**	**422.5**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 175**
Building Sq.Ft.: 19,439

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**AHU3**

Typical Building Information

Category	Construction	Use	Occ.	Day
16	BRICK	ENK PERS DINNING	0400-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	400	400	400	400	400	400	400
Stop Time	1930	1930	1930	1930	1930	1930	1930

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		10
Load Factor		0.8
CFM - HTG		4670
CFM - CLG		0
% OA		100.00%
% Area		15.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	85.80%	85.80%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,422	3,360
Heating HRSON	3,875	5,376
C/H HRSON	6,314	8,760
Cooling HRSAV	938	
Heating HRSAV	1,501	
C/H HRSAV	2,445	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	39.67	39.67
HOAOHC	24.34	24.34
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	3.39E+04	3.39E+04
NSC	9.39E+04	9.39E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 175
System Type 2
System Name: H&V UNIT
System Number: AHU3

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	17,001.1	0.0	
Optimum ST/SP	0.0	1,307.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	273.8	
Sub Total	**0.0**	**18,308.0**	**273.8**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	98.9	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**18,308.0**	**372.8**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG:** **175**
Building Sq.Ft.: **19,439**

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**AHU4**

Typical Building Information

Category	Construction	Use	Occ.	Day
16	BRICK	ENK PERS DINNING	0400-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	400	400	400	400	400	400	400
Stop Time	1930	1930	1930	1930	1930	1930	1930

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		7430
CFM - CLG		0
% OA		5.00%
% Area		24.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,422	3,360
Heating HRSON	3,875	5,376
C/H HRSON	6,314	8,760
Cooling HRSAV	938	
Heating HRSAV	1,501	
C/H HRSAV	2,445	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	39.67	39.67
HOAOHC	24.34	24.34
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	3.39E+04	3.39E+04
NSC	9.39E+04	9.39E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 175
System Type 2
System Name: H&V UNIT
System Number: AHU4

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	25,236.9	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	438.1	
Sub Total	**0.0**	**27,177.0**	**438.1**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	158.3	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**27,177.0**	**596.4**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG:** **175**
Building Sq.Ft.: **19,439**

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**AHU5**

Typical Building Information

Category	Construction	Use	Occ.	Day
16	BRICK	ENK PERS DINNING	0400-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	400	400	400	400	400	400	400
Stop Time	1930	1930	1930	1930	1930	1930	1930

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		6
Load Factor		0.8
CFM - HTG		3145
CFM - CLG		0
% OA		5.00%
% Area		10.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,422	3,360
Heating HRSON	3,875	5,376
C/H HRSON	6,314	8,760
Cooling HRSAV	938	
Heating HRSAV	1,501	
C/H HRSAV	2,445	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	39.67	39.67
HOAOHC	24.34	24.34
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	3.39E+04	3.39E+04
NSC	9.39E+04	9.39E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 175
System Type 2
System Name: H&V UNIT
System Number: AHU5

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	10,725.7	0.0	
Optimum ST/SP	0.0	824.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	182.5	
Sub Total	**0.0**	**11,550.2**	**182.5**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	66.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**11,550.2**	**248.5**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10150**
Building Sq.Ft.: 18,460

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU6**

Typical Building Information

Category	Construction	Use	Occ.	Day
16	BRICK	ENK PERS DINNING	0400-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	400	400	400	400	400	400	400
Stop Time	2000	2000	2000	2000	2000	2000	2000

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		4
Load Factor		0.8
CFM - HTG		600
CFM - CLG		0
% OA		0.00%
% Area		1.60%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	79.00%	79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,520	3,360
Heating HRSON	4,032	5,376
C/H HRSON	6,570	8,760
Cooling HRSAV	840	
Heating HRSAV	1,344	
C/H HRSAV	2,190	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	39.67	39.67
HOAOHC	24.34	24.34
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	3.39E+04	3.39E+04
NSC	9.39E+04	9.39E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 10150
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU6

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	6,614.1	0.0	
Optimum ST/SP	0.0	567.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	27.7	
Sub Total	**0.0**	**7,181.9**	**27.7**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	10.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**7,181.9**	**37.8**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG:** **175**
Building Sq.Ft.: **19,439**

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**9**
System Name:	**CONVERTER AND PUMPS**
System Number:	**HE1**

Typical Building Information

Category	Construction	Use	Occ.	Day
16	BRICK	ENK PERS DINNING	0400-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	400	400	400	400	400	400	400
Stop Time	2000	2000	2000	2000	2000	2000	2000

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		7.40%
TON CAPC.		0
MBTU CAPC.		1.5064
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,520	3,360
Heating HRSON	4,032	5,376
C/H HRSON	6,570	8,760
Cooling HRSAV	840	
Heating HRSAV	1,344	
C/H HRSAV	2,190	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	39.67	39.67
HOAOHC	24.34	24.34
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	3.39E+04	3.39E+04
NSC	9.39E+04	9.39E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 175
System Type 9
System Name: CONVERTER AND PUMPS
System Number: HE1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	3,349.5	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	135.1	
Sub Total	**0.0**	**3,637.0**	**135.1**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	48.8	
HW OA Reset	0.0	0.0	11.1	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**3,637.0**	**195.0**	**3**

ENERGY CALCULATIONS

BUILDING 1750

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 1750**
Building Sq.Ft.: 38,336

System Type	**12**
System Name:	**BASEBOARD RADIATION**
System Number:	**FT1-8**

Typical Building Information

Category	Construction	Use	Occ.	Day
2	BRICK	MOTOR REPAIR SHOP	0600-1730	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	0
Stop Time	0	1500	1500	1500	1500	1500	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		7.50%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		0.8
LOOK-UP VALUE		
EFFHP	0.00%	0.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,000	3,360
Heating HRSON	1,600	5,376
C/H HRSON	2,607	8,760
Cooling HRSAV	2,360	
Heating HRSAV	3,776	
C/H HRSAV	6,153	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	198.24	198.24
HOAOHC	121.66	121.66
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.04E+03	2.04E+03
NSC	5.85E+04	5.85E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 28-Mar-95

Bldg Number: 1750
System Type 12
System Name: BASEBOARD RADIATION
System Number: FT1-8

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	168.1	
Sub Total	**0.0**	**0.0**	**168.1**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	5.9	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**174.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 1750**
Building Sq.Ft.: 38,336

EMC NO.: 1406-006
DATE: 10-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**10**
System Name:	**HOT WATER BOILER AND PUMPS**
System Number:	**B1**

Typical Building Information

Category	Construction	Use	Occ.	Day
2	BRICK	MOTOR REPAIR SHOP	0600-1730	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	0
Stop Time	0	1500	1500	1500	1500	1500	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		7.5
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		1.3878
kW/Ton		0
MOSON		7
EFF		0.8
LOOK-UP VALUE		
EFFHP	83.10%	83.10%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,000	3,360
Heating HRSON	1,600	5,376
C/H HRSON	2,607	8,760
Cooling HRSAV	2,360	
Heating HRSAV	3,776	
C/H HRSAV	6,153	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	198.24	198.24
HOAOHC	121.66	121.66
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.04E+03	2.04E+03
NSC	5.85E+04	5.85E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 10-Apr-95

Bldg Number: 1750
System Type 10
System Name: HOT WATER BOILER AND PUMPS
System Number: B1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	20,327.7	0.0	
Optimum ST/SP	0.0	1,012.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**21,339.8**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	12.8	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**21,339.8**	**12.8**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 1750**
Building Sq.Ft.: 38,336

EMC NO.: 1406-006
DATE: 28-Mar-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**HV1**

Typical Building Information

Category	Construction	Use	Occ.	Day
2	BRICK	MOTOR REPAIR SHOP	0600-1730	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	0
Stop Time	0	1500	1500	1500	1500	1500	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		7.5
Load Factor		0.8
CFM - HTG		3290
CFM - CLG		0
% OA		10.00%
% Area		20.50%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	83.10%	83.10%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,000	3,360
Heating HRSON	1,600	5,376
C/H HRSON	2,607	8,760
Cooling HRSAV	2,360	
Heating HRSAV	3,776	
C/H HRSAV	6,153	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	198.24	198.24
HOAOHC	121.66	121.66
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.04E+03	2.04E+03
NSC	5.85E+04	5.85E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 28-Mar-95

Bldg Number: 1750
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: HV1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	33,123.3	0.0	
Optimum ST/SP	0.0	1,012.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	459.6	
Sub Total	**0.0**	**34,135.3**	**459.6**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	16.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**34,135.3**	**475.6**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 1750**
Building Sq.Ft.: 38,336

EMC NO.: 1406-006
DATE: 28-Mar-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**HV2**

Typical Building Information

Category	Construction	Use	Occ.	Day
2	BRICK	MOTOR REPAIR SHOP	0600-1730	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	0
Stop Time	0	1500	1500	1500	1500	1500	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		1230
CFM - CLG		0
% OA		10.00%
% Area		12.13%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,000	3,360
Heating HRSON	1,600	5,376
C/H HRSON	2,607	8,760
Cooling HRSAV	2,360	
Heating HRSAV	3,776	
C/H HRSAV	6,153	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	198.24	198.24
HOAOHC	121.66	121.66
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.04E+03	2.04E+03
NSC	5.85E+04	5.85E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 28-Mar-95

Bldg Number: 1750
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: HV2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	9,410.4	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	272.0	
Sub Total	**0.0**	**9,697.9**	**272.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	9.5	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**9,697.9**	**281.4**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 1750**
Building Sq.Ft.: 38,336

EMC NO.: 1406-006
DATE: 28-Mar-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**HV3**

Typical Building Information

Category	Construction	Use	Occ.	Day
2	BRICK	MOTOR REPAIR SHOP	0600-1730	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	0
Stop Time	0	1500	1500	1500	1500	1500	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		1.5
Load Factor		0.8
CFM - HTG		4850
CFM - CLG		0
% OA		100.00%
% Area		48.10%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	69.20%	69.20%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,000	3,360
Heating HRSON	1,600	5,376
C/H HRSON	2,607	8,760
Cooling HRSAV	2,360	
Heating HRSAV	3,776	
C/H HRSAV	6,153	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	198.24	198.24
HOAOHC	121.66	121.66
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.04E+03	2.04E+03
NSC	5.85E+04	5.85E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 28-Mar-95

Bldg Number: 1750
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: HV3

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	7,955.3	0.0	
Optimum ST/SP	0.0	243.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	1,078.4	
Sub Total	**0.0**	**8,198.4**	**1,078.4**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	37.6	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**8,198.4**	**1,116.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 1750**
Building Sq.Ft.: 38,336

EMC NO.: 1406-006
DATE: 28-Mar-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	1
System Name:	H&V UNIT WITHOUT RETURN FAN
System Number:	HV4

Typical Building Information

Category	Construction	Use	Occ.	Day
2	BRICK	MOTOR REPAIR SHOP	0600-1730	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	0
Stop Time	0	1500	1500	1500	1500	1500	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		1.5
Load Factor		0.8
CFM - HTG		4000
CFM - CLG		0
% OA		100.00%
% Area		9.91%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	69.20%	69.20%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,000	3,360
Heating HRSON	1,600	5,376
C/H HRSON	2,607	8,760
Cooling HRSAV	2,360	
Heating HRSAV	3,776	
C/H HRSAV	6,153	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	198.24	198.24
HOAOHC	121.66	121.66
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.04E+03	2.04E+03
NSC	5.85E+04	5.85E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 28-Mar-95

Bldg Number: 1750
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: HV4

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	7,955.3	0.0	
Optimum ST/SP	0.0	243.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	222.2	
Sub Total	**0.0**	**8,198.4**	**222.2**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	7.8	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**8,198.4**	**229.9**	**3**

ENERGY CALCULATIONS

BUILDING 2049

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2049**
Building Sq.Ft.: 16,704

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**HV1**

Typical Building Information

Category	Construction	Use	Occ.	Day
3	BRICK	MNT HANGAR AVUM-HAN	0600-2200	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

INPUTS		INPUT
Motor HP		12.5
Load Factor		0.8
CFM - HTG		9000
CFM - CLG		0
% OA		100.00%
% Area		37.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	85.80%	85.80%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	1,200
Heating HRSON	2,240	1,920
C/H HRSON	3,650	3,129
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	37.50	37.50
HOAOHC	18.70	18.70
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	0.00E+00	0.00E+00
NSC	2.30E+04	2.30E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 2049
System Type 2
System Name: H&V UNIT
System Number: HV1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	1,633.7	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	142.3	
Sub Total	**0.0**	**1,633.7**	**142.3**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**1,633.7**	**142.3**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM BLDG: 2049
Building Sq.Ft.: 16,704

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	2
System Name:	H&V UNIT
System Number:	HV2

Typical Building Information

Category	Construction	Use	Occ.	Day
3	BRICK	MNT HANGAR AVUM-HANG	0600-2200	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

INPUTS		INPUT
Motor HP		10
Load Factor		0.8
CFM - HTG		6300
CFM - CLG		0
% OA		100.00%
% Area		26.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	85.80%	85.80%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	1,200
Heating HRSON	2,240	1,920
C/H HRSON	3,650	3,129
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	37.50	37.50
HOAOHC	18.70	18.70
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	0.00E+00	0.00E+00
NSC	2.30E+04	2.30E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 2049
System Type 2
System Name: H&V UNIT
System Number: HV2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	1,307.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	100.0	
Sub Total	**0.0**	**1,307.0**	**100.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**1,307.0**	**100.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2049**
Building Sq.Ft.: 16,704

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**HV3**

Typical Building Information

Category	Construction	Use	Occ.	Day
3	BRICK	MNT HANGAR AVUM-HAN	0600-2200	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

INPUTS		INPUT
Motor HP		12.5
Load Factor		0.8
CFM - HTG		9000
CFM - CLG		0
% OA		100.00%
% Area		37.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	85.80%	85.80%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	1,200
Heating HRSON	2,240	1,920
C/H HRSON	3,650	3,129
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	37.50	37.50
HOAOHC	18.70	18.70
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	0.00E+00	0.00E+00
NSC	2.30E+04	2.30E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 2049
System Type 2
System Name: H&V UNIT
System Number: HV3

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	1,633.7	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	142.3	
Sub Total	**0.0**	**1,633.7**	**142.3**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**1,633.7**	**142.3**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2049**
Building Sq.Ft.: 15,836

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**HV4**

Typical Building Information

Category	Construction	Use	Occ.	Day
28	BRICK	MNT HANGAR AVUM - OP	0600-1800	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		7.5
Load Factor		0.8
CFM - HTG		9750
CFM - CLG		0
% OA		100.00%
% Area		31.80%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	83.10%	83.10%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	123.59	123.59
HOAOHC	61.63	61.63
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.14E+03	5.14E+03
NSC	2.70E+04	2.70E+04
FV	1	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 2049
System Type 2
System Name: H&V UNIT
System Number: HV4

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	27,509.1	0.0	
Optimum ST/SP	0.0	1,012.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	135.8	
Sub Total	**0.0**	**28,521.2**	**135.8**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	25.9	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**28,521.2**	**161.7**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2049**
Building Sq.Ft.: 15,836

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**HV5**

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

Typical Building Information

Category	Construction	Use	Occ.	Day
28	BRICK	MNT HANGAR AVUM - OP	0600-1800	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		3
Load Factor		0.8
CFM - HTG		1300
CFM - CLG		0
% OA		100.00%
% Area		4.24%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	79.00%	79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	123.59	123.59
HOAOHC	61.63	61.63
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.14E+03	5.14E+03
NSC	2.70E+04	2.70E+04
FV	1	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 2049
System Type 2
System Name: H&V UNIT
System Number: HV5

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	11,574.7	0.0	
Optimum ST/SP	0.0	425.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	18.1	
Sub Total	**0.0**	**12,000.6**	**18.1**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	3.5	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**12,000.6**	**21.6**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2049**
Building Sq.Ft.: 15,836

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**HV6**

Typical Building Information

Category	Construction	Use	Occ.	Day
28	BRICK	MNT HANGAR AVUM - OP	0600-1800	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		5
Load Factor		0.8
CFM - HTG		8200
CFM - CLG		0
% OA		100.00%
% Area		26.80%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	123.59	123.59
HOAOHC	61.63	61.63
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.14E+03	5.14E+03
NSC	2.70E+04	2.70E+04
FV	1	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 2049
System Type 2
System Name: H&V UNIT
System Number: HV6

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	18,676.5	0.0	
Optimum ST/SP	0.0	687.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	114.5	
Sub Total	**0.0**	**19,363.7**	**114.5**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	21.8	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**19,363.7**	**136.3**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2049**
Building Sq.Ft.: 15,836

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**HV7**

Typical Building Information

Category	Construction	Use	Occ.	Day
28	BRICK	MNT HANGAR AVUM - OP	0600-1800	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		5
Load Factor		0.8
CFM - HTG		7100
CFM - CLG		0
% OA		100.00%
% Area		23.20%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	123.59	123.59
HOAOHC	61.63	61.63
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.14E+03	5.14E+03
NSC	2.70E+04	2.70E+04
FV	1	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 2049
System Type 2
System Name: H&V UNIT
System Number: HV7

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	18,676.5	0.0	
Optimum ST/SP	0.0	687.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	99.1	
Sub Total	**0.0**	**19,363.7**	**99.1**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	18.9	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**19,363.7**	**118.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2049**
Building Sq.Ft.: 15,836

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**10**
System Name:	**HOT WATER BOILER AND PUMPS**
System Number:	**B1**

Typical Building Information

Category	Construction	Use	Occ.	Day
28	BRICK	MNT HANGAR AVUM - OP	0600-1800	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		4.8
kW/Ton		0
MOSON		7
EFF		0.8
LOOK-UP VALUE		
EFFHP	0.00%	0.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	123.59	123.59
HOAOHC	61.63	61.63
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.14E+03	5.14E+03
NSC	2.70E+04	2.70E+04
FV	0	1
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 2049
System Type 10
System Name: HOT WATER BOILER AND PUMPS
System Number: B1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	44.4	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**44.4**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2049**
Building Sq.Ft.: 15,836

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**10**
System Name:	**HOT WATER BOILER AND PUMPS**
System Number:	**B2**

Typical Building Information

Category	Construction	Use	Occ.	Day
28	BRICK	MNT HANGAR AVUM - OP	0600-1800	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		4.8
kW/Ton		0
MOSON		7
EFF		0.8
LOOK-UP VALUE		
EFFHP	0.00%	0.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	123.59	123.59
HOAOHC	61.63	61.63
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.14E+03	5.14E+03
NSC	2.70E+04	2.70E+04
FV	0	1
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **Date:** 06-Apr-95

Bldg Number: 2049
System Type 10
System Name: HOT WATER BOILER AND PUMPS
System Number: B2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	44.4	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**44.4**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2049**
Building Sq.Ft.: 15,836

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**12**
System Name:	**BASEBOARD RADIATION**
System Number:	**FTR-1**

Typical Building Information

Category	Construction	Use	Occ.	Day
28	BRICK	MNT HANGAR AVUM - OP	0600-1800	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	1200	1800	1800	1800	1800	1800	1200

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		14.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,560	3,360
Heating HRSON	4,096	5,376
C/H HRSON	6,674	8,760
Cooling HRSAV	800	
Heating HRSAV	1,280	
C/H HRSAV	2,086	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	123.59	123.59
HOAOHC	61.63	61.63
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.14E+03	5.14E+03
NSC	2.70E+04	2.70E+04
FV	1	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 2049
System Type 12
System Name: BASEBOARD RADIATION
System Number: FTR-1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	13,209.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	59.8	
Sub Total	**0.0**	**15,149.4**	**59.8**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	11.4	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**15,149.4**	**71.2**	**3**

ENERGY CALCULATIONS

BUILDING 2050

E M C ENGINEERS, INC.

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM BLDG: 2050
Building Sq.Ft.: 16,704

System Type	2
System Name:	H&V UNIT
System Number:	HV1

Typical Building Information

Category	Construction	Use	Occ.	Day
3	BRICK	MNT HANGAR AVUM-HANG	0600-2200	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

INPUTS		INPUT
Motor HP		12.5
Load Factor		0.8
CFM - HTG		9000
CFM - CLG		0
% OA		100.00%
% Area		37.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	85.80%	85.80%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	1,200
Heating HRSON	2,240	1,920
C/H HRSON	3,650	3,129
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	37.50	37.50
HOAOHC	18.70	18.70
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	0.00E+00	0.00E+00
NSC	2.30E+04	2.30E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 2050
System Type 2
System Name: H&V UNIT
System Number: HV1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	1,633.7	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	142.3	
Sub Total	**0.0**	**1,633.7**	**142.3**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**1,633.7**	**142.3**	**3**

E M C ENGINEERS, INC.

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM BLDG: 2050
Building Sq.Ft.: 16,704

System Type	2
System Name:	H&V UNIT
System Number:	HV2

Typical Building Information

Category	Construction	Use	Occ.	Day
3	BRICK	MNT HANGAR AVUM-HANG	0600-2200	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

INPUTS		INPUT
Motor HP		10
Load Factor		0.8
CFM - HTG		6300
CFM - CLG		0
% OA		100.00%
% Area		26.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	85.80%	85.80%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	1,200
Heating HRSON	2,240	1,920
C/H HRSON	3,650	3,129
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	37.50	37.50
HOAOHC	18.70	18.70
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	0.00E+00	0.00E+00
NSC	2.30E+04	2.30E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: **2050**
System Type **2**
System Name: **H&V UNIT**
System Number: **HV2**

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	1,307.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	100.0	
Sub Total	**0.0**	**1,307.0**	**100.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**1,307.0**	**100.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2050**
Building Sq.Ft.: 16,704

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**HV3**

Typical Building Information

Category	Construction	Use	Occ.	Day
3	BRICK	MNT HANGAR AVUM-HANG	0600-2200	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

INPUTS		INPUT
Motor HP		12.5
Load Factor		0.8
CFM - HTG		9000
CFM - CLG		0
% OA		100.00%
% Area		37.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	85.80%	85.80%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	1,200
Heating HRSON	2,240	1,920
C/H HRSON	3,650	3,129
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	37.50	37.50
HOAOHC	18.70	18.70
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	0.00E+00	0.00E+00
NSC	2.30E+04	2.30E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 2050
System Type 2
System Name: H&V UNIT
System Number: HV3

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	1,633.7	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	142.3	
Sub Total	**0.0**	**1,633.7**	**142.3**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**1,633.7**	**142.3**	**3**

E M C ENGINEERS, INC.

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM BLDG: 2050
Building Sq.Ft.: 16,020

System Type	2
System Name:	H&V UNIT
System Number:	HV4

Typical Building Information

Category	Construction	Use	Occ.	Day
28	BRICK	MNT HANGAR AVUM - OPS	0600-1800	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		7.5
Load Factor		0.8
CFM - HTG		9750
CFM - CLG		0
% OA		100.00%
% Area		31.80%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	83.10%	83.10%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	123.59	123.59
HOAOHC	61.63	61.63
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.14E+03	5.14E+03
NSC	2.70E+04	2.70E+04
FV	1	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 2050
System Type 2
System Name: H&V UNIT
System Number: HV4

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	27,509.1	0.0	
Optimum ST/SP	0.0	1,012.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	137.4	
Sub Total	**0.0**	**28,521.2**	**137.4**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	26.2	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**28,521.2**	**163.6**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2050**
Building Sq.Ft.: 16,020

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**HV5**

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

Typical Building Information

Category	Construction	Use	Occ.	Day
28	BRICK	MNT HANGAR AVUM - OPS	0600-1800	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		3
Load Factor		0.8
CFM - HTG		1300
CFM - CLG		0
% OA		100.00%
% Area		4.24%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	79.00%	79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	123.59	123.59
HOAOHC	61.63	61.63
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.14E+03	5.14E+03
NSC	2.70E+04	2.70E+04
FV	1	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: **2050**
System Type **2**
System Name: **H&V UNIT**
System Number: **HV5**

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	11,574.7	0.0	
Optimum ST/SP	0.0	425.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	18.3	
Sub Total	**0.0**	**12,000.6**	**18.3**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	3.5	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**12,000.6**	**21.8**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2050**
Building Sq.Ft.: 16,020

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**HV6**

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

Typical Building Information

Category	Construction	Use	Occ.	Day
28	BRICK	MNT HANGAR AVUM - OPS	0600-1800	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		5
Load Factor		0.8
CFM - HTG		8200
CFM - CLG		0
% OA		100.00%
% Area		26.80%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	123.59	123.59
HOAOHC	61.63	61.63
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.14E+03	5.14E+03
NSC	2.70E+04	2.70E+04
FV	1	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: **2050**
System Type **2**
System Name: **H&V UNIT**
System Number: **HV6**

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	18,676.5	0.0	
Optimum ST/SP	0.0	687.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	115.8	
Sub Total	**0.0**	**19,363.7**	**115.8**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	22.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**19,363.7**	**137.9**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2050**
Building Sq.Ft.: 16,020

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**HV7**

Typical Building Information

Category	Construction	Use	Occ.	Day
28	BRICK	MNT HANGAR AVUM - OPS	0600-1800	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		5
Load Factor		0.8
CFM - HTG		7100
CFM - CLG		0
% OA		100.00%
% Area		23.20%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	123.59	123.59
HOAOHC	61.63	61.63
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.14E+03	5.14E+03
NSC	2.70E+04	2.70E+04
FV	1	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 2050
System Type 2
System Name: H&V UNIT
System Number: HV7

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	18,676.5	0.0	
Optimum ST/SP	0.0	687.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	100.3	
Sub Total	**0.0**	**19,363.7**	**100.3**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	19.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**19,363.7**	**119.4**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2050**
Building Sq.Ft.: 16,020

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**10**
System Name:	**HOT WATER BOILER AND PUMPS**
System Number:	**B1**

Typical Building Information

Category	Construction	Use	Occ.	Day
28	BRICK	MNT HANGAR AVUM - OPS	0600-1800	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		4.8
kW/Ton		0.00%
MOSON		7
EFF		80.00%
LOOK-UP VALUE		
EFFHP	0.00%	0.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	123.59	123.59
HOAOHC	61.63	61.63
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.14E+03	5.14E+03
NSC	2.70E+04	2.70E+04
FV	1	1
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 2050
System Type 10
System Name: HOT WATER BOILER AND PUMPS
System Number: B1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	44.4	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**44.4**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2050**
Building Sq.Ft.: 16,020

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**10**
System Name:	**HOT WATER BOILER AND PUMPS**
System Number:	**B2**

Typical Building Information

Category	Construction	Use	Occ.	Day
28	BRICK	MNT HANGAR AVUM - OPS	0600-1800	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		4.8
kW/Ton		0.00%
MOSON		7
EFF		80.00%
LOOK-UP VALUE		
EFFHP	0.00%	0.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	123.59	123.59
HOAOHC	61.63	61.63
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.14E+03	5.14E+03
NSC	2.70E+04	2.70E+04
FV	1	1
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: **2050**
System Type **10**
System Name: **HOT WATER BOILER AND PUMPS**
System Number: **B2**

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	44.4	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**44.4**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2050**
Building Sq.Ft.: 16,020

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**12**
System Name:	**BASEBOARD RADIATION**
System Number:	**FTR-1**

Typical Building Information

Category	Construction	Use	Occ.	Day
28	BRICK	MNT HANGAR AVUM - OP	0600-1800	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	1200	1800	1800	1800	1800	1800	1200

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		14.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,560	3,360
Heating HRSON	4,096	5,376
C/H HRSON	6,674	8,760
Cooling HRSAV	800	
Heating HRSAV	1,280	
C/H HRSAV	2,086	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	123.59	123.59
HOAOHC	61.63	61.63
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.14E+03	5.14E+03
NSC	2.70E+04	2.70E+04
FV	1	1
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 2050
System Type 12
System Name: BASEBOARD RADIATION
System Number: FTR-1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	13,209.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	60.5	
Sub Total	**0.0**	**15,149.4**	**60.5**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	11.5	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**15,149.4**	**72.0**	**3**

ENERGY CALCULATIONS

BUILDING 2060

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2060**
Building Sq.Ft.: 10,545

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**HV1**

Typical Building Information

Category	Construction	Use	Occ.	Day
4	BRICK	MNT HANGAR AVUM - OPS	0000-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		19600
CFM - CLG		0
% OA		14.56%
% Area		86.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.59E+03	4.59E+03
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 2060
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: HV1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	41.6	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**41.6**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2060**
Building Sq.Ft.: 37,828

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**MAU1**

Typical Building Information

Category	Construction	Use	Occ.	Day
3	BRICK	MNT HANGAR AVUM-HAN	0600-2200	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	2200	2200	2200	2200	2200	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	2200	2200	2200	2200	2200	0

INPUTS		INPUT
Motor HP		8
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		100.00%
% Area		8.50%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	83.10%	83.10%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,800	1,600
Heating HRSON	2,880	2,560
C/H HRSON	4,693	4,171
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	37.50	37.50
HOAOHC	18.70	18.70
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	0.00E+00	0.00E+00
NSC	2.30E+04	2.30E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 2060
System Type 2
System Name: H&V UNIT
System Number: MAU1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	1,079.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	74.1	
Sub Total	**0.0**	**1,079.5**	**74.1**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**1,079.5**	**74.1**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2060**
Building Sq.Ft.: 37,828

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**RMAU1**

Typical Building Information

Category	Construction	Use	Occ.	Day
3	BRICK	MNT HANGAR AVUM-HAN	0600-2200	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	2200	2200	2200	2200	2200	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	2200	2200	2200	2200	2200	0

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		9320
CFM - CLG		0
% OA		100.00%
% Area		15.30%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,800	1,600
Heating HRSON	2,880	2,560
C/H HRSON	4,693	4,171
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	37.50	37.50
HOAOHC	18.70	18.70
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	0.00E+00	0.00E+00
NSC	2.30E+04	2.30E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 2060
System Type 2
System Name: H&V UNIT
System Number: RMAU1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	133.3	
Sub Total	**0.0**	**1,940.1**	**133.3**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**1,940.1**	**133.3**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2060**
Building Sq.Ft.: 37,828

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**RMAU2**

Typical Building Information

Category	Construction	Use	Occ.	Day
3	BRICK	MNT HANGAR AVUM-HAN	0600-2200	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	2200	2200	2200	2200	2200	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	2200	2200	2200	2200	2200	0

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		9320
CFM - CLG		0
% OA		100.00%
% Area		15.30%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,800	1,600
Heating HRSON	2,880	2,560
C/H HRSON	4,693	4,171
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	37.50	37.50
HOAOHC	18.70	18.70
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	0.00E+00	0.00E+00
NSC	2.30E+04	2.30E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 2060
System Type 2
System Name: H&V UNIT
System Number: RMAU2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	133.3	
Sub Total	**0.0**	**1,940.1**	**133.3**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**1,940.1**	**133.3**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2060**
Building Sq.Ft.: 37,828

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**RMAU3**

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

Typical Building Information

Category	Construction	Use	Occ.	Day
3	BRICK	MNT HANGAR AVUM-HAN	0600-2200	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	2200	2200	2200	2200	2200	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	2200	2200	2200	2200	2200	0

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		9320
CFM - CLG		0
% OA		100.00%
% Area		15.30%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,800	1,600
Heating HRSON	2,880	2,560
C/H HRSON	4,693	4,171
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	37.50	37.50
HOAOHC	18.70	18.70
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	0.00E+00	0.00E+00
NSC	2.30E+04	2.30E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 2060
System Type 2
System Name: H&V UNIT
System Number: RMAU3

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	133.3	
Sub Total	**0.0**	**1,940.1**	**133.3**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**1,940.1**	**133.3**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2060**
Building Sq.Ft.: 37,828

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**RMAU4**

Typical Building Information

Category	Construction	Use	Occ.	Day
3	BRICK	MNT HANGAR AVUM-HAN	0600-2200	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	2200	2200	2200	2200	2200	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	2200	2200	2200	2200	2200	0

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		9320
CFM - CLG		0
% OA		100.00%
% Area		15.30%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,800	1,600
Heating HRSON	2,880	2,560
C/H HRSON	4,693	4,171
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	37.50	37.50
HOAOHC	18.70	18.70
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	0.00E+00	0.00E+00
NSC	2.30E+04	2.30E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 2060
System Type 2
System Name: H&V UNIT
System Number: RMAU4

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	133.3	
Sub Total	**0.0**	**1,940.1**	**133.3**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**1,940.1**	**133.3**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2060**

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

Building Sq.Ft.:	**37,828**
System Type	**2**
System Name:	**H&V UNIT**
System Number:	**RMAU5**

Typical Building Information

Category	Construction	Use	Occ.	Day
3	BRICK	MNT HANGAR AVUM-HAN	0600-2200	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	2200	2200	2200	2200	2200	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	2200	2200	2200	2200	2200	0

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		9320
CFM - CLG		0
% OA		100.00%
% Area		15.30%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,800	1,600
Heating HRSON	2,880	2,560
C/H HRSON	4,693	4,171
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	37.50	37.50
HOAOHC	18.70	18.70
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	0.00E+00	0.00E+00
NSC	2.30E+04	2.30E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 2060
System Type 2
System Name: H&V UNIT
System Number: RMAU5

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	133.3	
Sub Total	**0.0**	**1,940.1**	**133.3**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**1,940.1**	**133.3**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2060**
Building Sq.Ft.: 37,828

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**RMAU6**

Typical Building Information

Category	Construction	Use	Occ.	Day
3	BRICK	MNT HANGAR AVUM-HAN	0600-2200	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	2200	2200	2200	2200	2200	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	2200	2200	2200	2200	2200	0

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		9320
CFM - CLG		0
% OA		100.00%
% Area		15.30%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,800	1,600
Heating HRSON	2,880	2,560
C/H HRSON	4,693	4,171
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	37.50	37.50
HOAOHC	18.70	18.70
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	0.00E+00	0.00E+00
NSC	2.30E+04	2.30E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 2060
System Type 2
System Name: H&V UNIT
System Number: RMAU6

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	133.3	
Sub Total	**0.0**	**1,940.1**	**133.3**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**1,940.1**	**133.3**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2060**
Building Sq.Ft.: 10,545

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**10**
System Name:	**HOT WATER BOILER AND PUMPS**
System Number:	**B1**

Typical Building Information

Category	Construction	Use	Occ.	Day
4	BRICK	MNT HANGAR AVUM - OP	0000-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		4.8
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.59E+03	4.59E+03
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 2060
System Type 10
System Name: HOT WATER BOILER AND PUMPS
System Number: B1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	35.5	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**35.5**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2060**
Building Sq.Ft.: 37,828

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**10**
System Name:	**HOT WATER BOILER AND PUMPS**
System Number:	**B2**

Typical Building Information

Category	Construction	Use	Occ.	Day
3	BRICK	MNT HANGAR AVUM-HAN	0600-2200	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	2200	2200	2200	2200	2200	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		4.8
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	0.00%	0.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,800	3,360
Heating HRSON	2,880	5,376
C/H HRSON	4,693	8,760
Cooling HRSAV	1,560	
Heating HRSAV	2,496	
C/H HRSAV	4,067	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	37.50	37.50
HOAOHC	18.70	18.70
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	0.00E+00	0.00E+00
NSC	2.30E+04	2.30E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 2060
System Type 10
System Name: HOT WATER BOILER AND PUMPS
System Number: B2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	35.5	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**35.5**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2060**
Building Sq.Ft.: 10,545

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**12**
System Name:	**BASEBOARD RADIATION**
System Number:	**RAD**

Typical Building Information

Category	Construction	Use	Occ.	Day
4	BRICK	MNT HANGAR AVUM - OP	0000-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time		0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		1
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		14.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	69.20%	69.20%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.59E+03	4.59E+03
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 2060
System Type 12
System Name: BASEBOARD RADIATION
System Number: RAD

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	6.8	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**6.8**	**3**

ENERGY CALCULATIONS

BUILDING 2065

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2065**
Building Sq.Ft.: 20,144

EMC NO.: 1406-006
DATE: 02-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**10**
System Name:	**HOT WATER BOILER AND PUMPS**
System Number:	**B1**

