FINAL SUBMITTAL

VOLUME III, APPENDICES G AND H

ENERGY ENGINEERING ANALYSIS PROGRAM STUDY FORT LEONARD WOOD, MISSOURI

Prepared for

KANSAS CITY DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

Under

CONTRACT NO. DACA41-92-C-0098

Approved for public release;
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E M C ENGINEERS, INC.
Denver, Colorado
Atlanta, Georgia

DEPARTMENT OF THE ARMY
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19971017 117

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December 1993

EMC No. 3204-000

QUALITY INSPECTED

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PREVIOUSLY SUBMITTED

Volume II

F ENERGY CALCULATIONS

Volume III

G COST ESTIMATES
H FIELD SURVEY NOTES

Volume IV

I COMPUTER SIMULATIONS

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
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
LED	-	light emitting diode
LPG	-	liquified 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
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
UPW	-	uniform present worth
VAV	-	variable air volume
wk	-	week(s)
yr	-	year(s)

APPENDIX G

COST ESTIMATES

ALTERNATIVE NO. 1
COST ESTIMATE SUMMARY

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA 41-92-C-0098	EFFECTIVE PRICING DATE MAR. 93	DATE PREPARED 27-Dec-93
PROJECT EEAP STUDY - EXPANSION OF EMCS	☐ CODE A ☒ CODE B ☐ CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	☐ OTHER _____	ESTIMATOR KC	CHECKED BY CEL

ALTERNATIVE NO. 1 SUMMARY	Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION	No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
EMC SOFTWARE/DATABASE	1	LS				$93,000					$93,000		
EMCS CENTRAL EQUIPMENT	1	LS				$7,500					$7,500		
TRAINING	1	LS									$33,750		
DOCUMENTATION AND SUBMITTALS	1	LS									$24,000		
TESTING	1	LS				$110,343					$110,343		
FIELD HARDWARES	1	LS									$1,696,902		
FO DATA TRANSMISSION MEDIA (DTM)	1	LS				$97,418		$26,652		$98,859	$222,929		
SUBTOTAL						$308,261		$26,652		$98,859	$2,188,424		
OVERHEAD	15.00%					$46,239		$3,998		$14,829	$328,264		
PROFIT	10.00%					$30,826		$2,665		$9,886	$218,842		
BOND	2.50%					$7,707		$666		$2,471	$54,711		
CONTINGENCY	10.00%					$39,303		$3,398		$12,605	$279,024		
ANTICIPATED CONTRACT COST						$432,336		$37,379		$138,650	$3,069,264		
S&A	5.50%					$23,778		$2,056		$7,626	$168,810		
CURRENT WORKING ESTIMATE						$456,115		$39,435		$146,276	$3,238,074		
FIRST YEAR MAINTENANCE COST	11.00%										$97,147		
TOTAL THIS SHEET													

DA FORM 5418-R, APR 85

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA 41-92-C-0098	EFFECTIVE PRICING DATE MAR. 93	DATE PREPARED 27-Dec-93
PROJECT EEAP STUDY -- EXPANSION OF EMCS	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL

ALTERNATIVE NO. 1	Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION	No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
EMCS SOFTWARE													
EMCS SOFTWARE	N/A	LS											
OPERATING SYSTEM	N/A	LS											
APPLICATION SOFTWARE	N/A	LS											
COMMAND SOFTWARE	N/A	LS											
LUMP SUM TOTAL													
EMCS DATABASE													
DATABASE GENERATION	275	EA	6.0	1650.0	$40	$66,000					$66,000		
GRAPHIC GENERATION	200	EA	2.3	450.0	$40	$18,000					$18,000		
GRAPHIC DUPLICATION	300	EA	0.8	225.0	$40	$9,000					$9,000		
TOTAL THIS SHEET						$93,000					$93,000		

DA FORM 5418-R, APR 85

COST ESTIMATE ANALYSIS

PROJECT EEAP STUDY – EXPANSION OF EMCS	INVITATION NO./CONTRACT NO. DACA 41–92–C–0098	EFFECTIVE PRICING DATE MAR. 93	DATE PREPARED 27–Dec–93
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		ESTIMATOR KC	CHECKED BY CEL

ALTERNATIVE NO. 1	Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION	No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
EMCS CENTRAL EQUIPMENT													
CENTRAL OPERATOR STATION	N/A	EA	4.0		$40				$6,000				
ALARM PRINTER	N/A	EA	1.0		$40				$800				
LOGGING PRINTER	N/A	EA	1.0		$40				$800				
FIBER OPTIC MODEM	N/A	EA	1.0		$40				$500				
TELEPHONE MODEM	N/A	EA	1.0		$40				$500				
PORTABLE TEST SET	N/A	EA							$800				
NETWORK CONTROLLER	N/A	EA	4.0						$800				
INSTALLATION AND TESTING	1	LS				$7,500					$7,500		
TOTAL THIS SHEET						$7,500					$7,500		

DA FORM 5418–R, APR 85

COST ESTIMATE ANALYSIS

PROJECT EEAP STUDY – EXPANSION OF EMCS	INVITATION NO./CONTRACT NO. DACA 41–92–C–0098	EFFECTIVE PRICING DATE MAR. 93	DATE PREPARED 27–Dec–93
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C [ ] OTHER _____	DRAWING NO.	SHT OF
		ESTIMATOR KC	CHECKED BY CEL

ALTERNATIVE NO. 1	Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION	No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
TRAINING													
OPERATOR TRAINING 1	1	EA									$1,500		
OPERATOR TRAINING 2	1	EA									$1,500		
OPERATOR TRAINING 3	1	EA									$1,500		
OPERATOR TRAINING 4	10	EA									$14,250		
MAINTENANCE TRAINING	1	EA									$2,000		
REVIEW AND SUBMITTALS	1	LS									$13,000		
TOTAL THIS SHEET											$33,750		

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COST ESTIMATE ANALYSIS

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PROJECT EEAP STUDY – EXPANSION OF EMCS	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL

ALTERNATIVE NO. 1	Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION	No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
DOCUMENTATION AND SUBMITTALS													
GROUP I T.D. PACKAGE	1	LS											
GROUP II T.D. PACKAGE	1	LS											
GROUP III T.D. PACKAGE	1	LS											
GROUP IV T.D. PACKAGE	1	LS											
GROUP V T.D. PACKAGE	1	LS											
TOTAL DOCUMENTATION											$24,000		
TESTING													
FACTORY TEST	1	LS	120.0	120.0	$40	$4,800					$4,800		
PERF. VERIFICATION TEST	1	LS	80.0	80.0	$40	$3,200					$3,200		
ENDURANCE TEST	1	LS	128.0	128.0	$40	$5,120					$5,120		
OPPOSITE SEASON TEST	1	LS	56.0	56.0	$40	$2,240					$2,240		
CONTRACTOR FIELD TEST (DIGITAL)	1368	PNT	0.8	1026.0	$26	$26,450					$26,450		
CONTRACTOR FIELD TEST (ANALOG)	2085	PNT	1.3	2658.4	$26	$68,533					$68,533		
TOTAL TESTING						$110,343					$110,343		
TOTAL THIS SHEET						$110,343					$134,343		

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COST ESTIMATE ANALYSIS

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LOCATION FT. LEONARD WOOD, MISSOURI	☐ OTHER _____	ESTIMATOR KC	CHECKED BY CEL

ALTERNATIVE NO. 1	Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION	No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
FIELD HARDWARES													
FIELD HARDWARE FOR BLDG. SYSTEMS	1	LS									$1,696,902		
REMOTE CONTROL UNITS (RCUs)	N/A	EA	12.0		$26				$4,066				
AUXILIARY CONTROL UNITS (ACUs)	N/A	EA	8.0		$26				$1,126				
UNITARY CONTROL UNITS (UCUs)	N/A	EA	6.0		$26				$400				
SUB TOTAL											$1,696,902		
FO DATA TRANSMISSION MEDIA (DTM)													
UNDERGROUND DTM CONDUIT-NEW BLDGS	27,527	LF	0.09	2562.6	$26	$66,064	$0.81	$22,297	$1.25	$34,409	$122,770		
AERIAL POLE DTM-NEW BLDGS	87,095	LF	0.01	1216.2	$26	$31,353	$0.05	$4,355	$0.74	$64,450	$100,159		
SUB TOTAL						$97,418		$26,652		$98,859	$222,929		
TOTAL THIS SHEET						$97,418		$26,652		$98,859	$1,919,831		

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COST ESTIMATE ANALYSIS

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PROJECT EEAP STUDY – EXPANSION OF EMCS	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL

MAINTENANCE COST FOR HSQ EMCS	Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION	No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
ESTIMATE COST OF EMCS HARDWARE													
CENTRAL COMPUTER	1	LS								$30,000	$30,000		
FID COST	45	LS							$6,000	$270,000	$270,000		
CONTROL HARDWARES	1	LS								$100,000	$100,000		
	1	LS											
	1	LS											
	1	LS											
SUBTOTAL										$400,000	$400,000		
FIRST YEAR MAINTENANCE COST	11.00%										$44,000		
TOTAL THIS SHEET													

DA FORM 5418-R, APR 85

ALTERNATIVE NO. 2
COST ESTIMATE SUMMARY

COST ESTIMATE ANALYSIS

PROJECT EEAP STUDY – EXPANSION OF EMCS	INVITATION NO./CONTRACT NO. DACA 41–92–C–0098	EFFECTIVE PRICING DATE MAR. 93	DATE PREPARED 27–Dec–93
LOCATION FT. LEONARD WOOD, MISSOURI	☐ CODE A ☒ CODE B ☐ CODE C ☐ OTHER _____	DRAWING NO.	SHT OF
		ESTIMATOR KC	CHECKED BY CEL

ALTERNATIVE NO. 2 SUMMARY	Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION	No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
EMC SOFTWARE/DATABASE	1	LS				$94,200					$104,200		
EMCS CENTRAL EQUIPMENT	1	LS				$5,920				$22,000	$27,920		
TRAINING	1	LS									$33,750		
DOCUMENTATION AND SUBMITTALS	1	LS									$24,000		
TESTING	1	LS				$84,988					$84,988		
FIELD HARDWARES	1	LS				$3,712					$1,330,370		
FO DATA TRANSMISSION MEDIA (DTM)	1	LS				$126,906		$26,652		$134,128	$287,685		
SUBTOTAL						$315,726		$26,652		$156,128	$1,892,914		
OVERHEAD	15.00%					$47,359		$3,998		$23,419	$283,937		
PROFIT	10.00%					$31,573		$2,665		$15,613	$189,291		
BOND	2.50%					$7,893		$666		$3,903	$47,323		
CONTINGENCY	10.00%					$40,255		$3,398		$19,906	$241,346		
ANTICIPATED CONTRACT COST						$442,806		$37,379		$218,969	$2,654,811		
S&A	5.50%					$24,354		$2,056		$12,043	$146,015		
CURRENT WORKING ESTIMATE						$467,161		$39,435		$231,012	$2,800,826		
FIRST YEAR MAINTENANCE COST	11.00%										$106,866		
TOTAL THIS SHEET													

DA FORM 5418–R, APR 85

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA 41-92-C-0098	EFFECTIVE PRICING DATE MAR. 93	DATE PREPARED 27-Dec-93
PROJECT EEAP STUDY - EXPANSION OF EMCS	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL

ALTERNATIVE NO. 2	Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION	No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
EMCS SOFTWARE													
EMCS SOFTWARE	1	LS											
OPERATING SYSTEM	1	LS											
APPLICATION SOFTWARE	1	LS											
COMMAND SOFTWARE	1	LS											
LUMP SUM TOTAL											$10,000		
EMCS DATABASE													
DATABASE GENERATION	305	EA	6.0	1830.0	$40	$73,200					$73,200		
GRAPHIC GENERATION	250	EA	1.5	375.0	$40	$15,000					$15,000		
GRAPHIC DUPLICATION	300	EA	0.5	150.0	$40	$6,000					$6,000		
TOTAL THIS SHEET						$94,200					$104,200		

DA FORM 5418-R, APR 85

COST ESTIMATE ANALYSIS

PROJECT: EEAP STUDY – EXPANSION OF EMCS	INVITATION NO./CONTRACT NO.: DACA 41-92-C-0098	EFFECTIVE PRICING DATE: MAR. 93	DATE PREPARED: 27-Dec-93
LOCATION: FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C [ ] OTHER _____	DRAWING NO.	SHT OF
		ESTIMATOR: KC	CHECKED BY: CEL

ALTERNATIVE NO. 2	Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION	No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
EMCS CENTRAL EQUIPMENT													
CENTRAL OPERATOR STATION	2	EA	4.0	8.0	$40	320			$6,000	$12,000	$12,320		
ALARM PRINTER	2	EA	1.0	2.0	$40	80			$800	$1,600	$1,680		
LOGGING PRINTER	1	EA	1.0	1.0	$40	40			$800	$800	$840		
FIBER OPTIC MODEM	10	EA	1.0	10.0	$40	400			$500	$5,000	$5,400		
TELEPHONE MODEM	2	EA	1.0	2.0	$40	80			$500	$1,000	$1,080		
PORTABLE TEST SET	1	EA							$800	$800	$800		
NETWORK CONTROLLER	1	EA	4.0	4.0					$800	$800	$800		
INSTALLATION AND TESTING	1	LS				$5,000					$5,000		
TOTAL THIS SHEET						$5,920				$22,000	$27,920		

DA FORM 5418-R, APR 85

COST ESTIMATE ANALYSIS

PROJECT EEAP STUDY – EXPANSION OF EMCS	INVITATION NO./CONTRACT NO. DACA 41-92-C-0098	EFFECTIVE PRICING DATE MAR. 93	DATE PREPARED 27-Dec-93
LOCATION FT. LEONARD WOOD, MISSOURI	☐ CODE A ☒ CODE B ☐ CODE C ☐ OTHER _____	DRAWING NO.	SHT OF
		ESTIMATOR KC	CHECKED BY CEL

ALTERNATIVE NO. 2	Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION	No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
TRAINING													
OPERATOR TRAINING 1	1	EA									$1,500		
OPERATOR TRAINING 2	1	EA									$1,500		
OPERATOR TRAINING 3	1	EA									$1,500		
OPERATOR TRAINING 4	10	EA									$14,250		
MAINTENANCE TRAINING	1	EA									$2,000		
REVIEW AND SUBMITTALS	1	LS									$13,000		
TOTAL THIS SHEET											$33,750		

DA FORM 5418-R, APR 85

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA 41-92-C-0098	EFFECTIVE PRICING DATE MAR. 93	DATE PREPARED 27-Dec-93
PROJECT EEAP STUDY – EXPANSION OF EMCS	CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL

ALTERNATIVE NO. 2	Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION	No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
DOCUMENTATION AND SUBMITTALS													
GROUP I T.D. PACKAGE	1	LS											
GROUP II T.D. PACKAGE	1	LS											
GROUP III T.D. PACKAGE	1	LS											
GROUP IV T.D. PACKAGE	1	LS											
GROUP V T.D. PACKAGE	1	LS											
TOTAL DOCUMENTATION											$24,000		
TESTING													
FACTORY TEST	1	LS	120.0	120.0	$40	$4,800					$4,800		
PERF. VERIFICATION TEST	1	LS	80.0	80.0	$40	$3,200					$3,200		
ENDURANCE TEST	1	LS	128.0	128.0	$40	$5,120					$5,120		
OPPOSITE SEASON TEST	1	LS	56.0	56.0	$40	$2,240					$2,240		
CONTRACTOR FIELD TEST (DIGITAL)	1575	PNT	0.5	787.5	$26	$20,302					$20,302		
CONTRACTOR FIELD TEST (ANALOG)	2251	PNT	0.9	1913.4	$26	$49,326					$49,326		
TOTAL TESTING						$84,988					$84,988		
TOTAL THIS SHEET						$84,988					$108,988		

DA FORM 5418-R, APR 85

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA 41-92-C-0098	EFFECTIVE PRICING DATE MAR. 93	DATE PREPARED 27-Dec-93
PROJECT EEAP STUDY - EXPANSION OF EMCS	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL

ALTERNATIVE NO. 2	Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION	No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
FIELD HARDWARES													
FIELD HARDWARE FOR BLDG. SYSTEMS	1	LS									$1,277,866		
REMOTE CONTROL UNITS (RCUs)	12	EA	12.0	144.0	$26	$3,712			$4,066	$48,792	$52,504		
SUB TOTAL						$3,712				$48,792	$1,330,370		
FO DATA TRANSMISSION MEDIA (DTM)													
UNDERGROUND DTM CONDUIT-NEW BLDGS	27,527	LF	0.09	2562.6	$25.78	$66,064	$0.81	$22,297	$1.25	$34,408.75	$122,770		
AERIAL POLE DTM-NEW BLDGS	87,095	LF	0.01	1216.2	$25.78	$31,353	$0.05	$4,355	$0.74	$64,450.30	$100,159		
DTM TO MAIN SUB-SITES	47,660	LF	0.02	1143.8	$25.78	$29,488			$0.74	$35,268.53	$64,757		
SUB TOTAL						$126,906		$26,652		$134,128	$287,685		
TOTAL THIS SHEET						$130,619		$26,652		$182,920	$1,618,056		

DA FORM 5418-R, APR 85

ALTERNATIVE NO. 3
COST ESTIMATE SUMMARY

COST ESTIMATE ANALYSIS

PROJECT EEAP STUDY -- EXPANSION OF EMCS	INVITATION NO./CONTRACT NO. DACA 41-92-C-0098	EFFECTIVE PRICING DATE MAR. 93	DATE PREPARED 27-Dec-93
LOCATION FT. LEONARD WOOD, MISSOURI	☐ CODE A ☒ CODE B ☐ CODE C ☐ OTHER _____	DRAWING NO.	SHT OF
		ESTIMATOR KC	CHECKED BY CEL

ALTERNATIVE NO. 3 SUMMARY	Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION	No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
EMC SOFTWARE/DATABASE	1	LS				$153,100					$163,100		
EMCS CENTRAL EQUIPMENT	1	LS				$5,920				$22,000	$27,920		
TRAINING	1	LS									$33,750		
DOCUMENTATION AND SUBMITTALS	1	LS									$24,000		
TESTING	1	LS				$105,717					$105,717		
FIELD HARDWARES	1	LS				$3,712					$1,330,370		
FO DATA TRANSMISSION MEDIA (DTM)	1	LS				$97,418		$26,652		$98,859	$222,929		
FIELD HARDWARE REPLACEMENT	1	LS				$9,900				$58,802	$68,702		
SUBTOTAL						$375,766		$26,652		$179,661	$1,976,487		
OVERHEAD	15.00%					$56,365		$3,998		$26,949	$296,473		
PROFIT	10.00%					$37,577		$2,665		$17,966	$197,649		
BOND	2.50%					$9,394		$666		$4,492	$49,412		
CONTINGENCY	10.00%					$47,910		$3,398		$22,907	$252,002		
ANTICIPATED CONTRACT COST						$527,012		$37,379		$251,975	$2,772,023		
S&A	5.50%					$28,986		$2,056		$13,859	$152,461		
CURRENT WORKING ESTIMATE						$555,998		$39,435		$265,833	$2,924,484		
FIRST YEAR MAINTENANCE COST	11.00%										$114,533		
TOTAL THIS SHEET													

DA FORM 5418-R, APR 85

COST ESTIMATE ANALYSIS

PROJECT EEAP STUDY – EXPANSION OF EMCS	INVITATION NO./CONTRACT NO. DACA 41–92–C–0098	EFFECTIVE PRICING DATE MAR. 93	DATE PREPARED 27–Dec–93
LOCATION FT. LEONARD WOOD, MISSOURI	☐ CODE A ☒ CODE B ☐ CODE C ☐ OTHER _____	DRAWING NO.	SHT OF
		ESTIMATOR KC	CHECKED BY CEL

ALTERNATIVE NO. 3	Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION	No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
EMCS SOFTWARE													
EMCS SOFTWARE	1	LS											
OPERATING SYSTEM	1	LS											
APPLICATION SOFTWARE	1	LS											
COMMAND SOFTWARE	1	LS											
LUMP SUM TOTAL											$10,000		
EMCS DATABASE													
DATABASE GENERATION	540	EA	6.0	3240.0	$40	$129,600					$129,600		
GRAPHIC GENERATION	275	EA	1.5	412.5	$40	$16,500					$16,500		
GRAPHIC DUPLICATION	350	EA	0.5	175.0	$40	$7,000					$7,000		
TOTAL THIS SHEET						$153,100					$163,100		

DA FORM 5418–R, APR 85

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA 41-92-C-0098	EFFECTIVE PRICING DATE MAR. 93	DATE PREPARED 27-Dec-93
PROJECT EEAP STUDY – EXPANSION OF EMCS	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL

ALTERNATIVE NO. 3	Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION	No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
EMCS CENTRAL EQUIPMENT													
CENTRAL OPERATOR STATION	2	EA	4.0	8.0	$40	320			$6,000	$12,000	$12,320		
ALARM PRINTER	2	EA	1.0	2.0	$40	80			$800	$1,600	$1,680		
LOGGING PRINTER	1	EA	1.0	1.0	$40	40			$800	$800	$840		
FIBER OPTIC MODEM	10	EA	1.0	10.0	$40	400			$500	$5,000	$5,400		
TELEPHONE MODEM	2	EA	1.0	2.0	$40	80			$500	$1,000	$1,080		
PORTABLE TEST SET	1	EA							$800	$800	$800		
NETWORK CONTROLLER	1	EA	4.0	4.0					$800	$800	$800		
INSTALLATION AND TESTING	1	LS				$5,000					$5,000		
TOTAL THIS SHEET						$5,920				$22,000	$27,920		

DA FORM 5418-R, APR 85

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA 41-92-C-0098	EFFECTIVE PRICING DATE MAR. 93	DATE PREPARED 27-Dec-93
PROJECT EEAP STUDY -- EXPANSION OF EMCS	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL

ALTERNATIVE NO. 3	Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION	No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
TRAINING													
OPERATOR TRAINING 1	1	EA									$1,500		
OPERATOR TRAINING 2	1	EA									$1,500		
OPERATOR TRAINING 3	1	EA									$1,500		
OPERATOR TRAINING 4	10	EA									$14,250		
MAINTENANCE TRAINING	1	EA									$2,000		
REVIEW AND SUBMITTALS	1	LS									$13,000		
TOTAL THIS SHEET											$33,750		

DA FORM 5418-R, APR 85

COST ESTIMATE ANALYSIS

PROJECT EEAP STUDY – EXPANSION OF EMCS	INVITATION NO./CONTRACT NO. DACA 41–92–C–0098	EFFECTIVE PRICING DATE MAR. 93	DATE PREPARED 27–Dec–93
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C [ ] OTHER _____	DRAWING NO.	SHT OF
		ESTIMATOR KC	CHECKED BY CEL

ALTERNATIVE NO. 3	Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION	No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
DOCUMENTATION AND SUBMITTALS													
GROUP I T.D. PACKAGE	1	LS											
GROUP II T.D. PACKAGE	1	LS											
GROUP III T.D. PACKAGE	1	LS											
GROUP IV T.D. PACKAGE	1	LS											
GROUP V T.D. PACKAGE	1	LS											
TOTAL DOCUMENTATION											$24,000		
TESTING													
FACTORY TEST	1	LS	120.0	120.0	$40	$4,800					$4,800		
PERF. VERIFICATION TEST	1	LS	80.0	80.0	$40	$3,200					$3,200		
ENDURANCE TEST	1	LS	128.0	128.0	$40	$5,120					$5,120		
OPPOSITE SEASON TEST	1	LS	56.0	56.0	$40	$2,240					$2,240		
DTM TESTING	1	LS	77.7	77.7	$40	$3,108					$3,108		
CONTRACTOR FIELD TEST (DIGITAL)	2245	PNT	0.5	1122.5	$26	$28,938					$28,938		
CONTRACTOR FIELD TEST (ANALOG)	2661	PNT	0.9	2261.9	$26	$58,310					$58,310		
TOTAL TESTING						$105,717					$105,717		
TOTAL THIS SHEET						$105,717					$129,717		

DA FORM 5418–R, APR 85

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA 41-92-C-0098	EFFECTIVE PRICING DATE MAR. 93	DATE PREPARED 27-Dec-93
PROJECT EEAP STUDY - EXPANSION OF EMCS	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL

ALTERNATIVE NO. 3	Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION	No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
FIELD HARDWARES													
FIELD HARDWARE FOR BLDG. SYSTEMS	1	LS									$1,277,866		
REMOTE CONTROL UNITS (RCUs)	12	EA	12.0	144.0	$26	$3,712			$4,066	$48,792	$52,504		
SUB TOTAL						$3,712				$48,792	$1,330,370		
FO DATA TRAISMISSION MEDIA (DTM)													
UNDERGROUND DTM CONDUIT	27,527	LF	0.09	2562.6	$25.78	$66,064	$0.81	$22,297	$1.25	$34,408.75	$122,770		
AERIAL POLE DTM	87,095	LF	0.01	1216.2	$25.78	$31,353	$0.05	$4,355	$0.74	$64,450.30	$100,159		
SUB TOTAL						$97,418		$26,652		$98,859	$222,929		
TOTAL THIS SHEET						$101,130		$26,652		$147,651	$1,553,299		

DA FORM 5418-R, APR 85

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA 41-92-C-0098	EFFECTIVE PRICING DATE MAR. 93	DATE PREPARED 27-Dec-93
PROJECT EEAP STUDY – EXPANSION OF EMCS	☐ CODE A ☒ CODE B ☐ CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	☐ OTHER _____	ESTIMATOR KC	CHECKED BY CEL

ALTERNATIVE NO. 3	Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION	No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
FIELD HARDWARE REPLACEMENT													
REMOTE CONTROL UNITS (RCUs)	2	EA	12.0	24.0	$26	$619			$4,066	$8,132	$8,751		
AUXILIARY CONTROL UNITS (ACUs)	45	EA	8.0	360.0	$26	$9,281			$1,126	$50,670	$59,951		
TOTAL THIS SHEET						$9,900				$58,802	$68,702		

DA FORM 5418-R, APR 85

COST ESTIMATE BACKUP DATA

Index	Description	MH/Unit	Comm Cost	TOTAL MH/Unit	Inst. rate ($/Hr)	Material ($)	Comm Cost ($)	TOTAL ($)
DO1	Control Relay	1.3	1	2	$25.78	$32.60	$10.80	$43.40
DO2	H/O/A & Control Relay	2.0	1	3	$25.78	$65.80	$10.80	$76.60
DO3								$0.00
DO4								$0.00
AO1	CPA (Electric)	3.0	1	4	$25.78	$280.50	$14.70	$295.20
AO2	Remote Readout	2.0	1	3	$25.78	$176.11	$14.70	$190.81
AO3	CPA (Damper)	2.0	1	3	$25.78	$280.50	$14.70	$295.20
AO4	CPA (Valve)	2.0	1	3	$25.78	$280.50	$14.70	$295.20
AO5	ACU (Fan Coil)	2.5	1	4	$25.78	$400.00	$14.70	$414.70
AO6								$0.00
DI1-1	Pressure Switch (Elec)	1.5	1	2	$25.78	$41.09	$10.80	$51.89
DI1-2	Pressure Switch (Plum)	1.0	1	2	$24.39	$40.00	$10.80	$50.80
DI2	Auxilary Contact	1.0	1	2	$25.78	$32.00	$10.80	$42.80
DI3	Status Relay	1.0	1	2	$25.78	$30.64	$10.80	$41.44
DI4	Flame Failure	1.0	1	2	$25.78	$30.64	$10.80	$41.44
DI5	Diff. Pressure Sw. (Fan)	2.5	1	3	$25.78	$60.24	$10.80	$71.04
DI6	Diff. Pressure Sw. (Filter)	2.5	1	3	$25.78	$60.24	$10.80	$71.04
DI7	End Position Switch	1.0	1	2	$25.78	$58.00	$10.80	$68.80
DI8	Current Switch	1.0	1	2	$25.78	$100.00	$10.80	$110.80
DI9								$0.00
DI10								$0.00
DI11								$0.00
AI1-1	Temp. Water (Elec)	2.0	1	3	$25.78	$207.43	$14.70	$222.13
AI1-2	Temp. Water (Plum)	1.0	1	2	$24.39	$50.35	$14.70	$65.05
AI2-1	Stack Temp. (Elec)	2.0	1	3	$25.78	$137.50	$14.70	$152.20
AI2-2	Stack Temp. (Plum)	1.0	1	2	$24.39	$40.00	$14.70	$54.70
AI3-1	PSIG/PSID (Elec)	2.0	1	3	$25.78	$187.50	$14.70	$202.20
AI3-2	PSIG/PSID (Plum)	1.0	1	2	$24.39	$40.00	$14.70	$54.70
AI4-1	Oxygen Analyser (Elec)	7.0	1	8	$25.78	$3,400.00	$14.70	$3,414.70
AI4-2	Oxygen Analyser (Plum)	1.0	1	2	$24.39	$100.00	$14.70	$114.70
AI5-1	Flow (Elec)	2.0	1	3	$25.78	$722.00	$14.70	$736.70
AI5-2	Flow (Plum)	1.0	1	2	$24.39	$71.00	$14.70	$85.70
AI6	Temp. Space	1.5	1	3	$25.78	$159.22	$14.70	$173.92
AI7	Temp. Duct	2.0	1	3	$25.78	$170.14	$14.70	$184.84
AI8	Temp. Avg. Duct	2.5	1	4	$25.78	$175.21	$14.70	$189.91
AI9	RH Space	1.5	1	3	$25.78	$225.00	$14.70	$239.70
AI10	Position	2.0	1	3	$25.78	$176.11	$14.70	$190.81
AI11	kW	2.0	1	3	$25.78	$388.89	$14.70	$403.59
AI12	Amp.	3.0	1	4	$25.78	$106.95	$14.70	$121.65
AI13	Temp. Space (RTD Only)	1.5	1	3	$25.78	$34.92	$14.70	$49.62

COMMON COST								
IFLDT	Quanity	Unit	MH/Unit	Labor	Total	Price	Total	Total
Wiring #18–1 pair	60	ft	0.01	26	$15.47	0.08	$4.80	$20.27
1/2" EMT Conduit	40	ft	0.002	26	$1.55	0.15	$6.00	$7.55
Termination	1	LS	0.25	26	$6.45		$0.00	$6.45
	Sub Total		0.91		$23.46		$10.80	$34.26
Analog Points	Quanity	Unit	MH/Unit	Labor	Total	Price	Total	Total
Wiring #18 TSP	80	ft	0.01	26	$20.62	0.09	$7.20	$27.82
1/2" EMT Conduit	50	ft	0.002	26	$1.93	0.15	$7.50	$9.43
Termination	1	LS	0.25	26	$6.45		$0.00	$6.45
	Sub Total		1.13		$29.00		$14.70	$43.70

BLDG NO.	BLDG USE	UNDER-GROUND DTM CONDUIT (FT.)	AERIAL POLE DTM LINE (FT.)	COST FOR U.G. DTM ($)	COST FOR A.P. DTM ($)	TOTAL COST FOR DTM PER BLDG ($)
181	Sewage Plant		803		$923.5	$923.5
183	Sewage Plant	120	402	$535.2	$462.3	$997.5
184	Sewage Plant	50	402	$223.0	$462.3	$685.3
185	Sewage Plant	50	402	$223.0	$462.3	$685.3
186	Sewage Collection	160	402	$713.6	$462.3	$1,175.9
187	Sewage Plant	50	402	$223.0	$462.3	$685.3
193	Sewage Pump Bldg	50	402	$223.0	$462.3	$685.3
194	Sewage Plant	75	402	$334.5	$462.3	$796.8
195	Sewage Plant	75	402	$334.5	$462.3	$796.8
196	Sewage Plant	520	402	$2,319.2	$462.3	$2,781.5
198	Sewage Plant	75	402	$334.5	$462.3	$796.8
199	Sewage Plant	75	402	$334.5	$462.3	$796.8
320	Administration	175		$780.5		$780.5
404	Telephone Exchange	400	725	$1,784.0	$833.8	$2,617.8
498	Old Commisary	50	650	$223.0	$747.5	$970.5
604	Wallace Pool		1,575		$1,811.3	$1,811.3
625	Battalion HQ		610		$701.5	$701.5
626	Administration/Supply		550		$632.5	$632.5
627	Barracks, with a/c	100	305	$446.0	$350.8	$796.8
628	Barracks, with a/c	75	405	$334.5	$465.8	$800.3
629	Barracks, with a/c	25	400	$111.5	$460.0	$571.5
630	Mess Hall		320		$368.0	$368.0
633	Administration/Supply	175	505	$780.5	$580.8	$1,361.3
634	Barracks, with a/c	125	530	$557.5	$609.5	$1,167.0
635	Barracks, with a/c	100	430	$446.0	$494.5	$940.5
636	Brigade HQ	100	225	$446.0	$258.8	$704.8
637	Chapel		350		$402.5	$402.5
638	Clinic	75		$334.5		$334.5
639	PX		500		$575.0	$575.0
650	Battalion HQ		425		$488.8	$488.8
651	Barracks, with a/c		250		$287.5	$287.5
652	Barracks, with a/c	150		$669.0	$0.0	$669.0
653	Mess Hall		300		$345.0	$345.0
654	Barracks, with a/c		475		$546.3	$546.3
655	Administration/Supply		375		$431.3	$431.3
656	Administration/Supply		420		$483.0	$483.0
657	Mess Hall		220		$253.0	$253.0
658	Battalion HQ	100		$446.0	$0.0	$446.0
659	Barracks, with a/c		475		$546.3	$546.3
660	Barracks, with a/c		450		$517.5	$517.5
672	Motor Pool	150	360	$669.0	$414.0	$1,083.0
673	Motor Pool	60	360	$267.6	$414.0	$681.6
680	Motor Pool	250	360	$1,115.0	$414.0	$1,529.0
681	Motor Pool	60	360	$267.6	$414.0	$681.6
730	Barracks, w/o a/c		450		$517.5	$517.5
731	Barracks, w/o a/c		750		$862.5	$862.5

BLDG NO.	BLDG USE	UNDER-GROUND DTM CONDUIT (FT.)	AERIAL POLE DTM LINE (FT.)	COST FOR U.G. DTM ($)	COST FOR A.P. DTM ($)	TOTAL COST FOR DTM PER BLDG ($)
732	Battalion HQ		560		$644.0	$644.0
733	Administration/Supply		325		$373.8	$373.8
734	Administration/Supply		250		$287.5	$287.5
735	Mess Hall		425		$488.8	$488.8
736	Barracks, w/o a/c		325		$373.8	$373.8
737	Barracks, w/o a/c		560		$644.0	$644.0
738	Barracks, w/o a/c		550		$632.5	$632.5
739	Mess Hall		350		$402.5	$402.5
740	Battalion HQ		550		$632.5	$632.5
741	Brigade HQ		875		$1,006.3	$1,006.3
750	Battalion HQ		225		$258.8	$258.8
751	Administration/Supply		350		$402.5	$402.5
752	Administration/Supply		400		$460.0	$460.0
753	Battalion HQ		680		$782.0	$782.0
768	Kanell Hall	125	520	$557.5	$598.0	$1,155.5
772	Motor Pool	60	183	$267.6	$210.5	$478.1
773	Motor Pool	100	182	$446.0	$209.3	$655.3
780	Motor Pool	125	182	$557.5	$209.3	$766.8
781	Motor Pool	60	183	$267.6	$210.5	$478.1
802	Day Care	125	520	$557.5	$598.0	$1,155.5
815	Barracks, w/o a/c		550		$632.5	$632.5
816	Barracks, w/o a/c		825		$948.8	$948.8
817	Barracks, w/o a/c		575		$661.3	$661.3
818	Barracks, w/o a/c		425		$488.8	$488.8
819	Barracks, w/o a/c	50	400	$223.0	$460.0	$683.0
820	Mess Hall		200	$0.0	$230.0	$230.0
822	Battalion HQ		280		$322.0	$322.0
823	Administration/Supply		880		$1,012.0	$1,012.0
824	Administration/Supply		400		$460.0	$460.0
825	Battalion HQ	100		$446.0		$446.0
826	Gym		425	$0.0	$488.8	$488.8
827	Barracks, w/o a/c		575		$661.3	$661.3
828	Barracks, w/o a/c		425		$488.8	$488.8
829	Barracks, w/o a/c		425		$488.8	$488.8
830	Barracks, w/o a/c		675		$776.3	$776.3
831	Barracks, w/o a/c	200		$892.0		$892.0
832	Clinic		475		$546.3	$546.3
836	Mess Hall		700		$805.0	$805.0
837	Mess Hall		250		$287.5	$287.5
838	Battalion HQ		500		$575.0	$575.0
840	Administration/Supply		175		$201.3	$201.3
841	Administration/Supply		250		$287.5	$287.5
842	Battalion HQ		695		$799.3	$799.3
844	Brigade HQ		325		$373.8	$373.8
872	Motor Pool	50	470	$223.0	$540.5	$763.5
873	Motor Pool	50	470	$223.0	$540.5	$763.5

BLDG NO.	BLDG USE	UNDER-GROUND DTM CONDUIT (FT.)	AERIAL POLE DTM LINE (FT.)	COST FOR U.G. DTM ($)	COST FOR A.P. DTM ($)	TOTAL COST FOR DTM PER BLDG ($)
880	Motor Pool	30	470	$133.8	$540.5	$674.3
881	Motor Pool	30	470	$133.8	$540.5	$674.3
990	Motor Pool	225	427	$1,003.5	$491.1	$1,494.6
991	Motor Pool	75	428	$334.5	$492.2	$826.7
998	Motor Pool	125	428	$557.5	$492.2	$1,049.7
999	Motor Pool	125	427	$557.5	$491.1	$1,048.6
1012	Barracks	250		$1,115.0		$1,115.0
1013	Barracks	163		$727.0		$727.0
1014	Barracks	163		$727.0		$727.0
1015	Barracks	163		$727.0		$727.0
1016	Barracks	163		$727.0		$727.0
1018	Medical Clinic	50	510	$223.0	$586.5	$809.5
1022	Battalion HQ		135		$155.3	$155.3
1023	Battalion HQ		500		$575.0	$575.0
1025	Administration/Supply	125	515	$557.5	$592.3	$1,149.8
1027	Mess Hall		270		$310.5	$310.5
1028	Barracks	275		$1,226.5		$1,226.5
1029	Barracks	100	100	$446.0	$115.0	$561.0
1350	Reserve Center	150	475	$669.0	$546.3	$1,215.3
1382	Car Wash	50	500	$223.0	$575.0	$798.0
1383	Auto Craft Shop		1,000		$1,150.0	$1,150.0
1390	Reserve Motor Pool		1,210		$1,391.5	$1,391.5
1391	Reserve Maintenance		265		$304.8	$304.8
1601	Water Treatment	725		$3,233.5		$3,233.5
1700	Storage	700		$3,122.0		$3,122.0
1701	Administration/Supply	250	100	$1,115.0	$115.0	$1,230.0
1702	Administration/Supply	325	325	$1,449.5	$373.8	$1,823.3
1703	Battalion HQ	325	100	$1,449.5	$115.0	$1,564.5
1704	Battalion HQ	150	200	$669.0	$230.0	$899.0
1705	Admin./Courtroom	300	100	$1,338.0	$115.0	$1,453.0
1706	Administration/Supply	300	100	$1,338.0	$115.0	$1,453.0
1707	Administration/Supply	675		$3,010.5		$3,010.5
1711	PX	150	163	$669.0	$187.5	$856.5
1712	Chapel	190	75	$847.4	$86.3	$933.7
1714	Gym	300	162	$1,338.0	$186.3	$1,524.3
1720	Barracks	150		$669.0		$669.0
1721	Dayroom	100		$446.0		$446.0
1722	Barracks	100		$446.0		$446.0
1723	Barracks	100		$446.0		$446.0
1724	Barracks	100		$446.0		$446.0
1725	Barracks	100		$446.0		$446.0
1726	Barracks	50		$223.0		$223.0
1727	Dayroom	75		$334.5		$334.5
1728	Barracks	225	100	$1,003.5	$115.0	$1,118.5
1729	Barracks	100		$446.0		$446.0
1730	Barracks	125		$557.5		$557.5

BLDG NO.	BLDG USE	UNDER-GROUND DTM CONDUIT (FT.)	AERIAL POLE DTM LINE (FT.)	COST FOR U.G. DTM ($)	COST FOR A.P. DTM ($)	TOTAL COST FOR DTM PER BLDG ($)
1731	Barracks	125		$557.5		$557.5
1732	Barracks	125	50	$557.5	$57.5	$615.0
1733	Barracks	225	40	$1,003.5	$46.0	$1,049.5
1734	Barracks	175		$780.5		$780.5
1735	Barracks	150	30	$669.0	$34.5	$703.5
1736	Dayroom	100		$446.0		$446.0
1740	Mess Hall	425		$1,895.5		$1,895.5
1750	Administration	200	250	$892.0	$287.5	$1,179.5
1760	Dayroom	100		$446.0		$446.0
1761	Barracks	125		$557.5		$557.5
1762	Barracks	125		$557.5		$557.5
1763	Barracks	125		$557.5		$557.5
1764	Barracks	125		$557.5		$557.5
1765	Barracks	125		$557.5		$557.5
1766	Barracks	125		$557.5		$557.5
1767	Barracks	150		$669.0		$669.0
1768	Barracks	150	200	$669.0	$230.0	$899.0
1769	Barracks	100		$446.0		$446.0
1770	Dayroom	75		$334.5		$334.5
1771	Barracks	125		$557.5		$557.5
1772	Dayroom	60		$267.6		$267.6
1773	Barracks	150		$669.0		$669.0
1774	Barracks	125		$557.5		$557.5
1775	Barracks	125		$557.5		$557.5
1776	Barracks	125		$557.5		$557.5
2100	Reception Center	1,830	250	$8,161.8	$287.5	$8,449.3
2105	Mess Hall	370	300	$1,650.2	$345.0	$1,995.2
2240	MP Kennel	250	820	$1,115.0	$943.0	$2,058.0
2250	Motor Pool	250	1,230	$1,115.0	$1,414.5	$2,529.5
2273	Entomology		2,050		$2,357.5	$2,357.5
2399	Vet Clinic	325	753	$1,449.5	$866.0	$2,315.5
2574	LPG Compressor Bldg	825		$3,679.5		$3,679.5
3210	Dayroom	30	150	$133.8	$172.5	$306.3
3211	EOQ	75	523	$334.5	$601.5	$936.0
3212	EOQ	100	522	$446.0	$600.3	$1,046.3
3213	EOQ	30	523	$133.8	$601.5	$735.3
3214	EOQ	100	522	$446.0	$600.3	$1,046.3
3215	Central Plant	250	150	$1,115.0	$172.5	$1,287.5
4051	Inflam. Material Storage	325	752	$1,449.5	$864.8	$2,314.3
4052	Administration	100	245	$446.0	$281.8	$727.8
4100	BEQ	50	735	$223.0	$845.3	$1,068.3
4101	BEQ	50	525	$223.0	$603.8	$826.8
4102	BEQ	50	550	$223.0	$632.5	$855.5
4103	VOQ	50	575	$223.0	$661.3	$884.3
4104	BEQ	50	550	$223.0	$632.5	$855.5
4109	Officers Club	175	950	$780.5	$1,092.5	$1,873.0

BLDG NO.	BLDG USE	UNDER-GROUND DTM CONDUIT (FT.)	AERIAL POLE DTM LINE (FT.)	COST FOR U.G. DTM ($)	COST FOR A.P. DTM ($)	TOTAL COST FOR DTM PER BLDG ($)
4110	BOQ	180	937	$802.8	$1,077.6	$1,880.4
4111	BOQ	30	938	$133.8	$1,078.7	$1,212.5
4112	BOQ	150	805	$669.0	$925.8	$1,594.8
4113	BOQ	350	690	$1,561.0	$793.5	$2,354.5
4114	BOQ	500	525	$2,230.0	$603.8	$2,833.8
4115	BOQ	275	525	$1,226.5	$603.8	$1,830.3
5001	Airfield Fire House	621	240	$2,769.7	$276.0	$3,045.7
5002	Airline Terminal	621	240	$2,769.7	$276.0	$3,045.7
5004	Air Force Ops	621	240	$2,769.7	$276.0	$3,045.7
5007	Hanger	622	240	$2,774.1	$276.0	$3,050.1
5265	DOL	75	2,400	$334.5	$2,760.0	$3,094.5
5266	Steam-Clean Facility	130		$579.8		$579.8
5267	Dispatch	275		$1,226.5		$1,226.5
5268	Wash Facility	290		$1,293.4		$1,293.4
5269	Car Wash	100		$446.0		$446.0
6150	Admin./Maintenance		1,190	$0.0	$1,368.5	$1,368.5
6505	Water Treatment		7,075	$0.0	$8,136.3	$8,136.3
7391	NCO Club	1,225	900	$5,463.5	$1,035.0	$6,498.5
9000	Front Gate	225	8,450	$1,003.5	$9,717.5	$10,721.0
	TOTALS	27,527	87,095	$122,770	$100,159	$222,930

STATUS RELAY

CONTROL RELAYS

Model		Description	Contact Rating	List	Code
RHN1B-5-DC	24V	SPDT	5 AMP	12.44	B
RH1B-UAC	24V	SPDT	10 AMP	14.44	B
RH1B-UAC	120V	SPDT	10 AMP	14.44	B
RH1B-UDC	24V	SPDT	10 AMP	13.22	B
RH2B-UAC	24V	DPDT	10 AMP	15.42	B
RH2B-UAC	120V	DPDT	10 AMP	15.42	B
RH2B-UDC	24V	DPDT	10 AMP	14.30	B
RH2LB-UDC	12V	DPDT-LATCHING	10 AMP	40.28	B
RH2LB-UDC	24V	DPDT-LATCHING	10 AMP	40.28	B
RH3B-UAC	24V	3PDT	10 AMP	19.06	B
RH3B-UAC	120V	3PDT	10 AMP	19.06	B
RH3B-UDC	24V	3PDT	10 AMP	18.19	B
RH4B-UAC	24V	4PDT	10 AMP	23.33	B
RH4B-UAC	120V	4PDT	10 AMP	23.33	B
RH4B-UDC	24V	4PDT	10 AMP	22.61	B
(L)SUFFIX*		LIGHT		4.03	B
(C)SUFFIX*		CHECK BUTTON		2.06	B

*Not available with Single Pole Relays

B ×0.5 = 6.61
ENCLOSURE 20
26.61

HEAVY DUTY CONTROL RELAYS

RR2P-UAC	24V	DPDT	10 AMP	24.28	B
RR2P-UAC	120V	DPDT	10 AMP	24.28	B
RR2P-UDC	24V	DPDT	10 AMP	22.75	B
RR3PA-UAC	24V	3PDT	10 AMP	29.11	B
RR3PA-UAC	120V	3PDT	10 AMP	29.11	B
RR3PA-UDC	24V	3PDT	10 AMP	28.47	B
(L)SUFFIX*		LIGHT	10 AMP	4.03	B
(C)SUFFIX*		CHECK BUTTON		2.06	B

CONTROL RELAY SOCKETS

Model	Description	List	Code
SH1B-05	SPDT-RH RELAY SOCKET	8.06	B
SH2B-05	DPDT-RH RELAY SOCKET	9.86	B
SH3B-05	3PDT-RH RELAY SOCKET	10.81	B
SH4B-05	4PDT-RH RELAY SOCKET	14.11	B
SR2P-06	DPDT-RR RELAY SOCKET	8.06	B
SR3P-06	3PDT-RR RELAY SOCKET	10.81	B

B 0.5 = 4.03
= 30.64

MOUNTING TRACK

BND-1000	39" RAIL	10.83	B
DIN-3F	2 METER (78.8")	20.84	B

100 ohm PLATINUM RTD SENSORS & TRANSMITTERS • HY-CAL			
Model	**Description**	**List**	**Code**
RTS-5737-K-T	SPACE	69.83	A
RTS-5737-P-T	WATER	166.25	A
RTS-5737-G-T	DUCT	91.67	A
RTS-5737-W-T	OSA	91.67	A
RTS-5737-V-T	PIPE STRAP	255.56	A
CT-801 (2)	TRANSMITTER	248.61	A

• Sensors are 100 ohm 385 Platinum
(2) Stocked temp. ranges: B1 - +30° to 240°F
B2 - -20° to 140°F
B3 - +32° to 122°F

1000 ohm PLATINUM RTD SENSORS & TRANSMITTERS • HY-CAL			
CT-859-B (1)	RANGEABLE SPACE	276.39	A
RTS-5737-K-U	SPACE	69.83	A
RTS-5737-P-U	WATER	166.25	A
RTS-5737-G-U	DUCT	91.67	A
RTS-5737-W-U	OSA	91.67	A
RTS-5737-V-U	PIPE STRAP	255.56	A
CT-807 (2)	TRANSMITTER	236.10	A
CT-809-A (3)	RANGEABLE TRANSMITTER	221.95	A

• Sensors are 1000 ohm 375 Ultra-7 Platinum
(1) Includes element and transmitter
(2) Stocked temp. ranges: B1 - +30° to 240°F
B2 - -20° to 140°F
B3 - +32° to 122°F
(3) Factory calibrated 30° to 130°F

IMMERSION WELLS • HY-CAL			
WEL-B-H	BRASS WELL	30.56	A
WEL-S-H	STAINLESS STEEL WELL	71.67	A

X0.5=35.84
PLUS PIPETAP 15
=50.35

EXPLOSION-PROOF PLATINUM RTD SENSORS & TRANSMITTERS • HY-CAL			
RTS-36-T	100Ω DOUBLE THREADED PROBE	211.72	A
RTS-37-T	100Ω SPRING LOADED PROBE	251.47	A
RTS-36-U	1000Ω DOUBLE THREADED PROBE	211.72	A
RTS-37-U	1000Ω SPRING LOADED PROBE	251.47	A
CT-881-A	RANGEABLE TRANSMITTER	1361.12	A

• COMPLETE HY-CAL LINE AVAILABLE. Delivery on non-stock items or larger than stock quantities is 6 to 8 weeks.

6 HUMIDITY

HUMIDITY SENSORS

Model	Description	Mfgr.	Range	Output	Accury.	List	Code
LCH-R	ROOM		10-90%	4-20ma	±5%	243.06	A
HW10K*	ROOM		0-100%	4-20ma	±3%	355.56	A
HD10K	DUCT/OSA		0-100%	4-20ma	±3%	383.34	A
EL3K	REPLACEABLE ELEMENT FOR HW10K, HD10K					208.34	A
HMD20U	DUCT/OSA	VAISALA	0-100%	4-20ma	±2%	738.89	A
HMD30U	DUCT/OSA	VAISALA	0-100%	0-5VDC	±2%	944.45	A
WMK-20	OSA SUN SHIELD AND MOUNTING KIT FOR VAISALA					41.67	A
HMW20U	ROOM	VAISALA	0-100%	4-20ma	±2%	619.45	A
HMW30U	ROOM	VAISALA	0-100%	0-5VDC	±2%	811.12	A
HMK20	HUMIDITY CALIBRATOR	VAISALA	0-100%	4-20ma	±2%	2208.35	A
HM34	PORTABLE RH METER	VAISALA	0-100%		±2%	1097.23	B
CT-829-A-MH	ROOM	HY-CAL	0-90%	4-20ma	±2%	450.00	A X0.5=225
CT-829-H19-X20	DUCT	HY-CAL	0-90%	4-20ma	±2%	486.12	A X0.5=243.06
CT-829-H19-X21	DUCT/OSA	HY-CAL	0-90%	4-20ma	±2%	486.12	A
CT-880B	EXPLOSION-PROOF TRANSMITTER	HY-CAL	0-100%	4-20ma	±2.5%	1805.55	A
SA-728-A	LOOP-POWERED METER	HY-CAL	0-100%			465.12	B
A21	ASPIRATED SENSOR HOUSING					277.78	B
T◊	THERMISTOR TEMP. SENSOR OPT. FOR HW10K					26.39	A

*Thermistor Temperature Sensor Option Available (See catalog for available curves.)

ENTHALPY / WET BULB SENSOR

Model	Description	List	Code
EWB	ENTHALPY / WET BULB ASPIRATED ENCLOSURE (NO SENSOR)	1652.79	A
S13364PF	1,000 ohm 385 PLATINUM RTD WET OR DRY BULB SENSOR	183.34	A
TT151PF1EK	4-20ma TRANSMITTER 30° to 110°F ± .4°F MATCHED TO SENSOR	386.12	A
ST-EWB-3	4" LONG THERMISTOR 30° to 200°F ± .4°F WET OR DRY BULB SENSOR	69.44	A
J-6317-50	5 GAL. TRANSLUCENT DISTILLED WATER RESERVOIR	41.67	A
CLS	INTAKE FILTER WITH DISPOSABLE ELEMENT	208.33	A

START/STOP RELAY W/ HOA SWITCH

12 MISCELLANEOUS

CONTROL RELAYS					
MODEL		TYPE	CONTACT RATING	LIST	PRICE CODE
RH1B-UAC	24V	SPDT	10 AMP	14.40	B
RH1B-UAC	120V	SPDT	10 AMP	14.40	B
RH1B-UDC	24V	SPDT	10 AMP	13.18	B
RH2B-UAC	24V	DPDT	10 AMP	15.37	B
RH2B-UAC	120V	DPDT	10 AMP	15.37	B
RH2B-UDC	24V	DPDT	10 AMP	14.62	B
RH2LB-UDC	**12V**	**DPDT-LATCHING**	**10 AMP**	**40.22**	**B**
RH2LB-UDC	**24V**	**DPDT-LATCHING**	**10 AMP**	**40.22**	**B**
RH3B-UAC	24V	3PDT	10 AMP	19.00	B
RH3B-UAC	120V	3PDT	10 AMP	19.00	B
RH3B-UDC	24V	3 PDT	10 AMP	18.14	B
RH4B-UAC	24V	4PDT	10 AMP	23.26	B
RH4B-UAC	120V	4PDT	10 AMP	23.26	B
RH4B-UDC	24V	4PDT	10 AMP	22.54	B
*(L)SUFFIX		LIGHT		5.54	B
*(C)SUFFIX		CHECK BUTTON		2.77	B

* Not available with Single Pole Relays

HEAVY DUTY CONTROL RELAYS					
RR2P-UAC	24V	DPDT	10 AMP	24.20	B
RR2P-UAC	120V	DPDT	10 AMP	24.20	B
RR2P-UDC	24V	DPDT	10 AMP	22.68	B
RR3PA-UAC	24V	3PDT	10 AMP	29.02	B
RR3PA-UAC	120V	3PDT	10 AMP	29.02	B
RR3PA-UDC	24V	3PDT	10 AMP	28.39	B
(L)SUFFIX		LIGHT		5.54	B
(C)SUFFIX		CHECK BUTTON		2.77	B

CONTROL RELAY SOCKETS			
SH1B-05	SPDT-RH RELAY	8.03	B
SH2B-05	DPDT-RH RELAY	9.83	B
SH3B-05	3PDT-RH RELAY	10.77	B
SH4B-05	4PDT-RH RELAY	14.07	B
SR2P-06	DPDT-RR RELAY	8.03	B
SR3P-06	3PDT-RR RELAY	10.77	B

MOUNTING TRACK			
BND-1000	39" RAIL	10.80	B

X.5 = $7.70

X.5 = 4.90

PLUS ENCLOSURE = 20.00

PLUS SWITCH = 35.20

TOTAL = $ 66.00

All purchases are subject to Kele & Associates standard terms of sale.
P.O. Box 34817 / Memphis, TN 38184 / 901-382-4300 / FAX 800-284-5353

FOR OFFICIAL USE ONLY

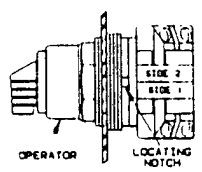
START/STOP RELAY W/HOA SWITCH

NON-ILLUMINATED 3 POSITION SELECTOR SWITCH OPERATORS

3 Position Selector Switch Operators — U.L. Types 4, 4X, 13 (NEMA 4, 4X, 13)

Legend Plate and Contact Block Not Included Unless Noted

CONTACT BLOCK REQUIRED — 1 - Contact Closed 0 - Contact Open

Contact Block Position	Quantity and Type	Mount on Side	Center Left	Center Right	Center Left	Center Right	Center Left	Center Right	Center Left	Center Right	Center Left	Center Right	Center Left	Center Right	Center Left	Center Right
 Top View	KA1 OR KA2 / KA3	KA1 #2 OR KA2 #2 / KA3 #2	1	0	0	1	0	0	0	1	1	0	0	1	0	0	1	0	0	0	1	0
			0	1	1	0	0	1	0	1	0	0	1	0	1	0	0	1	0	1	1	0	0
	KA1 OR KA2 / KA3	KA1 #1 OR KA2 #1 / KA3 #1	0	0	1	1	0	0	0	0	1	1	0	0	0	1	0	0	0	1	0	1	0	0	1
			1	1	0	0	0	1	0	1	0	0	1	0	1	0	0	0	1	1	0	1	0	1	0

CAM	B	C	D	E	F	G	J	L	
NON-ILLUMINATED OPERATORS	Type	Type	Type	Type	Type	Type	Type	Type	Price
Manual Return(1)									
Operator Only(1)									
Without Knob	SKS42	SKS43	SKS44	SKS45	SKS46	SKS47	SKS49	SKS401	$18.00
With Standard Black Knob	SKS42B	SKS43B	SKS44B	SKS45B	SKS46B	SKS47B	SKS49B	SKS401B	22.20
With Other Color Knob (See Table)(2)	SKS42(2)	SKS43(2)	SKS44(2)	SKS45(2)	SKS46(2)	SKS47(2)	SKS49(2)	SKS401(2)	22.20
With Contact Blocks									
With Standard Black Knob (See Table for Other Colors Replace B in Type Number with Other Color Code)									
With 1 KA1 on Side #2 (H13)	SKS42BH13	SKS43BH13	SKS44BH13	SKS45BH13	SKS46BH13	SKS47BH13	SKS49BH13	SKS401BH13	40.20
With 1 KA1 on Side #1 (H1)	SKS42BH1	SKS43BH1	SKS44BH1	SKS45BH1	SKS46BH1	SKS47BH1	SKS49BH1	SKS401BH1	40.20
With 1 KA1 on Side #1 and 1 KA1 on Side #2 (H2)	SKS42BH2	SKS43BH2	SKS44BH2	SKS45BH2	SKS46BH2	SKS47BH2	SKS49BH2	SKS401BH2	58.20
Spring Return From Left To Center(1)									
Operator Only(1)									
Without Knob	SKS62	SKS63	SKS64	SKS65	SKS66	SKS67	SKS69	SKS601	30.00
With Standard Black Knob	SKS62B	SKS63B	SKS64B	SKS65B	SKS66B	SKS67B	SKS69B	SKS601B	34.20
With Other Color Knob (See Table)(2)	SKS62(2)	SKS63(2)	SKS64(2)	SKS65(2)	SKS66(2)	SKS67(2)	SKS69(2)	SKS601(2)	34.20
Spring Return From Right To Center(1)									
Operator Only(1)									
Without Knob	SKS72	SKS73	SKS74	SKS75	SKS76	SKS77	SKS79	SKS701	30.00
With Standard Black Knob	SKS72B	SKS73B	SKS74B	SKS75B	SKS76B	SKS77B	SKS79B	SKS701B	34.20
With Other Color Knob (See Table)(2)	SKS72(2)	SKS73(2)	SKS74(2)	SKS75(2)	SKS76(2)	SKS77(2)	SKS79(2)	SKS701(2)	34.20
Spring Return Both Sides To Center(1)									
Operator Only(1)									
Without Knob	SKS52	SKS53	SKS54	SKS55	SKS56	SKS57	SKS59	SKS501	30.00
With Standard Black Knob	SKS52B	SKS53B	SKS54B	SKS55B	SKS56B	SKS57B	SKS59B	SKS501B	34.20
With Other Color Knob (See Table)(2)	SKS52(2)	SKS53(2)	SKS54(2)	SKS55(2)	SKS56(2)	SKS57(2)	SKS59(2)	SKS501(2)	34.20

(1) These operators can be ordered complete with contact blocks — for maximum block usage — see page 13-54. Add the "H" number chosen from page 13-50 to the end of the operator type number and add the cost of the "H" number to the operator cost.
EXAMPLE:
SKS43FB(22.20) + H13(KA1 Pos. 2)(18.00) = SKS43FBH13(40.20).

(2) Add the color code as chosen from knob color table.
EXAMPLE: SKS43(2) with a green gloved hand knob = SKS43FG

Selector Switch Knobs

Color	Standard Knob (2) Knob Code	Standard Knob Type	Gloved Hand Knob (2) Knob Code	Gloved Hand Knob Type	Coin Operated (2) Knob Code	Coin Operated Type	Price
Black	B	B11	FB	B25	TB	B18	
Red	R	R8	FR	R24	TR	R16	
Green	G	G8	FG	G24	TG	G16	
Yellow	Y	Y8	FY	Y24	TY	Y16	
Orange	S	S11	FS	S25	—	—	$4.20
Blue	L	L8	FL	L24	TL	L16	
White	W	W8	FW	W24	—	—	
Amber	A	A8	FA	A24	—	—	
Clear	C	C8	FC	C24	TC	C16	

For Basic Operators — See page 13-54.
For Boots — See page 13-53.
For Contact Blocks — See page 13-48.
For "H" Numbers — See page 13-50.
For Legend Plates — See pages 13-51 - 13-52.
For Lockouts — See page 13-53.
For Outline Dimensions — See pages 13-57 - 13-58.
For Ratings — See page 13-48.
For Replacement Parts — See page 13-56.
For Ring Nuts — See page 13-56.