Typical Building Information

Category	Construction	Use	Occ.	Day
5	BRICK	AF OPS BUILDING-NON A	0000-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		3
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		1.26
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	79.00%	79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	1.43E-04	1.43E-04
DDCCC	4.29E-04	4.29E-04
DSC	5.79E+04	5.79E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 02-Apr-95

Bldg Number: 2065
System Type 10
System Name: HOT WATER BOILER AND PUMPS
System Number: B1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	9.3	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**9.3**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2065**
Building Sq.Ft.: 20,144

EMC NO.: 1406-006
DATE: 02-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**10**
System Name:	**HOT WATER BOILER AND PUMPS**
System Number:	**B2**

Typical Building Information

Category	Construction	Use	Occ.	Day
5	BRICK	AF OPS BUILDING-NON A	0000-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		3
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		1.26
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	79.00%	79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	1.43E-04	1.43E-04
DDCCC	4.29E-04	4.29E-04
DSC	5.79E+04	5.79E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 02-Apr-95

Bldg Number: 2065
System Type 10
System Name: HOT WATER BOILER AND PUMPS
System Number: B2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	9.3	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**9.3**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2065**
Building Sq.Ft.: 20,144

EMC NO.: 1406-006
DATE: 02-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**12**
System Name:	**BASEBOARD RADIATION**
System Number:	**HX1**

Typical Building Information

Category	Construction	Use	Occ.	Day
5	BRICK	AF OPS BUILDING-NON A	0000-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		5
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		10.70%
TON CAPC.		0
MBTU CAPC.		1.0984
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	1.43E-04	1.43E-04
DDCCC	4.29E-04	4.29E-04
DSC	5.79E+04	5.79E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 02-Apr-95

Bldg Number: 2065
System Type 12
System Name: BASEBOARD RADIATION
System Number: HX1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	124.9	
HW OA Reset	0.0	0.0	8.1	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**133.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2065**
Building Sq.Ft.: 20,144

EMC NO.: 1406-006
DATE: 02-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**HV1**

Typical Building Information

Category	Construction	Use	Occ.	Day
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		2215
CFM - CLG		0
% OA		12.66%
% Area		12.70%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 02-Apr-95

Bldg Number: 2065
System Type 2
System Name: H&V UNIT
System Number: HV1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	124.5	
Sub Total	**0.0**	**287.5**	**124.5**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	14.9	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**287.5**	**139.4**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2065**
Building Sq.Ft.: 20,144

EMC NO.: 1406-006
DATE: 02-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**HV2**

Typical Building Information

Category	Construction	Use	Occ.	Day
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		7.5
Load Factor		0.8
CFM - HTG		6545
CFM - CLG		0
% OA		65.80%
% Area		37.70%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	83.10%	83.10%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 02-Apr-95

Bldg Number: 2065
System Type 2
System Name: H&V UNIT
System Number: HV2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	1,012.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	369.4	
Sub Total	**0.0**	**1,012.1**	**369.4**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	44.3	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**1,012.1**	**413.8**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2065**
Building Sq.Ft.: 4,322

EMC NO.: 1406-006
DATE: 02-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**HV3**

Typical Building Information

Category	Construction	Use	Occ.	Day
6	BRICK	AF OPS BUIDING-ADMIN	0600-1700	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		5
Load Factor		0.8
CFM - HTG		6545
CFM - CLG		0
% OA		12.68%
% Area		64.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	24.90	24.90
HOAOHC	12.42	12.42
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	7.70E+03	7.70E+03
NSC	2.89E+04	2.89E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 02-Apr-95

Bldg Number: 2065
System Type 2
System Name: H&V UNIT
System Number: HV3

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	19,629.4	0.0	
Optimum ST/SP	0.0	687.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	79.9	
Sub Total	**0.0**	**20,316.6**	**79.9**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	21.3	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**20,316.6**	**101.2**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2065**
Building Sq.Ft.: 20,144

EMC NO.: 1406-006
DATE: 02-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**HV4**

Typical Building Information

Category	Construction	Use	Occ.	Day
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		5
Load Factor		0.8
CFM - HTG		3000
CFM - CLG		0
% OA		31.60%
% Area		17.30%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 02-Apr-95

Bldg Number: 2065
System Type 2
System Name: H&V UNIT
System Number: HV4

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	687.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	169.5	
Sub Total	**0.0**	**687.1**	**169.5**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	20.4	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**687.1**	**189.9**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2065**
Building Sq.Ft.: 20,144

EMC NO.: 1406-006
DATE: 02-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**MU1**

Typical Building Information

Category	Construction	Use	Occ.	Day
5	BRICK	AF OPS BUILDING-NON A	0000-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.5
Load Factor		0.8
CFM - HTG		900
CFM - CLG		0
% OA		43.40%
% Area		5.23%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	1.43E-04	1.43E-04
DDCCC	4.29E-04	4.29E-04
DSC	5.79E+04	5.79E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 02-Apr-95

Bldg Number: 2065
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: MU1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	61.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**61.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2065**
Building Sq.Ft.: 20,144

EMC NO.: 1406-006
DATE: 02-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**MU2**

Typical Building Information

Category	Construction	Use	Occ.	Day
5	BRICK	AF OPS BUILDING-NON A	0000-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		1.5
Load Factor		0.8
CFM - HTG		3840
CFM - CLG		0
% OA		100.00%
% Area		22.10%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	69.20%	69.20%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	1.43E-04	1.43E-04
DDCCC	4.29E-04	4.29E-04
DSC	5.79E+04	5.79E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 02-Apr-95

Bldg Number: 2065
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: MU2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	258.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**258.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2065**
Building Sq.Ft.: 20,144

EMC NO.: 1406-006
DATE: 02-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**3**
System Name:	**SINGLE ZONE AHU WITHOUT RETURN FAN**
System Number:	**AC1**

Typical Building Information

Category	Construction	Use	Occ.	Day
5	BRICK	AF OPS BUILDING-NON A	0000-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		5
Load Factor		0.8
CFM - HTG		0
CFM - CLG		1000
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	1.43E-04	1.43E-04
DDCCC	4.29E-04	4.29E-04
DSC	5.79E+04	5.79E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 02-Apr-95

Bldg Number: 2065
System Type 3
System Name: SINGLE ZONE AHU WITHOUT RETURN FAN
System Number: AC1

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	7.3	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**7.3**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0		0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**7.3**	**0.0**	**0.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2065**
Building Sq.Ft.: 20,144

EMC NO.: 1406-006
DATE: 02-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**3**
System Name:	**SINGLE ZONE AHU WITHOUT RETURN FAN**
System Number:	**AC2**

Typical Building Information

Category	Construction	Use	Occ.	Day
5	BRICK	AF OPS BUILDING-NON A	0000-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		5
Load Factor		0.8
CFM - HTG		0
CFM - CLG		1000
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	1.43E-04	1.43E-04
DDCCC	4.29E-04	4.29E-04
DSC	5.79E+04	5.79E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 02-Apr-95

Bldg Number: 2065
System Type 3
System Name: SINGLE ZONE AHU WITHOUT RETURN FAN
System Number: AC2

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	7.3	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**7.3**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0		0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**7.3**	**0.0**	**0.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2065**
Building Sq.Ft.: 20,144

System Type	**3**
System Name:	**SINGLE ZONE AHU WITHOUT RETURN FAN**
System Number:	**AC4**

EMC NO.: 1406-006
DATE: 02-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

Typical Building Information

Category	Construction	Use	Occ.	Day
5	BRICK	AF OPS BUILDING-NON A	0000-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		5
Load Factor		0.8
CFM - HTG		0
CFM - CLG		1000
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	1.43E-04	1.43E-04
DDCCC	4.29E-04	4.29E-04
DSC	5.79E+04	5.79E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 02-Apr-95

Bldg Number: 2065
System Type 3
System Name: SINGLE ZONE AHU WITHOUT RETURN FAN
System Number: AC4

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	7.3	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**7.3**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0		0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**7.3**	**0.0**	**0.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2065**
Building Sq.Ft.: 20,144

EMC NO.: 1406-006
DATE: 02-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**3**
System Name:	**SINGLE ZONE AHU WITHOUT RETURN FAN**
System Number:	**AC4A**

Typical Building Information

Category	Construction	Use	Occ.	Day
5	BRICK	AF OPS BUILDING-NON A	0000-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		5
Load Factor		0.8
CFM - HTG		0
CFM - CLG		1000
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	1.43E-04	1.43E-04
DDCCC	4.29E-04	4.29E-04
DSC	5.79E+04	5.79E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 02-Apr-95

Bldg Number: 2065
System Type 3
System Name: SINGLE ZONE AHU WITHOUT RETURN FAN
System Number: AC4A

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	7.3	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**7.3**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0		0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**7.3**	**0.0**	**0.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2065**
Building Sq.Ft.: 20,144

EMC NO.: 1406-006
DATE: 02-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**3**
System Name:	**SINGLE ZONE AHU WITHOUT RETURN FAN**
System Number:	**AC5**

Typical Building Information

Category	Construction	Use	Occ.	Day
5	BRICK	AF OPS BUILDING-NON A	0000-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		5
Load Factor		0.8
CFM - HTG		0
CFM - CLG		1000
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	1.43E-04	1.43E-04
DDCCC	4.29E-04	4.29E-04
DSC	5.79E+04	5.79E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 02-Apr-95

Bldg Number: 2065
System Type 3
System Name: SINGLE ZONE AHU WITHOUT RETURN FAN
System Number: AC5

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	7.3	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**7.3**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0		0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**7.3**	**0.0**	**0.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2065**
Building Sq.Ft.: 20,144

EMC NO.: 1406-006
DATE: 02-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**3**
System Name:	**SINGLE ZONE AHU WITHOUT RETURN FAN**
System Number:	**AC6**

Typical Building Information

Category	Construction	Use	Occ.	Day
5	BRICK	AF OPS BUILDING-NON A	0000-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		20
Load Factor		0.8
CFM - HTG		0
CFM - CLG		1600
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	88.10%	88.10%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	1.43E-04	1.43E-04
DDCCC	4.29E-04	4.29E-04
DSC	5.79E+04	5.79E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 02-Apr-95

Bldg Number: 2065
System Type 3
System Name: SINGLE ZONE AHU WITHOUT RETURN FAN
System Number: AC6

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	27.1	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**27.1**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0		0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**27.1**	**0.0**	**0.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2065**
Building Sq.Ft.: 20,144

EMC NO.: 1406-006
DATE: 02-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**3**
System Name:	**SINGLE ZONE AHU WITHOUT RETURN FAN**
System Number:	**AC7**

Typical Building Information

Category	Construction	Use	Occ.	Day
5	BRICK	AF OPS BUILDING-NON A	0000-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		20
Load Factor		0.8
CFM - HTG		0
CFM - CLG		1600
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	88.10%	88.10%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	1.43E-04	1.43E-04
DDCCC	4.29E-04	4.29E-04
DSC	5.79E+04	5.79E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 02-Apr-95

Bldg Number: 2065
System Type 3
System Name: SINGLE ZONE AHU WITHOUT RETURN FAN
System Number: AC7

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	27.1	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**27.1**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0		0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**27.1**	**0.0**	**0.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2065**
Building Sq.Ft.: 20,144

EMC NO.: 1406-006
DATE: 02-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**3**
System Name:	**SINGLE ZONE AHU WITHOUT RETURN FAN**
System Number:	**AC8**

Typical Building Information

Category	Construction	Use	Occ.	Day
5	BRICK	AF OPS BUILDING-NON A	0000-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		5
Load Factor		0.8
CFM - HTG		0
CFM - CLG		700
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	1.43E-04	1.43E-04
DDCCC	4.29E-04	4.29E-04
DSC	5.79E+04	5.79E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 02-Apr-95

Bldg Number: 2065
System Type 3
System Name: SINGLE ZONE AHU WITHOUT RETURN FAN
System Number: AC8

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	7.3	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**7.3**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0		0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**7.3**	**0.0**	**0.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2065**
Building Sq.Ft.: 20,144

EMC NO.: 1406-006
DATE: 02-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**3**
System Name:	**SINGLE ZONE AHU WITHOUT RETURN FAN**
System Number:	**AC9**

Typical Building Information

Category	Construction	Use	Occ.	Day
5	BRICK	AF OPS BUILDING-NON A	0000-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		7.5
Load Factor		0.8
CFM - HTG		0
CFM - CLG		2415
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	83.10%	83.10%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	1.43E-04	1.43E-04
DDCCC	4.29E-04	4.29E-04
DSC	5.79E+04	5.79E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 02-Apr-95

Bldg Number: 2065
System Type 3
System Name: SINGLE ZONE AHU WITHOUT RETURN FAN
System Number: AC9

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	10.8	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**10.8**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0		0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**10.8**	**0.0**	**0.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2065**
Building Sq.Ft.: 20,144

EMC NO.: 1406-006
DATE: 02-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**11**
System Name:	**CONDENSING UNIT**
System Number:	**ACC1**

Typical Building Information

Category	Construction	Use	Occ.	Day
5	BRICK	AF OPS BUILDING-NON A	0000-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.75
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		1.8
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	1.43E-04	1.43E-04
DDCCC	4.29E-04	4.29E-04
DSC	5.79E+04	5.79E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 02-Apr-95

Bldg Number: 2065
System Type 11
System Name: CONDENSING UNIT
System Number: ACC1

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	1.4	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**1.4**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	17.2	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**1.4**	**17.2**	**0.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2065**
Building Sq.Ft.: 20,144

EMC NO.: 1406-006
DATE: 02-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**11**
System Name:	**CONDENSING UNIT**
System Number:	**ACC2**

Typical Building Information

Category	Construction	Use	Occ.	Day
5	BRICK	AF OPS BUILDING-NON A	0000-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.75
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		1.8
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	1.43E-04	1.43E-04
DDCCC	4.29E-04	4.29E-04
DSC	5.79E+04	5.79E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 02-Apr-95

Bldg Number: 2065
System Type 11
System Name: CONDENSING UNIT
System Number: ACC2

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	1.4	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**1.4**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	17.2	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**1.4**	**17.2**	**0.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2065**
Building Sq.Ft.: 20,144

EMC NO.: 1406-006
DATE: 02-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**11**
System Name:	**CONDENSING UNIT**
System Number:	**ACC4**

Typical Building Information

Category	Construction	Use	Occ.	Day
5	BRICK	AF OPS BUILDING-NON A	0000-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.75
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		1.8
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	1.43E-04	1.43E-04
DDCCC	4.29E-04	4.29E-04
DSC	5.79E+04	5.79E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 02-Apr-95

Bldg Number: 2065
System Type 11
System Name: CONDENSING UNIT
System Number: ACC4

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	1.4	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**1.4**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	17.2	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**1.4**	**17.2**	**0.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2065**
Building Sq.Ft.: 20,144

EMC NO.: 1406-006
DATE: 02-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**11**
System Name:	**CONDENSING UNIT**
System Number:	**ACC5**

Typical Building Information

Category	Construction	Use	Occ.	Day
5	BRICK	AF OPS BUILDING-NON A	0000-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.75
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		1.8
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	1.43E-04	1.43E-04
DDCCC	4.29E-04	4.29E-04
DSC	5.79E+04	5.79E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 02-Apr-95

Bldg Number: 2065
System Type 11
System Name: CONDENSING UNIT
System Number: ACC5

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	1.4	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**1.4**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	17.2	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**1.4**	**17.2**	**0.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2065**
Building Sq.Ft.: 20,144

EMC NO.: 1406-006
DATE: 02-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**11**
System Name:	**CONDENSING UNIT**
System Number:	**ACC6**

Typical Building Information

Category	Construction	Use	Occ.	Day
5	BRICK	AF OPS BUILDING-NON A	0000-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.75
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		2.92
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	1.43E-04	1.43E-04
DDCCC	4.29E-04	4.29E-04
DSC	5.79E+04	5.79E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 02-Apr-95

Bldg Number: 2065
System Type 11
System Name: CONDENSING UNIT
System Number: ACC6

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	1.4	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**1.4**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	27.9	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**1.4**	**27.9**	**0.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2065**
Building Sq.Ft.: 20,144

EMC NO.: 1406-006
DATE: 02-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**11**
System Name:	**CONDENSING UNIT**
System Number:	**ACC7**

Typical Building Information

Category	Construction	Use	Occ.	Day
5	BRICK	AF OPS BUILDING-NON A	0000-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.75
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		2.92
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	1.43E-04	1.43E-04
DDCCC	4.29E-04	4.29E-04
DSC	5.79E+04	5.79E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 02-Apr-95

Bldg Number: 2065
System Type 11
System Name: CONDENSING UNIT
System Number: ACC7

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	1.4	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**1.4**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	27.9	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**1.4**	**27.9**	**0.0**	**3**

ENERGY CALCULATIONS

BUILDING 2070

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2070**
Building Sq.Ft.: 10,545

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**HV1**

Typical Building Information

Category	Construction	Use	Occ.	Day
28	BRICK	MNT HANGAR AVUM - OPS	600-1800	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		10020
CFM - CLG		0
% OA		14.56%
% Area		57.70%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	123.59	123.59
HOAOHC	61.63	61.63
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.14E+03	5.14E+03
NSC	2.70E+04	2.70E+04
FV	1	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: **2070**
System Type **1**
System Name: **H&V UNIT WITHOUT RETURN FAN**
System Number: **HV1**

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	52,733.8	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	1,591.5	
Sub Total	**0.0**	**54,673.9**	**1,591.5**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	303.3	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**54,673.9**	**1,894.8**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2070**
Building Sq.Ft.: 10,545

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**HV2**

Typical Building Information

Category	Construction	Use	Occ.	Day
28	BRICK	MNT HANGAR AVUM - OPS	600-1800	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		5
Load Factor		0.8
CFM - HTG		3900
CFM - CLG		0
% OA		14.56%
% Area		22.40%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	123.59	123.59
HOAOHC	61.63	61.63
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.14E+03	5.14E+03
NSC	2.70E+04	2.70E+04
FV	1	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 2070
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: HV2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	18,676.5	0.0	
Optimum ST/SP	0.0	687.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	617.9	
Sub Total	**0.0**	**19,363.7**	**617.9**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	117.7	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**19,363.7**	**735.6**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM BLDG: 2070
Building Sq.Ft.: 10,545

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	1
System Name:	H&V UNIT WITHOUT RETURN FAN
System Number:	HV3

Typical Building Information

Category	Construction	Use	Occ.	Day
28	BRICK	MNT HANGAR AVUM - OPS	600-1800	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.75
Load Factor		0.8
CFM - HTG		1020
CFM - CLG		0
% OA		27.00%
% Area		5.87%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	123.59	123.59
HOAOHC	61.63	61.63
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.14E+03	5.14E+03
NSC	2.70E+04	2.70E+04
FV	1	1
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 2070
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: HV3

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	3,516.9	0.0	
Optimum ST/SP	0.0	129.4	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	161.9	
Sub Total	**0.0**	**3,646.3**	**161.9**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	30.9	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**3,646.3**	**192.8**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2070**
Building Sq.Ft.: 91,771

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**MAU1**

Typical Building Information

Category	Construction	Use	Occ.	Day
3	BRICK	MNT HANGAR AVUM-HANC	0600-2200	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

INPUTS		INPUT
Motor HP		12.5
Load Factor		0.8
CFM - HTG		14746
CFM - CLG		0
% OA		100.00%
% Area		12.30%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	85.80%	85.80%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	1,200
Heating HRSON	2,240	1,920
C/H HRSON	3,650	3,129
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	37.50	37.50
HOAOHC	18.70	18.70
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	0.00E+00	0.00E+00
NSC	2.30E+04	2.30E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 2070
System Type 2
System Name: H&V UNIT
System Number: MAU1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	1,633.7	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	260.0	
Sub Total	**0.0**	**1,633.7**	**260.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**1,633.7**	**260.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2070**
Building Sq.Ft.: 91,771

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**MAU2**

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

Typical Building Information

Category	Construction	Use	Occ.	Day
3	BRICK	MNT HANGAR AVUM-HANG	0600-2200	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		13945
CFM - CLG		0
% OA		100.00%
% Area		11.60%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	1,200
Heating HRSON	2,240	1,920
C/H HRSON	3,650	3,129
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	37.50	37.50
HOAOHC	18.70	18.70
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	0.00E+00	0.00E+00
NSC	2.30E+04	2.30E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 2070
System Type 2
System Name: H&V UNIT
System Number: MAU2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	245.2	
Sub Total	**0.0**	**1,940.1**	**245.2**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**1,940.1**	**245.2**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2070**
Building Sq.Ft.: 91,771

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**RMAU1**

Typical Building Information

Category	Construction	Use	Occ.	Day
3	BRICK	MNT HANGAR AVUM-HANC	0600-2200	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		10395
CFM - CLG		0
% OA		100.00%
% Area		8.46%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	1,200
Heating HRSON	2,240	1,920
C/H HRSON	3,650	3,129
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	37.50	37.50
HOAOHC	18.70	18.70
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	0.00E+00	0.00E+00
NSC	2.30E+04	2.30E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 2070
System Type 2
System Name: H&V UNIT
System Number: RMAU1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	178.8	
Sub Total	**0.0**	**1,940.1**	**178.8**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**1,940.1**	**178.8**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2070**
Building Sq.Ft.: 91,771

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**RMAU2**

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

Typical Building Information

Category	Construction	Use	Occ.	Day
3	BRICK	MNT HANGAR AVUM-HAN	0600-2200	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		10395
CFM - CLG		0
% OA		100.00%
% Area		8.40%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	1,200
Heating HRSON	2,240	1,920
C/H HRSON	3,650	3,129
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	37.50	37.50
HOAOHC	18.70	18.70
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	0.00E+00	0.00E+00
NSC	2.30E+04	2.30E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 2070
System Type 2
System Name: H&V UNIT
System Number: RMAU2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	177.5	
Sub Total	**0.0**	**1,940.1**	**177.5**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**1,940.1**	**177.5**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2070**
Building Sq.Ft.: 91,771

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**RMAU3**

Typical Building Information

Category	Construction	Use	Occ.	Day
3	BRICK	MNT HANGAR AVUM-HAN	0600-2200	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		10395
CFM - CLG		0
% OA		100.00%
% Area		8.40%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	1,200
Heating HRSON	2,240	1,920
C/H HRSON	3,650	3,129
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	37.50	37.50
HOAOHC	18.70	18.70
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	0.00E+00	0.00E+00
NSC	2.30E+04	2.30E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 2070
System Type 2
System Name: H&V UNIT
System Number: RMAU3

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	177.5	
Sub Total	**0.0**	**1,940.1**	**177.5**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**1,940.1**	**177.5**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2070**
Building Sq.Ft.: 91,771

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**RMAU4**

Typical Building Information

Category	Construction	Use	Occ.	Day
3	BRICK	MNT HANGAR AVUM-HAN	0600-2200	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		10395
CFM - CLG		0
% OA		100.00%
% Area		8.40%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	1,200
Heating HRSON	2,240	1,920
C/H HRSON	3,650	3,129
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	37.50	37.50
HOAOHC	18.70	18.70
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	0.00E+00	0.00E+00
NSC	2.30E+04	2.30E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 2070
System Type 2
System Name: H&V UNIT
System Number: RMAU4

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	177.5	
Sub Total	**0.0**	**1,940.1**	**177.5**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**1,940.1**	**177.5**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2070**
Building Sq.Ft.: 91,771

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**RMAU5**

Typical Building Information

Category	Construction	Use	Occ.	Day
3	BRICK	MNT HANGAR AVUM-HAN	0600-2200	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		10395
CFM - CLG		0
% OA		100.00%
% Area		8.40%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	1,200
Heating HRSON	2,240	1,920
C/H HRSON	3,650	3,129
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	37.50	37.50
HOAOHC	18.70	18.70
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	0.00E+00	0.00E+00
NSC	2.30E+04	2.30E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 2070
System Type 2
System Name: H&V UNIT
System Number: RMAU5

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	177.5	
Sub Total	**0.0**	**1,940.1**	**177.5**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**1,940.1**	**177.5**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2070**
Building Sq.Ft.: 91,771

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**RMAU6**

Typical Building Information

Category	Construction	Use	Occ.	Day
3	BRICK	MNT HANGAR AVUM-HAN	0600-2200	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		10395
CFM - CLG		0
% OA		100.00%
% Area		8.40%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	1,200
Heating HRSON	2,240	1,920
C/H HRSON	3,650	3,129
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	37.50	37.50
HOAOHC	18.70	18.70
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	0.00E+00	0.00E+00
NSC	2.30E+04	2.30E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 2070
System Type 2
System Name: H&V UNIT
System Number: RMAU6

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	177.5	
Sub Total	**0.0**	**1,940.1**	**177.5**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**1,940.1**	**177.5**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2070**
Building Sq.Ft.: 91,771

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**RMAU7**

Typical Building Information

Category	Construction	Use	Occ.	Day
3	BRICK	MNT HANGAR AVUM-HAN	0600-2200	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		10395
CFM - CLG		0
% OA		100.00%
% Area		8.40%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	1,200
Heating HRSON	2,240	1,920
C/H HRSON	3,650	3,129
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	37.50	37.50
HOAOHC	18.70	18.70
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	0.00E+00	0.00E+00
NSC	2.30E+04	2.30E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 2070
System Type 2
System Name: H&V UNIT
System Number: RMAU7

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	177.5	
Sub Total	**0.0**	**1,940.1**	**177.5**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**1,940.1**	**177.5**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2070**
Building Sq.Ft.: 91,771

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**RMAU8**

Typical Building Information

Category	Construction	Use	Occ.	Day
3	BRICK	MNT HANGAR AVUM-HANC	0600-2200	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		10395
CFM - CLG		0
% OA		100.00%
% Area		8.46%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	1,200
Heating HRSON	2,240	1,920
C/H HRSON	3,650	3,129
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	37.50	37.50
HOAOHC	18.70	18.70
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	0.00E+00	0.00E+00
NSC	2.30E+04	2.30E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 2070
System Type 2
System Name: H&V UNIT
System Number: RMAU8

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	178.8	
Sub Total	**0.0**	**1,940.1**	**178.8**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**1,940.1**	**178.8**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2070**
Building Sq.Ft.: 91,771

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**10**
System Name:	**HOT WATER BOILER AND PUMPS**
System Number:	**B1**

Typical Building Information

Category	Construction	Use	Occ.	Day
3	BRICK	MNT HANGAR AVUM-HAN	0600-2200	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	1200	1800	1800	1800	1800	1800	1200

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		6.695
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,560	3,360
Heating HRSON	4,096	5,376
C/H HRSON	6,674	8,760
Cooling HRSAV	800	
Heating HRSAV	1,280	
C/H HRSAV	2,086	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	37.50	37.50
HOAOHC	18.70	18.70
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	0.00E+00	0.00E+00
NSC	2.30E+04	2.30E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 2070
System Type 10
System Name: HOT WATER BOILER AND PUMPS
System Number: B1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	13,209.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**15,149.4**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	49.5	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**15,149.4**	**49.5**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2070**
Building Sq.Ft.: 91,771

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**10**
System Name:	**HOT WATER BOILER AND PUMPS**
System Number:	**B2**

Typical Building Information

Category	Construction	Use	Occ.	Day
3	BRICK	MNT HANGAR AVUM-HAN	0600-2200	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	1200	1800	1800	1800	1800	1800	1200

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		6.695
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	0.00%	0.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,560	3,360
Heating HRSON	4,096	5,376
C/H HRSON	6,674	8,760
Cooling HRSAV	800	
Heating HRSAV	1,280	
C/H HRSAV	2,086	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	37.50	37.50
HOAOHC	18.70	18.70
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	0.00E+00	0.00E+00
NSC	2.30E+04	2.30E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 2070
System Type 10
System Name: HOT WATER BOILER AND PUMPS
System Number: B2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	49.5	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**49.5**	**3**

ENERGY CALCULATIONS

BUILDING 2072

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2072**
Building Sq.Ft.: 7,811

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**HV1**

Typical Building Information

Category	Construction	Use	Occ.	Day
28	BRICK	MNT HANGAR AVUM - OP	0600-1800	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		7.5
Load Factor		0.8
CFM - HTG		13720
CFM - CLG		0
% OA		14.56%
% Area		86.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	83.10%	83.10%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	123.59	123.59
HOAOHC	61.63	61.63
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.14E+03	5.14E+03
NSC	2.70E+04	2.70E+04
FV	1	1
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 2072
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: HV1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	27,509.1	0.0	
Optimum ST/SP	0.0	1,012.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	181.2	
Sub Total	**0.0**	**28,521.2**	**181.2**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.2	
DDC Control	0.0	0.0	34.5	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**28,521.2**	**215.9**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2072**
Building Sq.Ft.: 37,828

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**MAU1**

Typical Building Information

Category	Construction	Use	Occ.	Day
3	BRICK	MNT HANGAR AVUM-HAN	0600-2200	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

INPUTS		INPUT
Motor HP		8
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		100.00%
% Area		8.50%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	83.10%	83.10%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	1,200
Heating HRSON	2,240	1,920
C/H HRSON	3,650	3,129
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	37.50	37.50
HOAOHC	18.70	18.70
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	0.00E+00	0.00E+00
NSC	2.30E+04	2.30E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 2072
System Type 2
System Name: H&V UNIT
System Number: MAU1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	1,079.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	74.1	
Sub Total	**0.0**	**1,079.5**	**74.1**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**1,079.5**	**74.1**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2072**
Building Sq.Ft.: 37,828

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**RMAU1**

Typical Building Information

Category	Construction	Use	Occ.	Day
3	BRICK	MNT HANGAR AVUM-HAN	0600-2200	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		9320
CFM - CLG		0
% OA		100.00%
% Area		15.30%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	1,200
Heating HRSON	2,240	1,920
C/H HRSON	3,650	3,129
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	37.50	37.50
HOAOHC	18.70	18.70
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	0.00E+00	0.00E+00
NSC	2.30E+04	2.30E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 2072
System Type 2
System Name: H&V UNIT
System Number: RMAU1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	133.3	
Sub Total	**0.0**	**1,940.1**	**133.3**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**1,940.1**	**133.3**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2072**
Building Sq.Ft.: 37,828

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**RMAU2**

Typical Building Information

Category	Construction	Use	Occ.	Day
3	BRICK	MNT HANGAR AVUM-HAN	0600-2200	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		9320
CFM - CLG		0
% OA		100.00%
% Area		15.30%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	1,200
Heating HRSON	2,240	1,920
C/H HRSON	3,650	3,129
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	37.50	37.50
HOAOHC	18.70	18.70
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	0.00E+00	0.00E+00
NSC	2.30E+04	2.30E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 2072
System Type 2
System Name: H&V UNIT
System Number: RMAU2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	133.3	
Sub Total	**0.0**	**1,940.1**	**133.3**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**1,940.1**	**133.3**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2072**
Building Sq.Ft.: 37,828

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**RMAU3**

Typical Building Information

Category	Construction	Use	Occ.	Day
3	BRICK	MNT HANGAR AVUM-HAN	0600-2200	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		9320
CFM - CLG		0
% OA		100.00%
% Area		15.30%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	1,200
Heating HRSON	2,240	1,920
C/H HRSON	3,650	3,129
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	37.50	37.50
HOAOHC	18.70	18.70
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	0.00E+00	0.00E+00
NSC	2.30E+04	2.30E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 2072
System Type 2
System Name: H&V UNIT
System Number: RMAU3

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	133.3	
Sub Total	**0.0**	**1,940.1**	**133.3**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**1,940.1**	**133.3**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2072**
Building Sq.Ft.: 37,828

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**RMAU4**

Typical Building Information

Category	Construction	Use	Occ.	Day
3	BRICK	MNT HANGAR AVUM-HAN	0600-2200	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		9320
CFM - CLG		0
% OA		100.00%
% Area		15.30%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	1,200
Heating HRSON	2,240	1,920
C/H HRSON	3,650	3,129
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	37.50	37.50
HOAOHC	18.70	18.70
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	0.00E+00	0.00E+00
NSC	2.30E+04	2.30E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 2072
System Type 2
System Name: H&V UNIT
System Number: RMAU4

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	133.3	
Sub Total	**0.0**	**1,940.1**	**133.3**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**1,940.1**	**133.3**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2072**
Building Sq.Ft.: 37,828

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**RMAU5**

Typical Building Information

Category	Construction	Use	Occ.	Day
3	BRICK	MNT HANGAR AVUM-HAN	0600-2200	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		9320
CFM - CLG		0
% OA		100.00%
% Area		15.30%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	1,200
Heating HRSON	2,240	1,920
C/H HRSON	3,650	3,129
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	37.50	37.50
HOAOHC	18.70	18.70
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	0.00E+00	0.00E+00
NSC	2.30E+04	2.30E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 2072
System Type 2
System Name: H&V UNIT
System Number: RMAU5

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	133.3	
Sub Total	**0.0**	**1,940.1**	**133.3**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**1,940.1**	**133.3**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2072**
Building Sq.Ft.: 37,828

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**RMAU6**

Typical Building Information

Category	Construction	Use	Occ.	Day
3	BRICK	MNT HANGAR AVUM-HAN	0600-2200	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		9320
CFM - CLG		0
% OA		100.00%
% Area		15.30%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	1,200
Heating HRSON	2,240	1,920
C/H HRSON	3,650	3,129
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	37.50	37.50
HOAOHC	18.70	18.70
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	0.00E+00	0.00E+00
NSC	2.30E+04	2.30E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 2072
System Type 2
System Name: H&V UNIT
System Number: RMAU6

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	133.3	
Sub Total	**0.0**	**1,940.1**	**133.3**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**1,940.1**	**133.3**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2072**
Building Sq.Ft.: 7,811

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**10**
System Name:	**HOT WATER BOILER AND PUMPS**
System Number:	**B1**

Typical Building Information

Category	Construction	Use	Occ.	Day
28	BRICK	MNT HANGAR AVUM - OP	0600-1800	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		4.8
kW/Ton		0
MOSON		7
EFF		0.8
LOOK-UP VALUE		
EFFHP	0.00%	0.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	123.59	123.59
HOAOHC	61.63	61.63
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.14E+03	5.14E+03
NSC	2.70E+04	2.70E+04
FV	0	1
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 2072
System Type 10
System Name: HOT WATER BOILER AND PUMPS
System Number: B1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	44.4	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**44.4**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2072**
Building Sq.Ft.: 7,811

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**10**
System Name:	**HOT WATER BOILER AND PUMPS**
System Number:	**B2**

Typical Building Information

Category	Construction	Use	Occ.	Day
28	BRICK	MNT HANGAR AVUM - OP	0600-1800	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		4.8
kW/Ton		0
MOSON		7
EFF		0.8
LOOK-UP VALUE		
EFFHP	0.00%	0.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	123.59	123.59
HOAOHC	61.63	61.63
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.14E+03	5.14E+03
NSC	2.70E+04	2.70E+04
FV	0	1
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 2072
System Type 10
System Name: HOT WATER BOILER AND PUMPS
System Number: B2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	44.4	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**44.4**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2072**
Building Sq.Ft.: 7,811

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**12**
System Name:	**BASEBOARD RADIATION**
System Number:	**FTR-1**

Typical Building Information

Category	Construction	Use	Occ.	Day
28	BRICK	MNT HANGAR AVUM - OP	0600-1800	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	1200	1800	1800	1800	1800	1800	1200

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		14.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		7
EFF		0.8
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,560	3,360
Heating HRSON	4,096	5,376
C/H HRSON	6,674	8,760
Cooling HRSAV	800	
Heating HRSAV	1,280	
C/H HRSAV	2,086	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	123.59	123.59
HOAOHC	61.63	61.63
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.14E+03	5.14E+03
NSC	2.70E+04	2.70E+04
FV	1	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 2072
System Type 12
System Name: BASEBOARD RADIATION
System Number: FTR-1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	13,209.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	29.5	
Sub Total	**0.0**	**15,149.4**	**29.5**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	5.6	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**15,149.4**	**35.1**	**3**

ENERGY CALCULATIONS

BUILDING 2074

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2074**
Building Sq.Ft.: 16,704

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**HV1**

Typical Building Information

Category	Construction	Use	Occ.	Day
3	BRICK	MNT HANGAR AVUM-HAN	0600-2200	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