PLUS $1 FOR KEY OPTI

13

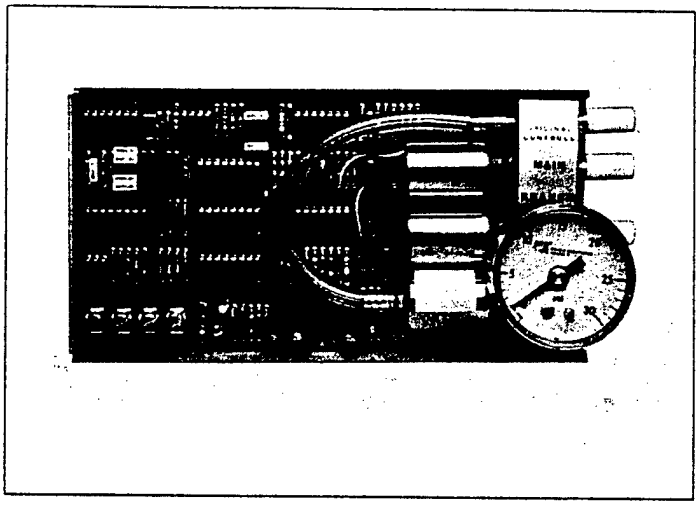
ELECTRONIC / PNEUMATIC TRANSDUCER

644 X 0.5 = 322
550 275

MODEL UEP-018

DESCRIPTION

The **Model UEP-018** is a crystal-controlled, electronic/pneumatic pulse width modulated transducer that converts a pulse width modulated input to a 0-18 PSIG pressure output. The **UEP-018** has voltage feedback which is proportional to the output pressure. The optional failsafe model transfers control to a backup pneumatic controller when a system failure is detected. The **UEP-018** replaces the **MEP-018**.

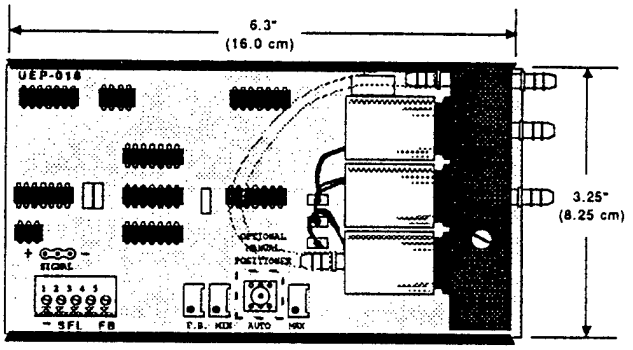


UEP-018 shown with optional **PG-05** gauge

FEATURES

- ***Can be mounted in any position***
- ***High air capacity***
- ***One-piece air valve / transducer assembly***
- ***No constant air bleed***
- ***High accuracy***
- ***No calibration required***
- ***Maintains pressure on loss of power***
- ***Quick-disconnect terminals***
- ***Pressure feedback voltage***
- ***Snap-track mounting***
- ***Optional branch pressure gauge***
- ***Optional failsafe***

DIMENSIONS



OPERATION

The **Model UEP-018** accepts a universal 24VDC (+ or -) pulse width modulated signal with a time base of .2 to 25.5 seconds. This pulse width modulated input produces a 0 to 18 PSIG output pressure which is proportional to the length of pulse input. The output pressure is monitored and maintained at the last command regardless of small air leaks or bleed restrictions in the branch line. The output pressure is changed by any pulse input that is different from the last one received. The output pressure is converted to a voltage feedback signal, which can be monitored by the controlling computer.

The optional failsafe model has an additional air valve which transfers control to a standard pneumatic controller should a system failure condition be detected. Any interruption of power at the FL terminals will cause the **UEP-018** to revert to the failsafe condition.

SPECIFICATIONS

Supply voltage	24VDC ±10% @ 90ma	**Output resolution**	.017 PSIG(1.17mbar)
Input signal	± 24VDC	**Feedback voltage**	1-8VDC, adjustable 1-10 max
Input signal pulse	.2 to 25.5 seconds	**Linearity**	.5% of span
Maximum press. rating	40 PSIG/2.76 bar	**Hysteresis**	.5% of span
Operating input press.	20 PSIG/1.4 bar	**Humidity**	5-95% noncondensing
Output pressure	0-18 PSIG/0...1.24 bar	**Operating temp. range**	35° to 105°F
Output capacity	1150 SCIM @ 20 PSIG(1.36kg/hr.)	**Temperature drift**	.5PSI(.034 bar) or better, 35° to 105°F
		Dimensions	3.25" x 6.3" (8.25 cm x 16.0 cm)

ELECTRONIC/PNEUMATIC TRANSDUCER

MODEL UEP-018

INSTALLATION

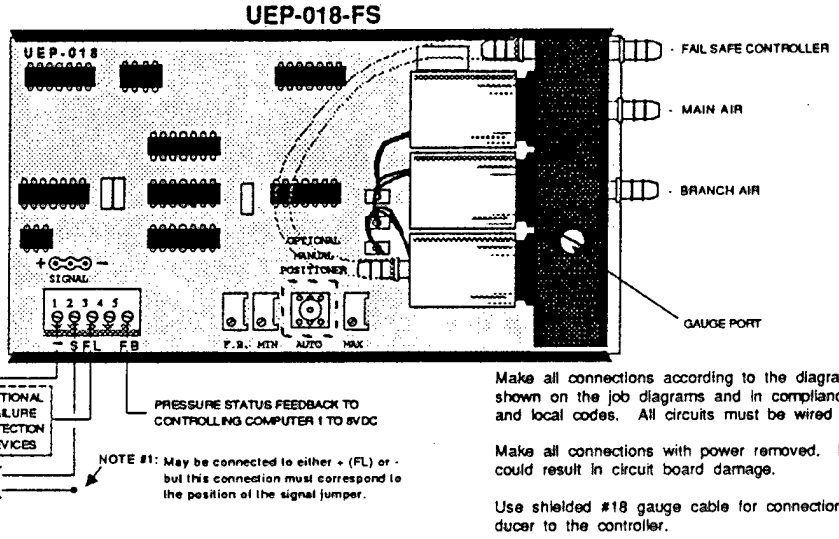
Mounting

Mount device inside an enclosure near the controlled equipment avoiding areas of temperature extremes, corrosive vapors, or electromagnetic interference. Use track slots for screw attachment.

Protect circuit board from metal filings created during panel construction.

Barbed fittings are provided for terminating 1/4" plastic tubing.

UEP-018-FS



Make all connections according to the diagram above or as shown on the job diagrams and in compliance with national and local codes. All circuits must be wired NEC class 1.

Make all connections with power removed. Failure to do so could result in circuit board damage.

Use shielded #18 gauge cable for connections from the transducer to the controller.

CHECKOUT

Tools Required: (voltmeter, **CLC-100-PW1 Signal Analyzer**)

Verify with a voltmeter that 24VDC is present across terminals "-" and "FL". Position the pulse width input jumper (J2) for the correct "-" or "+" polarity input mode. Verify that 20 PSIG(1.4 bar) main air is present.

To Check Transducer Operation:

1. Input a pulse of 25.5 seconds(use **CLC-100-PW1**). The branch pressure should go to 18 PSIG(1.24 bar) when the pulse is complete.
2. Input a pulse of 0.2 seconds. The branch pressure should go to 0 PSIG when the pulse is complete.

> **NOTE**
> This is a functional check only. The **UEP-018** is a highly accurate device and laboratory quality gauges are required to properly check calibration.

Calibration

The **UEP-018** is factory-calibrated for an output span of 0-18 PSIG. If a tighter span is required the MIN and MAX potentiometers are provided. To calibrate the span using the **CLC-100-PW1 Signal Analyzer**: input a pulse of .2 seconds; adjust the MIN potentiometer for the desired low pressure; input a pulse of 25.5 seconds; adjust the MAX potentiometer until the desired output pressure is reached; recheck the MIN setting and readjust as necessary. Repeat as necessary to achieve accurate results.

ORDERING INFORMATION

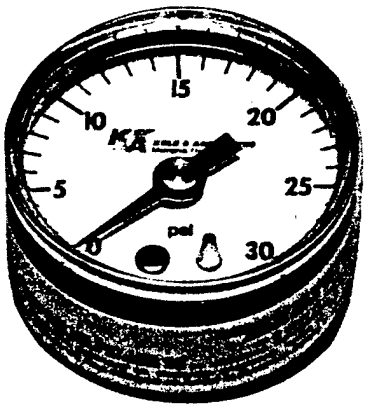
MODEL UEP-018	STANDARD MODEL
MODEL UEP-018-FS	FAILSAFE MODEL
PG-05	OPTIONAL GAUGE

PRESSURE GAUGE

MODEL PG-05 7.98 X0.7 = $5.586

DESCRIPTION

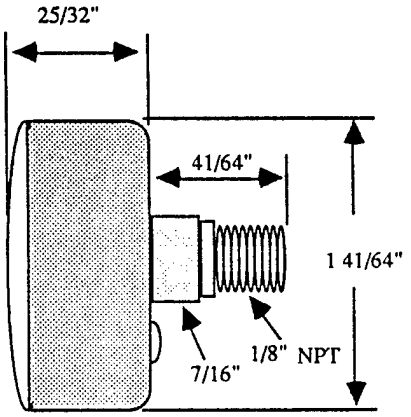
The **PG-05 Pressure Gauge** is for continuous indication of air pressure in pneumatic control systems. The **PG-05 Gauge** uses a spring-suspended movement which is largely resistant to the effects of shock, pulsation and vibration. The result of this is longer gauge life and greater reliability.



SPECIFICATIONS

Air pressure input	0-30 PSI
Accuracy	±2.5% of full scale
Air connection	1/8" NPT
Window	Polycarbonate push-in
Case	Epoxy painted steel
Socket	Brass
Operating temperature	-40° to 150°F (-40° to 65°C)
Humidity	95% noncondensing

DIMENSIONS



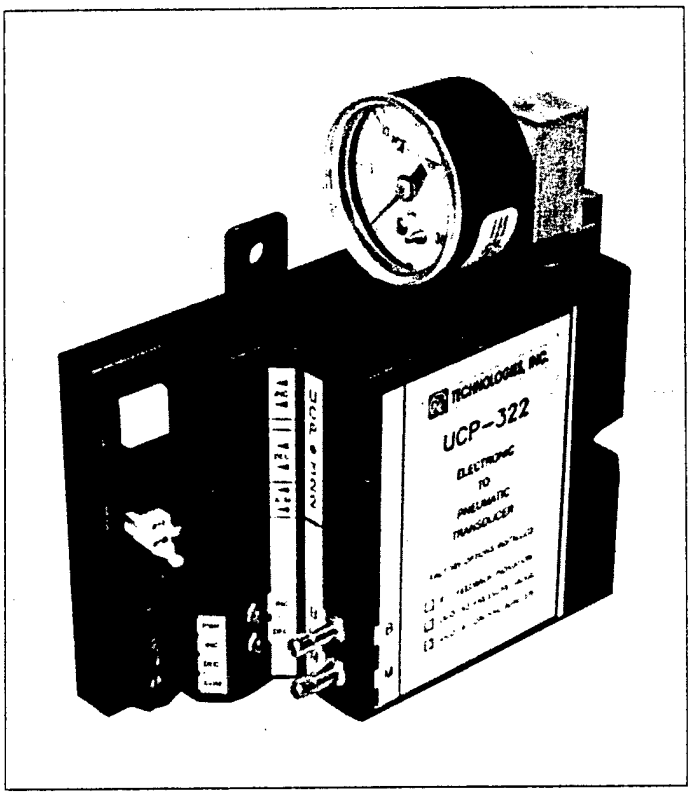
ELECTRONIC / PNEUMATIC TRANSDUCER

186.11 X0.5 = 93.06

MODEL UCP-322

DESCRIPTION

The **Model UCP-322 Electro/Pneumatic Transducer** is designed for direct digital control of pneumatic valves and dampers. Its low cost makes it ideal for applications on variable air volume terminal boxes. The transducer features low current, high cycle-rated, electro/pneumatic valves mounted in a **Noryl Plastic Enclosure.** For manual control of the output pressure, an increase/decrease switch is furnished. LED visual status is provided to verify the correct air valve selection. Visual pressure indication is optional using a top-mounted gauge.



FEATURES

- *Low cost*
- *Small size*
- *No bleed air consumption*
- *Momentary manual override for quick checkout*
- *Valve status LED*
- *AC or DC operation*
- *Quick-disconnect terminals for easy field service*
- *Low power draw*

OPTIONS

R - RESTRICTED OUTPUT (.007 restrictor for installation in the branch line)
F - FEEDBACK - Allows remote electronic readout of the output pressure. Standard calibration is for 3-15 PSI = 4-20ma.
UCO-43 - PRESSURE GAUGE INDICATION - Allows for local pressure indication without giving up valuable panel space.
UCO-47 - DIN RAIL MOUNTING ADAPTER - Allows the UCP-322 to be mounted with relays on the same track.

APPLICATION

The **UCP-322** is controlled from two discrete contact closures (or one tri-state output) from a controlling computer. Using a *puff-puff* technique, the *increase* or *decrease* air valves are pulsed to vary the branch air pressure. The branch pressure can be manually controlled by a technician during checkout by pressing *increase* or *decrease* momentary override switches located on the **UCP-322** . Note that the jumpers must be in *manual* position before the push buttons will work. For checkout situations where the pneumatic connections are complete but no control power is available, a portable battery pack may be used to provide power for manual valve positioning.

SPECIFICATIONS

Supply voltage	24VAC or VDC ± 10%	**Maximum pressure**	30 PSI(2.07 bar)
Power rating	1.5 watts	**Dimensions**	4 1/2"H x 2 "W x 4 3/4"D
Output capacity	Restricted: 46 SCIM @ 20 PSI (.054kg/hr.) Unrestricted: 1030 SCIM @ 20 PSI(1.2kg/hr.)	**Temperature**	32° to110°F (0° - 43°C)
		Humidity	0-95°RH noncondensing

ELECTRONIC / PNEUMATIC TRANSDUCER

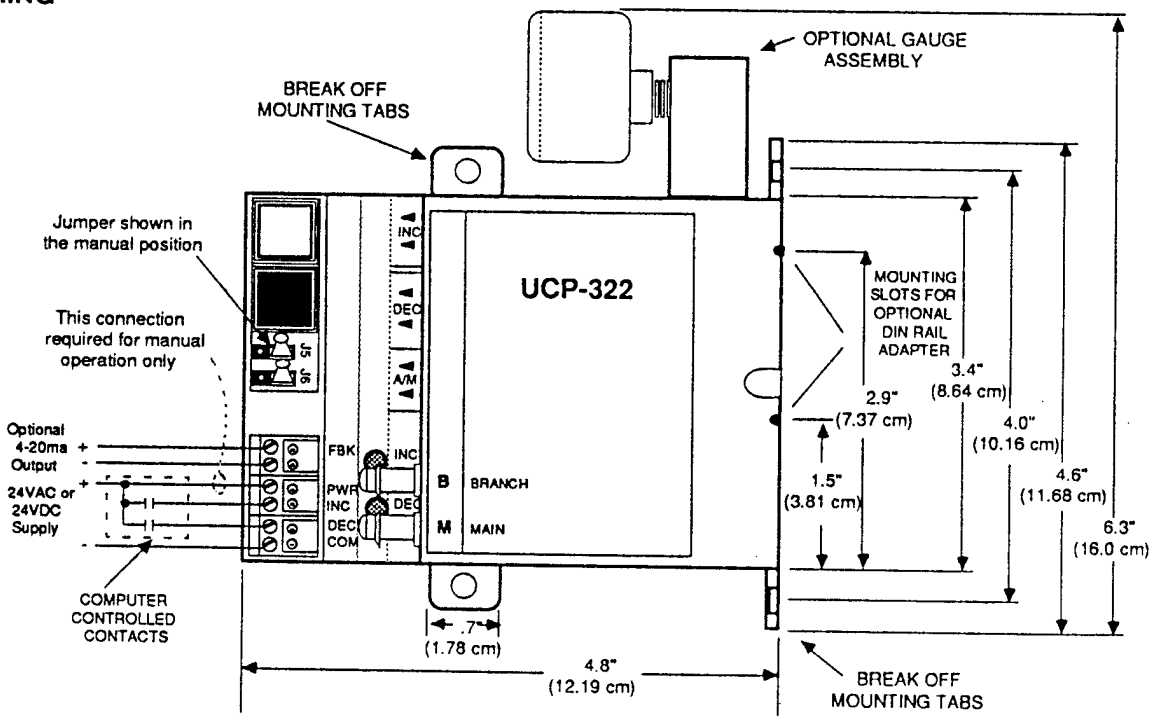
MODEL UCP-322

INSTALLATION

Mounting

Mount the **UCP-322** inside a **NEMA 1 Control Panel** in a clean, dry environment. Barbed fittings are provided for terminating 1/4 inch O.D. plastic tubing. The transducer is not position-sensitive. **Restrictor**: If restricted air volume is desired, a .007 restrictor "R" must be ordered to be placed in series with the branch output.

WIRING



For computer operation, the jumpers must be in the *auto* position. The transducer is 24VAC or 24VDC. Manual operation is only possible if 24V is wired to the "PWR" terminal. The jumpers must be in the *manual* position before the push buttons will work.

ORDERING INFORMATION

BASE MODEL	OPTIONS	
UCP-322	List in alphabetical order, one or two options	
	F	Feedback - allows remote 4-20ma electronic readout of the output pressure.
	R	Restricted output (.007 restrictor for installation in the branch line field installed)

UCP-322 - R - 43 - 47 **Example:** **Standard UCP-322 with restrictor output; pressure indication and DIN rail mount**

****FACTORY INSTALLED OPTIONS (FIELD REPLACEABLE)**

— To order these options, add the option number in Alpha / Numeric order as shown above

UCO-43 Pressure Gauge Indication - allows for local pressure indication without giving up valuable panel space.

UCO-47 DIN Rail Mounting Adapter - allows the **UCP-322** to be mounted along with relays on the same track.

** Options are factory installed only (see option data sheets for details).

PRESSURE-ELECTRIC SWITCH

P10 SERIES

58.50 X 0.7 = 41.09

4

DESCRIPTION

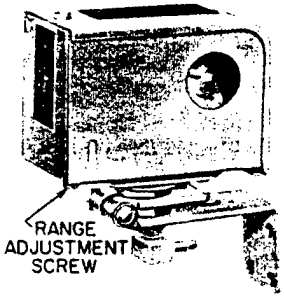
A change in operating pressure positions a preformed Buna-N diaphragm which actuates an electrical switch. Controls with SPDT contacts have color coded terminals; the common terminal is red; the red to yellow terminals close an electrical circuit on a rise in pressure; the red to blue terminals close a circuit on a drop in pressure.

APPLICATION

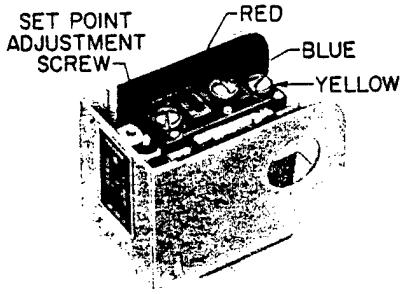
The **P10 Pressure Control** uses changes in operating pressure to open or close an electrical circuit. Typical applications include: pressure-electric switches in pneumatic systems, control of pumps or small air compressors, and pressure-electric interlock of fluid flow systems. The **P10BJ** and **P10FH** are available for electric heating applications.

FEATURES

- ***Screw terminals are easily accessible for field wiring***
- ***Snap-acting contacts in a dust-tight enclosure***
- ***Visible calibration scale***
- ***Field adjustment can be made with cover on or removed***
- ***Gas and oil resistant nylon reinforced diaphragm***



P10 Single Stage Pressure Control with barbed fitting and mounting bracket attached



Interior view of **P10BG** with terminals identified

SPECIFICATIONS

Electrical Ratings - (For each Pennswitch)

P10BC, P10FC, P10PA

Motor Ratings VAC	120	208	240	277
AC Full Load amp	16.0	9.2	8.0	7.0
AC Locked Rotor amp	96.0	55.2	48.0	42.0
Non-Inductive amp	16.0	9.2	8.0	7.2
Pilot Duty — 125 VA at 24 to 277 VAC				

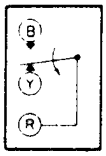
NOTE: On 2 and 3 stage models, the maximum connected load shall not exceed 2000 VA.