INPUTS		INPUT
Motor HP		12.5
Load Factor		0.8
CFM - HTG		9000
CFM - CLG		0
% OA		14.56%
% Area		37.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	85.80%	85.80%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	1,200
Heating HRSON	2,240	1,920
C/H HRSON	3,650	3,129
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	37.50	37.50
HOAOHC	18.70	18.70
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	0.00E+00	0.00E+00
NSC	2.30E+04	2.30E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 2074
System Type 2
System Name: H&V UNIT
System Number: HV1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	1,633.7	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	142.3	
Sub Total	**0.0**	**1,633.7**	**142.3**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**1,633.7**	**142.3**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2074**
Building Sq.Ft.: 16,704

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**HV2**

Typical Building Information

Category	Construction	Use	Occ.	Day
3	BRICK	MNT HANGAR AVUM-HAN	0600-2200	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

INPUTS		INPUT
Motor HP		10
Load Factor		0.8
CFM - HTG		6300
CFM - CLG		0
% OA		100.00%
% Area		26.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	85.80%	85.80%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	1,200
Heating HRSON	2,240	1,920
C/H HRSON	3,650	3,129
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	37.50	37.50
HOAOHC	18.70	18.70
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	0.00E+00	0.00E+00
NSC	2.30E+04	2.30E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 2074
System Type 2
System Name: H&V UNIT
System Number: HV2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	1,307.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	100.0	
Sub Total	**0.0**	**1,307.0**	**100.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**1,307.0**	**100.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2074**
Building Sq.Ft.: 16,704

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	2
System Name:	H&V UNIT
System Number:	HV3

Typical Building Information

Category	Construction	Use	Occ.	Day
3	BRICK	MNT HANGAR AVUM-HAN	0600-2200	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

INPUTS		INPUT
Motor HP		12.5
Load Factor		0.8
CFM - HTG		9000
CFM - CLG		0
% OA		14.56%
% Area		37.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	85.80%	85.80%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	1,200
Heating HRSON	2,240	1,920
C/H HRSON	3,650	3,129
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	37.50	37.50
HOAOHC	18.70	18.70
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	0.00E+00	0.00E+00
NSC	2.30E+04	2.30E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 2074
System Type 2
System Name: H&V UNIT
System Number: HV3

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	1,633.7	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	142.3	
Sub Total	**0.0**	**1,633.7**	**142.3**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**1,633.7**	**142.3**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2074**
Building Sq.Ft.: 16,179

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**HV4**

Typical Building Information

Category	Construction	Use	Occ.	Day
28	BRICK	MNT HANGAR AVUM - OP	0600-1800	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		7.5
Load Factor		0.8
CFM - HTG		9750
CFM - CLG		0
% OA		100.00%
% Area		31.80%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	83.10%	83.10%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	123.59	123.59
HOAOHC	61.63	61.63
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.14E+03	5.14E+03
NSC	2.70E+04	2.70E+04
FV	1	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 2074
System Type 2
System Name: H&V UNIT
System Number: HV4

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	27,509.1	0.0	
Optimum ST/SP	0.0	1,012.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	138.8	
Sub Total	**0.0**	**28,521.2**	**138.8**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	26.4	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**28,521.2**	**165.2**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2074**
Building Sq.Ft.: 16,179

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**HV5**

Typical Building Information

Category	Construction	Use	Occ.	Day
28	BRICK	MNT HANGAR AVUM - OP	0600-1800	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		3
Load Factor		0.8
CFM - HTG		1300
CFM - CLG		0
% OA		100.00%
% Area		42.40%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	79.00%	79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	123.59	123.59
HOAOHC	61.63	61.63
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.14E+03	5.14E+03
NSC	2.70E+04	2.70E+04
FV	1	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 2074
System Type 2
System Name: H&V UNIT
System Number: HV5

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	11,574.7	0.0	
Optimum ST/SP	0.0	425.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	185.0	
Sub Total	**0.0**	**12,000.6**	**185.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	35.3	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**12,000.6**	**220.3**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2074**
Building Sq.Ft.: 16,179

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**HV6**

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

Typical Building Information

Category	Construction	Use	Occ.	Day
28	BRICK	MNT HANGAR AVUM - OP	0600-1800	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		5
Load Factor		0.8
CFM - HTG		8200
CFM - CLG		0
% OA		100.00%
% Area		26.80%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	123.59	123.59
HOAOHC	61.63	61.63
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.14E+03	5.14E+03
NSC	2.70E+04	2.70E+04
FV	1	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 2074
System Type 2
System Name: H&V UNIT
System Number: HV6

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	18,676.5	0.0	
Optimum ST/SP	0.0	687.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	117.0	
Sub Total	**0.0**	**19,363.7**	**117.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	22.3	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**19,363.7**	**139.2**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2074**
Building Sq.Ft.: 16,179

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**HV7**

Typical Building Information

Category	Construction	Use	Occ.	Day
28	BRICK	MNT HANGAR AVUM - OP	0600-1800	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		5
Load Factor		0.8
CFM - HTG		7100
CFM - CLG		0
% OA		100.00%
% Area		23.20%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	123.59	123.59
HOAOHC	61.63	61.63
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.14E+03	5.14E+03
NSC	2.70E+04	2.70E+04
FV	1	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 2074
System Type 2
System Name: H&V UNIT
System Number: HV7

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	18,676.5	0.0	
Optimum ST/SP	0.0	687.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	101.2	
Sub Total	**0.0**	**19,363.7**	**101.2**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	19.3	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**19,363.7**	**120.5**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2074**
Building Sq.Ft.: 16,179

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**10**
System Name:	**HOT WATER BOILER AND PUMPS**
System Number:	**B1**

Typical Building Information

Category	Construction	Use	Occ.	Day
28	BRICK	MNT HANGAR AVUM - OP	0600-1800	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		4.8
kW/Ton		0
MOSON		7
EFF		0.8
LOOK-UP VALUE		
EFFHP	0.00%	0.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	123.59	123.59
HOAOHC	61.63	61.63
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.14E+03	5.14E+03
NSC	2.70E+04	2.70E+04
FV	0	1
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 2074
System Type 10
System Name: HOT WATER BOILER AND PUMPS
System Number: B1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	44.4	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**44.4**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2074**
Building Sq.Ft.: 16,179

System Type	**10**
System Name:	**HOT WATER BOILER AND PUMPS**
System Number:	**B2**

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

Typical Building Information

Category	Construction	Use	Occ.	Day
28	BRICK	MNT HANGAR AVUM - OP	0600-1800	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		4.8
kW/Ton		0
MOSON		7
EFF		0.8
LOOK-UP VALUE		
EFFHP	0.00%	0.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	123.59	123.59
HOAOHC	61.63	61.63
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.14E+03	5.14E+03
NSC	2.70E+04	2.70E+04
FV	0	1
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 2074
System Type 10
System Name: HOT WATER BOILER AND PUMPS
System Number: B2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	44.4	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**44.4**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2074**

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

Building Sq.Ft.:	**15,836**
System Type	**12**
System Name:	**BASEBOARD RADIATION**
System Number:	**FTR-1**

Typical Building Information

Category	Construction	Use	Occ.	Day
28	BRICK	MNT HANGAR AVUM - OP	0600-1800	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	1200	1800	1800	1800	1800	1800	1200

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		14.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,560	3,360
Heating HRSON	4,096	5,376
C/H HRSON	6,674	8,760
Cooling HRSAV	800	
Heating HRSAV	1,280	
C/H HRSAV	2,086	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	123.59	123.59
HOAOHC	61.63	61.63
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.14E+03	5.14E+03
NSC	2.70E+04	2.70E+04
FV	1	1
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 2074
System Type 12
System Name: BASEBOARD RADIATION
System Number: FTR-1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	13,209.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	59.8	
Sub Total	**0.0**	**15,149.4**	**59.8**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	11.4	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**15,149.4**	**71.2**	**3**

ENERGY CALCULATIONS

BUILDING 2792

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2792**
Building Sq.Ft.: 7,424

EMC NO.: 1406-006
DATE: 07-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**HV1**

Typical Building Information

Category	Construction	Use	Occ.	Day
2	BRICK	MOTOR REPAIR SHOP	0600-1730	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	600	600	600	600	600	600	600
Stop Time	1800	1800	1800	1800	1800	1800	1800

INPUTS		INPUT
Motor HP		1.5
Load Factor		0.8
CFM - HTG		2500
CFM - CLG		5000
% OA		24.90%
% Area		64.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	69.20%	69.20%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	1,680
Heating HRSON	2,240	2,688
C/H HRSON	3,650	4,380
Cooling HRSAV	280	
Heating HRSAV	448	
C/H HRSAV	730	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	198.24	198.24
HOAOHC	121.66	121.66
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.04E+03	2.04E+03
NSC	5.85E+04	5.85E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 07-Apr-95

Bldg Number: 2792
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: HV1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	943.9	0.0	
Optimum ST/SP	0.0	243.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	277.9	
Sub Total	**0.0**	**1,186.9**	**277.9**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	9.7	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**1,186.9**	**287.6**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 2792**
Building Sq.Ft.: 7,424

System Type	**10**
System Name:	**HOT WATER BOILER AND PUMPS**
System Number:	**B1**

Typical Building Information

Category	Construction	Use	Occ.	Day
2	BRICK	MOTOR REPAIR SHOP	0600-1730	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.576
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	0.00%	0.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	198.24	198.24
HOAOHC	121.66	121.66
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.04E+03	2.04E+03
NSC	5.85E+04	5.85E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 07-Apr-95

Bldg Number: 2792
System Type 10
System Name: HOT WATER BOILER AND PUMPS
System Number: B1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	4.3	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**4.3**	**3**

ENERGY CALCULATIONS

BUILDING 4230

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4230**
Building Sq.Ft.: 10,220

EMC NO.: 1406-006
DATE: 04-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**7**
System Name:	**VAV AHU**
System Number:	**AH-2**

Typical Building Information

Category	Construction	Use	Occ.	Day
7	BRICK	MINI MALL WITH GAS	0000-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		6.5
Load Factor		0.8
CFM - HTG		3620
CFM - CLG		3620
% OA		35.00%
% Area		25.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	1.02E-04	1.02E-04
ECHC	3.91E-05	3.91E-05
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	7.05E-05	7.05E-05
DDCCC	1.84E-04	1.84E-04
DSC	2.26E+04	2.26E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 04-Apr-95

Bldg Number: 4230
System Type 7
System Name: VAV AHU
System Number: AH-2

HEATING AND COOLING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	25,270.5	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**25,270.5**	**0.0**	
Economizer	0.0	486.8	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	2,289.0	57.8	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				6
TOTAL	**0.0**	**28,046.3**	**57.8**	**6**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4230**
Building Sq.Ft.: 10,220

EMC NO.: 1406-006
DATE: 04-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**11**
System Name:	**CONDENSING UNIT**
System Number:	**ACCU-1**

Typical Building Information

Category	Construction	Use	Occ.	Day
7	BRICK	MINI MALL WITH GAS	0000-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		20
MBTU CAPC.		0
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	0.00%	0.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	1.02E-04	1.02E-04
ECHC	3.91E-05	3.91E-05
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	7.05E-05	7.05E-05
DDCCC	1.84E-04	1.84E-04
DSC	2.26E+04	2.26E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 04-Apr-95

Bldg Number: 4230
System Type 11
System Name: CONDENSING UNIT
System Number: ACCU-1

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	191.4	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**191.4**	**0.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4230**
Building Sq.Ft.: 10,220

EMC NO.: 1406-006
DATE: 04-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**11**
System Name:	**CONDENSING UNIT**
System Number:	**ACCU-2**

Typical Building Information

Category	Construction	Use	Occ.	Day
7	BRICK	MINI MALL WITH GAS	0000-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		10
MBTU CAPC.		0
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	0.00%	0.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	1.02E-04	1.02E-04
ECHC	3.91E-05	3.91E-05
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	7.05E-05	7.05E-05
DDCCC	1.84E-04	1.84E-04
DSC	2.26E+04	2.26E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 04-Apr-95

Bldg Number: 4230
System Type 11
System Name: CONDENSING UNIT
System Number: ACCU-2

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	95.7	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**95.7**	**0.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4230**
Building Sq.Ft.: 10,220

EMC NO.: 1406-006
DATE: 04-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**10**
System Name:	**HOT WATER BOILER AND PUMPS**
System Number:	**B-1**

Typical Building Information

Category	Construction	Use	Occ.	Day
7	BRICK	MINI MALL WITH GAS	0000-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.75
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		100.00%
TON CAPC.		0
MBTU CAPC.		0.94
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	1.02E-04	1.02E-04
ECHC	3.91E-05	3.91E-05
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	7.05E-05	7.05E-05
DDCCC	1.84E-04	1.84E-04
DSC	2.26E+04	2.26E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 04-Apr-95

Bldg Number: 4230
System Type 10
System Name: HOT WATER BOILER AND PUMPS
System Number: B-1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	2,246.4	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**2,246.4**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	231.3	
HW OA Reset	0.0	0.0	7.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**2,246.4**	**238.2**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4230**
Building Sq.Ft.: 10,220

EMC NO.: 1406-006
DATE: 04-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**10**
System Name:	**HOT WATER BOILER AND PUMPS**
System Number:	**B-2**

Typical Building Information

Category	Construction	Use	Occ.	Day
7	BRICK	MINI MALL WITH GAS	0000-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.75
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		100.00%
TON CAPC.		0
MBTU CAPC.		0.94
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	1.02E-04	1.02E-04
ECHC	3.91E-05	3.91E-05
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	7.05E-05	7.05E-05
DDCCC	1.84E-04	1.84E-04
DSC	2.26E+04	2.26E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 04-Apr-95

Bldg Number: 4230
System Type 10
System Name: HOT WATER BOILER AND PUMPS
System Number: B-2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	2,246.4	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**2,246.4**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	231.3	
HW OA Reset	0.0	0.0	7.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**2,246.4**	**238.2**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4230**
Building Sq.Ft.: 10,220

EMC NO.: 1406-006
DATE: 04-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**7**
System Name:	**VAV AHU**
System Number:	**AH-1**

Typical Building Information

Category	Construction	Use	Occ.	Day
7	BRICK	MINI MALL WITH GAS	0000-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		5
Load Factor		0.8
CFM - HTG		5755
CFM - CLG		5755
% OA		14.00%
% Area		75.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	1.02E-04	1.02E-04
ECHC	3.91E-05	3.91E-05
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	7.05E-05	7.05E-05
DDCCC	1.84E-04	1.84E-04
DSC	2.26E+04	2.26E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 04-Apr-95

Bldg Number: 4230
System Type 7
System Name: VAV AHU
System Number: AH-1

HEATING AND COOLING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	19,438.9	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**19,438.9**	**0.0**	
Economizer	0.0	773.8	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	3,639.0	173.5	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				6
TOTAL	**0.0**	**23,851.7**	**173.5**	**6**

ENERGY CALCULATIONS

BUILDING 4305

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM BLDG: 4305
Building Sq.Ft.: 32,157

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	10
System Name:	HOT WATER BOILER AND PUMPS
System Number:	B1

Typical Building Information

Category	Construction	Use	Occ.	Day
8	BRICK	PHYS FIT CENTER	0645-2000	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		1.632
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	126.26	126.26
HOAOHC	77.49	77.49
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	9.76E+03	9.76E+03
NSC	5.41E+04	5.41E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 4305
System Type 10
System Name: HOT WATER BOILER AND PUMPS
System Number: B1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	12.1	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**12.1**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4305**
Building Sq.Ft.: 32,157

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**10**
System Name:	**HOT WATER BOILER AND PUMPS**
System Number:	**B2**

Typical Building Information

Category	Construction	Use	Occ.	Day
8	BRICK	PHYS FIT CENTER	0645-2000	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	0
Stop Time	0	2000	2000	2000	2000	2000	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		3.264
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,500	3,360
Heating HRSON	2,400	5,376
C/H HRSON	3,911	8,760
Cooling HRSAV	1,860	
Heating HRSAV	2,976	
C/H HRSAV	4,849	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	126.26	126.26
HOAOHC	77.49	77.49
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	9.76E+03	9.76E+03
NSC	5.41E+04	5.41E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 4305
System Type 10
System Name: HOT WATER BOILER AND PUMPS
System Number: B2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,551.6	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**4,839.1**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	24.2	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**4,839.1**	**24.2**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4305**
Building Sq.Ft.: 32,157

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**12**
System Name:	**BASEBOARD RADIATION**
System Number:	**FTR-1**

Typical Building Information

Category	Construction	Use	Occ.	Day
8	BRICK	PHYS FIT CENTER	0645-2000	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	0
Stop Time	0	2000	2000	2000	2000	2000	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		1.60%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	0.00%	0.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,500	3,360
Heating HRSON	2,400	5,376
C/H HRSON	3,911	8,760
Cooling HRSAV	1,860	
Heating HRSAV	2,976	
C/H HRSAV	4,849	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	126.26	126.26
HOAOHC	77.49	77.49
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	9.76E+03	9.76E+03
NSC	5.41E+04	5.41E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 4305
System Type 12
System Name: BASEBOARD RADIATION
System Number: FTR-1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	27.8	
Sub Total	**0.0**	**0.0**	**27.8**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	5.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**32.8**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4305**
Building Sq.Ft.: 32,157

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**HV-1**

Typical Building Information

Category	Construction	Use	Occ.	Day
8	BRICK	PHYS FIT CENTER	0645-2000	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	0
Stop Time	0	2000	2000	2000	2000	2000	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		65
Load Factor		0.8
CFM - HTG		38230
CFM - CLG		0
% OA		15.20%
% Area		87.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	91.70%	91.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,500	3,360
Heating HRSON	2,400	5,376
C/H HRSON	3,911	8,760
Cooling HRSAV	1,860	
Heating HRSAV	2,976	
C/H HRSAV	4,849	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	126.26	126.26
HOAOHC	77.49	77.49
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	9.76E+03	9.76E+03
NSC	5.41E+04	5.41E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: **4305**
System Type **2**
System Name: **H&V UNIT**
System Number: **HV-1**

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	205,030.1	0.0	
Optimum ST/SP	0.0	7,948.7	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	1,513.0	
Sub Total	**0.0**	**212,978.9**	**1,513.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	273.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**212,978.9**	**1,786.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM BLDG: 4305
Building Sq.Ft.: 32,157

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	2
System Name:	H&V UNIT
System Number:	HV2A

Typical Building Information

Category	Construction	Use	Occ.	Day
8	BRICK	PHYS FIT CENTER	0645-2000	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		17.5
Load Factor		0.8
CFM - HTG		13780
CFM - CLG		0
% OA		8.71%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	126.26	126.26
HOAOHC	77.49	77.49
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	9.76E+03	9.76E+03
NSC	5.41E+04	5.41E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 4305
System Type 2
System Name: H&V UNIT
System Number: HV2A

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**0.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM BLDG: 4305
Building Sq.Ft.: 32,157

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	2
System Name:	H&V UNIT
System Number:	HV2B

Typical Building Information

Category	Construction	Use	Occ.	Day
8	BRICK	PHYS FIT CENTER	0645-2000	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		6
Load Factor		0.8
CFM - HTG		10840
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	126.26	126.26
HOAOHC	77.49	77.49
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	9.76E+03	9.76E+03
NSC	5.41E+04	5.41E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 4305
System Type 2
System Name: H&V UNIT
System Number: HV2B

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**0.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4305**
Building Sq.Ft.: 32,157

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**HV3**

Typical Building Information

Category	Construction	Use	Occ.	Day
8	BRICK	PHYS FIT CENTER	0645-2000	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	0
Stop Time	0	2000	2000	2000	2000	2000	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		6.5
Load Factor		0.8
CFM - HTG		5120
CFM - CLG		0
% OA		26.37%
% Area		7.40%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,500	3,360
Heating HRSON	2,400	5,376
C/H HRSON	3,911	8,760
Cooling HRSAV	1,860	
Heating HRSAV	2,976	
C/H HRSAV	4,849	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	126.26	126.26
HOAOHC	77.49	77.49
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	9.76E+03	9.76E+03
NSC	5.41E+04	5.41E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 4305
System Type 2
System Name: H&V UNIT
System Number: HV3

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	23,040.8	0.0	
Optimum ST/SP	0.0	893.3	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	128.7	
Sub Total	**0.0**	**23,934.0**	**128.7**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	23.2	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**23,934.0**	**151.9**	**3**

ENERGY CALCULATIONS

BUILDING 4325

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4325**
Building Sq.Ft.: 21,720

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**12**
System Name:	**BASEBOARD RADIATION**
System Number:	**HX-1**

Typical Building Information

Category	Construction	Use	Occ.	Day
22	BRICK	CHILD SUPPORT CENTER	0700-1900	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	0
Stop Time	600	1900	1900	1900	1900	1900	600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		26.00%
TON CAPC.		0
MBTU CAPC.		2.155
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,720	3,360
Heating HRSON	2,752	5,376
C/H HRSON	4,484	8,760
Cooling HRSAV	1,640	
Heating HRSAV	2,624	
C/H HRSAV	4,276	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	91.77	91.77
HOAOHC	56.32	56.32
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.55E+04	2.55E+04
NSC	9.79E+04	9.79E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 4325
System Type 12
System Name: BASEBOARD RADIATION
System Number: HX-1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,013.2	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	552.8	
Sub Total	**0.0**	**4,300.8**	**552.8**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	143.9	
HW OA Reset	0.0	0.0	15.9	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**4,300.8**	**712.7**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4325**
Building Sq.Ft.: 21,720

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**HV-1**

Typical Building Information

Category	Construction	Use	Occ.	Day
22	BRICK	CHILD SUPPORT CENTER	0700-1900	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	0
Stop Time	0	1900	1900	1900	1900	1900	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		3445
CFM - CLG		0
% OA		25.30%
% Area		24.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	91.77	91.77
HOAOHC	56.32	56.32
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.55E+04	2.55E+04
NSC	9.79E+04	9.79E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 4325
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: HV-1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	7,815.4	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	552.1	
Sub Total	**0.0**	**8,103.0**	**552.1**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	143.7	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**8,103.0**	**695.8**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4325**
Building Sq.Ft.: 21,720

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**HV-2**

Typical Building Information

Category	Construction	Use	Occ.	Day
22	BRICK	CHILD SUPPORT CENTER	0700-1900	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	0
Stop Time	0	1900	1900	1900	1900	1900	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		1.5
Load Factor		0.8
CFM - HTG		2400
CFM - CLG		0
% OA		100.00%
% Area		16.80%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	69.20%	69.20%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	91.77	91.77
HOAOHC	56.32	56.32
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.55E+04	2.55E+04
NSC	9.79E+04	9.79E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 4325
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: HV-2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	6,607.0	0.0	
Optimum ST/SP	0.0	243.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	386.5	
Sub Total	**0.0**	**6,850.0**	**386.5**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	100.6	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**6,850.0**	**487.1**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4325**
Building Sq.Ft.: 21,720

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**HV-3**

Typical Building Information

Category	Construction	Use	Occ.	Day
22	BRICK	CHILD SUPPORT CENTER	0700-1900	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	0
Stop Time	0	1900	1900	1900	1900	1900	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		1.5
Load Factor		0.8
CFM - HTG		2359
CFM - CLG		0
% OA		25.30%
% Area		16.50%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	69.20%	69.20%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	91.77	91.77
HOAOHC	56.32	56.32
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.55E+04	2.55E+04
NSC	9.79E+04	9.79E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 4325
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: HV-3

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	6,607.0	0.0	
Optimum ST/SP	0.0	243.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	379.6	
Sub Total	**0.0**	**6,850.0**	**379.6**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	98.8	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**6,850.0**	**478.4**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4325**
Building Sq.Ft.: 21,720

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**HV-4**

Typical Building Information

Category	Construction	Use	Occ.	Day
22	BRICK	CHILD SUPPORT CENTER	0700-1900	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	0
Stop Time	0	1900	1900	1900	1900	1900	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		1.5
Load Factor		0.8
CFM - HTG		2359
CFM - CLG		0
% OA		25.30%
% Area		16.50%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	69.20%	69.20%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	91.77	91.77
HOAOHC	56.32	56.32
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.55E+04	2.55E+04
NSC	9.79E+04	9.79E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 4325
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: HV-4

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	6,607.0	0.0	
Optimum ST/SP	0.0	243.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	379.6	
Sub Total	**0.0**	**6,850.0**	**379.6**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	98.8	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**6,850.0**	**478.4**	**3**

ENERGY CALCULATIONS

BUILDING 4330

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4330**
Building Sq.Ft.: 12,968

EMC NO.: 1406-006
DATE: 03-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**3**
System Name:	**SINGLE ZONE AHU WITHOUT RETURN FAN**
System Number:	**AHU1**

Typical Building Information

Category	Construction	Use	Occ.	Day
23	BRICK	CHAPEL/REL ED/CHILD C	0600-1800	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	700	700	700	700	700	700	700
Stop Time	1700	2100	2100	2100	2100	2100	1700

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		30
Load Factor		0.8
CFM - HTG		19145
CFM - CLG		0
% OA		10.00%
% Area		82.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	90.20%	90.20%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,080	3,360
Heating HRSON	3,328	5,376
C/H HRSON	5,423	8,760
Cooling HRSAV	1,280	
Heating HRSAV	2,048	
C/H HRSAV	3,337	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	231.05	231.05
HOAOHC	115.21	115.21
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	9.94E+03	9.94E+03
NSC	5.70E+03	5.70E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 03-Apr-95

Bldg Number: 4330
System Type 3
System Name: SINGLE ZONE AHU WITHOUT RETURN FAN
System Number: AHU1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	40,629.4	0.0	
Optimum ST/SP	0.0	3,729.7	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	60.6	
Sub Total	**0.0**	**44,359.1**	**60.6**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	105.7	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**44,359.1**	**166.2**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4330**
Building Sq.Ft.: 12,968

EMC NO.: 1406-006
DATE: 03-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**10**
System Name:	**HOT WATER BOILER AND PUMPS**
System Number:	**B1**

Typical Building Information

Category	Construction	Use	Occ.	Day
23	BRICK	CHAPEL/REL ED/CHILD C	0600-1800	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	700	700	700	700	700	700	700
Stop Time	1700	2100	2100	2100	2100	2100	1700

Present Operations	S	M	T	W	TH	F	S
Start Time		0	0	0	0	0	0
Stop Time		2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		4
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		18.00%
TON CAPC.		0
MBTU CAPC.		0.95
kW/Ton		0
MOSON		7
EFF		0.82
LOOK-UP VALUE		
EFFHP	79.00%	79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,080	2,880
Heating HRSON	3,328	4,608
C/H HRSON	5,423	7,509
Cooling HRSAV	800	
Heating HRSAV	1,280	
C/H HRSAV	2,086	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	231.05	231.05
HOAOHC	115.21	115.21
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	9.94E+03	9.94E+03
NSC	5.70E+03	5.70E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 03-Apr-95

Bldg Number: 4330
System Type 10
System Name: HOT WATER BOILER AND PUMPS
System Number: B1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	3,865.8	0.0	
Optimum ST/SP	0.0	567.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	13.3	
Sub Total	**0.0**	**4,433.6**	**13.3**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	23.2	
HW OA Reset	0.0	0.0	8.6	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**4,433.6**	**45.1**	**3**

ENERGY CALCULATIONS

BUILDING 4350

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4350**
Building Sq.Ft.: 13,310

EMC NO.: 1406-006
DATE: 07-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	1
System Name:	H&V UNIT WITHOUT RETURN FAN
System Number:	AHU1

Typical Building Information

Category	Construction	Use	Occ.	Day
16	BRICK	ENK PERS DINNING	0400-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	400	400	400	400	400	400	400
Stop Time	2000	2000	2000	2000	2000	2000	2000

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		7.5
Load Factor		0.8
CFM - HTG		8000
CFM - CLG		0
% OA		100.00%
% Area		17.60%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	83.10%	83.10%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,520	3,360
Heating HRSON	4,032	5,376
C/H HRSON	6,570	8,760
Cooling HRSAV	840	
Heating HRSAV	1,344	
C/H HRSAV	2,190	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	39.67	39.67
HOAOHC	24.34	24.34
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	3.39E+04	3.39E+04
NSC	9.39E+04	9.39E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 07-Apr-95

Bldg Number: 4350
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	11,789.6	0.0	
Optimum ST/SP	0.0	1,012.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	220.0	
Sub Total	**0.0**	**12,801.7**	**220.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	79.5	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**12,801.7**	**299.5**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4350**
Building Sq.Ft.: 13,310

EMC NO.: 1406-006
DATE: 07-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**AHU2**

Typical Building Information

Category	Construction	Use	Occ.	Day
16	BRICK	ENK PERS DINNING	0400-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	400	400	400	400	400	400	400
Stop Time	2000	2000	2000	2000	2000	2000	2000

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		8
Load Factor		0.8
CFM - HTG		5265
CFM - CLG		0
% OA		25.30%
% Area		17.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	83.10%	83.10%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,520	3,360
Heating HRSON	4,032	5,376
C/H HRSON	6,570	8,760
Cooling HRSAV	840	
Heating HRSAV	1,344	
C/H HRSAV	2,190	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	39.67	39.67
HOAOHC	24.34	24.34
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	3.39E+04	3.39E+04
NSC	9.39E+04	9.39E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 07-Apr-95

Bldg Number: 4350
System Type 2
System Name: H&V UNIT
System Number: AHU2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	12,575.6	0.0	
Optimum ST/SP	0.0	1,079.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	212.5	
Sub Total	**0.0**	**13,655.2**	**212.5**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	76.8	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**13,655.2**	**289.3**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4350**
Building Sq.Ft.: 13,310

EMC NO.: 1406-006
DATE: 07-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**AHU3**

Typical Building Information

Category	Construction	Use	Occ.	Day
16	BRICK	ENK PERS DINNING	0400-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	400	400	400	400	400	400	400
Stop Time	2000	2000	2000	2000	2000	2000	2000

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		10
Load Factor		0.8
CFM - HTG		4670
CFM - CLG		0
% OA		100.00%
% Area		15.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	85.80%	85.80%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,520	3,360
Heating HRSON	4,032	5,376
C/H HRSON	6,570	8,760
Cooling HRSAV	840	
Heating HRSAV	1,344	
C/H HRSAV	2,190	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	39.67	39.67
HOAOHC	24.34	24.34
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	3.39E+04	3.39E+04
NSC	9.39E+04	9.39E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 07-Apr-95

Bldg Number: 4350
System Type 2
System Name: H&V UNIT
System Number: AHU3

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	15,224.8	0.0	
Optimum ST/SP	0.0	1,307.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	187.5	
Sub Total	**0.0**	**16,531.8**	**187.5**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	67.7	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**16,531.8**	**255.2**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4350**
Building Sq.Ft.: 13,310

EMC NO.: 1406-006
DATE: 07-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**AHU4**

Typical Building Information

Category	Construction	Use	Occ.	Day
16	BRICK	ENK PERS DINNING	0400-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	400	400	400	400	400	400	400
Stop Time	2000	2000	2000	2000	2000	2000	2000

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		7430
CFM - CLG		0
% OA		5.00%
% Area		24.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,520	3,360
Heating HRSON	4,032	5,376
C/H HRSON	6,570	8,760
Cooling HRSAV	840	
Heating HRSAV	1,344	
C/H HRSAV	2,190	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	39.67	39.67
HOAOHC	24.34	24.34
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	3.39E+04	3.39E+04
NSC	9.39E+04	9.39E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 07-Apr-95

Bldg Number: 4350
System Type 2
System Name: H&V UNIT
System Number: AHU4

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	22,600.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	300.0	
Sub Total	**0.0**	**24,540.3**	**300.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	108.4	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**24,540.3**	**408.4**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4350**
Building Sq.Ft.: 13,310

EMC NO.: 1406-006
DATE: 07-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**AHU5**

Typical Building Information

Category	Construction	Use	Occ.	Day
16	BRICK	ENK PERS DINNING	0400-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	400	400	400	400	400	400	400
Stop Time	2000	2000	2000	2000	2000	2000	2000

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		6
Load Factor		0.8
CFM - HTG		3145
CFM - CLG		0
% OA		5.00%
% Area		10.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,520	3,360
Heating HRSON	4,032	5,376
C/H HRSON	6,570	8,760
Cooling HRSAV	840	
Heating HRSAV	1,344	
C/H HRSAV	2,190	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	39.67	39.67
HOAOHC	24.34	24.34
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	3.39E+04	3.39E+04
NSC	9.39E+04	9.39E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 07-Apr-95

Bldg Number: 4350
System Type 2
System Name: H&V UNIT
System Number: AHU5

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	9,605.1	0.0	
Optimum ST/SP	0.0	824.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	125.0	
Sub Total	**0.0**	**10,429.6**	**125.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	45.2	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**10,429.6**	**170.2**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4350**
Building Sq.Ft.: 13,310

EMC NO.: 1406-006
DATE: 07-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU6**

Typical Building Information

Category	Construction	Use	Occ.	Day
16	BRICK	ENK PERS DINNING	0400-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	400	400	400	400	400	400	400
Stop Time	2000	2000	2000	2000	2000	2000	2000

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		4
Load Factor		0.8
CFM - HTG		600
CFM - CLG		0
% OA		0.00%
% Area		1.60%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	79.00%	79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,520	3,360
Heating HRSON	4,032	5,376
C/H HRSON	6,570	8,760
Cooling HRSAV	840	
Heating HRSAV	1,344	
C/H HRSAV	2,190	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	39.67	39.67
HOAOHC	24.34	24.34
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	3.39E+04	3.39E+04
NSC	9.39E+04	9.39E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 07-Apr-95

Bldg Number: 4350
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU6

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	6,614.1	0.0	
Optimum ST/SP	0.0	567.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	20.0	
Sub Total	**0.0**	**7,181.9**	**20.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	7.2	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**7,181.9**	**27.2**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4350**
Building Sq.Ft.: 13,310

System Type	**9**
System Name:	**CONVERTER AND PUMPS**
System Number:	**HE1**

EMC NO.: 1406-006
DATE: 07-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

Typical Building Information

Category	Construction	Use	Occ.	Day
16	BRICK	ENK PERS DINNING	0400-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	400	400	400	400	400	400	400
Stop Time	2000	2000	2000	2000	2000	2000	2000

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		7.40%
TON CAPC.		0
MBTU CAPC.		1.5064
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,520	3,360
Heating HRSON	4,032	5,376
C/H HRSON	6,570	8,760
Cooling HRSAV	840	
Heating HRSAV	1,344	
C/H HRSAV	2,190	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	39.67	39.67
HOAOHC	24.34	24.34
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	3.39E+04	3.39E+04
NSC	9.39E+04	9.39E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 07-Apr-95

Bldg Number: 4350
System Type 9
System Name: CONVERTER AND PUMPS
System Number: HE1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	2,055.6	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	92.5	
Sub Total	**0.0**	**2,343.1**	**92.5**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	33.4	
HW OA Reset	0.0	0.0	11.1	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**2,343.1**	**137.1**	**3**

ENERGY CALCULATIONS

BUILDING 4400

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG:** **4400**
Building Sq.Ft.: **13,712**

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU1**

Typical Building Information

Category	Construction	Use	Occ.	Day
17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		1230
CFM - CLG		0
% OA		100.00%
% Area		21.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 4400
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	8,214.2	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	179.9	
Sub Total	**0.0**	**8,501.7**	**179.9**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	13.9	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**8,501.7**	**193.8**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG:** **4400**
Building Sq.Ft.: **13,712**

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU-2**

Typical Building Information

Category	Construction	Use	Occ.	Day
17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		1
Load Factor		0.8
CFM - HTG		210
CFM - CLG		0
% OA		100.00%
% Area		4.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	69.20%	69.20%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 4400
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU-2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,629.4	0.0	
Optimum ST/SP	0.0	162.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	34.3	
Sub Total	**0.0**	**4,791.4**	**34.3**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	2.7	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**4,791.4**	**36.9**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG:** **4400**
Building Sq.Ft.: **13,712**

EMC NO.: 1406-006
DATE: 04-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**9**
System Name:	**CONVERTER AND PUMPS**
System Number:	**HE1**

Typical Building Information

Category	Construction	Use	Occ.	Day
17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.2602
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 04-Apr-95

Bldg Number: 4400
System Type 9
System Name: CONVERTER AND PUMPS
System Number: HE1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	5,041.0	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**5,328.6**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	1.9	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**5,328.6**	**1.9**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG:** **4400**
Building Sq.Ft.: **13,712**

EMC NO.: 1406-006
DATE: 04-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**12**
System Name:	**BASEBOARD RADIATION**
System Number:	**HE2**

Typical Building Information

Category	Construction	Use	Occ.	Day
17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.75
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		75.00%
TON CAPC.		0
MBTU CAPC.		0.1117
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 04-Apr-95

Bldg Number: 4400
System Type 12
System Name: BASEBOARD RADIATION
System Number: HE2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	2,268.5	0.0	
Optimum ST/SP	0.0	129.4	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	642.4	
Sub Total	**0.0**	**2,397.8**	**642.4**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	49.8	
HW OA Reset	0.0	0.0	0.8	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**2,397.8**	**693.0**	**3**

ENERGY CALCULATIONS

BUILDING 4405

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4405**
Building Sq.Ft.: 2,372

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**AHU1**

Typical Building Information

Category	Construction	Use	Occ.	Day
24	BRICK	CHAPEL ZONE	0800-1400	SUN

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	800	0	900	0	900	0	0
Stop Time	1300	0	1200	0	1200	0	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		17.5
Load Factor		0.8
CFM - HTG		3216
CFM - CLG		0
% OA		48.78%
% Area		58.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	340	3,360
Heating HRSON	544	5,376
C/H HRSON	886	8,760
Cooling HRSAV	3,020	
Heating HRSAV	4,832	
C/H HRSAV	7,874	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	372.76	372.76
HOAOHC	185.87	185.87
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	7.01E+03	7.01E+03
NSC	2.51E+05	2.51E+05
FV	147	147
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 4405
System Type 2
System Name: H&V UNIT
System Number: AHU1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	94,795.3	0.0	
Optimum ST/SP	0.0	2,263.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	345.9	
Sub Total	**0.0**	**97,058.7**	**345.9**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	22.1	
DDC Control	0.0	0.0	9.6	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**97,058.7**	**377.7**	**3**

E M C ENGINEERS, INC.