Maximum allowable pressure: 150 PSIG (1034 kPa)

P10BJ

Motor Ratings VAC		120	208	240	277	600
AC Full Load amp		16.0	9.2	8.0	—	—
AC Locked Rotor amp		96.0	55.2	48.0	—	—
Non-Ind. amp	Double Throw	16.0	16.0	16.0	16.0	16.0
	Single Throw	24.0	24.0	24.0	24.0	24.0
Pilot Duty — 125 VA at 24 to 600 VAC						

Series P10



ACTION ON INCREASE OF PRESSURE

Catalog Number	Number of Stages	Contact Action	Range PSIG (kPa)	Factory Setting				Pressure Connector NPT	Ship wt lb
				PSIG (kPa)		Switch Diff PSI (kPa)			
P10BC-7	1	SPDT	3 to 20 (21 to 138)	12 (R to Y Cut-in)		2		⅛ in.	1.0
P10BJ-1									
P10FC-4	2	SPDT		(R-Y Cutout) Low Stage	(R-Y Cut-in) High Stage	Low Stage	High Stage	⅛ in.	1.5
				8 (55)	12 (82)	2 (14)	2 (14)		
P10PA-11	3	SPST	3 to 20 (21 to 138)	Stage 1 Open Low	Stages 2 & 3 Open High	Stage 1	Stages 2 & 3	⅛ in.	1.5
				6 (41)	17.4 (120)	3 (21)	.4 (3)		

ORDERING INFORMATION

To order: Specify catalog number only.

PRESSURE AIR SENSING SWITCHES

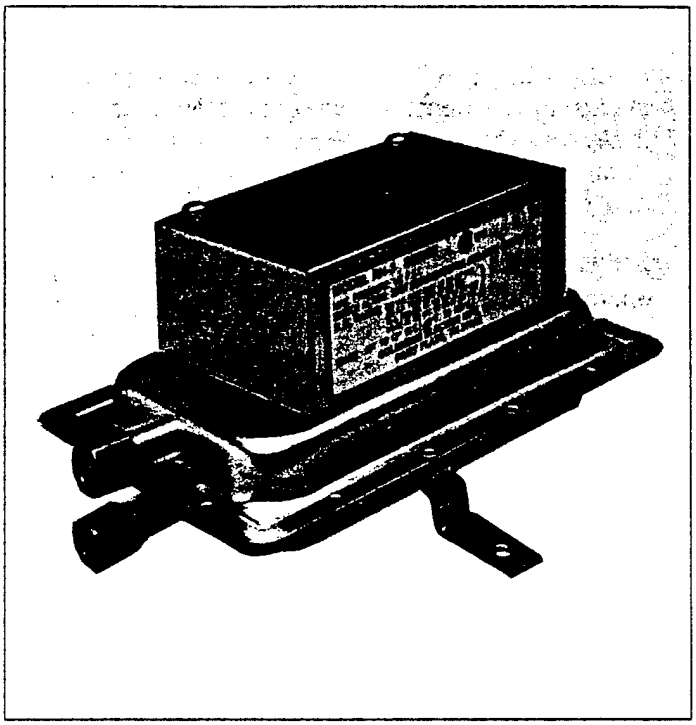
40.48 X0.5 = 20.24

MODELS RH-3 / RH-3-2

DESCRIPTION

RH-3 and **RH-3-2 Air Flow Switches** are used to sense pressure or vacuum or differentials of pressure or vacuum. Typical applications are to prove blower operation, sense dirty filters, signal buildup of frost and operate air cleaners in heat-pump installations.

Standard individual package includes 1/4" compression fittings suitable for use with 1/4" O.D. copper or plastic tubing and a 12" length of 1/4" plastic tubing.



OPERATION

When pressure is applied to the high side of the air flow switch or vacuum applied to the low side an internal diaphragm moves against and operates the lever of the snap switch. When the air flow switch is at rest (not operating) the snap switch N.C. contact is made to common. When an increase in differential pressure operates the snap switch, the "normally open" contact is made to the common terminal. The action of the diaphragm on the snap switch is the same whether pressure or vacuum is being controlled or sensed. The wiring from the air flow switch to other devices depends upon the application.

SPECIFICATIONS

S.P. Range:RH-3	.05" ± .02" to 12.0" ± .1"W.C.	**Electrical rating**	300VAC pilot duty at 125-277VAC 15 amp resistive at 125VAC 1/4 HP at 125VAC 1/2 HP at 250VAC
RH-3-2	.05" ± .02" to 2.0" ± .04"W.C.		
Switch differential	.04" W.C. at minimum setting .8" W.C. at maximum setting		
Maximum pressure	1/2 PSI	**Contact arrangement**	SPDT
Operating temp.	-40° to +180°F		
Mounting position	any vertical plane	**Approval**	UL, CSA

PRESSURE AIR SENSING SWITCHES

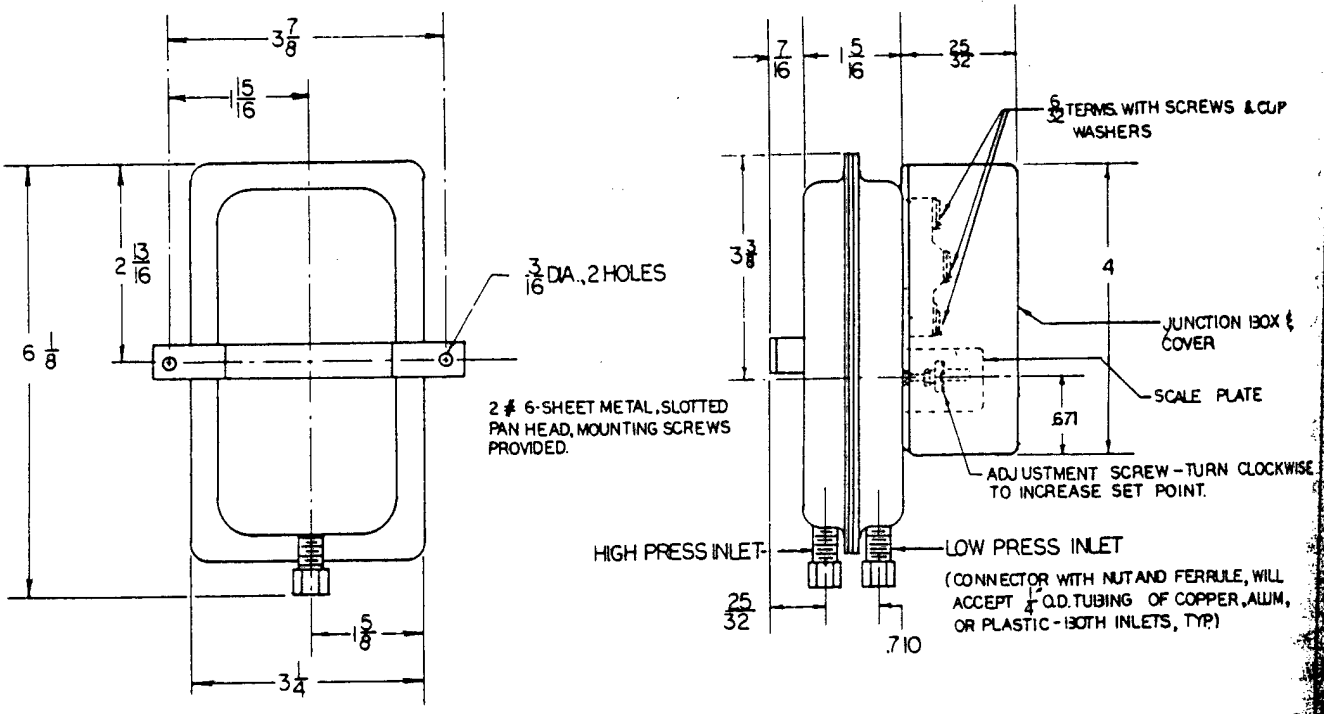
MODELS RH-3 / RH-3-2

INSTALLATION

MOUNTING: The **RH-3 Air Flow Switch** may be used to sense pressure or vacuum or differentials of pressure or vacuum. Mount the control vertically on duct or equipment using sheet metal screws. Connect 1/4" tubing to air flow switch using connectors as provided. Insert other end of tubing into area to be sensed. A **Total Pressure Tube (Model1729)** may be ordered when plastic tubing is used. When the total pressure tube is used face the tube opening upstream of the air flow.

ADJUSTMENT: The adjusting screw located in the junction box may be used to change the operating point. The operating range is .05" to 12.0" W.C. The differential is .04 rising to .8 at highest setting, i.e., the switch will operate at .05 and reset before .01 on the low end and operate at 12.0" and reset before 11.2" on the high end. Rotate adjusting screw clockwise to increase setting.

DIMENSIONS



DIFFERENTIAL PRESSURE TRANSMITTER

625X0.5=312.50

MODEL XLdp

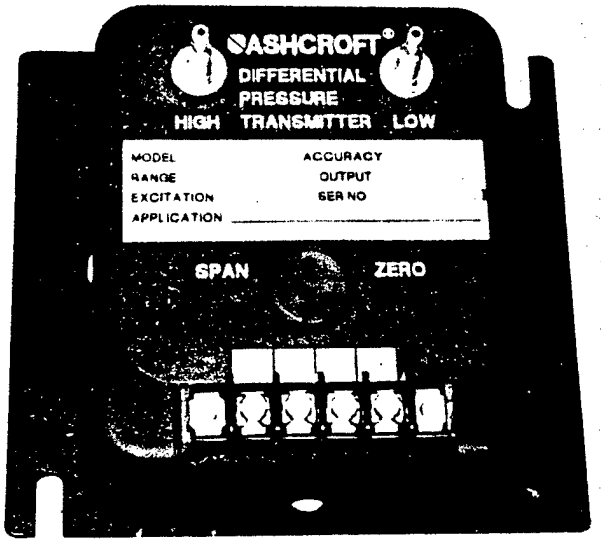
DESCRIPTION

The new **Ashcroft® XLdp** introduces a variable capacitance sensor within a glass clad silicon chip. The patented **SI-Glas** technology combines the inherent high sensitivity of a variable capacitance transducer with a micromachined, ultra-thin, silicon diaphragm.

The **Ashcroft SI-Glas Sensor** now enables precise measurement and control of very low pressure. Although the ultra-thin silicon diaphragm deflects only microns, the sensor is 100 times more sensitive to pressure than available silicon piezo-resistive pressure sensors.

The **SI-Glas Sensor** is composed of only sputtered metals and glass molecularly bonded to silicon. There are no epoxies or other organics to contribute to drift or mechanical degradation over time. The glass clad silicon diaphragm withstands extreme overpressure as well as severe shock and vibration. The **SI-Glas Sensor** construction, superior packaging techniques and unique **Ashcroft** circuit provide extraordinary long term stability.

This major sensor advance enables repeatable measurement and control of gas flows as low as 30 feet/minute (9.14 meters/min.) in most energy management, industrial, medical or aerospace applications.



FEATURES

- ***Certified 0.5% and 1% accuracy***
- ***High overload protection***
- ***Flame-proof NEMA 2 metal construction***
- ***Internal power regulation***
- ***Calibration certification***
- ***Easy installation***

SPECIFICATIONS

PERFORMANCE CHARACTERISTICS

Standard Ranges (Inches W.C.) (Uni or Bidirectional):

±0/0.1	±0/2.5
±0/0.25	±0/3.0
±0/.5	±0/5.0
±0/1.0	±0/10.0
±0/2.0	±0/25.0

Other ranges available

Accuracy Class (F.S.)

	0.5%	1.0%
Non-lin.(Term. Pt.)*	±0.4	±0.8
(B.F.S.L.)	±0.25	±0.5
Hysteresis	±0.02	±0.02
Non-Repeatability	±0.05	±0.10

*Includes hysteresis

Stability (F.S./year) ±1.0%

Overpressure:

Proof	10 PSIG/.689bar
Burst	50 PSIG/3.45bar

Response time: Less than 250msec

ENVIRONMENTAL EFFECTS

Storage Temperature:	-40/180°F
Operating Temperature:	-20/160°F
(10 - 95% R.H. Non-condensing)	
Compensated Range:	35-135°F

Thermal Coefficients:

	0.5%	1.0%
Zero	±0.015% F.S./°F	±0.02%F.S./°F
Span	±0.015%	±0.02%

Optional thermal compensation at additional cost.

Vibration:
Less than 0.05% F.S. temporary effect with 5g's, 0-60 H_z

Position Effect:

2.0" W.C. and higher	≤ 0.1% F.S.
0.5" - 1.0" W.C.	≤ 0.25% F.S.
0.1" - 0.25" W.C.	≤ 0.4% F.S.

ELECTRICAL

Output Signal:	Power:
4-20 mA (2 wire)	13-36 VDC unregulated
1-5 VDC (3 wire)	12-36 VDC
1-6 VDC (3 wire)	unregulated

Resolution: Infinite

Reverse Wiring Protected

Zero and Span: Externally accessible
Non-interactive

Power Supply Effect: ±0.005% F.S./VDC
±0.01% F.S./VDC
(1% unit)

Supply Current:
< 5mA for voltge output

Warm Up Time:
10 sec. max. to meet stated specificatons.

PHYSICAL
NEMA 2 Case
Weight: 14 oz.

MATERIALS:
Case: Epoxy coated steel

PRESSURE CONNECTIONS:
Dual barbed, 1/8" and 1/4"Stainless steel

NSTC Shipping qualified

Consult factory for use on other than air and non-conducting gases.

Calibration curve supplied with each transmitter.

DIFFERENTIAL PRESSURE TRANSMITTER

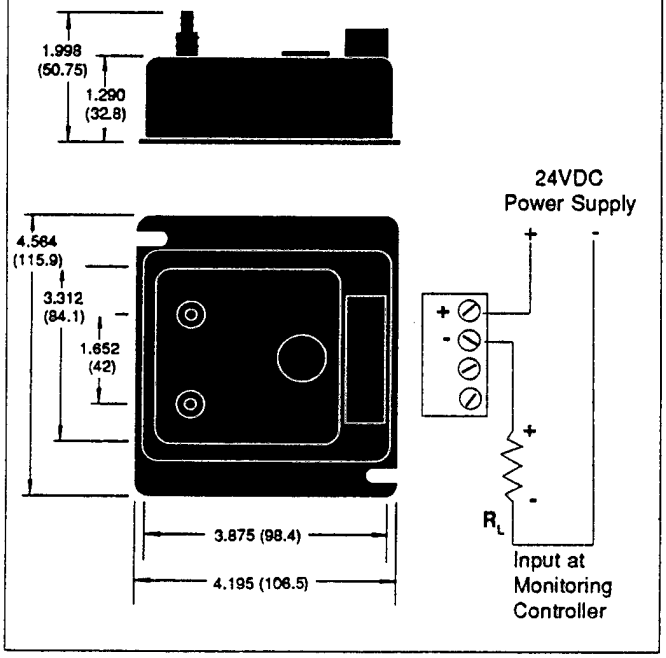
MODEL XLdp

APPLICATIONS

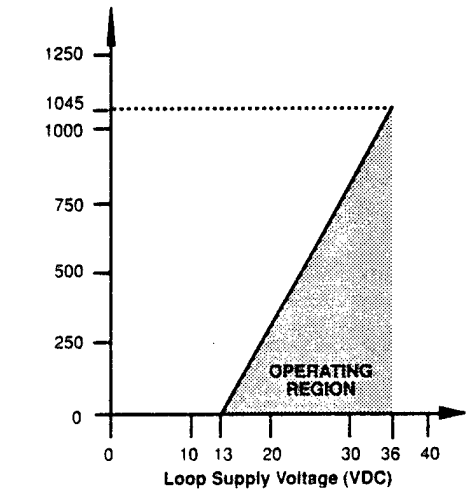
- *Precision fan tracking*
- *Repeatable VAV control*
- *Filter monitoring*
- *Laboratory fume hood control*
- *Lab/clean room pressurization*
- *Precise velocity pressure measurement*
- *Laminar flow measurement*
- *Furnace draft measurement*
- *Oven air flow control*
- *Operating / recovery room pressurization*
- *Leak detection*

4

DIMENSIONS



LOAD LIMITATIONS



$V_{min} = 13V + [\ .022A * (R_{Loop})]$

*includes a 10% safety factor

ORDERING INFORMATION

ASH - [X][L] [ ] – [ ][ ][ ] – [ ] – [ ] – [ ][ ][ ] – [ ][ ] – [ ][ ] – [ ] – [ ][ ][ ]

Model Configuration (XLdp)	Measurement Type (D) Differential	Accuracy %F.S. (100)1.0% (050) 0.5% (025) 0.25%	Compensated Range (C) 35/135°F	Thermal Error (N) .02 (1.0%) (O) .015 (0.5%)	Pressure Connection (MB2) 1/8 - 1/4 Barbed	Output Signal (42) 4-20ma (15) 1/5VDC (16) 1/6VDC	Supply (A) 13-36VDC (B) 12-36VDC For voltage output	(B) Bidirectional	Pressure Range "W.C. / mbar (010)0.1"W.C./.25 (025)0.25"W.C./.625 (050)0.50"W.C./1.25 (100)1.00"W.C./2.5 (200)2.00"W.C./5.0 (250)2.50"W.C./6.25 (300)3.00"W.C./7.5 (500)5.00"W.C./12.5 (10X)10.00"W.C./25.0 (25X)25.00"W.C./62.5

KW AND KWH TRANSDUCERS

MODEL WHU-238

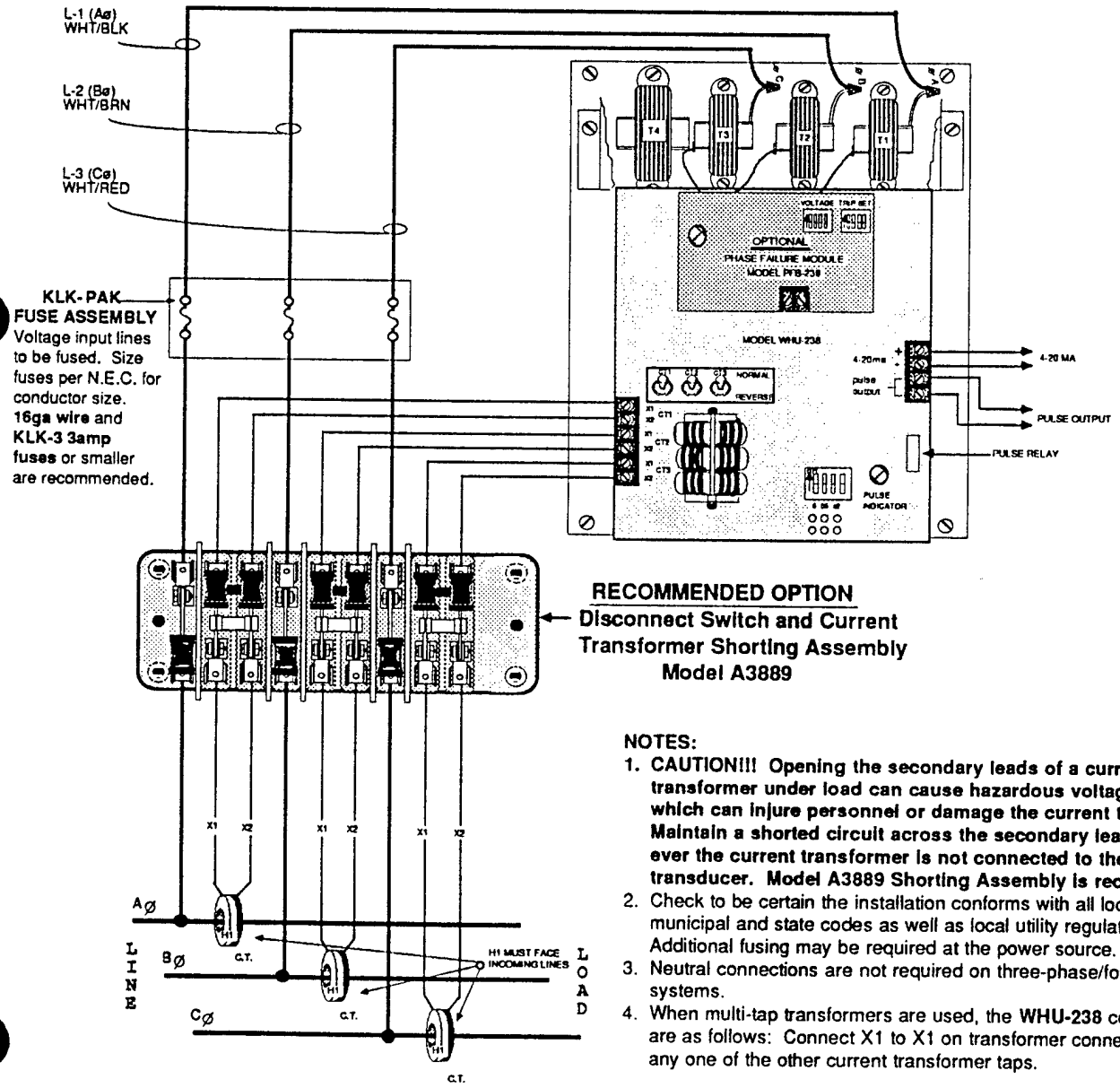
777.78 x 0.5 = 388.89

3

WIRING

TROUBLE SHOOTING

1. If there is no output or if output from **WHU-238** appears incorrect:
   A. Verify that CT's are installed with "H-1" side facing the incoming power. If a CT is installed backwards, move its respective CT switch in the **WHU-238** from the "Normal" to the "Reverse" until the highest 4-20ma output is obtained.
   B. If this does not correct the problem, verify that the current from each CT is in phase with its respective voltage. For example: If Phase A voltage is wired to "T-1" in the **WHU-238**, the CT installed on Phase A must be wired to "X-1" and "X-2" at CT-1 input.
   C. If output from **WHU-238** still appears incorrect, re-check calculations for KW demand and KWH/Pulse using equations shown in the Operation section.
2. If 4-20ma (KW) output is correct but there is no pulse (KWH) output, check the pulse indicator LED. If pulse indicator LED is functioning, the pulse relay is defective. Replace the relay.(Part number PRMA-1A05)
3. If the 4-20ma (KW) output is correct but the pulse (KWH) output appears incorrect, check to see that the four dip switches in the **WHU-238** are set per Table #1 for the correct pulse rate factor.



NOTES:

1. **CAUTION!!! Opening the secondary leads of a current transformer under load can cause hazardous voltages which can injure personnel or damage the current transformer. Maintain a shorted circuit across the secondary leads whenever the current transformer is not connected to the watt transducer. Model A3889 Shorting Assembly is recommended.**
2. Check to be certain the installation conforms with all local municipal and state codes as well as local utility regulations. Additional fusing may be required at the power source.
3. Neutral connections are not required on three-phase/four-wire systems.
4. When multi-tap transformers are used, the **WHU-238** connections are as follows: Connect X1 to X1 on transformer connect X2 to any one of the other current transformer taps.

KW AND KWH TRANSDUCERS

MODEL WHU-238

OPERATION

Calculating Instantaneous Power Demand (KW):

$$\text{Calculate KW DEMAND} = \frac{1.038 \times \text{CT Primary Amps} \times (\text{ma OUT} - 4)}{16}$$

Calculating KWH / Pulse:

$$\text{KWH / Pulse} = \frac{\text{PRF (from TABLE \#1)} \times \text{CT Ratio}^*}{1000}$$

$$^*\text{CT Ratio} = \frac{\text{Current Transformer Primary Amp Rating}}{\text{Current Transformer Secondary Amp Rating}}$$

TABLE #1

SWITCH				WHU-238-A1	WHU-238-A5
1	2	3	4	PRF	PRF
OFF	ON	OFF	OFF	.05	.25
OFF	ON	OFF	ON	.10	.50
ON	OFF	OFF	OFF	.50	2.50
ON	OFF	OFF	ON	1.00	5.00

ORDERING INFORMATION

WHU-238	Basic Model Number 208-240-480-600 V, 3 phase		
	A1	1 amp input from current transformer	
	A5	5 amp input from current transformer	
	Options (leave blank if none required)		
		S	**A3889 Shorting Switch** (mounted)
		F	**KLK-PAK Fuse Assembly** (mounted)
		B	**A3889** and **KLK-PAK** (mounted)
		W	**A3889** and **KLK-PAK** (mounted and wired)
		P	**PFB-239 Phase Monitor** (installed)

NOTE: Current transformer output must match **WHU-238** input

CURRENT OPERATED SWITCHES

200 X 0.5 = 100

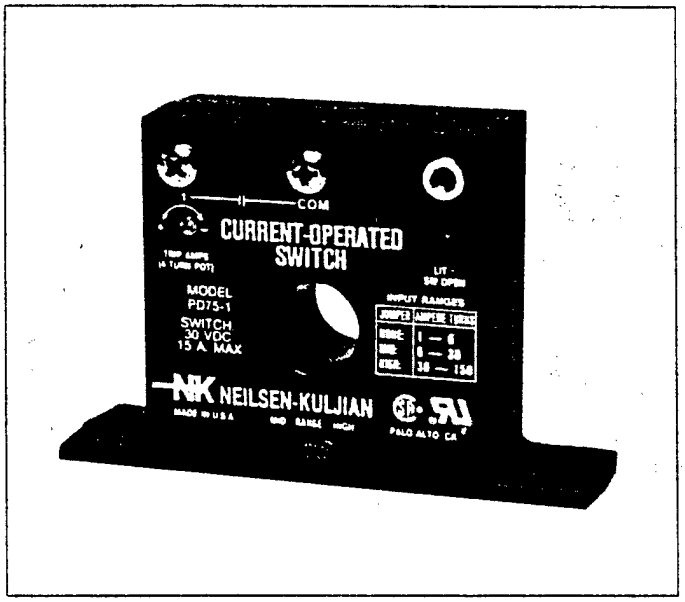
PD75 SERIES

USE THIS DEVICE TO MONITOR AC CURRENTS AND TO SWITCH DC CIRCUITS

DESCRIPTION

PD75 Series Precision Solid-state Switches operate when the AC current level sensed by the internal current transformer exceeds the threshold values set by the four-turn adjustments. Three selectable ranges offer optimum adjustability and resolution. Internal circuits are totally powered by induction from the line being monitored.

These switches monitor loads which may vary slowly about the setpoint and where switching must be fast and precise. See the **Model D150** for relatively fixed loads where reliable ON/OFF indication or control is needed at lowest cost.



FEATURES

- *Self-powered*
- *Small size*
- *Wide current range*
- *Solid-state reliability*
- *Simple adjustment*
- *Low cost*
- *UL recognized*
- *CSA certified*
- *See PD50AC Series page after next*

SPECIFICATIONS

Operating temperature: -58° to 149°F (-50° to 65°C) **Case:** ABS (Meets UL flammability rating 94V-0)

MONITORED AC CURRENT:

INPUT RANGE	JUMPER	MAX.CONTINUOUS	6 SEC'S	1 SECOND
1-6 amps	None	60 amps	100 amps	175 amps
6-30 amps	Mid	100 amps	150 amps	300 amps for 1 Sec. Monitor motors in this range up to 50 FLA.*
30-150 amps	High	160 amps	350 amps	500 amps for 1 Sec. Monitor motors in this range up to 85 FLA.*

* NOTE: For motors with higher FLA's and/or longer start times, and for larger diameter conductors, use an external current transformer whose secondary current flows thru the sensor.

Switching Capability: 150ma continuous, 500ma momentary, 30VDC.

SWITCHING CHARACTERISTICS

	LOW RANGE		MID RANGE		HIGH RANGE	
AMP INPUT:	1A.	6A.	6A.	30A.	30A.	150A.
HYSTERESIS:	.02A.	.7A.	.24A.	1.8A.	1.3A.	10A.
RESPONSE TIMES: (with sensor set to ranges and values above and current thru sensor 5% above trip point)						
ON delays	140ms.	110ms.	60ms.	40ms.	30ms.	30ms.
OFF delays	80ms.	40ms.	70ms.	50ms.	70ms.	40ms.

CURRENT OPERATED SWITCHES

PD75 SERIES

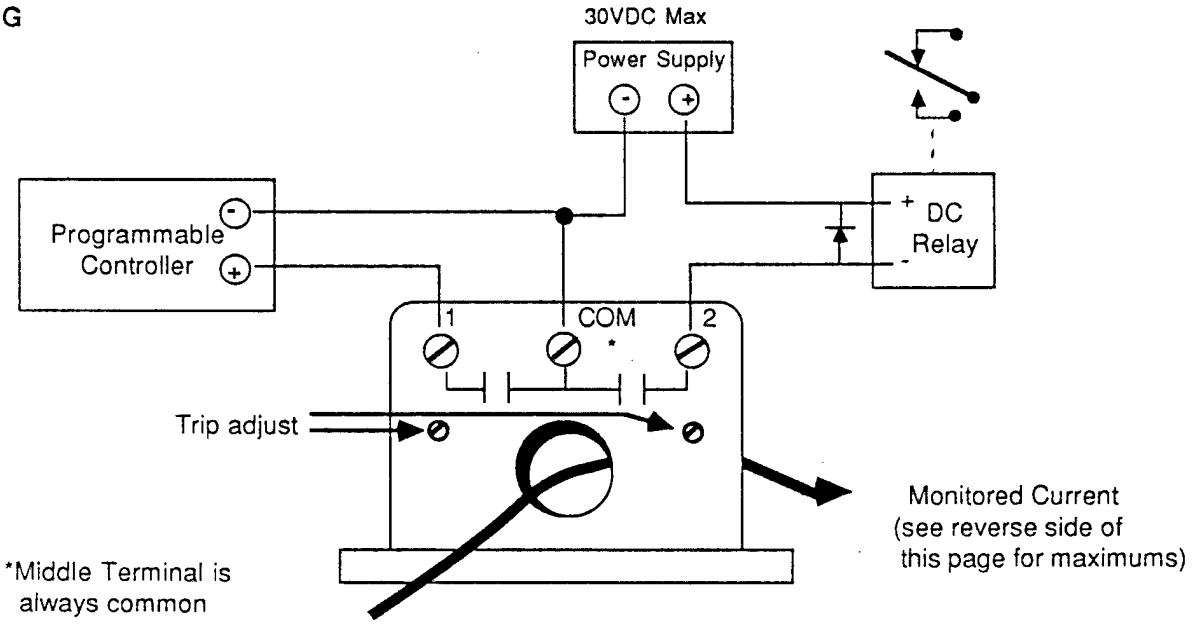
APPLICATION

- *Precision switching*
- *Direct connection to PC's with DC Inputs, for general status and proof-of-performance monitoring*
- *Directly control light DC loads, such as lamps and relays, in response to the current of a monitored AC circuit*
- *Replace differential pressure and air flow switches*
- *Safety and alarm circuits*
- *Monitor motors for broken belts and couplings*
- *Heat tracing, heater monitoring*

DIMENSIONS

Units are 2 1/8"H x 2 1/8"W x 1"D, with an integral mounting base 3 1/4" long and mounting centers of 2 3/4". Two holes are provided on one side to accept #6 screws, for alternate mounting. The thru-hole is .55" diameter, for up to #2/0 insulated wire (THHN, THWN type insulation).

WIRING



ORDERING INFORMATION

Normally - Open (1 Form A): **Model PD75-1**

Normally - Open (2 Form A): **Model PD75-2**

PLATINUM TEMPERATURE SENSOR

MODELS RTS-5737-G / RTS-5737-W / RTS-5737-K

DESCRIPTION

Hy-Cal's Room, Duct, and Outside Air Temperature Sensors are designed for energy and environmental control applications. These sensors use a thin film platinum element for fast, accurate point measurement.

The **RTS-5737-K** is available in a decorative wall mount housing to provide a pleasant, professional appearance. This housing can either flush mount, or mount directly over a standard handi box.

The **RTS-5737-G** features a rugged, stainless steel probe mounted in a standard handi box, making installation quick and easy with self-tapping screws.

The **RTS-5737-W** features a non-heat conductive, solar reflecting, non-corrosive shield. This configuration is completely sealed against moisture in weather conditions. The slotted shield allows air to flow freely to the stainless steel probe, to provide accurate measurement. Installation is made easy with a 1/2" female thread for mounting on the end of a conduit, or a "U" bolt can be used for flush mounting.

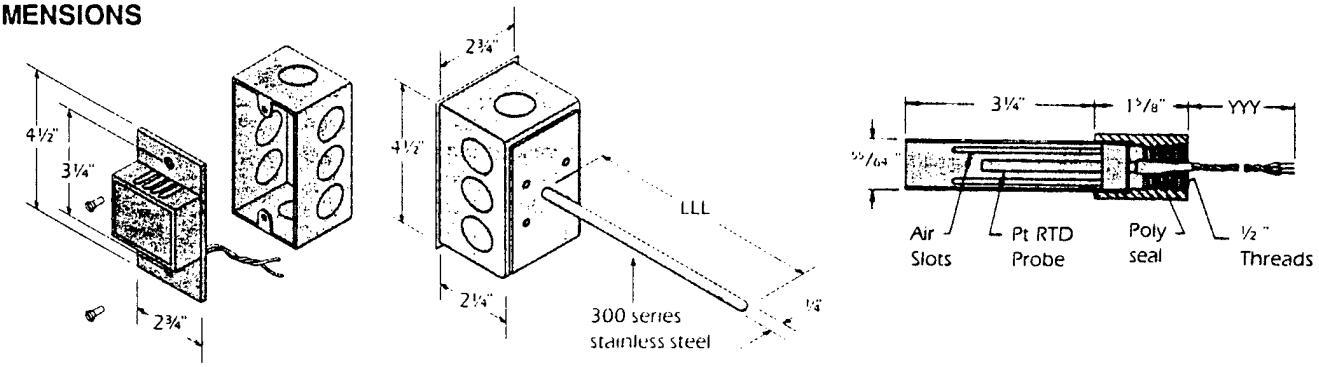


	SPACE	DUCT	WATER	OAS
SENSOR	69.83	91.67	166.25	91.67
TRANS	248.61	248.61	248.61	248.61
	318.44	340.28	414.86	340.28
	X0.5	X0.5	X0.5	X0.5
	159.22	170.14	207.43	170.14

FEATURES

- ***Low cost, easy installation***
- ***Rugged design***
- ***Platinum RTD's***
- ***Interchangeable sensors***

DIMENSIONS



1

PLATINUM TEMPERATURE SENSOR

MODELS RTS-5737-G / RTS-5737-W / RTS-5737-K

SPECIFICATIONS

Temperature range	**RTS-5737-G;**	-50°C to +260°C (-58°F to +500°F)
	RTS-5737-W;	-50°C to +80°C (-58°F to +176°F); limited by housing
	RTS-5737-K;	-50°C to +65°C (-58°F to +150°F); limited by housing
Sensing element	100 ohm platinum, .00385Ω/Ω/°C 1000 ohm platinum, .00375Ω/Ω/°C	
Ice point resistance, R_0	100 ± 0.2Ω (±0.2%); ±0.1Ω (±0.1%) 1000 ± 2.0Ω (±0.2%); ±1Ω (±0.1%)	
Time constant, air at 10 ft./sec.	**RTS-5737-G;**	3 minutes
	RTS-5737-W;	3 minutes
	RTS-5737-K;	3 minutes
Self heating	Typically > 15 mW/°C	

Interchangeability	All others; ±.5°C or 0.8% of temp. at ±0.2% R_0 trim ±.3°C or 0.6% of temp. at ±0.1% R_0 trim optional
Stability	Better than .05°C per year
Insulation resistance	>50 megohms at 50 VDC at 25°C
Maximum current	2 ma
Recommended current	1ma
Probe material & diameter	**RTS-5737-G**; stainless steel, 1/4" dia. **RTS-5737-W**; 300 series stainless steel body, 1/4" dia. **RTS-5737-K**; high purity alumina, 3/16" dia.
Housing material	**RTS-5737-G**; electro-zinc plated **RTS-5737-W**; white polyvinyl chloride **RTS-5737-K**; beige thermoplastic
Lead wire material	24 ga. nickel coated stranded copper, Teflon insulated

ORDERING INFORMATION

Basic Model	Description
RTS-5737-W	Outdoor Air Temperature Probe (Omit Code 2)
RTS-5737-G	Air duct probe (Omit Code 2)
RTS-5737-K	Room mount air temperature sensor (Omit Code 2 & 5)

Code 1	Temperature Coefficient
T	385 platinum 100 Ohm, 0.00385 Ohm/Ohm/°C DIN specification
U	375 Platinum 1000 Ohm thin film 0.00375 Ohm/Ohm/°C ULTRA-7

Code 2	Probe Length - "LLL"
__"	Specify in inches - RTS-5737-G only (8" standard)

Code 3	Lead Wire Configuration
2	2-wire (standard)
3	3-wire (available)

Code 4	Lead Length
__"	Specify in inches (6" standard on all except 18" on RTS-5737-W)

Code 5	Housings (optional)
H15	Handy box with 3/4" knockouts (RTS-5737-G only)
H16	Handy box with 1/2" knockouts (RTS-5737-G only)
H19*	Weatherproof housing with 1/2" female threaded outlets (RTS-5737-W only)

Code 6	Options
X1	Interchangeability 0.1% at 0°C (Not available on RTS-4205-P)
X55	Signal conditioning matched to probe ice point

*Supplied with close nipple for connection with RTS-5737-W

IMMERSION PROBES / SURFACE SENSORS

MODELS RTS-5737-P/ RTS-5737-V

DESCRIPTION

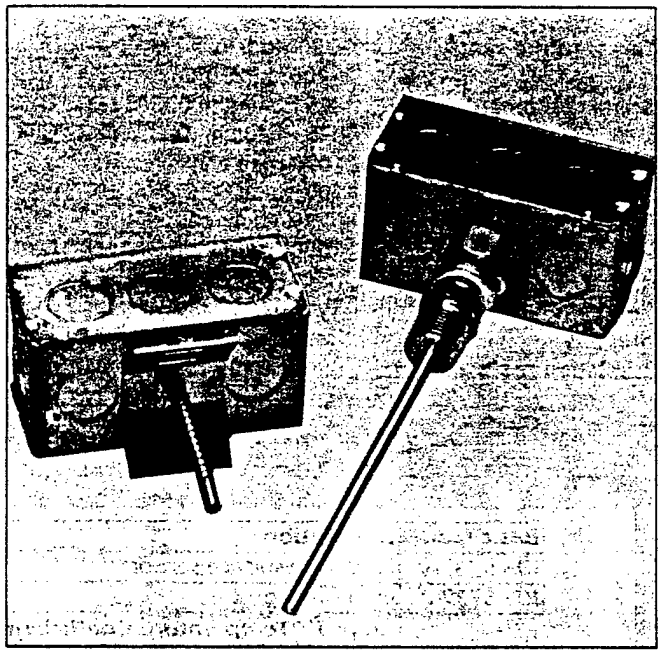
For energy control application requiring accurate temperature measurement of contained liquids or gases, **Hy-Cal** has designed several cost-effective immersion probes and non-intrusive sensors.

Hy-Cal's Immersion Probes are designed with a 1/2" tapered thread for easy installation in thermowells, standard pipe fittings or threaded bosses.

Hy-Cal welds and anchors the sensor leads in an alumina sheath using thermally matched proprietary cements. Immersion probe elements are then assembled into a close tolerance stainless steel tube, injected with heat transfer paste and packed with magnesium oxide. This provides an extremely stable and durable probe.

Where penetration of the container or pipe is not practical, strap-on or surface sensors are available. These sensors measure the temperature of the surface of the pipe or container. Properly installed and insulated from ambient conditions, this method provides reasonable temperature measurement.

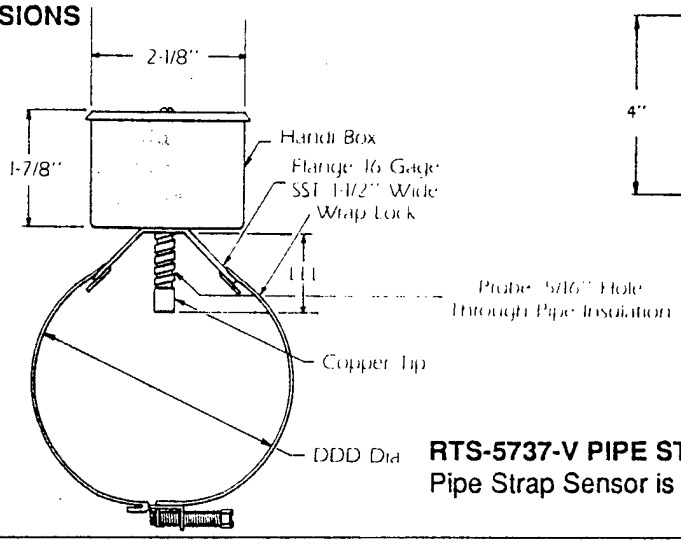
For those applications that require replacing the sensor without recalibration of the electronics, the **X1 Option** is recommended. This yields a tighter trim of the resistance value at ice point, making recalibration of the electronics unnecessary.



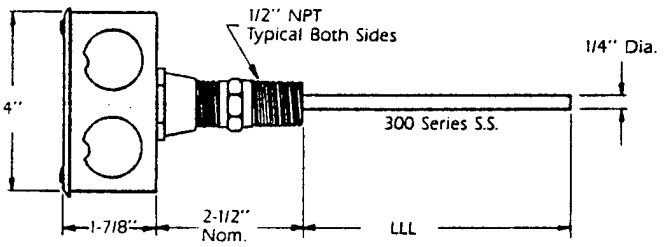
FEATURES

- ***Low cost, easy installation***
- ***Rugged construction***
- ***Immersion probes and non-intrusive sensors***
- ***Interchangeability***

DIMENSIONS



RTS-5737-V PIPE STRAP
Pipe Strap Sensor is mounted in a handi box.