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM BLDG: 4405
Building Sq.Ft.: 7,048

System Type	2
System Name:	H&V UNIT
System Number:	AHU2

Typical Building Information

Category	Construction	Use	Occ.	Day
25	BRICK	CHAPEL OFFICE ZONE	0600-1700	SUN-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	600	600	600	600	600	600	0
Stop Time	1300	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		2900
CFM - CLG		0
% OA		31.03%
% Area		77.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,480	3,360
Heating HRSON	2,368	5,376
C/H HRSON	3,859	8,760
Cooling HRSAV	1,880	
Heating HRSAV	3,008	
C/H HRSAV	4,901	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	347.79	347.79
HOAOHC	173.42	173.42
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.26E+04	1.26E+04
NSC	3.30E+04	3.30E+04
FV	52	52
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 4405
System Type 2
System Name: H&V UNIT
System Number: AHU2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	50,581.4	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	178.9	
Sub Total	**0.0**	**52,521.5**	**178.9**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	9.0	
DDC Control	0.0	0.0	68.4	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**52,521.5**	**256.3**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM BLDG: 4405
Building Sq.Ft.: 7,048

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	10
System Name:	HOT WATER BOILER AND PUMPS
System Number:	HE1

Typical Building Information

Category	Construction	Use	Occ.	Day
25	BRICK	CHAPEL OFFICE ZONE	0600-1700	SUN-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	1300	1800	1800	1800	1800	1800	1200

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.505
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	0.00%	0.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,580	3,360
Heating HRSON	4,128	5,376
C/H HRSON	6,726	8,760
Cooling HRSAV	780	
Heating HRSAV	1,248	
C/H HRSAV	2,034	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	347.79	347.79
HOAOHC	173.42	173.42
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.26E+04	1.26E+04
NSC	3.30E+04	3.30E+04
FV	52	52
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 4405
System Type 10
System Name: HOT WATER BOILER AND PUMPS
System Number: HE1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	3.7	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**3.7**	**3**

E M C ENGINEERS, INC.

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM BLDG: 4405
Building Sq.Ft.: 7,048

System Type	12
System Name:	BASEBOARD RADIATION
System Number:	FTR-1

Typical Building Information

Category	Construction	Use	Occ.	Day
25	BRICK	CHAPEL OFFICE ZONE	0600-1700	SUN-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	600	600	600	600	600	600	0
Stop Time	1300	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		28.50%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,480	3,360
Heating HRSON	2,368	5,376
C/H HRSON	3,859	8,760
Cooling HRSAV	1,880	
Heating HRSAV	3,008	
C/H HRSAV	4,901	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	347.79	347.79
HOAOHC	173.42	173.42
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.26E+04	1.26E+04
NSC	3.30E+04	3.30E+04
FV	52	52
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: **4405**
System Type **12**
System Name: **BASEBOARD RADIATION**
System Number: **FTR-1**

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,600.5	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	66.2	
Sub Total	**0.0**	**4,888.1**	**66.2**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	25.3	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**4,888.1**	**91.5**	**3**

ENERGY CALCULATIONS

BUILDING 4410

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG:** **4410**
Building Sq.Ft.: **12,838**

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU1**

Typical Building Information

Category	Construction	Use	Occ.	Day
17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		1230
CFM - CLG		0
% OA		100.00%
% Area		21.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 4410
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	8,214.2	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	168.4	
Sub Total	**0.0**	**8,501.7**	**168.4**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	13.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**8,501.7**	**181.5**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG:** **4410**
Building Sq.Ft.: **12,838**

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU-2**

Typical Building Information

Category	Construction	Use	Occ.	Day
17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		1
Load Factor		0.8
CFM - HTG		210
CFM - CLG		0
% OA		100.00%
% Area		4.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	69.20%	69.20%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 4410
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU-2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,629.4	0.0	
Optimum ST/SP	0.0	162.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	32.1	
Sub Total	**0.0**	**4,791.4**	**32.1**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	2.5	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**4,791.4**	**34.6**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG:** **4410**
Building Sq.Ft.: **12,838**

EMC NO.: 1406-006
DATE: 04-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**9**
System Name:	**CONVERTER AND PUMPS**
System Number:	**HE1**

Typical Building Information

Category	Construction	Use	Occ.	Day
17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.2602
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 04-Apr-95

Bldg Number: 4410
System Type 9
System Name: CONVERTER AND PUMPS
System Number: HE1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	5,041.0	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**5,328.6**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	1.9	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**5,328.6**	**1.9**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG:** **4410**
Building Sq.Ft.: **12,838**

EMC NO.: 1406-006
DATE: 04-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**12**
System Name:	**BASEBOARD RADIATION**
System Number:	**HE2**

Typical Building Information

Category	Construction	Use	Occ.	Day
17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.75
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		75.00%
TON CAPC.		0
MBTU CAPC.		0.1117
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 04-Apr-95

Bldg Number: 4410
System Type 12
System Name: BASEBOARD RADIATION
System Number: HE2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	2,268.5	0.0	
Optimum ST/SP	0.0	129.4	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	601.4	
Sub Total	**0.0**	**2,397.8**	**601.4**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	46.6	
HW OA Reset	0.0	0.0	0.8	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**2,397.8**	**648.9**	**3**

ENERGY CALCULATIONS

BUILDING 4412

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4,412**
Building Sq.Ft.: 51,280

EMC NO.: 1406-006
DATE: 01-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**9**
System Name:	**CONVERTER AND PUMPS**
System Number:	**HE-1**

Typical Building Information

Category	Construction	Use	Occ.	Day
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.5123
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 01-Apr-95

Bldg Number: 4,412
System Type 9
System Name: CONVERTER AND PUMPS
System Number: HE-1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**287.5**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	3.8	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**287.5**	**3.8**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4,412**
Building Sq.Ft.: 51,280

EMC NO.: 1406-006
DATE: 01-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**12**
System Name:	**BASEBOARD RADIATION**
System Number:	**HE-2**

Typical Building Information

Category	Construction	Use	Occ.	Day
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.75
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.9801
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 01-Apr-95

Bldg Number: 4,412
System Type 12
System Name: BASEBOARD RADIATION
System Number: HE-2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	7.3	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**7.3**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4412**
Building Sq.Ft.: 17,435

EMC NO.: 1406-006
DATE: 01-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	14
System Name:	VENTILATION
System Number:	AHU1

Typical Building Information

Category	Construction	Use	Occ.	Day
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		3
Load Factor		0.8
CFM - HTG		0
CFM - CLG		4779
% OA		100.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	79.00%	79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 01-Apr-95

Bldg Number: 4412
System Type 14
System Name: VENTILATION
System Number: AHU1

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,666.1	0.0	
Optimum ST/SP	0.0	425.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**5,092.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**5,092.0**	**0.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4412**
Building Sq.Ft.: 17,435

EMC NO.: 1406-006
DATE: 01-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	14
System Name:	VENTILATION
System Number:	AHU2

Typical Building Information

Category	Construction	Use	Occ.	Day
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		3
Load Factor		0.8
CFM - HTG		0
CFM - CLG		4566
% OA		100.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	79.00%	79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 01-Apr-95

Bldg Number: 4412
System Type 14
System Name: VENTILATION
System Number: AHU2

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,666.1	0.0	
Optimum ST/SP	0.0	425.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**5,092.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**5,092.0**	**0.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4412**
Building Sq.Ft.: 17,435

EMC NO.: 1406-006
DATE: 12-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**14**
System Name:	**VENTILATION**
System Number:	**AHU-3**

Typical Building Information

Category	Construction	Use	Occ.	Day
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		3
Load Factor		0.8
CFM - HTG		4566
CFM - CLG		0
% OA		100.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	79.00%	79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 12-Apr-95

Bldg Number: 4412
System Type 14
System Name: VENTILATION
System Number: AHU-3

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,666.1	0.0	
Optimum ST/SP	0.0	425.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**5,092.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				0
TOTAL	**0.0**	**5,092.0**	**0.0**	**0**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4412**
Building Sq.Ft.: 17,435

System Type	**14**
System Name:	**VENTILATION**
System Number:	**AHU-4**

EMC NO.: 1406-006
DATE: 12-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

Typical Building Information

Category	Construction	Use	Occ.	Day
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		3
Load Factor		0.8
CFM - HTG		4779
CFM - CLG		0
% OA		100.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	79.00%	79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 12-Apr-95

Bldg Number: 4412
System Type 14
System Name: VENTILATION
System Number: AHU-4

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,666.1	0.0	
Optimum ST/SP	0.0	425.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**5,092.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				0
TOTAL	**0.0**	**5,092.0**	**0.0**	**0**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4412**
Building Sq.Ft.: 17,435

EMC NO.: 1406-006
DATE: 02-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU6**

Typical Building Information

Category	Construction	Use	Occ.	Day
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		750
CFM - CLG		0
% OA		100.00%
% Area		12.75%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 02-Apr-95

Bldg Number: 4412
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU6

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	108.1	
Sub Total	**0.0**	**1,683.3**	**108.1**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	13.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**1,683.3**	**121.1**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4412**
Building Sq.Ft.: 17,435

EMC NO.: 1406-006
DATE: 02-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU7**

Typical Building Information

Category	Construction	Use	Occ.	Day
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		750
CFM - CLG		0
% OA		100.00%
% Area		12.75%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 02-Apr-95

Bldg Number: 4412
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU7

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	108.1	
Sub Total	**0.0**	**1,683.3**	**108.1**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	13.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**1,683.3**	**121.1**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4412**
Building Sq.Ft.: 17,435

EMC NO.: 1406-006
DATE: 02-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU8**

Typical Building Information

Category	Construction	Use	Occ.	Day
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		750
CFM - CLG		0
% OA		100.00%
% Area		12.75%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 02-Apr-95

Bldg Number: 4412
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU8

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	108.1	
Sub Total	**0.0**	**1,683.3**	**108.1**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	13.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**1,683.3**	**121.1**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4412**
Building Sq.Ft.: 17,435

EMC NO.: 1406-006
DATE: 02-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU9**

Typical Building Information

Category	Construction	Use	Occ.	Day
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		750
CFM - CLG		0
% OA		100.00%
% Area		12.75%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 02-Apr-95

Bldg Number: 4412
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU9

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	108.1	
Sub Total	**0.0**	**1,683.3**	**108.1**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	13.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**1,683.3**	**121.1**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4412**
Building Sq.Ft.: 33,845

EMC NO.: 1406-006
DATE: 02-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU10**

Typical Building Information

Category	Construction	Use	Occ.	Day
15	BRICK	ADM & SUPPLY, ENL BRK	0000-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.5
Load Factor		0.8
CFM - HTG		1860
CFM - CLG		0
% OA		100.00%
% Area		19.30%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.40E+04	1.40E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 02-Apr-95

Bldg Number: 4412
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU10

HEATING AND VENTILATING SYSTEM	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	79.2	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**79.2**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4412**
Building Sq.Ft.: 33,845

EMC NO.: 1406-006
DATE: 02-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU11**

Typical Building Information

Category	Construction	Use	Occ.	Day
15	BRICK	ADM & SUPPLY, ENL BRK	0000-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		1350
CFM - CLG		0
% OA		100.00%
% Area		19.30%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.40E+04	1.40E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 02-Apr-95

Bldg Number: 4412
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU11

HEATING AND VENTILATING SYSTEM	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	79.2	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**79.2**	**3**

ENERGY CALCULATIONS

BUILDING 4414

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4,414**
Building Sq.Ft.: 35,198

EMC NO.: 1406-006
DATE: 01-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**9**
System Name:	**CONVERTER AND PUMPS**
System Number:	**HE-1**

Typical Building Information

Category	Construction	Use	Occ.	Day
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.3875
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 01-Apr-95

Bldg Number: 4,414
System Type 9
System Name: CONVERTER AND PUMPS
System Number: HE-1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**287.5**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	2.9	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**287.5**	**2.9**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4,414**
Building Sq.Ft.: 35,198

EMC NO.: 1406-006
DATE: 01-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**12**
System Name:	**BASEBOARD RADIATION**
System Number:	**HE-2**

Typical Building Information

Category	Construction	Use	Occ.	Day
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.75
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.6683
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 01-Apr-95

Bldg Number: 4,414
System Type 12
System Name: BASEBOARD RADIATION
System Number: HE-2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	4.9	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**4.9**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4414**
Building Sq.Ft.: 8,800

EMC NO.: 1406-006
DATE: 02-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU1**

Typical Building Information

Category	Construction	Use	Occ.	Day
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		770
CFM - CLG		0
% OA		100.00%
% Area		17.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 02-Apr-95

Bldg Number: 4414
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	72.8	
Sub Total	**0.0**	**1,683.3**	**72.8**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	8.7	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**1,683.3**	**81.5**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4414**
Building Sq.Ft.: 8,800

EMC NO.: 1406-006
DATE: 02-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU2**

Typical Building Information

Category	Construction	Use	Occ.	Day
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		770
CFM - CLG		0
% OA		100.00%
% Area		17.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 02-Apr-95

Bldg Number: 4414
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	72.8	
Sub Total	**0.0**	**1,683.3**	**72.8**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	8.7	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**1,683.3**	**81.5**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4414**
Building Sq.Ft.: 8,800

EMC NO.: 1406-006
DATE: 02-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU4**

Typical Building Information

Category	Construction	Use	Occ.	Day
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		770
CFM - CLG		0
% OA		100.00%
% Area		17.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 02-Apr-95

Bldg Number: 4414
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU4

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	72.8	
Sub Total	**0.0**	**1,683.3**	**72.8**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	8.7	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**1,683.3**	**81.5**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4414**
Building Sq.Ft.: 26,399

EMC NO.: 1406-006
DATE: 01-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU5**

Typical Building Information

Category	Construction	Use	Occ.	Day
15	BRICK	ADM & SUPPLY, ENL BRK	0000-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		1300
CFM - CLG		0
% OA		100.00%
% Area		16.70%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.40E+04	1.40E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 02-Apr-95

Bldg Number: 4414
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU5

HEATING AND VENTILATING SYSTEM	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	62.9	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**62.9**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4414**
Building Sq.Ft.: 26,399

EMC NO.: 1406-006
DATE: 01-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU6**

Typical Building Information

Category	Construction	Use	Occ.	Day
15	BRICK	ADM & SUPPLY, ENL BRK	0000-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		1060
CFM - CLG		0
% OA		100.00%
% Area		16.70%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.40E+04	1.40E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 02-Apr-95

Bldg Number: 4414
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU6

HEATING AND VENTILATING SYSTEM	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	62.9	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**62.9**	**3**

ENERGY CALCULATIONS

BUILDING 4420

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4420**
Building Sq.Ft.: 13,007

EMC NO.: 1406-006
DATE: 09-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU1**

Typical Building Information

Category	Construction	Use	Occ.	Day
17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		1230
CFM - CLG		0
% OA		100.00%
% Area		21.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 09-Apr-95

Bldg Number: 4420
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	8,214.2	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	170.6	
Sub Total	**0.0**	**8,501.7**	**170.6**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	13.2	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**8,501.7**	**183.8**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG:** **4420**
Building Sq.Ft.: **13,007**

EMC NO.: 1406-006
DATE: 09-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU2**

Typical Building Information

Category	Construction	Use	Occ.	Day
17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		1
Load Factor		0.8
CFM - HTG		210
CFM - CLG		0
% OA		100.00%
% Area		4.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	69.20%	69.20%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 09-Apr-95

Bldg Number: 4420
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,629.4	0.0	
Optimum ST/SP	0.0	162.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	32.5	
Sub Total	**0.0**	**4,791.4**	**32.5**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	2.5	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**4,791.4**	**35.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG:** **4420**
Building Sq.Ft.: **13,007**

EMC NO.: 1406-006
DATE: 04-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**9**
System Name:	**CONVERTER AND PUMPS**
System Number:	**HE1**

Typical Building Information

Category	Construction	Use	Occ.	Day
17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.2602
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 04-Apr-95

Bldg Number: 4420
System Type 9
System Name: CONVERTER AND PUMPS
System Number: HE1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	5,041.0	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**5,328.6**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	1.9	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**5,328.6**	**1.9**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4420**
Building Sq.Ft.: 13,007

EMC NO.: 1406-006
DATE: 04-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**12**
System Name:	**BASEBOARD RADIATION**
System Number:	**HE2**

Typical Building Information

Category	Construction	Use	Occ.	Day
17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.75
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		75.00%
TON CAPC.		0
MBTU CAPC.		0.1117
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 04-Apr-95

Bldg Number: 4420
System Type 12
System Name: BASEBOARD RADIATION
System Number: HE2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	2,268.5	0.0	
Optimum ST/SP	0.0	129.4	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	609.4	
Sub Total	**0.0**	**2,397.8**	**609.4**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	47.2	
HW OA Reset	0.0	0.0	0.8	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**2,397.8**	**657.4**	**3**

ENERGY CALCULATIONS

BUILDING 4422

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4422**
Building Sq.Ft.: 34,190

EMC NO.: 1406-006
DATE: 07-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**9**
System Name:	**CONVERTER AND PUMPS**
System Number:	**HE1**

Typical Building Information

Category	Construction	Use	Occ.	Day
15	BRICK	ADM & SUPPLY, ENL BRK	0000-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	1.5
Load Factor	0.8
CFM - HTG	0
CFM - CLG	0
% OA	0.00%
% Area	0.00%
TON CAPC.	0
MBTU CAPC.	0.283
kW/Ton	0
MOSON	7
EFF	1
LOOK-UP VALUE	
EFFHP 69.20%	69.20%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.40E+04	1.40E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 07-Apr-95

Bldg Number: 4422
System Type 9
System Name: CONVERTER AND PUMPS
System Number: HE1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	2.1	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**2.1**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4422**
Building Sq.Ft.: 34,190

EMC NO.: 1406-006
DATE: 07-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**HV2**

Typical Building Information

Category	Construction	Use	Occ.	Day
15	BRICK	ADM & SUPPLY, ENL BRK	0000-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		1060
CFM - CLG		0
% OA		100.00%
% Area		16.70%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.40E+04	1.40E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 07-Apr-95

Bldg Number: 4422
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: HV2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	80.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**80.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4422**
Building Sq.Ft.: 34,190

EMC NO.: 1406-006
DATE: 07-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**HV1**

Typical Building Information

Category	Construction	Use	Occ.	Day
15	BRICK	ADM & SUPPLY, ENL BRK	0000-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		1300
CFM - CLG		0
% OA		100.00%
% Area		16.70%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.40E+04	1.40E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 07-Apr-95

Bldg Number: 4422
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: HV1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	80.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**80.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4422**
Building Sq.Ft.: 34,190

EMC NO.: 1406-006
DATE: 07-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**12**
System Name:	**BASEBOARD RADIATION**
System Number:	**FTR-1**

Typical Building Information

Category	Construction	Use	Occ.	Day
15	BRICK	ADM & SUPPLY, ENL BRK	0000-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		54.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.40E+04	1.40E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 07-Apr-95

Bldg Number: 4422
System Type 12
System Name: BASEBOARD RADIATION
System Number: FTR-1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	258.8	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**258.8**	**3**

ENERGY CALCULATIONS

BUILDING 4430

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG:** **4430**
Building Sq.Ft.: **12,451**

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU1**

Typical Building Information

Category	Construction	Use	Occ.	Day
17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		1230
CFM - CLG		0
% OA		100.00%
% Area		21.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 09-Apr-95

Bldg Number: 4430
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	8,214.2	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	163.3	
Sub Total	**0.0**	**8,501.7**	**163.3**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	12.7	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**8,501.7**	**176.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG:** **4430**
Building Sq.Ft.: **12,451**

EMC NO.: 1406-006
DATE: 09-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU2**

Typical Building Information

Category	Construction	Use	Occ.	Day
17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		1
Load Factor		0.8
CFM - HTG		210
CFM - CLG		0
% OA		100.00%
% Area		4.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	69.20%	69.20%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 09-Apr-95

Bldg Number: 4430
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,629.4	0.0	
Optimum ST/SP	0.0	162.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	31.1	
Sub Total	**0.0**	**4,791.4**	**31.1**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	2.4	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**4,791.4**	**33.5**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG:** **4430**
Building Sq.Ft.: **12,451**

EMC NO.: 1406-006
DATE: 04-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**9**
System Name:	**CONVERTER AND PUMPS**
System Number:	**HE1**

Typical Building Information

Category	Construction	Use	Occ.	Day
17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.2602
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 04-Apr-95

Bldg Number: 4430
System Type 9
System Name: CONVERTER AND PUMPS
System Number: HE1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	5,041.0	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**5,328.6**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	1.9	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**5,328.6**	**1.9**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG:** **4430**
Building Sq.Ft.: **12,451**

EMC NO.: 1406-006
DATE: 04-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**12**
System Name:	**BASEBOARD RADIATION**
System Number:	**HE2**

Typical Building Information

Category	Construction	Use	Occ.	Day
17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.75
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		75.00%
TON CAPC.		0
MBTU CAPC.		0.1117
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 04-Apr-95

Bldg Number: 4430
System Type 12
System Name: BASEBOARD RADIATION
System Number: HE2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	2,268.5	0.0	
Optimum ST/SP	0.0	129.4	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	583.3	
Sub Total	**0.0**	**2,397.8**	**583.3**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	45.2	
HW OA Reset	0.0	0.0	0.8	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**2,397.8**	**629.4**	**3**

ENERGY CALCULATIONS

BUILDING 4432

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4432**
Building Sq.Ft.: 35,294

EMC NO.: 1406-006
DATE: 07-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**9**
System Name:	**CONVERTER AND PUMPS**
System Number:	**HE1**

Typical Building Information

Category	Construction	Use	Occ.	Day
15	BRICK	ADM & SUPPLY, ENL BRK	0000-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		1.5
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.283
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	69.20%	69.20%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.40E+04	1.40E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 07-Apr-95

Bldg Number: 4432
System Type 9
System Name: CONVERTER AND PUMPS
System Number: HE1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	2.1	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**2.1**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4432**
Building Sq.Ft.: 35,294

EMC NO.: 1406-006
DATE: 07-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**12**
System Name:	**BASEBOARD RADIATION**
System Number:	**FTR-1**

Typical Building Information

Category	Construction	Use	Occ.	Day
15	BRICK	ADM & SUPPLY, ENL BRK	0000-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		54.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.40E+04	1.40E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 07-Apr-95

Bldg Number: 4432
System Type 12
System Name: BASEBOARD RADIATION
System Number: FTR-1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	267.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**267.1**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4432**
Building Sq.Ft.: 35,294

EMC NO.: 1406-006
DATE: 07-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**HV1**

Typical Building Information

Category	Construction	Use	Occ.	Day
15	BRICK	ADM & SUPPLY, ENL BRK	0000-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		1300
CFM - CLG		0
% OA		100.00%
% Area		16.70%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.40E+04	1.40E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 07-Apr-95

Bldg Number: 4432
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: HV1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	82.6	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**82.6**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4432**
Building Sq.Ft.: 35,294

EMC NO.: 1406-006
DATE: 07-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**HV2**

Typical Building Information

Category	Construction	Use	Occ.	Day
15	BRICK	ADM & SUPPLY, ENL BRK	0000-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		1060
CFM - CLG		0
% OA		100.00%
% Area		16.70%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.40E+04	1.40E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 07-Apr-95

Bldg Number: 4432
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: HV2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	82.6	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**82.6**	**3**

ENERGY CALCULATIONS

BUILDING 4450

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG:** **4450**
Building Sq.Ft.: **12,730**

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU1**

Typical Building Information

Category	Construction	Use	Occ.	Day
16	BRICK	ENK PERS DINNING	0400-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	400	400	400	400	400	400	400
Stop Time	2000	2000	2000	2000	2000	2000	2000

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		7.5
Load Factor		0.8
CFM - HTG		8000
CFM - CLG		0
% OA		100.00%
% Area		17.60%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	83.10%	83.10%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,520	3,360
Heating HRSON	4,032	5,376
C/H HRSON	6,570	8,760
Cooling HRSAV	840	
Heating HRSAV	1,344	
C/H HRSAV	2,190	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	39.67	39.67
HOAOHC	24.34	24.34
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	3.39E+04	3.39E+04
NSC	9.39E+04	9.39E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 4450
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	11,789.6	0.0	
Optimum ST/SP	0.0	1,012.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	174.4	
Sub Total	**0.0**	**12,801.7**	**174.4**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	63.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**12,801.7**	**237.4**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4450**
Building Sq.Ft.: 12,730

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**AHU2**

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

Typical Building Information

Category	Construction	Use	Occ.	Day
16	BRICK	ENK PERS DINNING	0400-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	400	400	400	400	400	400	400
Stop Time	1930	1930	1930	1930	1930	1930	1930

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		8
Load Factor		0.8
CFM - HTG		5265
CFM - CLG		0
% OA		25.00%
% Area		17.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	83.10%	83.10%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,422	3,360
Heating HRSON	3,875	5,376
C/H HRSON	6,314	8,760
Cooling HRSAV	938	
Heating HRSAV	1,501	
C/H HRSAV	2,445	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	39.67	39.67
HOAOHC	24.34	24.34
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	3.39E+04	3.39E+04
NSC	9.39E+04	9.39E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 4450
System Type 2
System Name: H&V UNIT
System Number: AHU2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	14,042.8	0.0	
Optimum ST/SP	0.0	1,079.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	203.2	
Sub Total	**0.0**	**15,122.3**	**203.2**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	73.4	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**15,122.3**	**276.7**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4450**
Building Sq.Ft.: 12,730

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**AHU3**

Typical Building Information

Category	Construction	Use	Occ.	Day
16	BRICK	ENK PERS DINNING	0400-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	400	400	400	400	400	400	400
Stop Time	1930	1930	1930	1930	1930	1930	1930

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		10
Load Factor		0.8
CFM - HTG		4670
CFM - CLG		0
% OA		100.00%
% Area		15.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	85.80%	85.80%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,422	3,360
Heating HRSON	3,875	5,376
C/H HRSON	6,314	8,760
Cooling HRSAV	938	
Heating HRSAV	1,501	
C/H HRSAV	2,445	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	39.67	39.67
HOAOHC	24.34	24.34
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	3.39E+04	3.39E+04
NSC	9.39E+04	9.39E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 4450
System Type 2
System Name: H&V UNIT
System Number: AHU3

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	17,001.1	0.0	
Optimum ST/SP	0.0	1,307.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	179.3	
Sub Total	**0.0**	**18,308.0**	**179.3**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	64.8	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**18,308.0**	**244.1**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4450**
Building Sq.Ft.: 12,730

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**AHU4**

Typical Building Information

Category	Construction	Use	Occ.	Day
16	BRICK	ENK PERS DINNING	0400-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	400	400	400	400	400	400	400
Stop Time	1930	1930	1930	1930	1930	1930	1930

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		7430
CFM - CLG		0
% OA		5.00%
% Area		24.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,422	3,360
Heating HRSON	3,875	5,376
C/H HRSON	6,314	8,760
Cooling HRSAV	938	
Heating HRSAV	1,501	
C/H HRSAV	2,445	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	39.67	39.67
HOAOHC	24.34	24.34
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	3.39E+04	3.39E+04
NSC	9.39E+04	9.39E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 4450
System Type 2
System Name: H&V UNIT
System Number: AHU4

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	25,236.9	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	286.9	
Sub Total	**0.0**	**27,177.0**	**286.9**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	103.7	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**27,177.0**	**390.6**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4450**
Building Sq.Ft.: 12,730

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**AHU5**

Typical Building Information

Category	Construction	Use	Occ.	Day
16	BRICK	ENK PERS DINNING	0400-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	400	400	400	400	400	400	400
Stop Time	1930	1930	1930	1930	1930	1930	1930

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		6
Load Factor		0.8
CFM - HTG		3145
CFM - CLG		0
% OA		5.00%
% Area		10.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,422	3,360
Heating HRSON	3,875	5,376
C/H HRSON	6,314	8,760
Cooling HRSAV	938	
Heating HRSAV	1,501	
C/H HRSAV	2,445	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	39.67	39.67
HOAOHC	24.34	24.34
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	3.39E+04	3.39E+04
NSC	9.39E+04	9.39E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 4450
System Type 2
System Name: H&V UNIT
System Number: AHU5

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	10,725.7	0.0	
Optimum ST/SP	0.0	824.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	119.5	
Sub Total	**0.0**	**11,550.2**	**119.5**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	43.2	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**11,550.2**	**162.7**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG:** **4450**
Building Sq.Ft.: **12,730**

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU6**

Typical Building Information

Category	Construction	Use	Occ.	Day
16	BRICK	ENK PERS DINNING	0400-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	400	400	400	400	400	400	400
Stop Time	2000	2000	2000	2000	2000	2000	2000

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		4
Load Factor		0.8
CFM - HTG		600
CFM - CLG		0
% OA		0.00%
% Area		1.60%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	79.00%	79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,520	3,360
Heating HRSON	4,032	5,376
C/H HRSON	6,570	8,760
Cooling HRSAV	840	
Heating HRSAV	1,344	
C/H HRSAV	2,190	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	39.67	39.67
HOAOHC	24.34	24.34
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	3.39E+04	3.39E+04
NSC	9.39E+04	9.39E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 4450
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU6

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	6,614.1	0.0	
Optimum ST/SP	0.0	567.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	19.1	
Sub Total	**0.0**	**7,181.9**	**19.1**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	6.9	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**7,181.9**	**26.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG:** **4450**
Building Sq.Ft.: **12,730**

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**9**
System Name:	**CONVERTER AND PUMPS**
System Number:	**HE1**

Typical Building Information

Category	Construction	Use	Occ.	Day
16	BRICK	ENK PERS DINNING	0400-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	400	400	400	400	400	400	400
Stop Time	2000	2000	2000	2000	2000	2000	2000

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		7.40%
TON CAPC.		0
MBTU CAPC.		1.5064
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,520	3,360
Heating HRSON	4,032	5,376
C/H HRSON	6,570	8,760
Cooling HRSAV	840	
Heating HRSAV	1,344	
C/H HRSAV	2,190	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	39.67	39.67
HOAOHC	24.34	24.34
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	3.39E+04	3.39E+04
NSC	9.39E+04	9.39E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 4450
System Type 9
System Name: CONVERTER AND PUMPS
System Number: HE1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	3,349.5	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	88.5	
Sub Total	**0.0**	**3,637.0**	**88.5**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	32.0	
HW OA Reset	0.0	0.0	11.1	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**3,637.0**	**131.6**	**3**

ENERGY CALCULATIONS

BUILDING 4475

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4475**
Building Sq.Ft.: 87,687

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**HV1**

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		22.5
Load Factor		0.8
CFM - HTG		11135
CFM - CLG		0
% OA		18.00%
% Area		10.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	88.10%	88.10%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 4475
System Type 2
System Name: H&V UNIT
System Number: HV1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	81,021.0	0.0	
Optimum ST/SP	0.0	2,863.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	81.2	
Sub Total	**0.0**	**83,884.9**	**81.2**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	20.7	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**83,884.9**	**101.9**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4475**
Building Sq.Ft.: 87,687

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**HV2**

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		27.5
Load Factor		0.8
CFM - HTG		11410
CFM - CLG		0
% OA		18.00%
% Area		10.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	89.40%	89.40%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 4475
System Type 2
System Name: H&V UNIT
System Number: HV2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	97,585.7	0.0	
Optimum ST/SP	0.0	3,449.4	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	81.2	
Sub Total	**0.0**	**101,035.1**	**81.2**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	20.7	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**101,035.1**	**101.9**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4475**
Building Sq.Ft.: 87,687

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**HV3**

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		22.5
Load Factor		0.8
CFM - HTG		6020
CFM - CLG		0
% OA		18.00%
% Area		10.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	88.10%	88.10%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 4475
System Type 2
System Name: H&V UNIT
System Number: HV3

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	81,021.0	0.0	
Optimum ST/SP	0.0	2,863.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	81.2	
Sub Total	**0.0**	**83,884.9**	**81.2**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	20.7	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**83,884.9**	**101.9**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4475**

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

Building Sq.Ft.:	**87,687**
System Type	**2**
System Name:	**H&V UNIT**
System Number:	**HV4**

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		22.5
Load Factor		0.8
CFM - HTG		4090
CFM - CLG		0
% OA		18.00%
% Area		5.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	88.10%	88.10%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 4475
System Type 2
System Name: H&V UNIT
System Number: HV4

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	81,021.0	0.0	
Optimum ST/SP	0.0	2,863.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	40.6	
Sub Total	**0.0**	**83,884.9**	**40.6**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	10.4	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**83,884.9**	**51.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4475**
Building Sq.Ft.: 87,687

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**MAU-1**

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		18150
CFM - CLG		0
% OA		100.00%
% Area		6.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 4475
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: MAU-1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	48.7	
Sub Total	**0.0**	**56,826.3**	**48.7**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	12.4	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**56,826.3**	**61.2**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4475**
Building Sq.Ft.: 87,687

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**MAU-2**

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		9200
CFM - CLG		0
% OA		100.00%
% Area		3.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 4475
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: MAU-2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	24.4	
Sub Total	**0.0**	**56,826.3**	**24.4**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	6.2	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**56,826.3**	**30.6**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4475**
Building Sq.Ft.: 87,687

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**MAU-3**

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		16920
CFM - CLG		0
% OA		100.00%
% Area		6.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 4475
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: MAU-3

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	48.7	
Sub Total	**0.0**	**56,826.3**	**48.7**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	12.4	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**56,826.3**	**61.2**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4475**
Building Sq.Ft.: 87,687

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**MAU-4**

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		2000
CFM - CLG		0
% OA		100.00%
% Area		6.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 4475
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: MAU-4

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	48.7	
Sub Total	**0.0**	**56,826.3**	**48.7**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	12.4	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**56,826.3**	**61.2**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4475**
Building Sq.Ft.: 87,687

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**MAU-5**

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		10000
CFM - CLG		0
% OA		100.00%
% Area		3.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 4475
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: MAU-5

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	24.4	
Sub Total	**0.0**	**56,826.3**	**24.4**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	6.2	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**56,826.3**	**30.6**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4475**
Building Sq.Ft.: 87,687

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**MAU-6**

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		16100
CFM - CLG		0
% OA		100.00%
% Area		5.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 4475
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: MAU-6

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	40.6	
Sub Total	**0.0**	**56,826.3**	**40.6**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	10.4	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**56,826.3**	**51.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4475**
Building Sq.Ft.: 87,687

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**MAU-7**

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		6840
CFM - CLG		0
% OA		100.00%
% Area		2.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 4475
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: MAU-7

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	16.2	
Sub Total	**0.0**	**56,826.3**	**16.2**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	4.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**56,826.3**	**20.4**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4475**
Building Sq.Ft.: 87,687

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**12**
System Name:	**BASEBOARD RADIATION**
System Number:	**HTP1**

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		5
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		24.00%
TON CAPC.		0
MBTU CAPC.		3.587
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 4475
System Type 12
System Name: BASEBOARD RADIATION
System Number: HTP1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	11,929.6	0.0	
Optimum ST/SP	0.0	687.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	194.8	
Sub Total	**0.0**	**12,616.7**	**194.8**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	49.8	
HW OA Reset	0.0	0.0	26.5	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**12,616.7**	**271.1**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4475**
Building Sq.Ft.: 87,687

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**9**
System Name:	**CONVERTER AND PUMPS**
System Number:	**HTP2**

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		5
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		4.62
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 4475
System Type 9
System Name: CONVERTER AND PUMPS
System Number: HTP2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	11,929.6	0.0	
Optimum ST/SP	0.0	687.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**12,616.7**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	34.2	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**12,616.7**	**34.2**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4475**
Building Sq.Ft.: 87,687

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**9**
System Name:	**CONVERTER AND PUMPS**
System Number:	**HTP3**

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		5
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		4.258
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 4475
System Type 9
System Name: CONVERTER AND PUMPS
System Number: HTP3

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	11,929.6	0.0	
Optimum ST/SP	0.0	687.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**12,616.7**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	31.5	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**12,616.7**	**31.5**	**3**

ENERGY CALCULATIONS

BUILDING 4485

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG:** **4485**
Building Sq.Ft.: **37,717**

EMC NO.: 1406-006
DATE: 04-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**HV1**

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		22.5
Load Factor		0.8
CFM - HTG		11135
CFM - CLG		0
% OA		33.00%
% Area		10.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	88.10%	88.10%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 04-Apr-95

Bldg Number: 4485
System Type 2
System Name: H&V UNIT
System Number: HV1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	81,021.0	0.0	
Optimum ST/SP	0.0	2,863.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	34.9	
Sub Total	**0.0**	**83,884.9**	**34.9**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	8.9	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**83,884.9**	**43.8**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4485**
Building Sq.Ft.: 37,717

EMC NO.: 1406-006
DATE: 04-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**HV2**

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		27.5
Load Factor		0.8
CFM - HTG		11410
CFM - CLG		0
% OA		33.00%
% Area		10.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	89.40%	89.40%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 04-Apr-95

Bldg Number: 4485
System Type 2
System Name: H&V UNIT
System Number: HV2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	97,585.7	0.0	
Optimum ST/SP	0.0	3,449.4	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	34.9	
Sub Total	**0.0**	**101,035.1**	**34.9**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	8.9	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**101,035.1**	**43.8**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4485**
Building Sq.Ft.: 37,717

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**HV3**

EMC NO.: 1406-006
DATE: 04-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		22.5
Load Factor		0.8
CFM - HTG		6020
CFM - CLG		0
% OA		33.00%
% Area		10.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	88.10%	88.10%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 04-Apr-95

Bldg Number: 4485
System Type 2
System Name: H&V UNIT
System Number: HV3

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	81,021.0	0.0	
Optimum ST/SP	0.0	2,863.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	34.9	
Sub Total	**0.0**	**83,884.9**	**34.9**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	8.9	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**83,884.9**	**43.8**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4485**
Building Sq.Ft.: 37,717

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**HV4**

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		22.5
Load Factor		0.8
CFM - HTG		4090
CFM - CLG		0
% OA		100.00%
% Area		5.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	88.10%	88.10%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 4485
System Type 2
System Name: H&V UNIT
System Number: HV4

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	81,021.0	0.0	
Optimum ST/SP	0.0	2,863.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	17.5	
Sub Total	**0.0**	**83,884.9**	**17.5**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	4.5	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**83,884.9**	**21.9**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4485**
Building Sq.Ft.: 37,717

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**MAU-1**

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		18150
CFM - CLG		0
% OA		100.00%
% Area		6.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 4485
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: MAU-1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	21.0	
Sub Total	**0.0**	**56,826.3**	**21.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	5.4	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**56,826.3**	**26.3**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG:** **4485**
Building Sq.Ft.: 37,717

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	1
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**MAU-2**

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		9200
CFM - CLG		0
% OA		100.00%
% Area		3.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 4485
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: MAU-2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	10.5	
Sub Total	**0.0**	**56,826.3**	**10.5**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	2.7	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**56,826.3**	**13.2**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4485**
Building Sq.Ft.: 37,717

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	1
System Name:	H&V UNIT WITHOUT RETURN FAN
System Number:	MAU-3

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		16920
CFM - CLG		0
% OA		100.00%
% Area		6.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 4485
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: MAU-3

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	21.0	
Sub Total	**0.0**	**56,826.3**	**21.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	5.4	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**56,826.3**	**26.3**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG:** **4485**
Building Sq.Ft.: **37,717**

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**MAU-4**

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		20000
CFM - CLG		0
% OA		100.00%
% Area		6.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 4485
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: MAU-4

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	21.0	
Sub Total	**0.0**	**56,826.3**	**21.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	5.4	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**56,826.3**	**26.3**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG:** **4485**
Building Sq.Ft.: 37,717

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**MAU-5**

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		10000
CFM - CLG		0
% OA		100.00%
% Area		3.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 4485
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: MAU-5

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	10.5	
Sub Total	**0.0**	**56,826.3**	**10.5**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	2.7	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**56,826.3**	**13.2**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4485**
Building Sq.Ft.: 37,717

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**MAU6**

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		16100
CFM - CLG		0
% OA		100.00%
% Area		5.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 4485
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: MAU6

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	17.5	
Sub Total	**0.0**	**56,826.3**	**17.5**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	4.5	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**56,826.3**	**21.9**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4485**
Building Sq.Ft.: 37,717

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**MAU-7**

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		7.5
Load Factor		0.8
CFM - HTG		16100
CFM - CLG		0
% OA		100.00%
% Area		2.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	83.10%	83.10%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 4485
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: MAU-7

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	28,632.0	0.0	
Optimum ST/SP	0.0	1,012.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	7.0	
Sub Total	**0.0**	**29,644.0**	**7.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	1.8	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**29,644.0**	**8.8**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG:** **4485**
Building Sq.Ft.: 37,717

System Type	12
System Name:	BASEBOARD RADIATION
System Number:	HTP1

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		5
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		24.00%
TON CAPC.		0
MBTU CAPC.		3.587
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 4485
System Type 12
System Name: BASEBOARD RADIATION
System Number: HTP1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	11,929.6	0.0	
Optimum ST/SP	0.0	687.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	83.8	
Sub Total	**0.0**	**12,616.7**	**83.8**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	21.4	
HW OA Reset	0.0	0.0	26.5	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**12,616.7**	**131.8**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG:** **4485**
Building Sq.Ft.: **37,717**

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**9**
System Name:	**CONVERTER AND PUMPS**
System Number:	**HTP2**

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		5
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		4.62
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 4485
System Type 9
System Name: CONVERTER AND PUMPS
System Number: HTP2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	11,929.6	0.0	
Optimum ST/SP	0.0	687.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**12,616.7**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	34.2	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**12,616.7**	**34.2**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG:** **4485**
Building Sq.Ft.: **37,717**

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**9**
System Name:	**CONVERTER AND PUMPS**
System Number:	**HTP2**

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		5
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		4.62
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 4485
System Type 9
System Name: CONVERTER AND PUMPS
System Number: HTP2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	11,929.6	0.0	
Optimum ST/SP	0.0	687.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**12,616.7**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	34.2	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**12,616.7**	**34.2**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG:** **4485**
Building Sq.Ft.: **37,717**

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**9**
System Name:	**CONVERTER AND PUMPS**
System Number:	**HTP3**

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		5
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		4.258
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 4485
System Type 9
System Name: CONVERTER AND PUMPS
System Number: HTP3

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	11,929.6	0.0	
Optimum ST/SP	0.0	687.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**12,616.7**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	31.5	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**12,616.7**	**31.5**	**3**

ENERGY CALCULATIONS

BUILDING 4486

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4486**
Building Sq.Ft.: 27,733

EMC NO.: 1406-006
DATE: 04-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**HV1**

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		22.5
Load Factor		0.8
CFM - HTG		11135
CFM - CLG		0
% OA		33.00%
% Area		10.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	88.10%	88.10%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 04-Apr-95

Bldg Number: 4486
System Type 2
System Name: H&V UNIT
System Number: HV1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	81,021.0	0.0	
Optimum ST/SP	0.0	2,863.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	25.7	
Sub Total	**0.0**	**83,884.9**	**25.7**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	6.6	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**83,884.9**	**32.2**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG:** **4486**

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

Building Sq.Ft.:	**27,723**
System Type	**2**
System Name:	**H&V UNIT**
System Number:	**HV2**

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		27.5
Load Factor		0.8
CFM - HTG		11410
CFM - CLG		0
% OA		20.00%
% Area		10.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	89.40%	89.40%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 4486
System Type 2
System Name: H&V UNIT
System Number: HV2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	97,585.7	0.0	
Optimum ST/SP	0.0	3,449.4	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	25.7	
Sub Total	**0.0**	**101,035.1**	**25.7**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	6.6	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**101,035.1**	**32.2**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4486**
Building Sq.Ft.: 27,733

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**HV3**

EMC NO.: 1406-006
DATE: 04-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		22.5
Load Factor		0.8
CFM - HTG		6020
CFM - CLG		0
% OA		33.00%
% Area		10.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	88.10%	88.10%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 04-Apr-95

Bldg Number: 4486
System Type 2
System Name: H&V UNIT
System Number: HV3

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	81,021.0	0.0	
Optimum ST/SP	0.0	2,863.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	25.7	
Sub Total	**0.0**	**83,884.9**	**25.7**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	6.6	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**83,884.9**	**32.2**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4486**
Building Sq.Ft.: 27,733

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**HV4**

EMC NO.: 1406-006
DATE: 10-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		22.5
Load Factor		0.8
CFM - HTG		4090
CFM - CLG		0
% OA		100.00%
% Area		5.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	88.10%	88.10%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 10-Apr-95

Bldg Number: 4486
System Type 2
System Name: H&V UNIT
System Number: HV4

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	81,021.0	0.0	
Optimum ST/SP	0.0	2,863.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	12.8	
Sub Total	**0.0**	**83,884.9**	**12.8**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	3.3	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**83,884.9**	**16.1**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG:** **4486**
Building Sq.Ft.: **27,733**

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**MAU-1**

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		18150
CFM - CLG		0
% OA		100.00%
% Area		6.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 4486
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: MAU-1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	15.4	
Sub Total	**0.0**	**56,826.3**	**15.4**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	3.9	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**56,826.3**	**19.3**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG:** **4486**
Building Sq.Ft.: **27,733**

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**MAU-2**

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		9200
CFM - CLG		0
% OA		100.00%
% Area		3.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 4486
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: MAU-2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	7.7	
Sub Total	**0.0**	**56,826.3**	**7.7**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	2.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**56,826.3**	**9.7**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4486**
Building Sq.Ft.: 27,733

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**MAU-3**

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		16920
CFM - CLG		0
% OA		100.00%
% Area		6.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 4486
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: MAU-3

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	15.4	
Sub Total	**0.0**	**56,826.3**	**15.4**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	3.9	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**56,826.3**	**19.3**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG:** **4486**
Building Sq.Ft.: **27,733**

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**MAU-4**

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		20000
CFM - CLG		0
% OA		100.00%
% Area		6.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 4486
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: MAU-4

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	15.4	
Sub Total	**0.0**	**56,826.3**	**15.4**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	3.9	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**56,826.3**	**19.3**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG:** **4486**
Building Sq.Ft.: **27,733**

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**MAU-5**

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		10000
CFM - CLG		0
% OA		100.00%
% Area		3.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 4486
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: MAU-5

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	7.7	
Sub Total	**0.0**	**56,826.3**	**7.7**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	2.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**56,826.3**	**9.7**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG:** **4486**
Building Sq.Ft.: **27,733**

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**MAU6**

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		16100
CFM - CLG		0
% OA		100.00%
% Area		5.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 4486
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: MAU6

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	12.8	
Sub Total	**0.0**	**56,826.3**	**12.8**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	3.3	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**56,826.3**	**16.1**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG:** **4486**
Building Sq.Ft.: **27,733**

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**MAU-7**

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		7.5
Load Factor		0.8
CFM - HTG		16100
CFM - CLG		0
% OA		100.00%
% Area		2.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	83.10%	83.10%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 4486
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: MAU-7

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	28,632.0	0.0	
Optimum ST/SP	0.0	1,012.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	5.1	
Sub Total	**0.0**	**29,644.0**	**5.1**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	1.3	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**29,644.0**	**6.4**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG:** **4486**
Building Sq.Ft.: **27,733**

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**12**
System Name:	**BASEBOARD RADIATION**
System Number:	**HTP1**

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		5
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		24.00%
TON CAPC.		0
MBTU CAPC.		3.587
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 4486
System Type 12
System Name: BASEBOARD RADIATION
System Number: HTP1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	11,929.6	0.0	
Optimum ST/SP	0.0	687.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	61.6	
Sub Total	**0.0**	**12,616.7**	**61.6**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	15.7	
HW OA Reset	0.0	0.0	26.5	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**12,616.7**	**103.9**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG:** **4486**
Building Sq.Ft.: **27,733**

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**9**
System Name:	**CONVERTER AND PUMPS**
System Number:	**HTP2**

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		5
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		4.62
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 4486
System Type 9
System Name: CONVERTER AND PUMPS
System Number: HTP2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	11,929.6	0.0	
Optimum ST/SP	0.0	687.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**12,616.7**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	34.2	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**12,616.7**	**34.2**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG:** **4486**
Building Sq.Ft.: **27,733**

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**9**
System Name:	**CONVERTER AND PUMPS**
System Number:	**HTP3**

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		5
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		4.258
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 4486
System Type 9
System Name: CONVERTER AND PUMPS
System Number: HTP3

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	11,929.6	0.0	
Optimum ST/SP	0.0	687.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**12,616.7**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	31.5	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**12,616.7**	**31.5**	**3**

ENERGY CALCULATIONS

BUILDING 4525

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4525**
Building Sq.Ft.: 113,120

EMC NO.: 1406-006
DATE: 17-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**AHU1**

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	0
Stop Time	0	1900	1900	1900	1900	1900	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		5
Load Factor		0.8
CFM - HTG		7475
CFM - CLG		14600
% OA		31.70%
% Area		22.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 17-Apr-95

Bldg Number: 4525
System Type 2
System Name: H&V UNIT
System Number: AHU1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	18,676.5	0.0	
Optimum ST/SP	0.0	687.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	230.4	
Sub Total	**0.0**	**19,363.7**	**230.4**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	58.8	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**19,363.7**	**289.2**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4525**
Building Sq.Ft.: 113,120

EMC NO.: 1406-006
DATE: 17-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**AHU2**

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	0
Stop Time	0	1900	1900	1900	1900	1900	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		4
Load Factor		0.8
CFM - HTG		5000
CFM - CLG		9700
% OA		29.58%
% Area		14.50%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	79.00%	79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 17-Apr-95

Bldg Number: 4525
System Type 2
System Name: H&V UNIT
System Number: AHU2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	15,433.0	0.0	
Optimum ST/SP	0.0	567.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	151.9	
Sub Total	**0.0**	**16,000.8**	**151.9**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	38.8	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**16,000.8**	**190.6**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4525**
Building Sq.Ft.: 113,120

EMC NO.: 1406-006
DATE: 17-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**AHU3**

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	0
Stop Time	0	1900	1900	1900	1900	1900	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		4
Load Factor		0.8
CFM - HTG		3300
CFM - CLG		6600
% OA		7.29%
% Area		3.40%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	79.00%	79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 17-Apr-95

Bldg Number: 4525
System Type 2
System Name: H&V UNIT
System Number: AHU3

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	15,433.0	0.0	
Optimum ST/SP	0.0	567.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	35.6	
Sub Total	**0.0**	**16,000.8**	**35.6**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	9.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**16,000.8**	**44.7**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4525**
Building Sq.Ft.: 113,120

EMC NO.: 1406-006
DATE: 17-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU4**

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	0
Stop Time	0	1900	1900	1900	1900	1900	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		1300
CFM - CLG		2600
% OA		7.23%
% Area		0.67%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 17-Apr-95

Bldg Number: 4525
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU4

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	7,815.4	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	7.0	
Sub Total	**0.0**	**8,103.0**	**7.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	1.8	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**8,103.0**	**8.8**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4525**
Building Sq.Ft.: 113,120

EMC NO.: 1406-006
DATE: 17-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU5**

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	0
Stop Time	0	1900	1900	1900	1900	1900	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		1.5
Load Factor		0.8
CFM - HTG		1000
CFM - CLG		2000
% OA		7.23%
% Area		0.52%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	69.20%	69.20%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 17-Apr-95

Bldg Number: 4525
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU5

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	6,607.0	0.0	
Optimum ST/SP	0.0	243.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	5.4	
Sub Total	**0.0**	**6,850.0**	**5.4**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	1.4	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**6,850.0**	**6.8**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4525**
Building Sq.Ft.: 113,120

EMC NO.: 1406-006
DATE: 17-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU6**

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	0
Stop Time	0	1900	1900	1900	1900	1900	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		1.5
Load Factor		0.8
CFM - HTG		900
CFM - CLG		1800
% OA		7.23%
% Area		0.40%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	69.20%	69.20%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 17-Apr-95

Bldg Number: 4525
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU6

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	6,607.0	0.0	
Optimum ST/SP	0.0	243.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	4.2	
Sub Total	**0.0**	**6,850.0**	**4.2**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	1.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**6,850.0**	**5.3**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4525**
Building Sq.Ft.: 113,120

EMC NO.: 1406-006
DATE: 17-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU7**

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	0
Stop Time	0	1900	1900	1900	1900	1900	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		3
Load Factor		0.8
CFM - HTG		1600
CFM - CLG		3200
% OA		13.30%
% Area		1.35%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	79.00%	79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 17-Apr-95

Bldg Number: 4525
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU7

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	11,574.7	0.0	
Optimum ST/SP	0.0	425.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	14.1	
Sub Total	**0.0**	**12,000.6**	**14.1**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	3.6	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**12,000.6**	**17.7**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4525**
Building Sq.Ft.: 113,120

EMC NO.: 1406-006
DATE: 17-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	1
System Name:	H&V UNIT WITHOUT RETURN FAN
System Number:	MAU1

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	0
Stop Time	0	1900	1900	1900	1900	1900	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		5
Load Factor		0.8
CFM - HTG		2000
CFM - CLG		2000
% OA		100.00%
% Area		5.50%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 17-Apr-95

Bldg Number: 4525
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: MAU1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	18,676.5	0.0	
Optimum ST/SP	0.0	687.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	57.6	
Sub Total	**0.0**	**19,363.7**	**57.6**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	14.7	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**19,363.7**	**72.3**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4525**
Building Sq.Ft.: 113,120

EMC NO.: 1406-006
DATE: 17-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**MAU1**

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	0
Stop Time	0	1900	1900	1900	1900	1900	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.5
Load Factor		0.8
CFM - HTG		1200
CFM - CLG		1200
% OA		100.00%
% Area		3.30%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 17-Apr-95

Bldg Number: 4525
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: MAU1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	2,344.6	0.0	
Optimum ST/SP	0.0	86.3	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	34.6	
Sub Total	**0.0**	**2,430.9**	**34.6**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	8.8	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**2,430.9**	**43.4**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4525**
Building Sq.Ft.: 113,120

EMC NO.: 1406-006
DATE: 17-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**9**
System Name:	**CONVERTER AND PUMPS**
System Number:	**HE1**

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		1.3454
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	0.00%	0.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 17-Apr-95

Bldg Number: 4525
System Type 9
System Name: CONVERTER AND PUMPS
System Number: HE1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	10.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**10.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4525**
Building Sq.Ft.: 113,120

EMC NO.: 1406-006
DATE: 17-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**9**
System Name:	**CONVERTER AND PUMPS**
System Number:	**HE2**

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		1.1966
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	0.00%	0.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 17-Apr-95

Bldg Number: **4525**
System Type **9**
System Name: **CONVERTER AND PUMPS**
System Number: **HE2**

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	8.9	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**8.9**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4525**
Building Sq.Ft.: 113,120

EMC NO.: 1406-006
DATE: 17-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**9**
System Name:	**CONVERTER AND PUMPS**
System Number:	**HE3**

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.905
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	0.00%	0.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 17-Apr-95

Bldg Number: 4525
System Type 9
System Name: CONVERTER AND PUMPS
System Number: HE3

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	6.7	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**6.7**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4525**
Building Sq.Ft.: 113,120

EMC NO.: 1406-006
DATE: 17-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**9**
System Name:	**CONVERTER AND PUMPS**
System Number:	**HE4**

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		1.1335
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	0.00%	0.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 17-Apr-95

Bldg Number: 4525
System Type 9
System Name: CONVERTER AND PUMPS
System Number: HE4

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	8.4	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**8.4**	**3**

ENERGY CALCULATIONS

BUILDING 4530

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4530**
Building Sq.Ft.: 195,670

EMC NO.: 1406-006
DATE: 18-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**4**
System Name:	**SINGLE ZONE AHU**
System Number:	**AC1**

Typical Building Information

Category	Construction	Use	Occ.	Day
9	BRICK	SMA BUILDING	0730-1630	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	700	700	700	700	700	700	700
Stop Time	1700	1700	1700	1700	1700	1700	1700

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		1.5
Load Factor		0.8
CFM - HTG		6000
CFM - CLG		6000
% OA		14.67%
% Area		0.70%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	69.20%	69.20%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,680	3,360
Heating HRSON	2,688	5,376
C/H HRSON	4,380	8,760
Cooling HRSAV	1,680	
Heating HRSAV	2,688	
C/H HRSAV	4,380	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	245.00	245.00
HOAOHC	150.00	150.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.76E+03	5.76E+03
NSC	8.07E+04	8.07E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 18-Apr-95

Bldg Number: 4530
System Type 4
System Name: SINGLE ZONE AHU
System Number: AC1

HEATING AND COOLING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	5,663.1	0.0	
Optimum ST/SP	0.0	243.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	2.6	0.0	0.0	
Night Setback	0.0	0.0	110.5	
Sub Total	**2.6**	**5,906.2**	**110.5**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	7.9	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**2.6**	**5,906.2**	**118.4**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4530**
Building Sq.Ft.: 195,670

EMC NO.: 1406-006
DATE: 18-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**4**
System Name:	**SINGLE ZONE AHU**
System Number:	**AC2**

Typical Building Information

Category	Construction	Use	Occ.	Day
9	BRICK	SMA BUILDING	0730-1630	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	700	700	700	700	700	700	700
Stop Time	1700	1700	1700	1700	1700	1700	1700

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		1.5
Load Factor		0.8
CFM - HTG		6000
CFM - CLG		6000
% OA		100.00%
% Area		2.91%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	69.20%	69.20%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,680	3,360
Heating HRSON	2,688	5,376
C/H HRSON	4,380	8,760
Cooling HRSAV	1,680	
Heating HRSAV	2,688	
C/H HRSAV	4,380	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	245.00	245.00
HOAOHC	150.00	150.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.76E+03	5.76E+03
NSC	8.07E+04	8.07E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 18-Apr-95

Bldg Number: 4530
System Type 4
System Name: SINGLE ZONE AHU
System Number: AC2

HEATING AND COOLING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	5,663.1	0.0	
Optimum ST/SP	0.0	243.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	2.6	0.0	0.0	
Night Setback	0.0	0.0	459.5	
Sub Total	**2.6**	**5,906.2**	**459.5**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	32.8	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**2.6**	**5,906.2**	**492.3**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4530**
Building Sq.Ft.: 195,670

EMC NO.: 1406-006
DATE: 18-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**4**
System Name:	**SINGLE ZONE AHU**
System Number:	**AC3**

Typical Building Information

Category	Construction	Use	Occ.	Day
9	BRICK	SMA BUILDING	0730-1630	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	700	700	700	700	700	700	700
Stop Time	1700	1700	1700	1700	1700	1700	1700

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.5
Load Factor		0.8
CFM - HTG		2500
CFM - CLG		2500
% OA		36.00%
% Area		0.54%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,680	3,360
Heating HRSON	2,688	5,376
C/H HRSON	4,380	8,760
Cooling HRSAV	1,680	
Heating HRSAV	2,688	
C/H HRSAV	4,380	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	245.00	245.00
HOAOHC	150.00	150.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.76E+03	5.76E+03
NSC	8.07E+04	8.07E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 18-Apr-95

Bldg Number: 4530
System Type 4
System Name: SINGLE ZONE AHU
System Number: AC3

HEATING AND COOLING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	2,009.7	0.0	
Optimum ST/SP	0.0	86.3	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.9	0.0	0.0	
Night Setback	0.0	0.0	85.3	
Sub Total	**0.9**	**2,095.9**	**85.3**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	6.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.9**	**2,095.9**	**91.4**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4530**
Building Sq.Ft.: 195,670

EMC NO.: 1406-006
DATE: 18-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**11**
System Name:	**CONDENSING UNIT**
System Number:	**ACC1**

Typical Building Information

Category	Construction	Use	Occ.	Day
9	BRICK	SMA BUILDING	0730-1630	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	700	700	700	700	700	700	700
Stop Time	1700	1700	1700	1700	1700	1700	1700

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		15
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		0.8
LOOK-UP VALUE		
EFFHP	0.00%	0.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,680	3,360
Heating HRSON	2,688	5,376
C/H HRSON	4,380	8,760
Cooling HRSAV	1,680	
Heating HRSAV	2,688	
C/H HRSAV	4,380	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	261.93	261.93
HOAOHC	160.74	160.74
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.19E+03	5.19E+03
NSC	1.59E+05	1.59E+05
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 18-Apr-95

Bldg Number: 4530
System Type 11
System Name: CONDENSING UNIT
System Number: ACC1

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	143.6	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**143.6**	**0.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4530**
Building Sq.Ft.: 195,670

EMC NO.: 1406-006
DATE: 18-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**11**
System Name:	**CONDENSING UNIT**
System Number:	**ACC2**

Typical Building Information

Category	Construction	Use	Occ.	Day
9	BRICK	SMA BUILDING	0730-1630	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	700	700	700	700	700	700	700
Stop Time	1700	1700	1700	1700	1700	1700	1700

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		27.0833
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		0.8
LOOK-UP VALUE		
EFFHP	0.00%	0.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,680	3,360
Heating HRSON	2,688	5,376
C/H HRSON	4,380	8,760
Cooling HRSAV	1,680	
Heating HRSAV	2,688	
C/H HRSAV	4,380	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	261.93	261.93
HOAOHC	160.74	160.74
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.19E+03	5.19E+03
NSC	1.59E+05	1.59E+05
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 18-Apr-95

Bldg Number: 4530
System Type 11
System Name: CONDENSING UNIT
System Number: ACC2

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	259.2	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**259.2**	**0.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4530**
Building Sq.Ft.: 195,670

EMC NO.: 1406-006
DATE: 18-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**11**
System Name:	**CONDENSING UNIT**
System Number:	**ACC3**

Typical Building Information

Category	Construction	Use	Occ.	Day
9	BRICK	SMA BUILDING	0730-1630	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	700	700	700	700	700	700	700
Stop Time	1700	1700	1700	1700	1700	1700	1700

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		6.666667
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		0.8
LOOK-UP VALUE		
EFFHP	0.00%	0.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,680	3,360
Heating HRSON	2,688	5,376
C/H HRSON	4,380	8,760
Cooling HRSAV	1,680	
Heating HRSAV	2,688	
C/H HRSAV	4,380	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	261.93	261.93
HOAOHC	160.74	160.74
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.19E+03	5.19E+03
NSC	1.59E+05	1.59E+05
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 18-Apr-95

Bldg Number: 4530
System Type 11
System Name: CONDENSING UNIT
System Number: ACC3

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	63.8	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**63.8**	**0.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4530**
Building Sq.Ft.: 195,670

EMC NO.: 1406-006
DATE: 18-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**9**
System Name:	**CONVERTER AND PUMPS**
System Number:	**HTP-1**

Typical Building Information

Category	Construction	Use	Occ.	Day
9	BRICK	SMA BUILDING	0730-1630	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	1700	1700	1700	1700	1700	1700	1700

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		75
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		6.00%
TON CAPC.		0
MBTU CAPC.		22.4
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	91.70%	91.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,660	3,360
Heating HRSON	4,256	5,376
C/H HRSON	6,935	8,760
Cooling HRSAV	700	
Heating HRSAV	1,120	
C/H HRSAV	1,825	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	245.00	245.00
HOAOHC	150.00	150.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.76E+03	5.76E+03
NSC	8.07E+04	8.07E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 18-Apr-95

Bldg Number: 4530
System Type 9
System Name: CONVERTER AND PUMPS
System Number: HTP-1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,639.4	0.0	
Optimum ST/SP	0.0	9,171.6	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	947.4	
Sub Total	**0.0**	**63,811.0**	**947.4**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	67.6	
HW OA Reset	0.0	0.0	165.8	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**63,811.0**	**1,180.8**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4530**
Building Sq.Ft.: 195,670

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**HV1**

Typical Building Information

Category	Construction	Use	Occ.	Day
9	BRICK	SMA BUILDING	0730-1630	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	700	700	700	700	700	700	700
Stop Time	1700	1700	1700	1700	1700	1700	1700

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		45
Load Factor		0.8
CFM - HTG		23765
CFM - CLG		47530
% OA		19.40%
% Area		1.64%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	90.60%	90.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,680	3,360
Heating HRSON	2,688	5,376
C/H HRSON	4,380	8,760
Cooling HRSAV	1,680	
Heating HRSAV	2,688	
C/H HRSAV	4,380	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	245.00	245.00
HOAOHC	150.00	150.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.76E+03	5.76E+03
NSC	8.07E+04	8.07E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 18-Apr-95

Bldg Number: 4530
System Type 2
System Name: H&V UNIT
System Number: HV1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	129,764.0	0.0	
Optimum ST/SP	0.0	5,569.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	259.0	
Sub Total	**0.0**	**135,333.8**	**259.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	18.5	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**135,333.8**	**277.4**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4530**
Building Sq.Ft.: 195,670

EMC NO.: 1406-006
DATE: 18-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**HV2**

Typical Building Information

Category	Construction	Use	Occ.	Day
9	BRICK	SMA BUILDING	0730-1630	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	700	700	700	700	700	700	700
Stop Time	1700	1700	1700	1700	1700	1700	1700

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		45
Load Factor		0.8
CFM - HTG		30170
CFM - CLG		59540
% OA		74.60%
% Area		8.03%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	90.60%	90.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,680	3,360
Heating HRSON	2,688	5,376
C/H HRSON	4,380	8,760
Cooling HRSAV	1,680	
Heating HRSAV	2,688	
C/H HRSAV	4,380	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	245.00	245.00
HOAOHC	150.00	150.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.76E+03	5.76E+03
NSC	8.07E+04	8.07E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 18-Apr-95

Bldg Number: 4530
System Type 2
System Name: H&V UNIT
System Number: HV2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	129,764.0	0.0	
Optimum ST/SP	0.0	5,569.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	1,268.0	
Sub Total	**0.0**	**135,333.8**	**1,268.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	90.5	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**135,333.8**	**1,358.5**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4530**
Building Sq.Ft.: 195,670

EMC NO.: 1406-006
DATE: 18-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**HV3**

Typical Building Information

Category	Construction	Use	Occ.	Day
9	BRICK	SMA BUILDING	0730-1630	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	700	700	700	700	700	700	700
Stop Time	1700	1700	1700	1700	1700	1700	1700

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		45
Load Factor		0.8
CFM - HTG		24090
CFM - CLG		48140
% OA		74.60%
% Area		2.91%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	90.60%	90.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,680	3,360
Heating HRSON	2,688	5,376
C/H HRSON	4,380	8,760
Cooling HRSAV	1,680	
Heating HRSAV	2,688	
C/H HRSAV	4,380	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	245.00	245.00
HOAOHC	150.00	150.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.76E+03	5.76E+03
NSC	8.07E+04	8.07E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 18-Apr-95

Bldg Number: 4530
System Type 2
System Name: H&V UNIT
System Number: HV3

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	129,764.0	0.0	
Optimum ST/SP	0.0	5,569.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	459.5	
Sub Total	**0.0**	**135,333.8**	**459.5**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	32.8	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**135,333.8**	**492.3**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4530**
Building Sq.Ft.: 195,670

EMC NO.: 1406-006
DATE: 18-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**MAU1**

Typical Building Information

Category	Construction	Use	Occ.	Day
9	BRICK	SMA BUILDING	0730-1630	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	700	700	700	700	700	700	700
Stop Time	1700	1700	1700	1700	1700	1700	1700

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		40
Load Factor		0.8
CFM - HTG		43380
CFM - CLG		43380
% OA		100.00%
% Area		15.78%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	90.60%	90.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,680	3,360
Heating HRSON	2,688	5,376
C/H HRSON	4,380	8,760
Cooling HRSAV	1,680	
Heating HRSAV	2,688	
C/H HRSAV	4,380	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	245.00	245.00
HOAOHC	150.00	150.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.76E+03	5.76E+03
NSC	8.07E+04	8.07E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 18-Apr-95

Bldg Number: 4530
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: MAU1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	115,345.8	0.0	
Optimum ST/SP	0.0	4,950.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	2,491.8	
Sub Total	**0.0**	**120,296.7**	**2,491.8**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	177.8	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**120,296.7**	**2,669.6**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4530**
Building Sq.Ft.: 195,670

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**MAU2**

Typical Building Information

Category	Construction	Use	Occ.	Day
9	BRICK	SMA BUILDING	0730-1630	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	700	700	700	700	700	700	700
Stop Time	1700	1700	1700	1700	1700	1700	1700

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		40
Load Factor		0.8
CFM - HTG		43380
CFM - CLG		43380
% OA		100.00%
% Area		15.78%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	90.60%	90.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,680	3,360
Heating HRSON	2,688	5,376
C/H HRSON	4,380	8,760
Cooling HRSAV	1,680	
Heating HRSAV	2,688	
C/H HRSAV	4,380	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	245.00	245.00
HOAOHC	150.00	150.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.76E+03	5.76E+03
NSC	8.07E+04	8.07E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 18-Apr-95

Bldg Number: 4530
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: MAU2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	115,345.8	0.0	
Optimum ST/SP	0.0	4,950.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	2,491.8	
Sub Total	**0.0**	**120,296.7**	**2,491.8**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	177.8	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**120,296.7**	**2,669.6**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4530**
Building Sq.Ft.: 195,670

EMC NO.: 1406-006
DATE: 18-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**MAU3**

Typical Building Information

Category	Construction	Use	Occ.	Day
9	BRICK	SMA BUILDING	0730-1630	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	700	700	700	700	700	700	700
Stop Time	1700	1700	1700	1700	1700	1700	1700

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		30
Load Factor		0.8
CFM - HTG		30360
CFM - CLG		30360
% OA		100.00%
% Area		11.08%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	90.20%	90.20%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,680	3,360
Heating HRSON	2,688	5,376
C/H HRSON	4,380	8,760
Cooling HRSAV	1,680	
Heating HRSAV	2,688	
C/H HRSAV	4,380	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	245.00	245.00
HOAOHC	150.00	150.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.76E+03	5.76E+03
NSC	8.07E+04	8.07E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 18-Apr-95