RTS-5737-P IMMERSION PROBE
RTS-5737-P is a thin film Immersion Probe mounted in a handi box.

1

IMMERSION PROBES / SURFACE SENSORS

MODELS RTS-5737-P / RTS-5737-V

SPECIFICATIONS

Temperature range	-320° to 500°F (-200° to 260°C)
Sensing element	385 Platinum .00385 Ω/Ω/°C 375 Platinum .00375 Ω/Ω/°C 1000 ohm only
Ice point resistance, R_o	100 ± 0.2Ω (±0.2%); ±0.1Ω (0.1%) optional 1000 ± 0.2Ω (±0.2%); ±0.1Ω (±0.1%) optional
Self heating	Typically > 15mW/°C
Stability	Better than .25°C per year
Insulation resistance	>50 megohms at 50VDC at 25°C
Interchangeability	±.5°C or 0.8% of temp. at ±0.2%R_o trim; ±.3°C or 0.6% of temp. at ±0.1%R_o trim optional
Maximum current	2ma
Recommended current	1ma
Probe material & diameter	**RTS-5737-P**: stainless steel body **RTS-5737-V**:copper tipped stainless steel body
Lead material	Nickel-coated stranded copper, Teflon insulated; all others: 24 GA

ORDERING INFORMATION

Basic Model	Description
RTS-5737-V	Pipe strap surface sensor
RTS-5737-P	Immersion probe

Code 1	Temperature Coefficient
T	385 platinum thin film, 100Ω; .00385Ω/Ω/°C DIN specification
U	375 platinum thin film, 1000Ω; ULTRA-7™, .00375Ω/Ω/°C

Code 2	Resistance at ice point (R_o)
100	100 ±0.2Ω (Thin film)
1000	1000 ±2.0Ω (ULTRA-7™ thin film)

Code 3	Immersion Length ("LLL")
____"	Specify in inches (2" minimum)

Code 4	Lead Wire Configuration
2	2-Wire; standard
3	3-Wire available

Code 5	Lead Wire Length ("YYY")
____"	Specify in inches (6" standard)

Code 6	Options
X1	Interchangeability 0.1% @ 0°C
X15	Type 316 S.S. probe tube
X55	Signal conditioning matched to ordered probe at Ice Point
H15	Handy box with ¾" knockouts (RTS-5737-P only)
H16	Handy box with ½" knockouts (RTS-5737-P only)
H19*	Weatherproof utility box (RTS-5737-P & RTS-5737-V only)

* For RTS-5737-P-U-1000-LLL-2-6 when ordered with a CT-809 rangeable transmitter, the H19 weatherproof box is included with the transmitter. No box is required with the probe. X55 option is recommended to provide ice point calibration for accurate matching to any range.

PLATINUM 1000Ω SPACE TEMPERATURE TRANSMITTER

MODEL CT-859

DESCRIPTION

The **CT-859** is a **Dip Switch Rangeable Room Temperature Transmitter**. The unit features wide rangeability and stable performance. Non-interacting vernier multi-turn controls provide a constant resolution adjustment. Gold plated dip switches ensure stable overlapping incremental selections between -10° and 60°F for zero and 35° to 150°F for span.

The maximum ventilation design derived from extensive development testing enhances sensor response and ensures excellent dissipation of heat from the circuit.

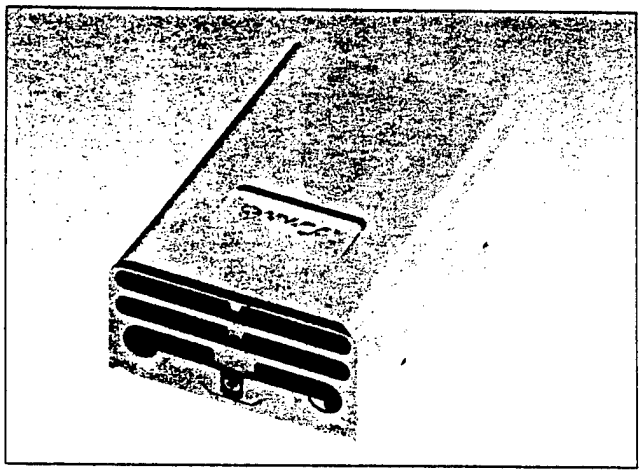
Repeatability is excellent because the **CT-859** uses a Platinum RTD as the sensing element. Calibrated system accuracy of the **CT-859** is typically 0.25°F.

Once installed, the cover does not need to be removed for field calibration or on-line verification. A jack is accessible through the cover where the **Hy-Cal Model SA-728-A Field Calibration Meter** plugs in for direct 0-100% of scale reading.

Calibration is performed by plugging in a meter, comparing it to a portable standard, adjusting one pot, unplugging the meter and walking away. The cover stays on for on-line accuracy verification.

A calibrated 4.0ma ±0.01ma is provided when the sensor leads are shorted. This is a "zero" reference to aid in installation and set-up.

The two transmitter loop leads are insensitive to power supply polarity. This prevents reversed hook-ups and simplifies installation.



FEATURES

- ***Unique wall mount housing***
- ***Optimum flow-through ventilation***
- ***Easy zero & span ranging***
- ***Exclusive walk-up plug-in readout***
- ***On-line calibration***
- ***Calibrated system test current***
- ***Non-polar connections***

SPECIFICATIONS

Sensing element	**Ultra-7** ™ 1000 ohm platinum RTD
System accuracy	±0.5°F(0.3°C) at room temperature or ±0.8% of span operating at 24VDC; Optional sensor matching provides ±0.25°F (±0.14°C) at room temp.
Rangeability	Zero: -10° to 60°F (-23° to 15°C) Span: 35° to 150°F (19° to 83°C) Gold plated dip switch selected
Output	4-20ma, 2-wire
Transmitter linearity	±0.05% of span (negligible) Included in system accuracy
Sensor stability	Better than 0.09°F (0.05°C) per year
INSTALLATION:	
Transmitter housing	Style "MH" - 4 7/16"H x 2 13/16"W x 1 3/8"D, ABS housing.
Operating/storage temperature	-58° to 150°F (-50° to 66°C)
Power supply sizing	9.4VDC + (R_{load} x 0.02A) minimum, 45VDC maximum, unregulated. Add 2.7 volts for operations with **SA-728-A Meter**.
Recommended R_{load}	100 ohms ±0.1% at 11.4VDC minimum; 250 ohms ±0.1% at 14.4VDC minimum; 500 ohms ±0.1% at19.4VDC minimum; add 2.7 volts for operations with **SA-728-A Meter.**
Connections	Screw terminals. Non-polar, connect either way
SERVICEABILITY:	
Periodic maintenance	Integral receptacle for plug-in local **SA-728-A Indicator** permits on-site calibration to a transfer standard
Vernier zero & span adjust	Zero and span adjust non-interacting. Resolution is constant and is independent of dip switch range selection. Adjust zero only for on-site calibration.

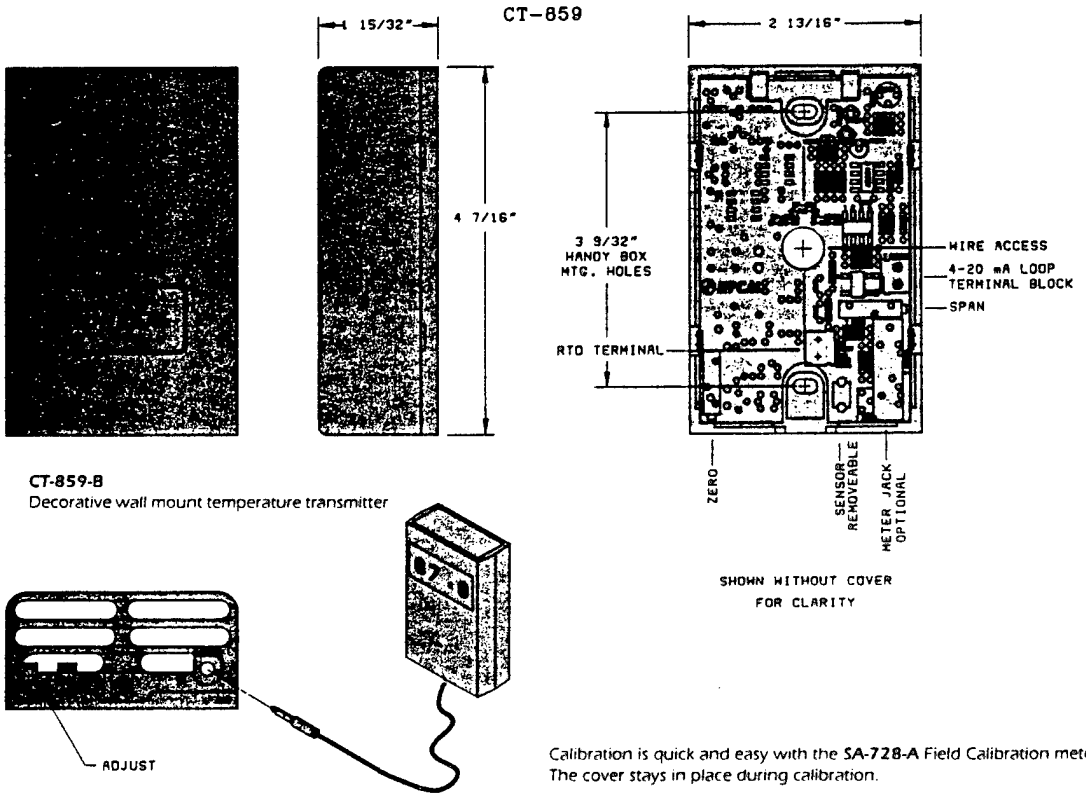
Specifications subject to change without notice.

1

PLATINUM 1000Ω SPACE TEMPERATURE TRANSMITTER

MODEL CT-859

WIRING / DIMENSIONS



CT-859-B
Decorative wall mount temperature transmitter

Calibration is quick and easy with the **SA-728-A** Field Calibration meter. The cover stays in place during calibration.

ORDERING INFORMATION

CT-859-B Space Temperature Transmitter with Sensor

Basic Model	Description	
CT-859-B	2-Wire, 4-20 mA Space Temperature Transmitter with Platinum RTD sensor	
	Code 1	**Temperature Range (100% re-rangeable)**
	(Range)	Specify range in either °F or °C; e.g. (30/130°F)
	(40/90°F)	Stock range
	Code 2	**Options**
	X5	Transmitter Matched to Sensor Ice Point

Basic Model	Description
SA-728-A	Hand held loop powered digital meter

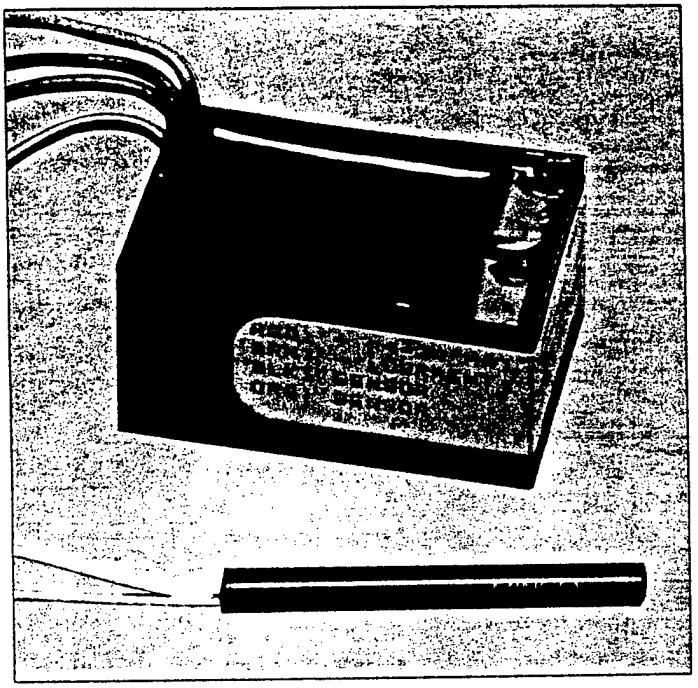
1000 ohm PLATINUM RTD SENSORS & TRANSMITTERS

TYPE 91

DESCRIPTION

The **Type 91 Platinum Wirewound RTD Sensors** by **Minco** are designed to meet the requirements of commercial HVAC applications. These sensors are placed in room enclosures or stainless steel probes as required to monitor duct, water, or outdoor air. Temperatures over the range of -20° to 240°F may be monitored.

Temptran™ Transmitters provide signal conditioning where remote temperature measurements or 4-20ma temperature signals are required.



SPECIFICATIONS	
SENSOR	1000 ohms @ 0°C ± .2% (TCR) .00375
TRANSMITTER	4-20ma ± .1 % of temperature span

ORDERING INFORMATION

TYPE 91/1000 ohm PLATINUM SENSORS AND TRANSMITTERS

MODEL	TYPE
ST-S91P	Space
ST-S91E	Space
ST-S91	Space
ST-D91	Duct
①ST-AV91	Averaging
ST-W91	Water*
ST-O91	OSA
ST-R91	Raw Sensor

MODEL	TYPE
M91T-30240	Transmitter** 30° to 240°F
M91T-20140	Transmitter** -20° to 140°F
M91T-32122	Transmitter** 32° to 122°F

Sensors are 1000 ohm 375 Platinum
* Includes Brass Thermowell
** Special Ranges Available
①Sensor is Continuous Resistance Element

See Index for complete Temperature Sensing Assemblies using Minco Sensing Elements.

PLATINUM CURVE AVERAGING SENSORS

SENSOR 233.75 X 0.5 = 116.88
TRANSMITTER 166.67 X 0.5 = 58.33
$175.21

MODEL ST-AV81 / ST-AV91

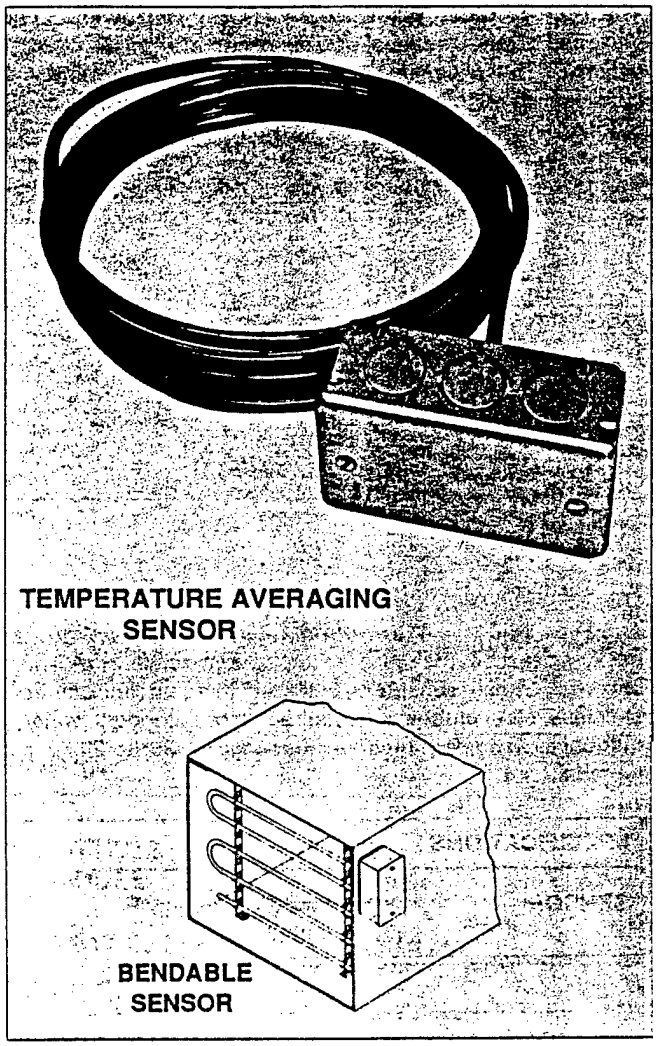
DESCRIPTION

Bendable Area Averaging Sensors

These continuous resistance element **Averaging Sensors** provide accurate sensing of duct temperatures when a large area must be covered. They average temperatures over their entire lengths thus avoiding point measurement errors.

The **Averaging Sensors** use a proprietary **Minco Sensing Element** that closely matches platinum resistance/temperature characteristics over the specified range of -30° to +240°F.

The sensors have a copper case which is bendable to a radius of 4". They can crisscross a duct or plenum to average out temperature stratification in both directions.



TEMPERATURE AVERAGING SENSOR

BENDABLE SENSOR

SPECIFICATIONS	
TYPE 81/100 ohm AVERAGING SENSORS	
SENSOR	100 ohms @ 0°C ±.5% (TCR) .00385
TYPE 91/1000 ohm AVERAGING SENSORS	
SENSOR	1000 ohms @ 0°C ±.5% (TCR) .00375
TRANSMITTER (Refer to index for **M81T or M91T Transmitters** for more information.)	4-20ma ±.1% of temperature span

ORDERING INFORMATION

Model	Description	
ST-AV	AVERAGING DUCT SENSOR	
	81	100 ohm 385 Platinum Sensor, 20 feet long
	91	1000 ohm 375 Platinum Sensor, 20 feet long

ST-AV - 81 **Averaging Duct Sensor** 100 ohm 385 Platinum, 20 feet long

1

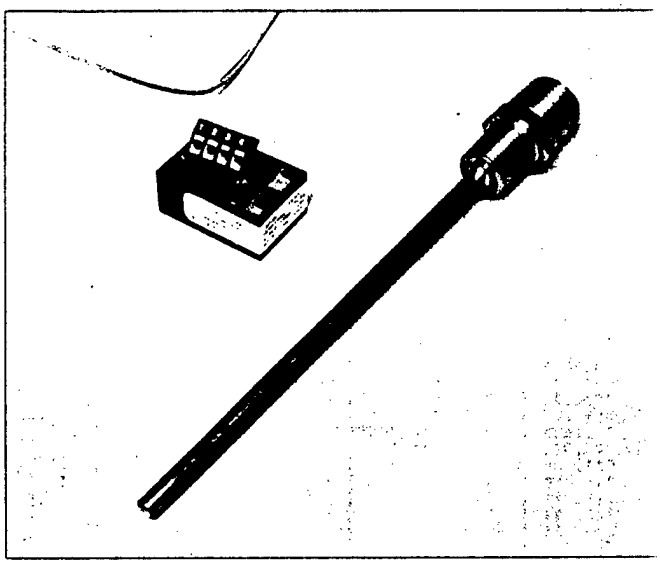
HIGH TEMPERATURE SENSOR AND TRANSMITTER

MODELS S241HT / TT111-0800

$275 X 0.5 = $137.5

DESCRIPTION

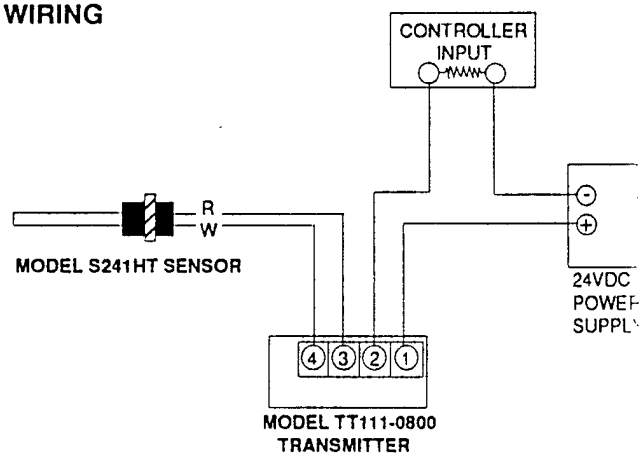
The **Model S241HT** is a direct insertion type, **High Temperature Sensor** which is used to monitor the temperature of boiler stacks, steam lines, and other applications where the temperature may rise above the operating range of standard sensors. When used with the **TT111-0800 Transmitter**, a 4-20ma output is provided which is linear from 0 to 800°F.