Bldg Number: 4530
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: MAU3

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	86,893.0	0.0	
Optimum ST/SP	0.0	3,729.7	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	1,749.6	
Sub Total	**0.0**	**90,622.6**	**1,749.6**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	124.9	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**90,622.6**	**1,874.5**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4530**
Building Sq.Ft.: 195,670

EMC NO.: 1406-006
DATE: 18-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	1
System Name:	H&V UNIT WITHOUT RETURN FAN
System Number:	MAU4

Typical Building Information

Category	Construction	Use	Occ.	Day
9	BRICK	SMA BUILDING	0730-1630	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	700	700	700	700	700	700	700
Stop Time	1700	1700	1700	1700	1700	1700	1700

Present Operations	S	M	T	W	TH	F	S
Start Time	700	700	700	700	700	700	700
Stop Time	1700	1700	1700	1700	1700	1700	1700

INPUTS		INPUT
Motor HP		5
Load Factor		0.8
CFM - HTG		14700
CFM - CLG		14700
% OA		100.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,680	1,400
Heating HRSON	2,688	2,240
C/H HRSON	4,380	3,650
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	261.93	261.93
HOAOHC	160.74	160.74
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.19E+03	5.19E+03
NSC	1.59E+05	1.59E+05
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 18-Apr-95

Bldg Number: 4530
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: MAU4

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**0.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4530**
Building Sq.Ft.: 195,670

EMC NO.: 1406-006
DATE: 18-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**MAU5**

Typical Building Information

Category	Construction	Use	Occ.	Day
9	BRICK	SMA BUILDING	0730-1630	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	700	700	700	700	700	700	700
Stop Time	1700	1700	1700	1700	1700	1700	1700

Present Operations	S	M	T	W	TH	F	S
Start Time	700	700	700	700	700	700	700
Stop Time	1700	1700	1700	1700	1700	1700	1700

INPUTS		INPUT
Motor HP		1.5
Load Factor		0.8
CFM - HTG		5400
CFM - CLG		5400
% OA		100.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	69.20%	69.20%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,680	1,400
Heating HRSON	2,688	2,240
C/H HRSON	4,380	3,650
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	261.93	261.93
HOAOHC	160.74	160.74
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.19E+03	5.19E+03
NSC	1.59E+05	1.59E+05
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 18-Apr-95

Bldg Number: 4530
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: MAU5

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**0.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4530**
Building Sq.Ft.: 195,670

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**MAU6**

Typical Building Information

Category	Construction	Use	Occ.	Day
9	BRICK	SMA BUILDING	0730-1630	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	700	700	700	700	700	700	700
Stop Time	1700	1700	1700	1700	1700	1700	1700

Present Operations	S	M	T	W	TH	F	S
Start Time	700	700	700	700	700	700	700
Stop Time	1700	1700	1700	1700	1700	1700	1700

INPUTS		INPUT
Motor HP		40
Load Factor		0.8
CFM - HTG		40680
CFM - CLG		40680
% OA		100.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	90.60%	90.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,680	1,400
Heating HRSON	2,688	2,240
C/H HRSON	4,380	3,650
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	261.93	261.93
HOAOHC	160.74	160.74
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.19E+03	5.19E+03
NSC	1.59E+05	1.59E+05
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 18-Apr-95

Bldg Number: 4530
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: MAU6

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**0.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4530**
Building Sq.Ft.: 195,670

EMC NO.: 1406-006
DATE: 18-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**MAU7**

Typical Building Information

Category	Construction	Use	Occ.	Day
9	BRICK	SMA BUILDING	0730-1630	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	700	700	700	700	700	700	700
Stop Time	1700	1700	1700	1700	1700	1700	1700

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.5
Load Factor		0.8
CFM - HTG		1540
CFM - CLG		1540
% OA		100.00%
% Area		0.06%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,680	3,360
Heating HRSON	2,688	5,376
C/H HRSON	4,380	8,760
Cooling HRSAV	1,680	
Heating HRSAV	2,688	
C/H HRSAV	4,380	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	245.00	245.00
HOAOHC	150.00	150.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.76E+03	5.76E+03
NSC	8.07E+04	8.07E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 18-Apr-95

Bldg Number: 4530
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: MAU7

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	2,009.7	0.0	
Optimum ST/SP	0.0	86.3	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	9.5	
Sub Total	**0.0**	**2,095.9**	**9.5**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.7	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**2,095.9**	**10.2**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4530**
Building Sq.Ft.: 195,670

EMC NO.: 1406-006
DATE: 18-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**MAU8**

Typical Building Information

Category	Construction	Use	Occ.	Day
9	BRICK	SMA BUILDING	0730-1630	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	700	700	700	700	700	700	700
Stop Time	1700	1700	1700	1700	1700	1700	1700

Present Operations	S	M	T	W	TH	F	S
Start Time	700	700	700	700	700	700	700
Stop Time	1700	1700	1700	1700	1700	1700	1700

INPUTS		INPUT
Motor HP		20
Load Factor		0.8
CFM - HTG		28000
CFM - CLG		28000
% OA		100.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	88.10%	88.10%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,680	1,400
Heating HRSON	2,688	2,240
C/H HRSON	4,380	3,650
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	245.00	245.00
HOAOHC	150.00	150.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.76E+03	5.76E+03
NSC	8.07E+04	8.07E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 18-Apr-95

Bldg Number: 4530
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: MAU8

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**0.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 4530**
Building Sq.Ft.: 195,670

EMC NO.: 1406-006
DATE: 18-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**MAU9**

Typical Building Information

Category	Construction	Use	Occ.	Day
9	BRICK	SMA BUILDING	0730-1630	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	700	700	700	700	700	700	700
Stop Time	1700	1700	1700	1700	1700	1700	1700

Present Operations	S	M	T	W	TH	F	S
Start Time	700	700	700	700	700	700	700
Stop Time	1700	1700	1700	1700	1700	1700	1700

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		7000
CFM - CLG		7000
% OA		100.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,680	1,400
Heating HRSON	2,688	2,240
C/H HRSON	4,380	3,650
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	261.93	261.93
HOAOHC	160.74	160.74
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.19E+03	5.19E+03
NSC	1.59E+05	1.59E+05
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 18-Apr-95

Bldg Number: 4530
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: MAU9

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**0.0**	**3**

ENERGY CALCULATIONS

BUILDING 10000

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10000**
Building Sq.Ft.: 80,294

EMC NO.: 1406-006
DATE: 07-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**3**
System Name:	**SINGLE ZONE AHU WITHOUT RETURN FAN**
System Number:	**AHU-1**

Typical Building Information

Category	Construction	Use	Occ.	Day
10	BRICK	DIV CMD/CNTRL BUILDING	600-1800	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		1
Load Factor		0.8
CFM - HTG		1125
CFM - CLG		1125
% OA		29.20%
% Area		0.83%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		0
EFF		1
LOOK-UP VALUE		
EFFHP	69.20%	69.20%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	2.17E-05	2.17E-05
COAUHC	8.32E-06	8.32E-06
HOAOH	14.77	14.77
HOAOHC	9.07	9.07
COAOC	2.10E-05	2.10E-05
COAOHC	8.04E-06	8.04E-06
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	1.26E-05	1.26E-05
NSUCHC	7.74E-06	7.74E-06
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	8.71E+03	8.71E+03
NSC	5.97E+04	5.97E+04
FV	6	6
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 07-Apr-95

Bldg Number: 10000
System Type 3
System Name: SINGLE ZONE AHU WITHOUT RETURN FAN
System Number: AHU-1

HEATING AND COOLING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,418.6	0.0	
Optimum ST/SP	0.0	162.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	1.7	0.0	0.0	
Night Setback	0.0	0.0	39.8	
Sub Total	**1.7**	**4,580.7**	**39.8**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.5	0.3	
DDC Control	0.0	0.0	5.8	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**1.7**	**4,581.2**	**45.9**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10000**
Building Sq.Ft.: 80,294

EMC NO.: 1406-006
DATE: 07-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	3
System Name:	SINGLE ZONE AHU WITHOUT RETURN FAN
System Number:	AHU-2

Typical Building Information

Category	Construction	Use	Occ.	Day
10	BRICK	DIV CMD/CNTRL BUILDING	600-1800	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		1340
CFM - CLG		1340
% OA		29.20%
% Area		1.20%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	2.17E-05	2.17E-05
COAUHC	8.32E-06	8.32E-06
HOAOH	14.77	14.77
HOAOHC	9.07	9.07
COAOC	2.10E-05	2.10E-05
COAOHC	8.04E-06	8.04E-06
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	1.26E-05	1.26E-05
NSUCHC	7.74E-06	7.74E-06
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	8.71E+03	8.71E+03
NSC	5.97E+04	5.97E+04
FV	6	6
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 07-Apr-95

Bldg Number: 10000
System Type 3
System Name: SINGLE ZONE AHU WITHOUT RETURN FAN
System Number: AHU-2

HEATING AND COOLING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	7,832.1	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	3.1	0.0	0.0	
Night Setback	0.0	0.0	57.5	
Sub Total	**3.1**	**8,119.6**	**57.5**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.6	0.4	
DDC Control	0.0	0.0	8.4	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**3.1**	**8,120.2**	**66.3**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10000**
Building Sq.Ft.: 80,294

EMC NO.: 1406-006
DATE: 07-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**3**
System Name:	**SINGLE ZONE AHU WITHOUT RETURN FAN**
System Number:	**AHU-3**

Typical Building Information

Category	Construction	Use	Occ.	Day
10	BRICK	DIV CMD/CNTRL BUILDING	600-1800	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		2910
CFM - CLG		2910
% OA		29.20%
% Area		1.80%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	2.17E-05	2.17E-05
COAUHC	8.32E-06	8.32E-06
HOAOH	14.77	14.77
HOAOHC	9.07	9.07
COAOC	2.10E-05	2.10E-05
COAOHC	8.04E-06	8.04E-06
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	1.26E-05	1.26E-05
NSUCHC	7.74E-06	7.74E-06
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	8.71E+03	8.71E+03
NSC	5.97E+04	5.97E+04
FV	6	6
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 07-Apr-95

Bldg Number: 10000
System Type 3
System Name: SINGLE ZONE AHU WITHOUT RETURN FAN
System Number: AHU-3

HEATING AND COOLING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	7,851.6	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	3.1	0.0	0.0	
Night Setback	0.0	0.0	86.2	
Sub Total	**3.1**	**8,139.1**	**86.2**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	1.3	0.8	
DDC Control	0.0	0.0	12.6	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**3.1**	**8,140.4**	**99.7**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10000**
Building Sq.Ft.: 80,294

System Type	**3**
System Name:	**SINGLE ZONE AHU WITHOUT RETURN FAN**
System Number:	**AHU-4**

Typical Building Information

Category	Construction	Use	Occ.	Day
10	BRICK	DIV CMD/CNTRL BUILDING	600-1800	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		1.5
Load Factor		0.8
CFM - HTG		2575
CFM - CLG		2575
% OA		29.20%
% Area		1.90%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	69.20%	69.20%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	2.17E-05	2.17E-05
COAUHC	8.32E-06	8.32E-06
HOAOH	14.77	14.77
HOAOHC	9.07	9.07
COAOC	2.10E-05	2.10E-05
COAOHC	8.04E-06	8.04E-06
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	1.26E-05	1.26E-05
NSUCHC	7.74E-06	7.74E-06
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	8.71E+03	8.71E+03
NSC	5.97E+04	5.97E+04
FV	6	6
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 07-Apr-95

Bldg Number: 10000
System Type 3
System Name: SINGLE ZONE AHU WITHOUT RETURN FAN
System Number: AHU-4

HEATING AND COOLING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	6,638.9	0.0	
Optimum ST/SP	0.0	243.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	2.6	0.0	0.0	
Night Setback	0.0	0.0	91.0	
Sub Total	**2.6**	**6,882.0**	**91.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	1.2	0.7	
DDC Control	0.0	0.0	13.3	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**2.6**	**6,883.2**	**105.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10000**
Building Sq.Ft.: 80,294

EMC NO.: 1406-006
DATE: 07-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	3
System Name:	SINGLE ZONE AHU WITHOUT RETURN FAN
System Number:	AHU-5

Typical Building Information

Category	Construction	Use	Occ.	Day
10	BRICK	DIV CMD/CNTRL BUILDING	600-1800	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		585
CFM - CLG		585
% OA		29.20%
% Area		0.35%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	2.17E-05	2.17E-05
COAUHC	8.32E-06	8.32E-06
HOAOH	14.77	14.77
HOAOHC	9.07	9.07
COAOC	2.10E-05	2.10E-05
COAOHC	8.04E-06	8.04E-06
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	1.26E-05	1.26E-05
NSUCHC	7.74E-06	7.74E-06
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	8.71E+03	8.71E+03
NSC	5.97E+04	5.97E+04
FV	6	6
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 07-Apr-95

Bldg Number: 10000
System Type 3
System Name: SINGLE ZONE AHU WITHOUT RETURN FAN
System Number: AHU-5

HEATING AND COOLING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,554.7	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.6	0.0	0.0	
Night Setback	0.0	0.0	16.8	
Sub Total	**0.6**	**1,611.6**	**16.8**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.3	0.2	
DDC Control	0.0	0.0	2.4	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.6**	**1,611.9**	**19.4**	**3**

E M C ENGINEERS, INC.

EMC NO.: 1406-006
DATE: 07-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM BLDG: 10000
Building Sq.Ft.: 80,294

System Type	3
System Name:	SINGLE ZONE AHU WITHOUT RETURN FAN
System Number:	AHU-6

Typical Building Information

Category	Construction	Use	Occ.	Day
10	BRICK	DIV CMD/CNTRL BUILDING	600-1800	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.125
Load Factor		0.8
CFM - HTG		410
CFM - CLG		410
% OA		29.20%
% Area		0.10%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	2.17E-05	2.17E-05
COAUHC	8.32E-06	8.32E-06
HOAOH	14.77	14.77
HOAOHC	9.07	9.07
COAOC	2.10E-05	2.10E-05
COAOHC	8.04E-06	8.04E-06
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	1.26E-05	1.26E-05
NSUCHC	7.74E-06	7.74E-06
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	8.71E+03	8.71E+03
NSC	5.97E+04	5.97E+04
FV	6	6
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 07-Apr-95

Bldg Number: 10000
System Type 3
System Name: SINGLE ZONE AHU WITHOUT RETURN FAN
System Number: AHU-6

HEATING AND COOLING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	591.2	0.0	
Optimum ST/SP	0.0	21.6	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.2	0.0	0.0	
Night Setback	0.0	0.0	4.6	
Sub Total	**0.2**	**612.8**	**4.6**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.2	0.1	
DDC Control	0.0	0.0	0.7	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.2**	**613.0**	**5.3**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10000**
Building Sq.Ft.: 80,294

EMC NO.: 1406-006
DATE: 07-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	3
System Name:	SINGLE ZONE AHU WITHOUT RETURN FAN
System Number:	AHU-7

Typical Building Information

Category	Construction	Use	Occ.	Day
10	BRICK	DIV CMD/CNTRL BUILDING	600-1800	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.75
Load Factor		0.8
CFM - HTG		410
CFM - CLG		410
% OA		29.20%
% Area		1.06%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	2.17E-05	2.17E-05
COAUHC	8.32E-06	8.32E-06
HOAOH	14.77	14.77
HOAOHC	9.07	9.07
COAOC	2.10E-05	2.10E-05
COAOHC	8.04E-06	8.04E-06
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	1.26E-05	1.26E-05
NSUCHC	7.74E-06	7.74E-06
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	8.71E+03	8.71E+03
NSC	5.97E+04	5.97E+04
FV	6	6
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 07-Apr-95

Bldg Number: 10000
System Type 3
System Name: SINGLE ZONE AHU WITHOUT RETURN FAN
System Number: AHU-7

HEATING AND COOLING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	3,522.0	0.0	
Optimum ST/SP	0.0	129.4	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	1.4	0.0	0.0	
Night Setback	0.0	0.0	50.8	
Sub Total	**1.4**	**3,651.4**	**50.8**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.2	0.1	
DDC Control	0.0	0.0	7.4	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**1.4**	**3,651.6**	**58.3**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10000**
Building Sq.Ft.: 80,294

EMC NO.: 1406-006
DATE: 07-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**3**
System Name:	**SINGLE ZONE AHU WITHOUT RETURN FAN**
System Number:	**AHU-8**

Typical Building Information

Category	Construction	Use	Occ.	Day
10	BRICK	DIV CMD/CNTRL BUILDING	600-1800	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		860
CFM - CLG		860
% OA		29.20%
% Area		0.86%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	2.17E-05	2.17E-05
COAUHC	8.32E-06	8.32E-06
HOAOH	14.77	14.77
HOAOHC	9.07	9.07
COAOC	2.10E-05	2.10E-05
COAOHC	8.04E-06	8.04E-06
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	1.26E-05	1.26E-05
NSUCHC	7.74E-06	7.74E-06
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	8.71E+03	8.71E+03
NSC	5.97E+04	5.97E+04
FV	6	6
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 07-Apr-95

Bldg Number: 10000
System Type 3
System Name: SINGLE ZONE AHU WITHOUT RETURN FAN
System Number: AHU-8

HEATING AND COOLING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,558.1	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.6	0.0	0.0	
Night Setback	0.0	0.0	41.2	
Sub Total	**0.6**	**1,615.1**	**41.2**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.4	0.2	
DDC Control	0.0	0.0	6.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.6**	**1,615.5**	**47.5**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10000**
Building Sq.Ft.: 80,294

System Type	3
System Name:	SINGLE ZONE AHU WITHOUT RETURN FAN
System Number:	AHU-9

Typical Building Information

Category	Construction	Use	Occ.	Day
10	BRICK	DIV CMD/CNTRL BUILDING	600-1800	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		860
CFM - CLG		860
% OA		29.20%
% Area		0.56%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	2.17E-05	2.17E-05
COAUHC	8.32E-06	8.32E-06
HOAOH	14.77	14.77
HOAOHC	9.07	9.07
COAOC	2.10E-05	2.10E-05
COAOHC	8.04E-06	8.04E-06
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	1.26E-05	1.26E-05
NSUCHC	7.74E-06	7.74E-06
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	8.71E+03	8.71E+03
NSC	5.97E+04	5.97E+04
FV	6	6
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 07-Apr-95

Bldg Number: 10000
System Type 3
System Name: SINGLE ZONE AHU WITHOUT RETURN FAN
System Number: AHU-9

HEATING AND COOLING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,558.1	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.6	0.0	0.0	
Night Setback	0.0	0.0	26.8	
Sub Total	**0.6**	**1,615.1**	**26.8**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.4	0.2	
DDC Control	0.0	0.0	3.9	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.6**	**1,615.5**	**31.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10000**
Building Sq.Ft.: 80,294

EMC NO.: 1406-006
DATE: 07-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**3**
System Name:	**SINGLE ZONE AHU WITHOUT RETURN FAN**
System Number:	**AHU-10**

Typical Building Information

Category	Construction	Use	Occ.	Day
10	BRICK	DIV CMD/CNTRL BUILDING	600-1800	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		860
CFM - CLG		860
% OA		29.20%
% Area		0.75%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	2.17E-05	2.17E-05
COAUHC	8.32E-06	8.32E-06
HOAOH	14.77	14.77
HOAOHC	9.07	9.07
COAOC	2.10E-05	2.10E-05
COAOHC	8.04E-06	8.04E-06
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	1.26E-05	1.26E-05
NSUCHC	7.74E-06	7.74E-06
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	8.71E+03	8.71E+03
NSC	5.97E+04	5.97E+04
FV	6	6
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 07-Apr-95

Bldg Number: 10000
System Type 3
System Name: SINGLE ZONE AHU WITHOUT RETURN FAN
System Number: AHU-10

HEATING AND COOLING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,558.1	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.6	0.0	0.0	
Night Setback	0.0	0.0	36.0	
Sub Total	**0.6**	**1,615.1**	**36.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.4	0.2	
DDC Control	0.0	0.0	5.3	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.6**	**1,615.5**	**41.5**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10000**
Building Sq.Ft.: 80,294

EMC NO.: 1406-006
DATE: 07-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**3**
System Name:	**SINGLE ZONE AHU WITHOUT RETURN FAN**
System Number:	**AHU-11**

Typical Building Information

Category	Construction	Use	Occ.	Day
10	BRICK	DIV CMD/CNTRL BUILDING	600-1800	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.25
Load Factor		0.8
CFM - HTG		500
CFM - CLG		500
% OA		29.20%
% Area		0.46%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	2.17E-05	2.17E-05
COAUHC	8.32E-06	8.32E-06
HOAOH	14.77	14.77
HOAOHC	9.07	9.07
COAOC	2.10E-05	2.10E-05
COAOHC	8.04E-06	8.04E-06
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	1.26E-05	1.26E-05
NSUCHC	7.74E-06	7.74E-06
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	8.71E+03	8.71E+03
NSC	5.97E+04	5.97E+04
FV	6	6
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 07-Apr-95

Bldg Number: 10000
System Type 3
System Name: SINGLE ZONE AHU WITHOUT RETURN FAN
System Number: AHU-11

HEATING AND COOLING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,178.5	0.0	
Optimum ST/SP	0.0	43.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.5	0.0	0.0	
Night Setback	0.0	0.0	22.1	
Sub Total	**0.5**	**1,221.7**	**22.1**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.2	0.1	
DDC Control	0.0	0.0	3.2	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.5**	**1,221.9**	**25.5**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10000**
Building Sq.Ft.: 80,294

EMC NO.: 1406-006
DATE: 07-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**3**
System Name:	**SINGLE ZONE AHU WITHOUT RETURN FAN**
System Number:	**AHU-12**

Typical Building Information

Category	Construction	Use	Occ.	Day
10	BRICK	DIV CMD/CNTRL BUILDING	600-1800	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.25
Load Factor		0.8
CFM - HTG		1150
CFM - CLG		1150
% OA		29.20%
% Area		3.41%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	2.17E-05	2.17E-05
COAUHC	8.32E-06	8.32E-06
HOAOH	14.77	14.77
HOAOHC	9.07	9.07
COAOC	2.10E-05	2.10E-05
COAOHC	8.04E-06	8.04E-06
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	1.26E-05	1.26E-05
NSUCHC	7.74E-06	7.74E-06
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	8.71E+03	8.71E+03
NSC	5.97E+04	5.97E+04
FV	6	6
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 07-Apr-95

Bldg Number: 10000
System Type 3
System Name: SINGLE ZONE AHU WITHOUT RETURN FAN
System Number: AHU-12

HEATING AND COOLING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,186.6	0.0	
Optimum ST/SP	0.0	43.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.5	0.0	0.0	
Night Setback	0.0	0.0	163.4	
Sub Total	**0.5**	**1,229.7**	**163.4**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.5	0.3	
DDC Control	0.0	0.0	23.8	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.5**	**1,230.2**	**187.5**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10000**
Building Sq.Ft.: 80,294

EMC NO.: 1406-006
DATE: 07-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**3**
System Name:	**SINGLE ZONE AHU WITHOUT RETURN FAN**
System Number:	**AHU-13**

Typical Building Information

Category	Construction	Use	Occ.	Day
10	BRICK	DIV CMD/CNTRL BUILDING	600-1800	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.25
Load Factor		0.8
CFM - HTG		1150
CFM - CLG		1150
% OA		29.20%
% Area		3.41%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	2.17E-05	2.17E-05
COAUHC	8.32E-06	8.32E-06
HOAOH	14.77	14.77
HOAOHC	9.07	9.07
COAOC	2.10E-05	2.10E-05
COAOHC	8.04E-06	8.04E-06
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	1.26E-05	1.26E-05
NSUCHC	7.74E-06	7.74E-06
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	8.71E+03	8.71E+03
NSC	5.97E+04	5.97E+04
FV	6	6
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 07-Apr-95

Bldg Number: 10000
System Type 3
System Name: SINGLE ZONE AHU WITHOUT RETURN FAN
System Number: AHU-13

HEATING AND COOLING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,186.6	0.0	
Optimum ST/SP	0.0	43.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.5	0.0	0.0	
Night Setback	0.0	0.0	163.4	
Sub Total	**0.5**	**1,229.7**	**163.4**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.5	0.3	
DDC Control	0.0	0.0	23.8	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.5**	**1,230.2**	**187.5**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM BLDG: 10000
Building Sq.Ft.: 80,294

EMC NO.: 1406-006
DATE: 07-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	1
System Name:	H&V UNIT WITHOUT RETURN FAN
System Number:	AHU-14

Typical Building Information

Category	Construction	Use	Occ.	Day
10	BRICK	DIV CMD/CNTRL BUILDING	600-1800	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		3
Load Factor		0.8
CFM - HTG		4400
CFM - CLG		0
% OA		100.00%
% Area		16.20%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	79.00%	79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	2.17E-05	2.17E-05
COAUHC	8.32E-06	8.32E-06
HOAOH	14.77	14.77
HOAOHC	9.07	9.07
COAOC	2.10E-05	2.10E-05
COAOHC	8.04E-06	8.04E-06
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	1.26E-05	1.26E-05
NSUCHC	7.74E-06	7.74E-06
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	8.71E+03	8.71E+03
NSC	5.97E+04	5.97E+04
FV	6	6
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 07-Apr-95

Bldg Number: 10000
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU-14

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	11,574.7	0.0	
Optimum ST/SP	0.0	425.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	776.1	
Sub Total	**0.0**	**12,000.6**	**776.1**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	113.3	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**12,000.6**	**889.4**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10000**
Building Sq.Ft.: 80,294

EMC NO.: 1406-006
DATE: 07-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU-15**

Typical Building Information

Category	Construction	Use	Occ.	Day
10	BRICK	DIV CMD/CNTRL BUILDING	600-1800	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		1
Load Factor		0.8
CFM - HTG		2550
CFM - CLG		0
% OA		100.00%
% Area		10.30%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	69.20%	69.20%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	2.17E-05	2.17E-05
COAUHC	8.32E-06	8.32E-06
HOAOH	14.77	14.77
HOAOHC	9.07	9.07
COAOC	2.10E-05	2.10E-05
COAOHC	8.04E-06	8.04E-06
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	1.26E-05	1.26E-05
NSUCHC	7.74E-06	7.74E-06
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	8.71E+03	8.71E+03
NSC	5.97E+04	5.97E+04
FV	6	6
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 07-Apr-95

Bldg Number: 10000
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU-15

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,404.6	0.0	
Optimum ST/SP	0.0	162.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	493.5	
Sub Total	**0.0**	**4,566.7**	**493.5**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	72.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**4,566.7**	**565.5**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10000**
Building Sq.Ft.: 80,294

EMC NO.: 1406-006
DATE: 07-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU-16**

Typical Building Information

Category	Construction	Use	Occ.	Day
10	BRICK	DIV CMD/CNTRL BUILDING	600-1800	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.5
Load Factor		0.8
CFM - HTG		1610
CFM - CLG		0
% OA		100.00%
% Area		6.50%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	2.17E-05	2.17E-05
COAUHC	8.32E-06	8.32E-06
HOAOH	14.77	14.77
HOAOHC	9.07	9.07
COAOC	2.10E-05	2.10E-05
COAOHC	8.04E-06	8.04E-06
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	1.26E-05	1.26E-05
NSUCHC	7.74E-06	7.74E-06
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	8.71E+03	8.71E+03
NSC	5.97E+04	5.97E+04
FV	6	6
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 07-Apr-95

Bldg Number: 10000
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU-16

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	2,344.6	0.0	
Optimum ST/SP	0.0	86.3	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	311.4	
Sub Total	**0.0**	**2,430.9**	**311.4**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	45.4	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**2,430.9**	**356.8**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10000**
Building Sq.Ft.: 80,294

EMC NO.: 1406-006
DATE: 13-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**14**
System Name:	**VENTILATION**
System Number:	**SF-1**

Typical Building Information

Category	Construction	Use	Occ.	Day
10	BRICK	DIV CMD/CNTRL BUILDIN	600-1800	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		1.5
Load Factor		0.8
CFM - HTG		0
CFM - CLG		2750
% OA		100.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	69.20%	69.20%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	2.17E-05	0.00E+00
COAUHC	8.32E-06	0.00E+00
HOAOH	14.77	14.77
HOAOHC	9.07	9.07
COAOC	2.10E-05	2.10E-05
COAOHC	8.04E-06	8.04E-06
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	1.26E-05	1.26E-05
NSUCHC	7.74E-06	7.74E-06
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	8.71E+03	8.71E+03
NSC	5.97E+04	5.97E+04
FV	6	6
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 13-Apr-95

Bldg Number: 10000
System Type 14
System Name: VENTILATION
System Number: SF-1

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	2,534.2	0.0	
Optimum ST/SP	0.0	243.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**2,777.3**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				0
TOTAL	**0.0**	**2,777.3**	**0.0**	**0**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10000**
Building Sq.Ft.: 80,294

EMC NO.: 1406-006
DATE: 13-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**14**
System Name:	**VENTILATION**
System Number:	**SF-2**

Typical Building Information

Category	Construction	Use	Occ.	Day
10	BRICK	DIV CMD/CNTRL BUILDIN	600-1800	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		1.5
Load Factor		0.8
CFM - HTG		0
CFM - CLG		2750
% OA		100.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	69.20%	69.20%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	2.17E-05	0.00E+00
COAUHC	8.32E-06	0.00E+00
HOAOH	14.77	14.77
HOAOHC	9.07	9.07
COAOC	2.10E-05	2.10E-05
COAOHC	8.04E-06	8.04E-06
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	1.26E-05	1.26E-05
NSUCHC	7.74E-06	7.74E-06
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	8.71E+03	8.71E+03
NSC	5.97E+04	5.97E+04
FV	6	6
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 13-Apr-95

Bldg Number: 10000
System Type 14
System Name: VENTILATION
System Number: SF-2

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	2,534.2	0.0	
Optimum ST/SP	0.0	243.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**2,777.3**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				0
TOTAL	**0.0**	**2,777.3**	**0.0**	**0**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10000**
Building Sq.Ft.: 80,294

EMC NO.: 1406-006
DATE: 13-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**14**
System Name:	**VENTILATION**
System Number:	**SF-3**

Typical Building Information

Category	Construction	Use	Occ.	Day
10	BRICK	DIV CMD/CNTRL BUILDIN	600-1800	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		1.5
Load Factor		0.8
CFM - HTG		0
CFM - CLG		2750
% OA		100.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	69.20%	69.20%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	2.17E-05	0.00E+00
COAUHC	8.32E-06	0.00E+00
HOAOH	14.77	14.77
HOAOHC	9.07	9.07
COAOC	2.10E-05	2.10E-05
COAOHC	8.04E-06	8.04E-06
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	1.26E-05	1.26E-05
NSUCHC	7.74E-06	7.74E-06
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	8.71E+03	8.71E+03
NSC	5.97E+04	5.97E+04
FV	6	6
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 13-Apr-95

Bldg Number: 10000
System Type 14
System Name: VENTILATION
System Number: SF-3

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	2,534.2	0.0	
Optimum ST/SP	0.0	243.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**2,777.3**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				0
TOTAL	**0.0**	**2,777.3**	**0.0**	**0**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10000**
Building Sq.Ft.: 80,294

EMC NO.: 1406-006
DATE: 13-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**14**
System Name:	**VENTILATION**
System Number:	**SF-4**

Typical Building Information

Category	Construction	Use	Occ.	Day
10	BRICK	DIV CMD/CNTRL BUILDIN	600-1800	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		0
CFM - CLG		4750
% OA		100.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	2.17E-05	0.00E+00
COAUHC	8.32E-06	0.00E+00
HOAOH	14.77	14.77
HOAOHC	9.07	9.07
COAOC	2.10E-05	2.10E-05
COAOHC	8.04E-06	8.04E-06
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	1.26E-05	1.26E-05
NSUCHC	7.74E-06	7.74E-06
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	8.71E+03	8.71E+03
NSC	5.97E+04	5.97E+04
FV	6	6
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 13-Apr-95

Bldg Number: 10000
System Type 14
System Name: VENTILATION
System Number: SF-4

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	2,997.7	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**3,285.2**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				0
TOTAL	**0.0**	**3,285.2**	**0.0**	**0**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10000**
Building Sq.Ft.: 80,294

System Type	**14**
System Name:	**VENTILATION**
System Number:	**SF-31**

EMC NO.: 1406-006
DATE: 13-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

Typical Building Information

Category	Construction	Use	Occ.	Day
10	BRICK	DIV CMD/CNTRL BUILDIN	600-1800	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		0
CFM - CLG		4750
% OA		100.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	2.17E-05	0.00E+00
COAUHC	8.32E-06	0.00E+00
HOAOH	14.77	14.77
HOAOHC	9.07	9.07
COAOC	2.10E-05	2.10E-05
COAOHC	8.04E-06	8.04E-06
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	1.26E-05	1.26E-05
NSUCHC	7.74E-06	7.74E-06
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	8.71E+03	8.71E+03
NSC	5.97E+04	5.97E+04
FV	6	6
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 13-Apr-95

Bldg Number: 10000
System Type 14
System Name: VENTILATION
System Number: SF-31

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	2,997.7	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**3,285.2**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				0
TOTAL	**0.0**	**3,285.2**	**0.0**	**0**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10000**
Building Sq.Ft.: 80,294

EMC NO.: 1406-006
DATE: 07-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**12**
System Name:	**BASEBOARD RADIATION**
System Number:	**FTR-1**

Typical Building Information

Category	Construction	Use	Occ.	Day
10	BRICK	DIV CMD/CNTRL BUILDIN	600-1800	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	1200	1800	1800	1800	1800	1800	1200

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		5
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		32.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,560	3,360
Heating HRSON	4,096	5,376
C/H HRSON	6,674	8,760
Cooling HRSAV	800	
Heating HRSAV	1,280	
C/H HRSAV	2,086	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	2.17E-05	2.17E-05
COAUHC	8.32E-06	8.32E-06
HOAOH	14.77	14.77
HOAOHC	9.07	9.07
COAOC	2.10E-05	2.10E-05
COAOHC	8.04E-06	8.04E-06
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	1.26E-05	1.26E-05
NSUCHC	7.74E-06	7.74E-06
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	8.71E+03	8.71E+03
NSC	5.97E+04	5.97E+04
FV	6	6
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 07-Apr-95

Bldg Number: 10000
System Type 12
System Name: BASEBOARD RADIATION
System Number: FTR-1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,678.3	0.0	
Optimum ST/SP	0.0	687.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	1,533.1	
Sub Total	**0.0**	**5,365.4**	**1,533.1**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	223.7	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**5,365.4**	**1,756.8**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10000**
Building Sq.Ft.: 80,294

EMC NO.: 1406-006
DATE: 07-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**9**
System Name:	**CONVERTER AND PUMPS**
System Number:	**HE1**

Typical Building Information

Category	Construction	Use	Occ.	Day
10	BRICK	DIV CMD/CNTRL BUILDIN	600-1800	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		1.372
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	0.00%	0.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	2.17E-05	2.17E-05
COAUHC	8.32E-06	8.32E-06
HOAOH	14.77	14.77
HOAOHC	9.07	9.07
COAOC	2.10E-05	2.10E-05
COAOHC	8.04E-06	8.04E-06
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	1.26E-05	1.26E-05
NSUCHC	7.74E-06	7.74E-06
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	8.71E+03	8.71E+03
NSC	5.97E+04	5.97E+04
FV	0	6
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 07-Apr-95

Bldg Number: 10000
System Type 9
System Name: CONVERTER AND PUMPS
System Number: HE1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	10.2	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**10.2**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10000**
Building Sq.Ft.: 80,294

EMC NO.: 1406-006
DATE: 07-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**9**
System Name:	**CONVERTER AND PUMPS**
System Number:	**HE2**

Typical Building Information

Category	Construction	Use	Occ.	Day
10	BRICK	DIV CMD/CNTRL BUILDIN	600-1800	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	0
Load Factor	0.8
CFM - HTG	0
CFM - CLG	0
% OA	0.00%
% Area	0.00%
TON CAPC.	0
MBTU CAPC.	1.108
kW/Ton	0
MOSON	7
EFF	1
LOOK-UP VALUE	
EFFHP 0.00%	0.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	2.17E-05	2.17E-05
COAUHC	8.32E-06	8.32E-06
HOAOH	14.77	14.77
HOAOHC	9.07	9.07
COAOC	2.10E-05	2.10E-05
COAOHC	8.04E-06	8.04E-06
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	1.26E-05	1.26E-05
NSUCHC	7.74E-06	7.74E-06
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	8.71E+03	8.71E+03
NSC	5.97E+04	5.97E+04
FV	0	6
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 07-Apr-95

Bldg Number: 10000
System Type 9
System Name: CONVERTER AND PUMPS
System Number: HE2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	8.2	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**8.2**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10000**
Building Sq.Ft.: 80,294

EMC NO.: 1406-006
DATE: 07-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**8**
System Name:	**CHILLER AND PUMPS**
System Number:	**CH-1**

Typical Building Information

Category	Construction	Use	Occ.	Day
10	BRICK	DIV CMD/CNTRL BUILDIN	600-1800	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.75
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		30
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	2.17E-05	2.17E-05
COAUHC	8.32E-06	8.32E-06
HOAOH	14.77	14.77
HOAOHC	9.07	9.07
COAOC	2.10E-05	2.10E-05
COAOHC	8.04E-06	8.04E-06
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	1.26E-05	1.26E-05
NSUCHC	7.74E-06	7.74E-06
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	8.71E+03	8.71E+03
NSC	5.97E+04	5.97E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 07-Apr-95

Bldg Number: 10000
System Type 8
System Name: CHILLER AND PUMPS
System Number: CH-1

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	1.4	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**1.4**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	287.1	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**1.4**	**287.1**	**0.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10000**
Building Sq.Ft.: 80,294

EMC NO.: 1406-006
DATE: 07-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**8**
System Name:	**CHILLER AND PUMPS**
System Number:	**CH-2**

Typical Building Information

Category	Construction	Use	Occ.	Day
10	BRICK	DIV CMD/CNTRL BUILDIN	600-1800	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.75
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		30
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	2.17E-05	2.17E-05
COAUHC	8.32E-06	8.32E-06
HOAOH	14.77	14.77
HOAOHC	9.07	9.07
COAOC	2.10E-05	2.10E-05
COAOHC	8.04E-06	8.04E-06
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	1.26E-05	1.26E-05
NSUCHC	7.74E-06	7.74E-06
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	8.71E+03	8.71E+03
NSC	5.97E+04	5.97E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 07-Apr-95

Bldg Number: 10000
System Type 8
System Name: CHILLER AND PUMPS
System Number: CH-2

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	1.4	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**1.4**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	287.1	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**1.4**	**287.1**	**0.0**	**3**

ENERGY CALCULATIONS

BUILDING 10030

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM BLDG: 10030
Building Sq.Ft.: 2,372

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	2
System Name:	H&V UNIT
System Number:	AHU1

Typical Building Information

Category	Construction	Use	Occ.	Day
24	BRICK	CHAPEL ZONE	0800-1400	SUN

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	800	0	900	0	900	0	0
Stop Time	1300	0	1200	0	1200	0	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		17.5
Load Factor		0.8
CFM - HTG		3216
CFM - CLG		0
% OA		48.78%
% Area		58.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	340	3,360
Heating HRSON	544	5,376
C/H HRSON	886	8,760
Cooling HRSAV	3,020	
Heating HRSAV	4,832	
C/H HRSAV	7,874	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	372.76	372.76
HOAOHC	185.87	185.87
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	7.01E+03	7.01E+03
NSC	2.51E+05	2.51E+05
FV	147	147
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 10030
System Type 2
System Name: H&V UNIT
System Number: AHU1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	94,795.3	0.0	
Optimum ST/SP	0.0	2,263.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	345.9	
Sub Total	**0.0**	**97,058.7**	**345.9**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	22.1	
DDC Control	0.0	0.0	9.6	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**97,058.7**	**377.7**	**3**

E M C ENGINEERS, INC.

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM BLDG: 10030
Building Sq.Ft.: 7,048

System Type	2
System Name:	H&V UNIT
System Number:	AHU2

Typical Building Information

Category	Construction	Use	Occ.	Day
25	BRICK	CHAPEL OFFICE ZONE	0600-1700	SUN-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	600	600	600	600	600	600	0
Stop Time	1300	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		2900
CFM - CLG		0
% OA		31.03%
% Area		77.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,480	3,360
Heating HRSON	2,368	5,376
C/H HRSON	3,859	8,760
Cooling HRSAV	1,880	
Heating HRSAV	3,008	
C/H HRSAV	4,901	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	347.79	347.79
HOAOHC	173.42	173.42
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.26E+04	1.26E+04
NSC	3.30E+04	3.30E+04
FV	52	52
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 10030
System Type 2
System Name: H&V UNIT
System Number: AHU2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	50,581.4	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	178.9	
Sub Total	**0.0**	**52,521.5**	**178.9**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	9.0	
DDC Control	0.0	0.0	68.4	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**52,521.5**	**256.3**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10030**
Building Sq.Ft.: 7,048

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**10**
System Name:	**HOT WATER BOILER AND PUMPS**
System Number:	**HE1**

Typical Building Information

Category	Construction	Use	Occ.	Day
25	BRICK	CHAPEL OFFICE ZONE	0600-1700	SUN-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	1300	1800	1800	1800	1800	1800	1200

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.505
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	0.00%	0.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,580	3,360
Heating HRSON	4,128	5,376
C/H HRSON	6,726	8,760
Cooling HRSAV	780	
Heating HRSAV	1,248	
C/H HRSAV	2,034	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	347.79	347.79
HOAOHC	173.42	173.42
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.26E+04	1.26E+04
NSC	3.30E+04	3.30E+04
FV	52	52
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 10030
System Type 10
System Name: HOT WATER BOILER AND PUMPS
System Number: HE1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	3.7	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**3.7**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM BLDG: 10030
Building Sq.Ft.: 7,048

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	12
System Name:	BASEBOARD RADIATION
System Number:	FTR-1

Typical Building Information

Category	Construction	Use	Occ.	Day
25	BRICK	CHAPEL OFFICE ZONE	0600-1700	SUN-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	600	600	600	600	600	600	0
Stop Time	1300	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		28.50%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,480	3,360
Heating HRSON	2,368	5,376
C/H HRSON	3,859	8,760
Cooling HRSAV	1,880	
Heating HRSAV	3,008	
C/H HRSAV	4,901	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	347.79	347.79
HOAOHC	173.42	173.42
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.26E+04	1.26E+04
NSC	3.30E+04	3.30E+04
FV	52	52
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 10030
System Type 12
System Name: BASEBOARD RADIATION
System Number: FTR-1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,600.5	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	66.2	
Sub Total	**0.0**	**4,888.1**	**66.2**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	25.3	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**4,888.1**	**91.5**	**3**

ENERGY CALCULATIONS

BUILDING 10050

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10050**
Building Sq.Ft.: 77,130

EMC NO.: 1406-006
DATE: 03-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU1**

Typical Building Information

Category	Construction	Use	Occ.	Day
8	BRICK	PHYS FIT CENTER	0645-2000	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	800	600	600	600	600	600	800
Stop Time	2000	2100	2100	2100	2100	2100	2000

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		20875
CFM - CLG		0
% OA		20.00%
% Area		14.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,260	3,360
Heating HRSON	3,616	5,376
C/H HRSON	5,892	8,760
Cooling HRSAV	1,100	
Heating HRSAV	1,760	
C/H HRSAV	2,868	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	126.26	126.26
HOAOHC	77.49	77.49
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	9.76E+03	9.76E+03
NSC	5.41E+04	5.41E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 03-Apr-95

Bldg Number: 10050
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	29,595.5	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	584.0	
Sub Total	**0.0**	**31,535.6**	**584.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	105.4	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**31,535.6**	**689.3**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10050**
Building Sq.Ft.: 77,130

EMC NO.: 1406-006
DATE: 03-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU2**

Typical Building Information

Category	Construction	Use	Occ.	Day
8	BRICK	PHYS FIT CENTER	0645-2000	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	800	600	600	600	600	600	800
Stop Time	2000	2100	2100	2100	2100	2100	2000

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		20875
CFM - CLG		0
% OA		20.00%
% Area		14.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,260	3,360
Heating HRSON	3,616	5,376
C/H HRSON	5,892	8,760
Cooling HRSAV	1,100	
Heating HRSAV	1,760	
C/H HRSAV	2,868	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	126.26	126.26
HOAOHC	77.49	77.49
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	9.76E+03	9.76E+03
NSC	5.41E+04	5.41E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 03-Apr-95

Bldg Number: 10050
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	29,595.5	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	584.0	
Sub Total	**0.0**	**31,535.6**	**584.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	105.4	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**31,535.6**	**689.3**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10050**
Building Sq.Ft.: 77,130

EMC NO.: 1406-006
DATE: 03-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU3**

Typical Building Information

Category	Construction	Use	Occ.	Day
8	BRICK	PHYS FIT CENTER	0645-2000	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	800	600	600	600	600	600	800
Stop Time	2000	2100	2100	2100	2100	2100	2000

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		20875
CFM - CLG		0
% OA		20.00%
% Area		14.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,260	3,360
Heating HRSON	3,616	5,376
C/H HRSON	5,892	8,760
Cooling HRSAV	1,100	
Heating HRSAV	1,760	
C/H HRSAV	2,868	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	126.26	126.26
HOAOHC	77.49	77.49
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	9.76E+03	9.76E+03
NSC	5.41E+04	5.41E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 03-Apr-95

Bldg Number: 10050
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU3

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	29,595.5	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	584.0	
Sub Total	**0.0**	**31,535.6**	**584.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	105.4	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**31,535.6**	**689.3**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10050**
Building Sq.Ft.: 77,130

EMC NO.: 1406-006
DATE: 03-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	1
System Name:	H&V UNIT WITHOUT RETURN FAN
System Number:	AHU4

Typical Building Information

Category	Construction	Use	Occ.	Day
8	BRICK	PHYS FIT CENTER	0645-2000	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	800	600	600	600	600	600	800
Stop Time	2000	2100	2100	2100	2100	2100	2000

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		20875
CFM - CLG		0
% OA		20.00%
% Area		14.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,260	3,360
Heating HRSON	3,616	5,376
C/H HRSON	5,892	8,760
Cooling HRSAV	1,100	
Heating HRSAV	1,760	
C/H HRSAV	2,868	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	126.26	126.26
HOAOHC	77.49	77.49
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	9.76E+03	9.76E+03
NSC	5.41E+04	5.41E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 03-Apr-95

Bldg Number: 10050
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU4

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	29,595.5	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	584.0	
Sub Total	**0.0**	**31,535.6**	**584.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	105.4	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**31,535.6**	**689.3**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10050**
Building Sq.Ft.: 77,130

EMC NO.: 1406-006
DATE: 03-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU5**

Typical Building Information

Category	Construction	Use	Occ.	Day
8	BRICK	PHYS FIT CENTER	0645-2000	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	1100	1600	1700	1600	1700	1600	1100
Stop Time	2000	2000	2000	2000	2000	2000	2000

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		5
Load Factor		0.8
CFM - HTG		6500
CFM - CLG		0
% OA		100.00%
% Area		4.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,000	3,360
Heating HRSON	1,600	5,376
C/H HRSON	2,607	8,760
Cooling HRSAV	2,360	
Heating HRSAV	3,776	
C/H HRSAV	6,153	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	126.26	126.26
HOAOHC	77.49	77.49
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	9.76E+03	9.76E+03
NSC	5.41E+04	5.41E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 03-Apr-95

Bldg Number: 10050
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU5

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	22,488.1	0.0	
Optimum ST/SP	0.0	687.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	166.8	
Sub Total	**0.0**	**23,175.2**	**166.8**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	30.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**23,175.2**	**197.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10050**
Building Sq.Ft.: 77,130

System Type	1
System Name:	H&V UNIT WITHOUT RETURN FAN
System Number:	AHU6

EMC NO.: 1406-006
DATE: 03-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

Typical Building Information

Category	Construction	Use	Occ.	Day
8	BRICK	PHYS FIT CENTER	0645-2000	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	1100	1600	1700	1600	1700	1600	1100
Stop Time	2000	2000	2000	2000	2000	2000	2000

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		5
Load Factor		0.8
CFM - HTG		6500
CFM - CLG		0
% OA		100.00%
% Area		4.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,000	3,360
Heating HRSON	1,600	5,376
C/H HRSON	2,607	8,760
Cooling HRSAV	2,360	
Heating HRSAV	3,776	
C/H HRSAV	6,153	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	126.26	126.26
HOAOHC	77.49	77.49
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	9.76E+03	9.76E+03
NSC	5.41E+04	5.41E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 03-Apr-95

Bldg Number: 10050
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU6

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	22,488.1	0.0	
Optimum ST/SP	0.0	687.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	166.8	
Sub Total	**0.0**	**23,175.2**	**166.8**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	30.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**23,175.2**	**197.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10050**
Building Sq.Ft.: 77,130

EMC NO.: 1406-006
DATE: 03-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	1
System Name:	H&V UNIT WITHOUT RETURN FAN
System Number:	AHU7

Typical Building Information

Category	Construction	Use	Occ.	Day
8	BRICK	PHYS FIT CENTER	0645-2000	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	1100	1600	1700	1600	1700	2600	1100
Stop Time	2000	2000	2000	2000	2000	2000	2000

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		2500
CFM - CLG		0
% OA		100.00%
% Area		1.60%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	800	3,360
Heating HRSON	1,280	5,376
C/H HRSON	2,086	8,760
Cooling HRSAV	2,560	
Heating HRSAV	4,096	
C/H HRSAV	6,674	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	126.26	126.26
HOAOHC	77.49	77.49
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	9.76E+03	9.76E+03
NSC	5.41E+04	5.41E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 03-Apr-95

Bldg Number: 10050
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU7

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	10,207.9	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	66.7	
Sub Total	**0.0**	**10,495.4**	**66.7**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	12.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**10,495.4**	**78.8**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10050**
Building Sq.Ft.: 77,130

EMC NO.: 1406-006
DATE: 03-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU8**

Typical Building Information

Category	Construction	Use	Occ.	Day
8	BRICK	PHYS FIT CENTER	0645-2000	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	800	600	600	600	600	600	800
Stop Time	2000	2100	2100	2100	2100	2100	2000

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		7.5
Load Factor		0.8
CFM - HTG		9364
CFM - CLG		0
% OA		100.00%
% Area		6.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	83.10%	83.10%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,260	3,360
Heating HRSON	3,616	5,376
C/H HRSON	5,892	8,760
Cooling HRSAV	1,100	
Heating HRSAV	1,760	
C/H HRSAV	2,868	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	126.26	126.26
HOAOHC	77.49	77.49
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	9.76E+03	9.76E+03
NSC	5.41E+04	5.41E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 03-Apr-95

Bldg Number: 10050
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU8

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	15,438.8	0.0	
Optimum ST/SP	0.0	1,012.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	250.3	
Sub Total	**0.0**	**16,450.9**	**250.3**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	45.2	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**16,450.9**	**295.4**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10050**
Building Sq.Ft.: 77,130

EMC NO.: 1406-006
DATE: 03-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	1
System Name:	H&V UNIT WITHOUT RETURN FAN
System Number:	AHU9

Typical Building Information

Category	Construction	Use	Occ.	Day
8	BRICK	PHYS FIT CENTER	0645-2000	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	800	600	600	600	600	600	800
Stop Time	2000	2100	2100	2100	2100	2100	2000

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		3
Load Factor		0.8
CFM - HTG		4170
CFM - CLG		0
% OA		100.00%
% Area		2.80%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	79.00%	79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,260	3,360
Heating HRSON	3,616	5,376
C/H HRSON	5,892	8,760
Cooling HRSAV	1,100	
Heating HRSAV	1,760	
C/H HRSAV	2,868	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	126.26	126.26
HOAOHC	77.49	77.49
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	9.76E+03	9.76E+03
NSC	5.41E+04	5.41E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 03-Apr-95

Bldg Number: 10050
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU9

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	6,496.0	0.0	
Optimum ST/SP	0.0	425.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	116.8	
Sub Total	**0.0**	**6,921.9**	**116.8**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	21.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**6,921.9**	**137.9**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10050**
Building Sq.Ft.: 77,130

EMC NO.: 1406-006
DATE: 03-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU10**

Typical Building Information

Category	Construction	Use	Occ.	Day
8	BRICK	PHYS FIT CENTER	0645-2000	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	800	600	600	600	600	600	800
Stop Time	2000	2100	2100	2100	2100	2100	2000

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		10
Load Factor		0.8
CFM - HTG		12000
CFM - CLG		0
% OA		100.00%
% Area		8.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	85.80%	85.80%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,260	3,360
Heating HRSON	3,616	5,376
C/H HRSON	5,892	8,760
Cooling HRSAV	1,100	
Heating HRSAV	1,760	
C/H HRSAV	2,868	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	126.26	126.26
HOAOHC	77.49	77.49
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	9.76E+03	9.76E+03
NSC	5.41E+04	5.41E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 03-Apr-95

Bldg Number: 10050
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU10

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	19,937.3	0.0	
Optimum ST/SP	0.0	1,307.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	333.7	
Sub Total	**0.0**	**21,244.3**	**333.7**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	60.2	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**21,244.3**	**393.9**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10050**
Building Sq.Ft.: 77,130

EMC NO.: 1406-006
DATE: 03-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU11**

Typical Building Information

Category	Construction	Use	Occ.	Day
8	BRICK	PHYS FIT CENTER	0645-2000	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	800	600	600	600	600	600	800
Stop Time	2000	2100	2100	2100	2100	2100	2000

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		10
Load Factor		0.8
CFM - HTG		14200
CFM - CLG		0
% OA		100.00%
% Area		9.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	85.80%	85.80%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,260	3,360
Heating HRSON	3,616	5,376
C/H HRSON	5,892	8,760
Cooling HRSAV	1,100	
Heating HRSAV	1,760	
C/H HRSAV	2,868	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	126.26	126.26
HOAOHC	77.49	77.49
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	9.76E+03	9.76E+03
NSC	5.41E+04	5.41E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 03-Apr-95

Bldg Number: 10050
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU11

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	19,937.3	0.0	
Optimum ST/SP	0.0	1,307.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	375.4	
Sub Total	**0.0**	**21,244.3**	**375.4**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	67.7	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**21,244.3**	**443.2**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10050**
Building Sq.Ft.: 77,130

EMC NO.: 1406-006
DATE: 03-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU12**

Typical Building Information

Category	Construction	Use	Occ.	Day
8	BRICK	PHYS FIT CENTER	0645-2000	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	800	600	600	600	600	600	800
Stop Time	2000	2100	2100	2100	2100	2100	2000

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		7.5
Load Factor		0.8
CFM - HTG		10500
CFM - CLG		0
% OA		100.00%
% Area		7.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	83.10%	83.10%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,260	3,360
Heating HRSON	3,616	5,376
C/H HRSON	5,892	8,760
Cooling HRSAV	1,100	
Heating HRSAV	1,760	
C/H HRSAV	2,868	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	126.26	126.26
HOAOHC	77.49	77.49
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	9.76E+03	9.76E+03
NSC	5.41E+04	5.41E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 03-Apr-95

Bldg Number: 10050
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU12

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	15,438.8	0.0	
Optimum ST/SP	0.0	1,012.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	292.0	
Sub Total	**0.0**	**16,450.9**	**292.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	52.7	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**16,450.9**	**344.7**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10050**
Building Sq.Ft.: 77,130

EMC NO.: 1406-006
DATE: 03-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**9**
System Name:	**CONVERTER AND PUMPS**
System Number:	**HE1**

Typical Building Information

Category	Construction	Use	Occ.	Day
8	BRICK	PHYS FIT CENTER	0645-2000	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	800	600	600	600	600	600	800
Stop Time	2000	2100	2100	2100	2100	2100	2000

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		5
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		1.60%
TON CAPC.		0
MBTU CAPC.		0.563
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,260	3,360
Heating HRSON	3,616	5,376
C/H HRSON	5,892	8,760
Cooling HRSAV	1,100	
Heating HRSAV	1,760	
C/H HRSAV	2,868	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	126.26	126.26
HOAOHC	77.49	77.49
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	9.76E+03	9.76E+03
NSC	5.41E+04	5.41E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 03-Apr-95

Bldg Number: 10050
System Type 9
System Name: CONVERTER AND PUMPS
System Number: HE1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	6,432.6	0.0	
Optimum ST/SP	0.0	687.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	66.7	
Sub Total	**0.0**	**7,119.7**	**66.7**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	12.0	
HW OA Reset	0.0	0.0	4.2	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**7,119.7**	**82.9**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10050**
Building Sq.Ft.: 77,130

EMC NO.: 1406-006
DATE: 03-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**9**
System Name:	**CONVERTER AND PUMPS**
System Number:	**HE2**

Typical Building Information

Category	Construction	Use	Occ.	Day
8	BRICK	PHYS FIT CENTER	0645-2000	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	800	600	600	600	600	600	800
Stop Time	2000	2100	2100	2100	2100	2100	2000

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		98.40%
TON CAPC.		0
MBTU CAPC.		6.512
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,260	3,360
Heating HRSON	3,616	5,376
C/H HRSON	5,892	8,760
Cooling HRSAV	1,100	
Heating HRSAV	1,760	
C/H HRSAV	2,868	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	126.26	126.26
HOAOHC	77.49	77.49
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	9.76E+03	9.76E+03
NSC	5.41E+04	5.41E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 03-Apr-95

Bldg Number: 10050
System Type 9
System Name: CONVERTER AND PUMPS
System Number: HE2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	18,162.7	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	4,104.4	
Sub Total	**0.0**	**20,102.8**	**4,104.4**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	740.7	
HW OA Reset	0.0	0.0	48.2	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**20,102.8**	**4,893.3**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10050**
Building Sq.Ft.: 77,130

EMC NO.: 1406-006
DATE: 03-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**9**	
System Name:	**CONVERTER AND PUMPS**	for pool water
System Number:	**HE3**	

Typical Building Information

Category	Construction	Use	Occ.	Day
8	BRICK	PHYS FIT CENTER	0645-2000	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	900	1400	1500	1400	1500	1400	830
Stop Time	1900	1900	1900	1900	1900	1900	1900

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		10
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		1.065
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	85.80%	85.80%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,154	3,360
Heating HRSON	1,846	5,376
C/H HRSON	3,009	8,760
Cooling HRSAV	2,206	
Heating HRSAV	3,530	
C/H HRSAV	5,751	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	126.26	126.26
HOAOHC	77.49	77.49
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	9.76E+03	9.76E+03
NSC	5.41E+04	5.41E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 03-Apr-95

Bldg Number: 10050
System Type 9
System Name: CONVERTER AND PUMPS
System Number: HE3

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	24,537.7	0.0	
Optimum ST/SP	0.0	1,307.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**25,844.7**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	7.9	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**25,844.7**	**7.9**	**3**

ENERGY CALCULATIONS

BUILDING 10100

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10100**
Building Sq.Ft.: 11,250

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	1
System Name:	H&V UNIT WITHOUT RETURN FAN
System Number:	AHU1

Typical Building Information

Category	Construction	Use	Occ.	Day
17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		1230
CFM - CLG		0
% OA		100.00%
% Area		21.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 10100
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	8,214.2	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	147.6	
Sub Total	**0.0**	**8,501.7**	**147.6**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	11.4	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**8,501.7**	**159.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10100**
Building Sq.Ft.: 11,250

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU-2**

Typical Building Information

Category	Construction	Use	Occ.	Day
17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		1
Load Factor		0.8
CFM - HTG		210
CFM - CLG		0
% OA		100.00%
% Area		4.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	69.20%	69.20%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 10100
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU-2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,629.4	0.0	
Optimum ST/SP	0.0	162.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	28.1	
Sub Total	**0.0**	**4,791.4**	**28.1**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	2.2	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**4,791.4**	**30.3**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG:** **10100**
Building Sq.Ft.: **11,250**

EMC NO.: 1406-006
DATE: 04-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**9**
System Name:	**CONVERTER AND PUMPS**
System Number:	**HE1**

Typical Building Information

Category	Construction	Use	Occ.	Day
17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.2602
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 04-Apr-95

Bldg Number: 10100
System Type 9
System Name: CONVERTER AND PUMPS
System Number: HE1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	5,041.0	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**5,328.6**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	1.9	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**5,328.6**	**1.9**	**3**

E M C ENGINEERS, INC.

EMC NO.: 1406-006
DATE: 04-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG:** **10100**
Building Sq.Ft.: **11,250**

System Type	**12**
System Name:	**BASEBOARD RADIATION**
System Number:	**HE2**

Typical Building Information

Category	Construction	Use	Occ.	Day
17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.75
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		75.00%
TON CAPC.		0
MBTU CAPC.		0.1117
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 04-Apr-95

Bldg Number: 10100
System Type 12
System Name: BASEBOARD RADIATION
System Number: HE2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	2,268.5	0.0	
Optimum ST/SP	0.0	129.4	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	527.0	
Sub Total	**0.0**	**2,397.8**	**527.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	40.9	
HW OA Reset	0.0	0.0	0.8	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**2,397.8**	**568.7**	**3**

ENERGY CALCULATIONS

BUILDING 10110

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10110**
Building Sq.Ft.: 12,450

EMC NO.: 1406-006
DATE: 10-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU1**

Typical Building Information

Category	Construction	Use	Occ.	Day
17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		1230
CFM - CLG		0
% OA		100.00%
% Area		21.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 10-Apr-95

Bldg Number: 10110
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	8,214.2	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	163.3	
Sub Total	**0.0**	**8,501.7**	**163.3**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	12.7	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**8,501.7**	**176.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10110**
Building Sq.Ft.: 12,450

EMC NO.: 1406-006
DATE: 10-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU2**

Typical Building Information

Category	Construction	Use	Occ.	Day
17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		1
Load Factor		0.8
CFM - HTG		210
CFM - CLG		0
% OA		100.00%
% Area		4.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	69.20%	69.20%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 10-Apr-95

Bldg Number: 10110
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,629.4	0.0	
Optimum ST/SP	0.0	162.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	31.1	
Sub Total	**0.0**	**4,791.4**	**31.1**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	2.4	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**4,791.4**	**33.5**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10110**
Building Sq.Ft.: 12,450

EMC NO.: 1406-006
DATE: 04-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**9**
System Name:	**CONVERTER AND PUMPS**
System Number:	**HE1**

Typical Building Information

Category	Construction	Use	Occ.	Day
17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.2602
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 04-Apr-95

Bldg Number: 10110
System Type 9
System Name: CONVERTER AND PUMPS
System Number: HE1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	5,041.0	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**5,328.6**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	1.9	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**5,328.6**	**1.9**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10110**
Building Sq.Ft.: 12,450

EMC NO.: 1406-006
DATE: 10-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**12**
System Name:	**BASEBOARD RADIATION**
System Number:	**HE2**

Typical Building Information

Category	Construction	Use	Occ.	Day
17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.75
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		75.00%
TON CAPC.		0
MBTU CAPC.		0.1117
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 10-Apr-95

Bldg Number: 10110
System Type 12
System Name: BASEBOARD RADIATION
System Number: HE2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	2,268.5	0.0	
Optimum ST/SP	0.0	129.4	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	583.3	
Sub Total	**0.0**	**2,397.8**	**583.3**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	45.2	
HW OA Reset	0.0	0.0	0.8	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**2,397.8**	**629.3**	**3**

ENERGY CALCULATIONS

BUILDING 10112

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10112**
Building Sq.Ft.: 49,162

EMC NO.: 1406-006
DATE: 01-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**9**
System Name:	**CONVERTER AND PUMPS**
System Number:	**HE1**

Typical Building Information

Category	Construction	Use	Occ.	Day
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.3875
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 01-Apr-95

Bldg Number: 10112
System Type 9
System Name: CONVERTER AND PUMPS
System Number: HE1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**287.5**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	2.9	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**287.5**	**2.9**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG:** **10112**
Building Sq.Ft.: **49,162**

EMC NO.: 1406-006
DATE: 01-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**12**
System Name:	**BASEBOARD RADIATION**
System Number:	**HE2**

Typical Building Information

Category	Construction	Use	Occ.	Day
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.75
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.6683
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 01-Apr-95

Bldg Number: 10112
System Type 12
System Name: BASEBOARD RADIATION
System Number: HE2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	129.4	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**129.4**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	4.9	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**129.4**	**4.9**	**3**

E M C ENGINEERS, INC.

EMC NO.: 1406-006
DATE: 02-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM BLDG: 10112
Building Sq.Ft.: 12,289

System Type	1
System Name:	H&V UNIT WITHOUT RETURN FAN
System Number:	AHU1

Typical Building Information

Category	Construction	Use	Occ.	Day
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		770
CFM - CLG		0
% OA		100.00%
% Area		17.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 02-Apr-95

Bldg Number: 10112
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	101.6	
Sub Total	**0.0**	**1,683.3**	**101.6**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	12.2	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**1,683.3**	**113.8**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM BLDG: 10112
Building Sq.Ft.: 12,289

EMC NO.: 1406-006
DATE: 02-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	1
System Name:	H&V UNIT WITHOUT RETURN FAN
System Number:	AHU2

Typical Building Information

Category	Construction	Use	Occ.	Day
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		770
CFM - CLG		0
% OA		100.00%
% Area		17.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 02-Apr-95

Bldg Number: 10112
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	101.6	
Sub Total	**0.0**	**1,683.3**	**101.6**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	12.2	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**1,683.3**	**113.8**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM BLDG: 10112
Building Sq.Ft.: 12,289

EMC NO.: 1406-006
DATE: 02-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	1
System Name:	H&V UNIT WITHOUT RETURN FAN
System Number:	AHU4

Typical Building Information

Category	Construction	Use	Occ.	Day
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		770
CFM - CLG		0
% OA		100.00%
% Area		17.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FM	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 02-Apr-95

Bldg Number: 10112
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU4

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	101.6	
Sub Total	**0.0**	**1,683.3**	**101.6**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	12.2	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**1,683.3**	**113.8**	**3**

E M C ENGINEERS, INC.

EMC NO.: 1406-006
DATE: 01-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM BLDG: 10112
Building Sq.Ft.: 36,867

System Type	1
System Name:	H&V UNIT WITHOUT RETURN FAN
System Number:	AHU5

Typical Building Information

Category	Construction	Use	Occ.	Day
15	BRICK	ADM & SUPPLY, ENL BRK	0000-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		1300
CFM - CLG		0
% OA		100.00%
% Area		16.70%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.40E+04	1.40E+04
NSC	0.00E+00	0.00E+00
FM	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 02-Apr-95

Bldg Number: 10112
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU5

HEATING AND VENTILATING SYSTEM	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	87.8	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**87.8**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM BLDG: 10112
Building Sq.Ft.: 36,867

EMC NO.: 1406-006
DATE: 01-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	1
System Name:	H&V UNIT WITHOUT RETURN FAN
System Number:	AHU6

Typical Building Information

Category	Construction	Use	Occ.	Day
15	BRICK	ADM & SUPPLY, ENL BRK	0000-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		1060
CFM - CLG		0
% OA		100.00%
% Area		16.70%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.40E+04	1.40E+04
NSC	0.00E+00	0.00E+00
FM	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 02-Apr-95

Bldg Number: 10112
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU6

HEATING AND VENTILATING SYSTEM	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	87.8	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**87.8**	**3**

ENERGY CALCULATIONS

BUILDING 10114

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10,114**
Building Sq.Ft.: 47,038

EMC NO.: 1406-006
DATE: 01-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**9**
System Name:	**CONVERTER AND PUMPS**
System Number:	**HE-1**

Typical Building Information

Category	Construction	Use	Occ.	Day
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.3875
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 01-Apr-95

Bldg Number: 10,114
System Type 9
System Name: CONVERTER AND PUMPS
System Number: HE-1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**287.5**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	2.9	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**287.5**	**2.9**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10,114**
Building Sq.Ft.: 47,038

EMC NO.: 1406-006
DATE: 01-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**12**
System Name:	**BASEBOARD RADIATION**
System Number:	**HE-2**

Typical Building Information

Category	Construction	Use	Occ.	Day
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.75
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.6683
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 01-Apr-95

Bldg Number: 10,114
System Type 12
System Name: BASEBOARD RADIATION
System Number: HE-2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	4.9	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**4.9**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10114**
Building Sq.Ft.: 11,760

EMC NO.: 1406-006
DATE: 02-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU1**

Typical Building Information

Category	Construction	Use	Occ.	Day
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		770
CFM - CLG		0
% OA		100.00%
% Area		17.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 02-Apr-95

Bldg Number: 10114
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	97.3	
Sub Total	**0.0**	**1,683.3**	**97.3**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	11.7	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**1,683.3**	**108.9**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10114**
Building Sq.Ft.: 11,760

EMC NO.: 1406-006
DATE: 02-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU4**

Typical Building Information

Category	Construction	Use	Occ.	Day
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		770
CFM - CLG		0
% OA		100.00%
% Area		17.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 02-Apr-95

Bldg Number: 10114
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU4

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	97.3	
Sub Total	**0.0**	**1,683.3**	**97.3**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	11.7	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**1,683.3**	**108.9**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10114**
Building Sq.Ft.: 35,279

EMC NO.: 1406-006
DATE: 01-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU5**

Typical Building Information

Category	Construction	Use	Occ.	Day
15	BRICK	ADM & SUPPLY, ENL BRK	0000-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		1300
CFM - CLG		0
% OA		100.00%
% Area		16.70%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.40E+04	1.40E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 02-Apr-95

Bldg Number: 10114
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU5

HEATING AND VENTILATING SYSTEM	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	84.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**84.1**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10114**
Building Sq.Ft.: 35,279

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU6**

Typical Building Information

Category	Construction	Use	Occ.	Day
15	BRICK	ADM & SUPPLY, ENL BRK	0000-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		1060
CFM - CLG		0
% OA		100.00%
% Area		16.70%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.40E+04	1.40E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 02-Apr-95

Bldg Number: 10114
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU6

HEATING AND VENTILATING SYSTEM	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	84.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**84.1**	**3**

ENERGY CALCULATIONS

BUILDING 10120

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10120**
Building Sq.Ft.: 12,450

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU1**

Typical Building Information

Category	Construction	Use	Occ.	Day
17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		1230
CFM - CLG		0
% OA		100.00%
% Area		21.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 10120
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	8,214.2	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	163.3	
Sub Total	**0.0**	**8,501.7**	**163.3**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	12.7	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**8,501.7**	**176.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10120**
Building Sq.Ft.: 12,450

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	1
System Name:	H&V UNIT WITHOUT RETURN FAN
System Number:	AHU-2

Typical Building Information

Category	Construction	Use	Occ.	Day
17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		1
Load Factor		0.8
CFM - HTG		210
CFM - CLG		0
% OA		100.00%
% Area		4.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	69.20%	69.20%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 10120
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU-2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,629.4	0.0	
Optimum ST/SP	0.0	162.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	31.1	
Sub Total	**0.0**	**4,791.4**	**31.1**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	2.4	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**4,791.4**	**33.5**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10120**
Building Sq.Ft.: 12,450

EMC NO.: 1406-006
DATE: 04-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**9**
System Name:	**CONVERTER AND PUMPS**
System Number:	**HE1**

Typical Building Information

Category	Construction	Use	Occ.	Day
17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.2602
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 04-Apr-95

Bldg Number: 10120
System Type 9
System Name: CONVERTER AND PUMPS
System Number: HE1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	5,041.0	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**5,328.6**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	1.9	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**5,328.6**	**1.9**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10120**
Building Sq.Ft.: 12,450

EMC NO.: 1406-006
DATE: 04-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**12**
System Name:	**BASEBOARD RADIATION**
System Number:	**HE2**

Typical Building Information

Category	Construction	Use	Occ.	Day
17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.75
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		75.00%
TON CAPC.		0
MBTU CAPC.		0.1117
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 04-Apr-95

Bldg Number: 10120
System Type 12
System Name: BASEBOARD RADIATION
System Number: HE2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	2,268.5	0.0	
Optimum ST/SP	0.0	129.4	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	583.3	
Sub Total	**0.0**	**2,397.8**	**583.3**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	45.2	
HW OA Reset	0.0	0.0	0.8	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**2,397.8**	**629.3**	**3**

ENERGY CALCULATIONS

BUILDING 10122

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10,122**
Building Sq.Ft.: 49,156

EMC NO.: 1406-006
DATE: 01-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**9**
System Name:	**CONVERTER AND PUMPS**
System Number:	**HE-1**

Typical Building Information

Category	Construction	Use	Occ.	Day
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.3875
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 01-Apr-95

Bldg Number: 10,122
System Type 9
System Name: CONVERTER AND PUMPS
System Number: HE-1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**287.5**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	2.9	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**287.5**	**2.9**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10,122**
Building Sq.Ft.: 49,156

EMC NO.: 1406-006
DATE: 01-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**12**
System Name:	**BASEBOARD RADIATION**
System Number:	**HE-2**

Typical Building Information

Category	Construction	Use	Occ.	Day
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.75
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.6683
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 01-Apr-95

Bldg Number: 10,122
System Type 12
System Name: BASEBOARD RADIATION
System Number: HE-2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	4.9	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**4.9**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10122**
Building Sq.Ft.: 12,289

EMC NO.: 1406-006
DATE: 02-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	1
System Name:	H&V UNIT WITHOUT RETURN FAN
System Number:	AHU1

Typical Building Information

Category	Construction	Use	Occ.	Day
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		770
CFM - CLG		0
% OA		100.00%
% Area		17.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 02-Apr-95

Bldg Number: 10122
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	101.6	
Sub Total	**0.0**	**1,683.3**	**101.6**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	12.2	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**1,683.3**	**113.8**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10122**
Building Sq.Ft.: 12,289

EMC NO.: 1406-006
DATE: 02-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU2**

Typical Building Information

Category	Construction	Use	Occ.	Day
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		770
CFM - CLG		0
% OA		100.00%
% Area		17.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 02-Apr-95

Bldg Number: 10122
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	101.6	
Sub Total	**0.0**	**1,683.3**	**101.6**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	12.2	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**1,683.3**	**113.8**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10122**
Building Sq.Ft.: 12,289

EMC NO.: 1406-006
DATE: 02-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU4**

Typical Building Information

Category	Construction	Use	Occ.	Day
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		770
CFM - CLG		0
% OA		100.00%
% Area		17.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 02-Apr-95

Bldg Number: 10122
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU4

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	101.6	
Sub Total	**0.0**	**1,683.3**	**101.6**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	12.2	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**1,683.3**	**113.8**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10122**
Building Sq.Ft.: 36,867

EMC NO.: 1406-006
DATE: 01-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	1
System Name:	H&V UNIT WITHOUT RETURN FAN
System Number:	AHU5

Typical Building Information

Category	Construction	Use	Occ.	Day
15	BRICK	ADM & SUPPLY, ENL BRK	0000-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		1300
CFM - CLG		0
% OA		100.00%
% Area		16.70%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.40E+04	1.40E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 02-Apr-95

Bldg Number: 10122
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU5

HEATING AND VENTILATING SYSTEM	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	87.8	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**87.8**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10122**
Building Sq.Ft.: 36,867

EMC NO.: 1406-006
DATE: 01-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU6**

Typical Building Information

Category	Construction	Use	Occ.	Day
15	BRICK	ADM & SUPPLY, ENL BRK	0000-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		1060
CFM - CLG		0
% OA		100.00%
% Area		16.70%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.40E+04	1.40E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 02-Apr-95

Bldg Number: 10122
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU6

HEATING AND VENTILATING SYSTEM	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	87.8	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**87.8**	**3**

ENERGY CALCULATIONS

BUILDING 10124

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10124**
Building Sq.Ft.: 47,038

EMC NO.: 1406-006
DATE: 14-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**9**
System Name:	**CONVERTER AND PUMPS**
System Number:	**HE-1**

Typical Building Information

Category	Construction	Use	Occ.	Day
14	BRICK	ADM & SUPPLY,ENL BRK	600-1700	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.3875
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	14.77
HOAOHC	110.07	9.07
COAOC	0.00E+00	2.10E-05
COAOHC	0.00E+00	8.04E-06
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	1.26E-05
NSUCHC	0.00E+00	7.74E-06
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	8.71E+03
NSC	4.86E+04	5.97E+04
FV	0	6
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 14-Apr-95

Bldg Number: 10124
System Type 9
System Name: CONVERTER AND PUMPS
System Number: HE-1

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**287.5**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	2.9	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**287.5**	**2.9**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10,124**
Building Sq.Ft.: 47,038

EMC NO.: 1406-006
DATE: 01-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**12**
System Name:	**BASEBOARD RADIATION**
System Number:	**HE-2**

Typical Building Information

Category	Construction	Use	Occ.	Day
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.75
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.6683
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 01-Apr-95

Bldg Number: 10,124
System Type 12
System Name: BASEBOARD RADIATION
System Number: HE-2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	4.9	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**4.9**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10124**
Building Sq.Ft.: 11,760

EMC NO.: 1406-006
DATE: 02-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	1
System Name:	H&V UNIT WITHOUT RETURN FAN
System Number:	AHU1

Typical Building Information

Category	Construction	Use	Occ.	Day
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		770
CFM - CLG		0
% OA		100.00%
% Area		17.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 02-Apr-95

Bldg Number: 10124
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	97.3	
Sub Total	**0.0**	**1,683.3**	**97.3**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	11.7	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**1,683.3**	**108.9**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10124**
Building Sq.Ft.: 11,760

EMC NO.: 1406-006
DATE: 02-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU2**

Typical Building Information

Category	Construction	Use	Occ.	Day
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		770
CFM - CLG		0
% OA		100.00%
% Area		17.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 02-Apr-95

Bldg Number: 10124
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	97.3	
Sub Total	**0.0**	**1,683.3**	**97.3**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	11.7	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**1,683.3**	**108.9**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10124**
Building Sq.Ft.: 11,760

EMC NO.: 1406-006
DATE: 02-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	1
System Name:	H&V UNIT WITHOUT RETURN FAN
System Number:	AHU4

Typical Building Information

Category	Construction	Use	Occ.	Day
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		770
CFM - CLG		0
% OA		100.00%
% Area		17.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 02-Apr-95

Bldg Number: 10124
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU4

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	97.3	
Sub Total	**0.0**	**1,683.3**	**97.3**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	11.7	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**1,683.3**	**108.9**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10124**
Building Sq.Ft.: 35,279

EMC NO.: 1406-006
DATE: 01-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	1
System Name:	H&V UNIT WITHOUT RETURN FAN
System Number:	AHU5

Typical Building Information

Category	Construction	Use	Occ.	Day
15	BRICK	ADM & SUPPLY, ENL BRK	0000-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		1300
CFM - CLG		0
% OA		100.00%
% Area		16.70%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.40E+04	1.40E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 02-Apr-95

Bldg Number: 10124
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU5

HEATING AND VENTILATING SYSTEM	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	84.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**84.1**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10124**
Building Sq.Ft.: 35,279

EMC NO.: 1406-006
DATE: 01-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	1
System Name:	H&V UNIT WITHOUT RETURN FAN
System Number:	AHU6

Typical Building Information

Category	Construction	Use	Occ.	Day
15	BRICK	ADM & SUPPLY, ENL BRK	0000-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		1060
CFM - CLG		0
% OA		100.00%
% Area		16.70%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.40E+04	1.40E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 02-Apr-95

Bldg Number: 10124
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU6

HEATING AND VENTILATING SYSTEM	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	84.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**84.1**	**3**

ENERGY CALCULATIONS

BUILDING 10130

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10130**
Building Sq.Ft.: 13,305

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU1**

Typical Building Information

Category	Construction	Use	Occ.	Day
17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		1230
CFM - CLG		0
% OA		100.00%
% Area		21.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 10130
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	8,214.2	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	174.5	
Sub Total	**0.0**	**8,501.7**	**174.5**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	13.5	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**8,501.7**	**188.1**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10130**
Building Sq.Ft.: 13,305

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	1
System Name:	H&V UNIT WITHOUT RETURN FAN
System Number:	AHU-2

Typical Building Information

Category	Construction	Use	Occ.	Day
17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		1
Load Factor		0.8
CFM - HTG		210
CFM - CLG		0
% OA		100.00%
% Area		4.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	69.20%	69.20%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 10130
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU-2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,629.4	0.0	
Optimum ST/SP	0.0	162.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	33.2	
Sub Total	**0.0**	**4,791.4**	**33.2**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	2.6	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**4,791.4**	**35.8**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10130**
Building Sq.Ft.: 13,305

EMC NO.: 1406-006
DATE: 04-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**9**
System Name:	**CONVERTER AND PUMPS**
System Number:	**HE1**

Typical Building Information

Category	Construction	Use	Occ.	Day
17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.2602
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 04-Apr-95

Bldg Number: 10130
System Type 9
System Name: CONVERTER AND PUMPS
System Number: HE1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	5,041.0	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**5,328.6**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	1.9	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**5,328.6**	**1.9**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG:** **10130**
Building Sq.Ft.: **13,305**

EMC NO.: 1406-006
DATE: 04-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**12**
System Name:	**BASEBOARD RADIATION**
System Number:	**HE2**

Typical Building Information

Category	Construction	Use	Occ.	Day
17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.75
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		75.00%
TON CAPC.		0
MBTU CAPC.		0.1117
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 04-Apr-95

Bldg Number: 10130
System Type 12
System Name: BASEBOARD RADIATION
System Number: HE2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	2,268.5	0.0	
Optimum ST/SP	0.0	129.4	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	623.3	
Sub Total	**0.0**	**2,397.8**	**623.3**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	48.3	
HW OA Reset	0.0	0.0	0.8	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**2,397.8**	**672.5**	**3**

ENERGY CALCULATIONS

BUILDING 10132

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10,132**
Building Sq.Ft.: 50,156

EMC NO.: 1406-006
DATE: 01-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**9**
System Name:	**CONVERTER AND PUMPS**
System Number:	**HE-1**

Typical Building Information

Category	Construction	Use	Occ.	Day
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.5123
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 01-Apr-95

Bldg Number: 10,132
System Type 9
System Name: CONVERTER AND PUMPS
System Number: HE-1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**287.5**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	3.8	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**287.5**	**3.8**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10,132**
Building Sq.Ft.: 50,156

EMC NO.: 1406-006
DATE: 01-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**12**
System Name:	**BASEBOARD RADIATION**
System Number:	**HE-2**

Typical Building Information

Category	Construction	Use	Occ.	Day
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.75
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.9801
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 01-Apr-95

Bldg Number: 10,132
System Type 12
System Name: BASEBOARD RADIATION
System Number: HE-2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	7.3	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**7.3**	**3**

E M C ENGINEERS, INC.

EMC NO.: 1406-006
DATE: 12-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM BLDG: 10132
Building Sq.Ft.: 17,053

System Type	14
System Name:	VENTILATION
System Number:	AHU-1

Typical Building Information

Category	Construction	Use	Occ.	Day
14	BRICK	ADM & SUPPLY,ENL BRK W	0600-1700	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		3
Load Factor		0.8
CFM - HTG		0
CFM - CLG		4779
% OA		100.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	79.00%	79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 12-Apr-95

Bldg Number: 10132
System Type 14
System Name: VENTILATION
System Number: AHU-1

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,666.1	0.0	
Optimum ST/SP	0.0	425.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**5,092.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				0
TOTAL	**0.0**	**5,092.0**	**0.0**	**0**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10132**
Building Sq.Ft.: 17,053

EMC NO.: 1406-006
DATE: 12-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**14**
System Name:	**VENTILATION**
System Number:	**AHU2**

Typical Building Information

Category	Construction	Use	Occ.	Day
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		3
Load Factor		0.8
CFM - HTG		0
CFM - CLG		4566
% OA		100.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	79.00%	79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 12-Apr-95

Bldg Number: 10132
System Type 14
System Name: VENTILATION
System Number: AHU2

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,666.1	0.0	
Optimum ST/SP	0.0	425.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**5,092.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				0
TOTAL	**0.0**	**5,092.0**	**0.0**	**0**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10132**

EMC NO.: 1406-006
DATE: 01-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

Building Sq.Ft.:	17,053
System Type	14
System Name:	VENTILATION
System Number:	AHU3

Typical Building Information

Category	Construction	Use	Occ.	Day
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		3
Load Factor		0.8
CFM - HTG		0
CFM - CLG		4779
% OA		100.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	79.00%	79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 01-Apr-95

Bldg Number: 10132
System Type 14
System Name: VENTILATION
System Number: AHU3

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,666.1	0.0	
Optimum ST/SP	0.0	425.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**5,092.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**5,092.0**	**0.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10132**
Building Sq.Ft.: 17,053

EMC NO.: 1406-006
DATE: 12-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**14**
System Name:	**VENTILATION**
System Number:	**AHU-4**

Typical Building Information

Category	Construction	Use	Occ.	Day
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		3
Load Factor		0.8
CFM - HTG		4779
CFM - CLG		0
% OA		100.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	79.00%	79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 12-Apr-95

Bldg Number: 10132
System Type 14
System Name: VENTILATION
System Number: AHU-4

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,666.1	0.0	
Optimum ST/SP	0.0	425.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**5,092.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				0
TOTAL	**0.0**	**5,092.0**	**0.0**	**0**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10132**
Building Sq.Ft.: 17,053

EMC NO.: 1406-006
DATE: 01-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	1
System Name:	H&V UNIT WITHOUT RETURN FAN
System Number:	AHU6

Typical Building Information

Category	Construction	Use	Occ.	Day
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		750
CFM - CLG		0
% OA		100.00%
% Area		12.75%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 01-Apr-95

Bldg Number: 10132
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU6

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	75.9	
Sub Total	**0.0**	**1,683.3**	**75.9**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	9.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**1,683.3**	**85.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10132**
Building Sq.Ft.: 17,053

EMC NO.: 1406-006
DATE: 01-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU7**

Typical Building Information

Category	Construction	Use	Occ.	Day
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		750
CFM - CLG		0
% OA		100.00%
% Area		12.75%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 01-Apr-95

Bldg Number: 10132
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU7

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	75.9	
Sub Total	**0.0**	**1,683.3**	**75.9**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	9.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**1,683.3**	**85.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10132**
Building Sq.Ft.: 17,053

EMC NO.: 1406-006
DATE: 01-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU8**

Typical Building Information

Category	Construction	Use	Occ.	Day
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		750
CFM - CLG		0
% OA		100.00%
% Area		12.75%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 01-Apr-95

Bldg Number: 10132
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU8

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	75.9	
Sub Total	**0.0**	**1,683.3**	**75.9**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	9.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**1,683.3**	**85.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10132**
Building Sq.Ft.: 17,053

EMC NO.: 1406-006
DATE: 01-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU9**

Typical Building Information

Category	Construction	Use	Occ.	Day
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		750
CFM - CLG		0
% OA		100.00%
% Area		12.75%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 01-Apr-95

Bldg Number: 10132
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU9

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	75.9	
Sub Total	**0.0**	**1,683.3**	**75.9**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	9.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**1,683.3**	**85.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10132**
Building Sq.Ft.: 35,279

EMC NO.: 1406-006
DATE: 02-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU10**

Typical Building Information

Category	Construction	Use	Occ.	Day
15	BRICK	ADM & SUPPLY, ENL BRK	0000-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.5
Load Factor		0.8
CFM - HTG		1860
CFM - CLG		0
% OA		100.00%
% Area		19.30%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.40E+04	1.40E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 02-Apr-95

Bldg Number: 10132
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU10

HEATING AND VENTILATING SYSTEM	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	77.5	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**77.5**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10132**
Building Sq.Ft.: 35,279

EMC NO.: 1406-006
DATE: 02-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU11**

Typical Building Information

Category	Construction	Use	Occ.	Day
15	BRICK	ADM & SUPPLY, ENL BRK	0000-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		1350
CFM - CLG		0
% OA		100.00%
% Area		19.30%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.40E+04	1.40E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 02-Apr-95

Bldg Number: 10132
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU11

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	92.5	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**92.5**	**3**

ENERGY CALCULATIONS

BUILDING 10134

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10,134**
Building Sq.Ft.: 59,693

EMC NO.: 1406-006
DATE: 01-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**9**
System Name:	**CONVERTER AND PUMPS**
System Number:	**HE-1**

Typical Building Information

Category	Construction	Use	Occ.	Day
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.5123
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 01-Apr-95

Bldg Number: 10,134
System Type 9
System Name: CONVERTER AND PUMPS
System Number: HE-1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**287.5**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	3.8	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**287.5**	**3.8**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10,134**
Building Sq.Ft.: 59,693

EMC NO.: 1406-006
DATE: 01-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**12**
System Name:	**BASEBOARD RADIATION**
System Number:	**HE-2**

Typical Building Information

Category	Construction	Use	Occ.	Day
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.75
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.9801
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 01-Apr-95

Bldg Number: 10,134
System Type 12
System Name: BASEBOARD RADIATION
System Number: HE-2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	7.3	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**7.3**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10134**
Building Sq.Ft.: 20,296

EMC NO.: 1406-006
DATE: 01-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	14
System Name:	VENTILATION
System Number:	AHU1

Typical Building Information

Category	Construction	Use	Occ.	Day
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		3
Load Factor		0.8
CFM - HTG		0
CFM - CLG		4566
% OA		100.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	79.00%	79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 12-Apr-95

Bldg Number: 10134
System Type 14
System Name: VENTILATION
System Number: AHU-1

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,666.1	0.0	
Optimum ST/SP	0.0	425.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**5,092.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				0
TOTAL	**0.0**	**5,092.0**	**0.0**	**0**

E M C ENGINEERS, INC.

EMC NO.: 1406-006
DATE: 12-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM BLDG: 10134
Building Sq.Ft.: 17,053

System Type	14
System Name:	VENTILATION
System Number:	AHU-2

Typical Building Information

Category	Construction	Use	Occ.	Day
14	BRICK	ADM & SUPPLY,ENL BRK W	0600-1700	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		3
Load Factor		0.8
CFM - HTG		0
CFM - CLG		4779
% OA		100.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	79.00%	79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 12-Apr-95

Bldg Number: 10134
System Type 14
System Name: VENTILATION
System Number: AHU-2

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,666.1	0.0	
Optimum ST/SP	0.0	425.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**5,092.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				0
TOTAL	**0.0**	**5,092.0**	**0.0**	**0**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10134**
Building Sq.Ft.: 20,296

EMC NO.: 1406-006
DATE: 01-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**14**
System Name:	**VENTILATION**
System Number:	**AHU3**

Typical Building Information

Category	Construction	Use	Occ.	Day
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		3
Load Factor		0.8
CFM - HTG		0
CFM - CLG		4566
% OA		100.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	79.00%	79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 01-Apr-95

Bldg Number: 10134
System Type 14
System Name: VENTILATION
System Number: AHU3

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,666.1	0.0	
Optimum ST/SP	0.0	425.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**5,092.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**5,092.0**	**0.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM BLDG: 10134
Building Sq.Ft.: 20,296

EMC NO.: 1406-006
DATE: 01-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	14
System Name:	VENTILATION
System Number:	AHU4

Typical Building Information

Category	Construction	Use	Occ.	Day
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		3
Load Factor		0.8
CFM - HTG		0
CFM - CLG		4566
% OA		100.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	79.00%	79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 01-Apr-95

Bldg Number: 10134
System Type 14
System Name: VENTILATION
System Number: AHU4

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,666.1	0.0	
Optimum ST/SP	0.0	425.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**5,092.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**5,092.0**	**0.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10134**
Building Sq.Ft.: 20,296

EMC NO.: 1406-006
DATE: 02-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU6**

Typical Building Information

Category	Construction	Use	Occ.	Day
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		750
CFM - CLG		0
% OA		100.00%
% Area		12.75%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 02-Apr-95

Bldg Number: 10134
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU6

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	125.9	
Sub Total	**0.0**	**1,683.3**	**125.9**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	15.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**1,683.3**	**141.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10134**
Building Sq.Ft.: 20,296

EMC NO.: 1406-006
DATE: 02-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU7**

Typical Building Information

Category	Construction	Use	Occ.	Day
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		750
CFM - CLG		0
% OA		100.00%
% Area		12.75%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 02-Apr-95

Bldg Number: 10134
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU7

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	125.9	
Sub Total	**0.0**	**1,683.3**	**125.9**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	15.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**1,683.3**	**141.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10134**
Building Sq.Ft.: 20,296

EMC NO.: 1406-006
DATE: 02-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU8**

Typical Building Information

Category	Construction	Use	Occ.	Day
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		750
CFM - CLG		0
% OA		100.00%
% Area		12.75%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 02-Apr-95

Bldg Number: 10134
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU8

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	125.9	
Sub Total	**0.0**	**1,683.3**	**125.9**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	15.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**1,683.3**	**141.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10134**
Building Sq.Ft.: 20,296

EMC NO.: 1406-006
DATE: 02-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	1
System Name:	H&V UNIT WITHOUT RETURN FAN
System Number:	AHU9

Typical Building Information

Category	Construction	Use	Occ.	Day
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		750
CFM - CLG		0
% OA		100.00%
% Area		12.75%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 02-Apr-95

Bldg Number: 10134
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU9

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	125.9	
Sub Total	**0.0**	**1,683.3**	**125.9**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	15.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**1,683.3**	**141.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10134**
Building Sq.Ft.: 39,397

EMC NO.: 1406-006
DATE: 02-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU10**

Typical Building Information

Category	Construction	Use	Occ.	Day
15	BRICK	ADM & SUPPLY, ENL BRK	0000-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.5
Load Factor		0.8
CFM - HTG		1860
CFM - CLG		0
% OA		100.00%
% Area		19.30%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.40E+04	1.40E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 02-Apr-95

Bldg Number: 10134
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU10

HEATING AND VENTILATING SYSTEM	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	92.2	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**92.2**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10134**
Building Sq.Ft.: 39,397

EMC NO.: 1406-006
DATE: 02-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU11**

Typical Building Information

Category	Construction	Use	Occ.	Day
15	BRICK	ADM & SUPPLY, ENL BRK	0000-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		1350
CFM - CLG		0
% OA		100.00%
% Area		19.30%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.40E+04	1.40E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 02-Apr-95

Bldg Number: 10134
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU11

HEATING AND VENTILATING SYSTEM	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**0.0**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	92.2	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**0.0**	**92.2**	**3**

ENERGY CALCULATIONS

BUILDING 10150

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10150**
Building Sq.Ft.: 18,460

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU1**

Typical Building Information

Category	Construction	Use	Occ.	Day
16	BRICK	ENK PERS DINNING	0400-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	400	400	400	400	400	400	400
Stop Time	2000	2000	2000	2000	2000	2000	2000

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		7.5
Load Factor		0.8
CFM - HTG		8000
CFM - CLG		0
% OA		100.00%
% Area		17.60%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	83.10%	83.10%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,520	3,360
Heating HRSON	4,032	5,376
C/H HRSON	6,570	8,760
Cooling HRSAV	840	
Heating HRSAV	1,344	
C/H HRSAV	2,190	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	39.67	39.67
HOAOHC	24.34	24.34
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	3.39E+04	3.39E+04
NSC	9.39E+04	9.39E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 10150
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	11,789.6	0.0	
Optimum ST/SP	0.0	1,012.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	174.4	
Sub Total	**0.0**	**12,801.7**	**174.4**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	63.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**12,801.7**	**237.4**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG:** **10150**
Building Sq.Ft.: **18,460**

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**AHU2**

Typical Building Information

Category	Construction	Use	Occ.	Day
16	BRICK	ENK PERS DINNING	0400-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	400	400	400	400	400	400	400
Stop Time	1930	1930	1930	1930	1930	1930	1930

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		8
Load Factor		0.8
CFM - HTG		5265
CFM - CLG		0
% OA		25.00%
% Area		17.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	83.10%	83.10%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,422	3,360
Heating HRSON	3,875	5,376
C/H HRSON	6,314	8,760
Cooling HRSAV	938	
Heating HRSAV	1,501	
C/H HRSAV	2,445	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	39.67	39.67
HOAOHC	24.34	24.34
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	3.39E+04	3.39E+04
NSC	9.39E+04	9.39E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 10150
System Type 2
System Name: H&V UNIT
System Number: AHU2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	14,042.8	0.0	
Optimum ST/SP	0.0	1,079.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	294.7	
Sub Total	**0.0**	**15,122.3**	**294.7**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	106.5	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**15,122.3**	**401.2**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10150**
Building Sq.Ft.: 18,460

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**AHU3**

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

Typical Building Information

Category	Construction	Use	Occ.	Day
16	BRICK	ENK PERS DINNING	0400-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	400	400	400	400	400	400	400
Stop Time	1930	1930	1930	1930	1930	1930	1930

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		10
Load Factor		0.8
CFM - HTG		4670
CFM - CLG		0
% OA		100.00%
% Area		15.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	85.80%	85.80%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,422	3,360
Heating HRSON	3,875	5,376
C/H HRSON	6,314	8,760
Cooling HRSAV	938	
Heating HRSAV	1,501	
C/H HRSAV	2,445	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	39.67	39.67
HOAOHC	24.34	24.34
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	3.39E+04	3.39E+04
NSC	9.39E+04	9.39E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 10150
System Type 2
System Name: H&V UNIT
System Number: AHU3

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	17,001.1	0.0	
Optimum ST/SP	0.0	1,307.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	260.0	
Sub Total	**0.0**	**18,308.0**	**260.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	93.9	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**18,308.0**	**354.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG:** **10150**
Building Sq.Ft.: **18,460**

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**AHU4**

Typical Building Information

Category	Construction	Use	Occ.	Day
16	BRICK	ENK PERS DINNING	0400-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	400	400	400	400	400	400	400
Stop Time	1930	1930	1930	1930	1930	1930	1930

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	15
Load Factor	0.8
CFM - HTG	7430
CFM - CLG	0
% OA	5.00%
% Area	24.00%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,422	3,360
Heating HRSON	3,875	5,376
C/H HRSON	6,314	8,760
Cooling HRSAV	938	
Heating HRSAV	1,501	
C/H HRSAV	2,445	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	39.67	39.67
HOAOHC	24.34	24.34
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	3.39E+04	3.39E+04
NSC	9.39E+04	9.39E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 10150
System Type 2
System Name: H&V UNIT
System Number: AHU4

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	25,236.9	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	416.1	
Sub Total	**0.0**	**27,177.0**	**416.1**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	150.3	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**27,177.0**	**566.4**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10150**
Building Sq.Ft.: 18,460

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**AHU5**

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

Typical Building Information

Category	Construction	Use	Occ.	Day
16	BRICK	ENK PERS DINNING	0400-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	400	400	400	400	400	400	400
Stop Time	1930	1930	1930	1930	1930	1930	1930

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		6
Load Factor		0.8
CFM - HTG		3145
CFM - CLG		0
% OA		5.00%
% Area		10.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,422	3,360
Heating HRSON	3,875	5,376
C/H HRSON	6,314	8,760
Cooling HRSAV	938	
Heating HRSAV	1,501	
C/H HRSAV	2,445	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	39.67	39.67
HOAOHC	24.34	24.34
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	3.39E+04	3.39E+04
NSC	9.39E+04	9.39E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 10150
System Type 2
System Name: H&V UNIT
System Number: AHU5

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	10,725.7	0.0	
Optimum ST/SP	0.0	824.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	173.4	
Sub Total	**0.0**	**11,550.2**	**173.4**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	62.6	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**11,550.2**	**236.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 175**
Building Sq.Ft.: 19,439

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**AHU6**

Typical Building Information

Category	Construction	Use	Occ.	Day
16	BRICK	ENK PERS DINNING	0400-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	400	400	400	400	400	400	400
Stop Time	2000	2000	2000	2000	2000	2000	2000

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		4
Load Factor		0.8
CFM - HTG		600
CFM - CLG		0
% OA		0.00%
% Area		1.60%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	79.00%	79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,520	3,360
Heating HRSON	4,032	5,376
C/H HRSON	6,570	8,760
Cooling HRSAV	840	
Heating HRSAV	1,344	
C/H HRSAV	2,190	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	39.67	39.67
HOAOHC	24.34	24.34
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	3.39E+04	3.39E+04
NSC	9.39E+04	9.39E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 175
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: AHU6

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	6,614.1	0.0	
Optimum ST/SP	0.0	567.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	29.2	
Sub Total	**0.0**	**7,181.9**	**29.2**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	10.6	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**7,181.9**	**39.8**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10150**
Building Sq.Ft.: 18,460

EMC NO.: 1406-006
DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**9**
System Name:	**CONVERTER AND PUMPS**
System Number:	**HE1**

Typical Building Information

Category	Construction	Use	Occ.	Day
16	BRICK	ENK PERS DINNING	0400-2400	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	400	400	400	400	400	400	400
Stop Time	2000	2000	2000	2000	2000	2000	2000

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		7.40%
TON CAPC.		0
MBTU CAPC.		1.5064
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,520	3,360
Heating HRSON	4,032	5,376
C/H HRSON	6,570	8,760
Cooling HRSAV	840	
Heating HRSAV	1,344	
C/H HRSAV	2,190	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	39.67	39.67
HOAOHC	24.34	24.34
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	3.39E+04	3.39E+04
NSC	9.39E+04	9.39E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 06-Apr-95

Bldg Number: 10150
System Type 9
System Name: CONVERTER AND PUMPS
System Number: HE1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	3,349.5	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	128.3	
Sub Total	**0.0**	**3,637.0**	**128.3**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	46.3	
HW OA Reset	0.0	0.0	11.1	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**3,637.0**	**185.8**	**3**

ENERGY CALCULATIONS

BUILDING 10170

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG:** **10170**
Building Sq.Ft.: **25,984**

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**HV1**

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		22.5
Load Factor		0.8
CFM - HTG		11135
CFM - CLG		0
% OA		100.00%
% Area		10.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	88.10%	88.10%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 10170
System Type 2
System Name: H&V UNIT
System Number: HV1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	81,021.0	0.0	
Optimum ST/SP	0.0	2,863.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	24.1	
Sub Total	**0.0**	**83,884.9**	**24.1**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	6.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**83,884.9**	**30.2**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG:** **10170**
Building Sq.Ft.: **25,984**

EMC NO.: 1406-006
DATE: 04-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**HV2**

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		27.5
Load Factor		0.8
CFM - HTG		11410
CFM - CLG		0
% OA		33.00%
% Area		10.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	89.40%	89.40%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 04-Apr-95

Bldg Number: 10170
System Type 2
System Name: H&V UNIT
System Number: HV2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	97,585.7	0.0	
Optimum ST/SP	0.0	3,449.4	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	24.1	
Sub Total	**0.0**	**101,035.1**	**24.1**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	6.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**101,035.1**	**30.2**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG:** **10170**
Building Sq.Ft.: **25,984**

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**HV3**

EMC NO.: 1406-006
DATE: 04-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		22.5
Load Factor		0.8
CFM - HTG		6020
CFM - CLG		0
% OA		33.00%
% Area		10.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	88.10%	88.10%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 04-Apr-95

Bldg Number: 10170
System Type 2
System Name: H&V UNIT
System Number: HV3

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	81,021.0	0.0	
Optimum ST/SP	0.0	2,863.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	24.1	
Sub Total	**0.0**	**83,884.9**	**24.1**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	6.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**83,884.9**	**30.2**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10170**
Building Sq.Ft.: 25,984

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**2**
System Name:	**H&V UNIT**
System Number:	**HV4**

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		22.5
Load Factor		0.8
CFM - HTG		4090
CFM - CLG		0
% OA		100.00%
% Area		5.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	88.10%	88.10%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 10170
System Type 2
System Name: H&V UNIT
System Number: HV4

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	81,021.0	0.0	
Optimum ST/SP	0.0	2,863.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	12.0	
Sub Total	**0.0**	**83,884.9**	**12.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	3.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**83,884.9**	**15.1**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG:** **10170**
Building Sq.Ft.: **25,984**

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**MAU-1**

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		18150
CFM - CLG		0
% OA		100.00%
% Area		6.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 10170
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: MAU-1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	14.4	
Sub Total	**0.0**	**56,826.3**	**14.4**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	3.7	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**56,826.3**	**18.1**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10170**
Building Sq.Ft.: 25,984

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**MAU-2**

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		9200
CFM - CLG		0
% OA		100.00%
% Area		3.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 10170
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: MAU-2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	7.2	
Sub Total	**0.0**	**56,826.3**	**7.2**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	1.8	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**56,826.3**	**9.1**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10170**
Building Sq.Ft.: 25,984

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**MAU-3**

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		16920
CFM - CLG		0
% OA		100.00%
% Area		6.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 10170
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: MAU-3

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	14.4	
Sub Total	**0.0**	**56,826.3**	**14.4**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	3.7	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**56,826.3**	**18.1**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG:** **10170**
Building Sq.Ft.: **25,984**

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**MAU-4**

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		20000
CFM - CLG		0
% OA		100.00%
% Area		6.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 10170
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: MAU-4

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	14.4	
Sub Total	**0.0**	**56,826.3**	**14.4**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	3.7	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**56,826.3**	**18.1**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10170**
Building Sq.Ft.: 25,984

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**MAU-5**

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		10000
CFM - CLG		0
% OA		100.00%
% Area		3.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 10170
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: MAU-5

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	7.2	
Sub Total	**0.0**	**56,826.3**	**7.2**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	1.8	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**56,826.3**	**9.1**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10170**
Building Sq.Ft.: 25,984

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**MAU-6**

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		16100
CFM - CLG		0
% OA		100.00%
% Area		5.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 10170
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: MAU-6

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	12.0	
Sub Total	**0.0**	**56,826.3**	**12.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	3.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**56,826.3**	**15.1**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10170**
Building Sq.Ft.: 25,984

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**1**
System Name:	**H&V UNIT WITHOUT RETURN FAN**
System Number:	**MAU-7**

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		7.5
Load Factor		0.8
CFM - HTG		16100
CFM - CLG		0
% OA		100.00%
% Area		2.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	83.10%	83.10%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 10170
System Type 1
System Name: H&V UNIT WITHOUT RETURN FAN
System Number: MAU-7

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	28,632.0	0.0	
Optimum ST/SP	0.0	1,012.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	4.8	
Sub Total	**0.0**	**29,644.0**	**4.8**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	1.2	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**29,644.0**	**6.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG:** **10170**
Building Sq.Ft.: **25,984**

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**12**
System Name:	**BASEBOARD RADIATION**
System Number:	**HTP1**

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		5
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		24.00%
TON CAPC.		0
MBTU CAPC.		3.587
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 10170
System Type 12
System Name: BASEBOARD RADIATION
System Number: HTP1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	11,929.6	0.0	
Optimum ST/SP	0.0	687.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	57.7	
Sub Total	**0.0**	**12,616.7**	**57.7**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	14.7	
HW OA Reset	0.0	0.0	26.5	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**12,616.7**	**99.0**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG:** **10170**
Building Sq.Ft.: **25,984**

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**9**
System Name:	**CONVERTER AND PUMPS**
System Number:	**HTP2**

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		5
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		4.62
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 10170
System Type 9
System Name: CONVERTER AND PUMPS
System Number: HTP2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	11,929.6	0.0	
Optimum ST/SP	0.0	687.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**12,616.7**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	34.2	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**12,616.7**	**34.2**	**3**

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM **BLDG: 10170**
Building Sq.Ft.: 25,984

EMC NO.: 1406-006
DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

System Type	**9**
System Name:	**CONVERTER AND PUMPS**
System Number:	**HTP3**

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		5
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		4.258
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC.

PROJECT: UMCS FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY
LOCATION: FT. DRUM

Date: 05-Apr-95

Bldg Number: 10170
System Type 9
System Name: CONVERTER AND PUMPS
System Number: HTP3

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	11,929.6	0.0	
Optimum ST/SP	0.0	687.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	**0.0**	**12,616.7**	**0.0**	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	31.5	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	**0.0**	**12,616.7**	**31.5**	**3**