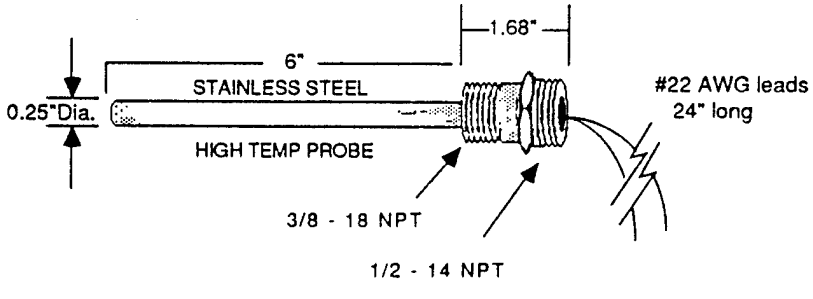
SPECIFICATIONS

SENSOR:	
Resistance	100Ω ±0.1% @32°F (0°C)
Temp. coefficient	.00391Ω/Ω/°C
Temp. range	-148° to 850°F (-100° to 454°C)
Leads	AWG #22, stranded nickel-clad copper with glass braid insulation 24" long
Working pressure	2500 PSI@ 77°F (25°C) 1000 PSI@ 850°F (454°C)
Construction	Probe - 316 stainless steel Threaded fitting - 416 stainless steel Element - chemically pure platinum wire
TRANSMITTER:	
Input	100Ω platinum .00391Ω/Ω/°C
Output range	4-20ma / 0° to 800°F (-18° to 427°C)
Ambient temp.range	32° to 122°F (0° to 50°C)
Storage temp. range	-67° to 212°F (-55° to 100°C)
Supply voltage	24VDC
Accuracy	±0.31%
Loop resistance	750Ω maximum

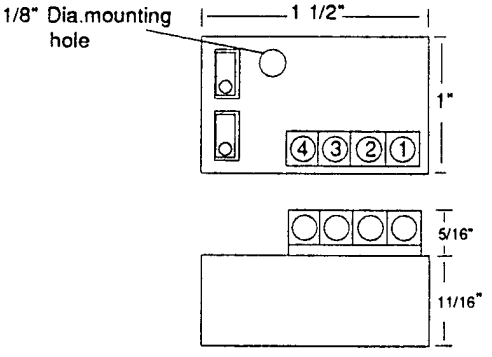
WIRING



DIMENSIONS



MODEL S241HT SENSOR



MODEL TT111-0800 TRANSMITTER

ORDERING INFORMATION

S241HT - **Direct Insertion High Temperature Sensor**
TT111-0800 - **High Temperature Transmitter**, 0 to 800°F, 4-20ma

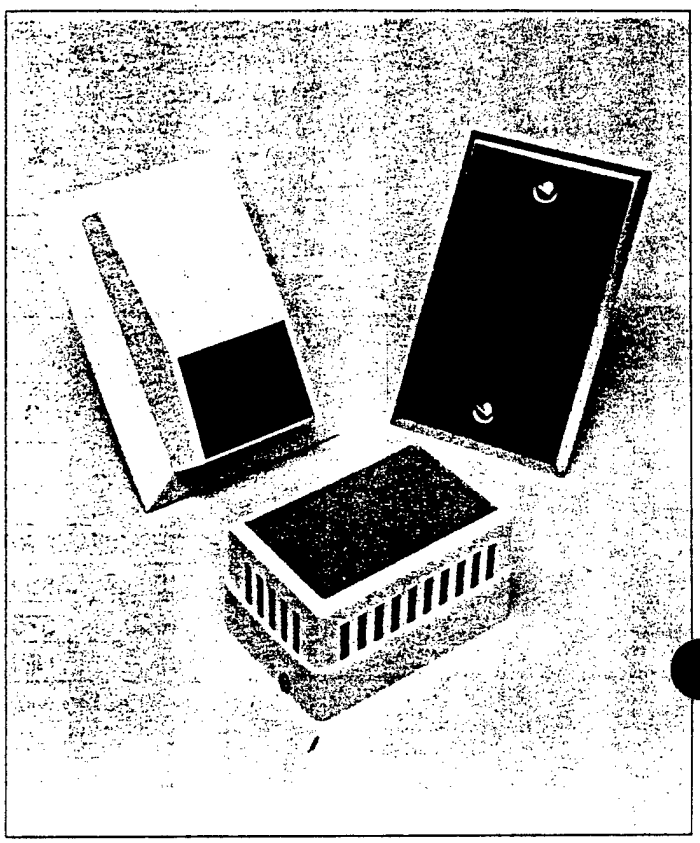
PLATINUM / BALCO RTD ROOM SENSORS

S.PACE 97.22
SENSOR ~~65.97~~ X 0.5 = ~~32.99~~ 48.61
X-MITTER 166.67 X 0.5 = 83.33
~~116.32~~ 131.94

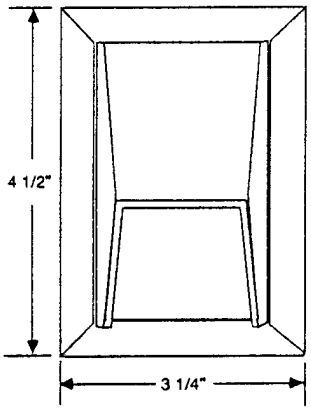
MODEL ST-S

DESCRIPTION

MINCO Wirewound RTD Sensors are used to provide reliable accurate temperature readings in surface mount room environments. The room sensors feature: a stainless steel insulated plate; a standard plastic ventilated enclosure; and a deluxe executive enclosure design. The stainless steel plate is ideal for areas of vandalism or where the sensor can be easily knocked off the wall. The sensors are designed for interior use only in the temperature range of -30° to 100°F.

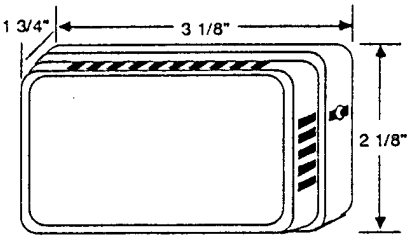


DIMENSIONS



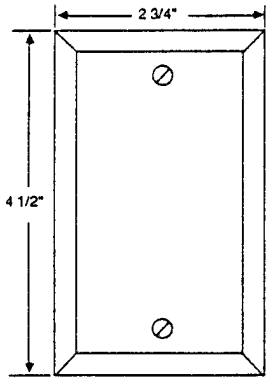
Toggle bolts or other direct wall mount screws can be used where conduit is not required. Adapters are not required when mounting directly to electrical outlet boxes.

EXECUTIVE
ST-SXXE



Horizontal or vertical mounting is permitted. Toggle bolts or other direct wall mount screws can be used where conduit is not required.

STANDARD
ST-SXXP



Horizontal or vertical mounting is permitted. The 6-32 screws supplied fit standard electrical boxes. Toggle bolts or other direct wall mount screws can be used where conduit is not required. Tighten down mounting screws, crushing foam gasketing, until plate edges just touch wall.

STAINLESS STEEL
ST-SXX

1

PLATINUM / BALCO RTD ROOM SENSORS

MODEL ST-S

SPECIFICATIONS

TYPE 81/100 ohm PLATINUM SENSORS SENSOR 100 ohms @ 0°C ± .2% (TCR) .00385 **TYPE 91/1000 ohm PLATINUM SENSORS** SENSOR 1000 ohms @ 0°C ± .2% (TCR) .00375	**TYPE 77/1000 ohm BALCO RTD SENSORS** SENSOR 1000 ohms @ 70°F ± .5°F (TCR) .00527 **TYPE 78/2000 ohm BALCO RTD SENSORS** SENSOR 2000 ohms @ 70°F ± .5°F (TCR) .00527
TRANSMITTER 4-20ma ± .1% of temperature span	SEE INDEX FOR **MODEL M77T TRANSMITTER** INFORMATION

ORDERING INFORMATION

Model	Description	
ST-S	SURFACE MOUNT ROOM SENSOR	
	81	100 ohm 385 Platinum Sensor
	91	1000 ohm 375 Platinum Sensor
	77	1000 ohm Nickel / Iron / Balco 2.48 ohms / °F Sensor
	78	2000 ohm Nickel / Iron / Balco 4.96 ohms / °F Sensor
		P Plastic Ventilated Room Enclosure
		E Executive Style Room Enclosure
		- Stainless Steel Plate - No Code Required

ST-S – 81 – [ ] Surface Mount 100 ohm 385 Platinum Room Sensor, stainless steel plate

1

1000 ohm & 2000 ohm BALCO RTD SENSORS & TRANSMITTERS

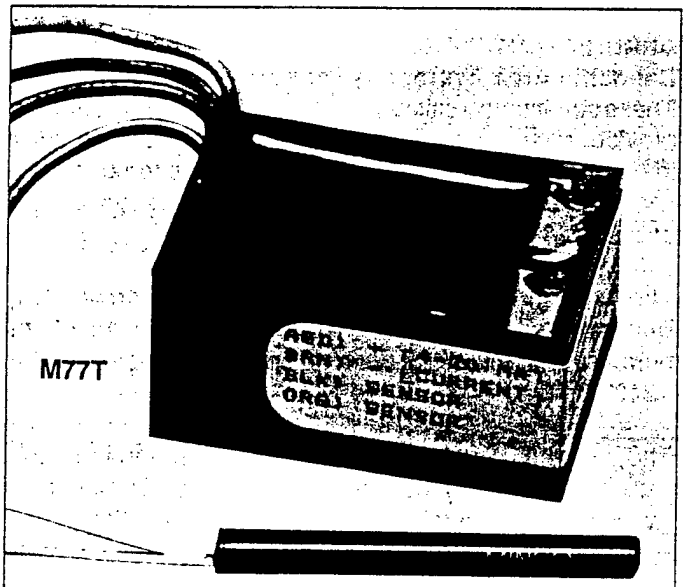
TYPE 77 (1000 ohm) / TYPE 78 (2000 ohm)

DESCRIPTION: TYPE 77

The **Type 77 Balco Wirewound RTD Sensors** by **Minco** are designed to meet the requirements of commercial HVAC applications. These sensors are placed in room enclosures or stainless steel probes as required to monitor duct, water, or outdoor air. Temperatures over the range of -30° to 240°F may be monitored.

Temptran™ Transmitters provide signal conditioning where remote temperature measurements or 4-20ma temperature signals are required.

SPECIFICATIONS	
SENSOR	1000 ohms @ 70°F ± .5°F (TCR).00527
TRANSMITTER	4-20ma ± .1 % of temperature span



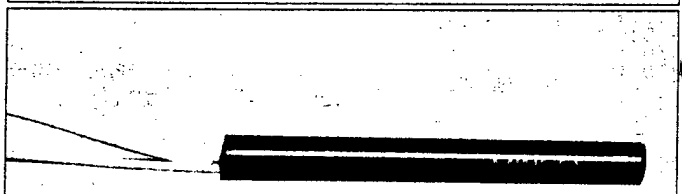
M77T

TYPE 77

DESCRIPTION: TYPE 78

The **Type 78 Balco Wirewound RTD Sensors** by **Minco** are designed to meet the requirements of commercial HVAC applications. These sensors are placed in room enclosures or stainless steel probes as required to monitor duct, water, or outdoor air. Temperatures over the range of -30° to 240°F may be monitored.

SPECIFICATIONS	
SENSOR	2000 ohms @ 70°F ± .5°F (TCR).00527



TYPE 78

ORDERING INFORMATION

TYPE 77/1000 ohm RTD SENSORS AND TRANSMITTERS

MODEL	TYPE
ST-S77P	Space
ST-S77E	Space
ST-S77	Space
ST-A77	All Purpose
ST-D77	Duct
ST-W77	Water*
ST-077	OSA
ST-R77	Raw Sensor
M77T-30130	Transmitter -30° to 130°F
M77T-30240	Transmitter 30° to 240°F

* Includes Brass Thermowell

TYPE 78/2000 ohm RTD SENSORS

MODEL	TYPE
ST-S78P	Space
ST-S78E	Space
ST-S78	Space
ST-A78	All Purpose
ST-D78	Duct
ST-W78	Water*
ST-078	OSA
ST-R78	Raw Sensor

* Includes Brass Thermowell

SEE INDEX FOR COMPLETE TEMPERATURE SENSING ASSEMBLIES USING MINCO SENSING ELEMENTS.

SECTION 5

OPTIONS FOR AVERAGING TUBE FLOW SENSORS

POSITION SENSOR

Model	Description	List	Code
130-PC-00-00	DIFFERENTIAL PRESSURE GAUGE	713.89	A
VERTICAL	FOR INSTALLATION IN VERTICAL PIPE (301 SERIES)	147.22	A
SECURITY CHAIN	301 SERIES ONLY	33.33	A
ALL316SS	301 SERIES ONLY	138.89	A

FLOW METERS* • HERSEY

MODEL V	TARGET TYPE	CALL KELE & ASSOCIATES FOR PRICING
MODEL VS	TARGET TYPE FOR STEAM	
MODEL TW	SIGNAL TRANSMITTER	INFORMATION REQUIRED:
MODEL 1050	LINEAR SIGNAL TRANSMITTER	1. Fluid to be metered
MODEL 1200	FLOW RATE INDICATOR AND TOTALIZER	2. Operating pressure
MODEL 1500	MASS FLOW COMPUTER	3. Max flow (GPM, lbs/hr, SCFM, etc.)
		4. Pipe size and type
* Non-stock items		5. Operating temperature

TURBINE* • NUTATING DISC

MTX	TURBINE WATER METER	CALL KELE & ASSOCIATES FOR PRICING
WPX	TURBINE WATER METER	
REGISTERS	VARIOUS TYPES	INFORMATION REQUIRED:
1010	DIGITAL FLOW RATE INDICATOR	1. Fluid to be metered
1020	DIGITAL FLOW RATE INDICATOR / TOTALIZER	2. Operating pressure
		3. Max flow (GPM, lbs/hr, SCFM, etc.)
* Non-stock items		4. Pipe size and type
		5. Operating temperature

SECTION 6

SPECIALTY SENSORS

Model	Description	Output	List	Code
A70-SL	WIND SPEED	4-20ma	750.01	A
A70-DL	WIND DIRECTION	4-20ma	1041.68	A
A70-PL	BAROMETRIC PRESSURE	4-20ma	1041.68	A
A70-SDL	WIND SPEED, DIRECTION	4-20ma	1791.68	A
A70-SDPL	WIND SPEED, DIRECTION, BAROMETRIC PRESSURE	4-20ma	2763.91	A
501	VIBRATION SWITCH, 1 LIMIT	NO OR NC SWITCH	972.23	A
502	VIBRATION SWITCH, 2 LIMITS	2-NO OR NC SWITCHES	1097.23	A
191-1	VIBRATION TRANSMTR., 0-1in/sec	4-20ma	694.45	A
191-2	VIBRATION TRANSMTR., 0-2in/sec	4-20ma	694.45	A
WCO-1	CO SENSOR	4-20ma	972.23	A
CM-FCK	CO FIELD CALIBRATION KIT	4-20ma	377.78	A
CD-D	CO2 DUCT SENSOR	4-20ma	1875.02	A
CD-W	CO2 SPACE SENSOR	4-20ma	1875.02	A
WSP-"X"	WATER LEVEL SENSOR	4-20ma	220.84	A
	"X" = LENGTH IN INCHES - ADD PER FT.		15.97	A
PH-7615-1	PH SENSOR	4-20ma	1836.13	A
C-7615-1	CONDUCTIVITY SENSOR	4-20ma	1625.01	A
PQ1001-3	DAMPER POSITION INDICATOR	RESISTANCE	152.78	A
PQ1001-3-VTI-1	DAMPER POSITION INDICATOR	4-20ma	272.22	~~A~~ 0.5 136.11
WD-1	WATER DETECTOR	SPDT SWITCH	216.67	A
#802	COMPRESSOR FOR BUBBLER	4 PSIG MAX	52.78	A
400-1911	COMPRESSOR FOR BUBBLER	18 PSIG MAX	330.55	A

CUTLER-HAMMER CONTROL COMPONENTS

Auxiliary Contacts Non-Reversing Contactors and Starters

A10, A11, A13, A30, A31, A40, A41, B10, B11, C10 AND C30

FILE C320

DESCRIPTION

Size 00 devices have one NO contact built into the contactor frame. Size 0-5 devices are provided with a NO base auxiliary contact in position L1. Size 6 devices have 2 NO-2 NC contacts mounted in position L1. Size 7 & 8 devices are provided with NO-NC contacts in position L1.

AUXILIARY CONTACTS — SIZE 00

Mounting Position	Circuits	Catalog Number	Kit Price
Front (See Sketch Below) Open and Enclosed Types	2 NO	MC320KE20	$32.
	2 NC	KE02	32.
	1 NO & 1 NC	KE11	32.
	1 NO & 1 NC Late Break	KE11L	32.
	4 NO	KE40	64.
	3 NO & 1 NC	KE31	64.
	2 NO & 2 NC	KE22	64.
	2 NO & 2 NC Late Break	KE22L	64.

AUXILIARY CONTACTS — SIZES 0-5

Circuit	Available Mounting Positions (See Sketch Below for Position Designations)			Catalog Number	Kit Price
	Open Types Sizes 0-5	Enclosed Types			
		Sizes 0 & 1	Sizes 2-5		
NO	L2, L3, R2, R3	L2, L3	L2, L3, R2, R3	C320KA1	$24.
NC	L2, L3, R2, R3	L2, L3	L2, L3, R2, R3	KA2	24.
❶NO-NC	L2 & L3, R2 & R3	L2 & L3	L2 & L3, R2 & R3	KA3	32.

BASE AUXILIARY CONTACTS — SIZES 0-5

Circuit	Open Types — Sizes 0-5 Enclosed Types — Sizes 2-5	Catalog Numbers ❸			Kit Price
		Sizes 0-2	Size 3	Sizes 4-5	
NO	R1	C320KB1	C320KB4	C320KB7	$24.
❷NO-NCI	R1	KB2	KB5	KB8	32.

AUXILIARY CONTACTS — SIZES 6-8

Circuit	Size 6	Size 7	Size 8	Catalog Number	Kit Price
NO-NC	---	L2, R1, R2	L2, R2	C320KA5	$88.
2NO-2NC	R1	---	---	C320KA6	88.

NOTE: Individually boxed auxiliary contacts master packed 10 per carton. Does not apply to base auxiliary contacts.

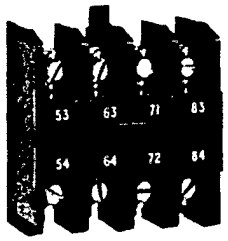
❶ NO-NC occupies two positions — L2 & L3 or R2 & R3.

❷ NCI is a normally closed early opening contact designed for use in reversing applications.

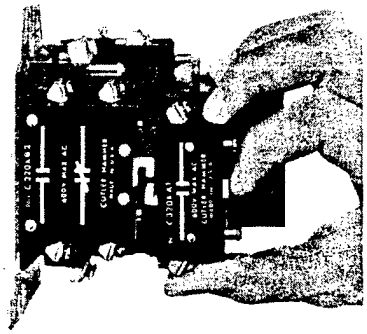
❸ Contacts listed for Size 2 & 3 are for the new Series B1 starters. If they are to be installed on previous design Size 2 & 3 Series A1 starters, select one size larger — for Size 2 use contacts listed for Size 3, for Size 3 use contacts listed for Size 4.

MAXIMUM AMPERE RATING

Description	Volts Ac			
	120	240	480	600
Make & Interrupting Capacity	60.0	30.0	15.0	12.0
Normal Load Break	6.0	3.0	1.5	1.2
Continuous Current	10.0	10.0	10.0	10.0



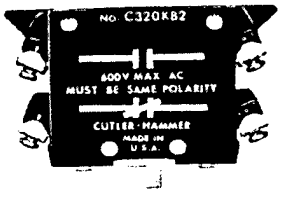
Auxiliary Contacts — Size 00



Addition of auxiliary contacts is a simple stack-on and screw-down operation



Auxiliary Contact — Size 0-5, Size 6 & 7 Series A1



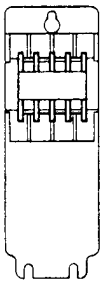
Base Auxiliary Contact — Size 0-5, Size 6 & 7 Series A1



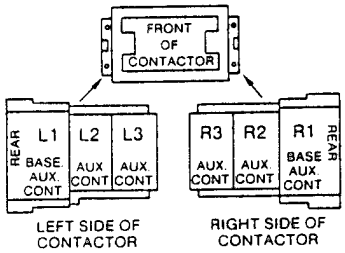
Auxiliary Contacts Sizes 6-8 Series B1

LOCATIONS OF AUXILIARY CONTACTS ON NON-REVERSING CONTACTORS

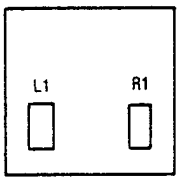
The sketches below illustrate the maximum number of auxiliary contacts that can be assembled to a contactor and their locations.



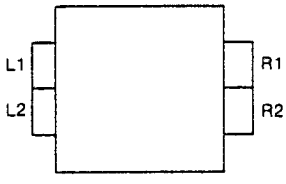
Size OO



Size 0-5



Size 6



Series 7-8

A Base Auxiliary Contact must be added in position R1 before additional auxiliary contacts can be mounted on the right hand side on Sizes 0-5.

DISCOUNT SCHEDULE 1CD-1

Non Plug-in Limit Switches — Types L, LX, CX, CB & CBX Oiltight, Watertight & Hazardous Locations

FILE E50 10316

WHEN ORDERING SPECIFY

Rotary Operated Switches
- Catalog Number of Basic Switch
  EXAMPLE — **10316H187**
- Catalog Number of Operating Lever
  EXAMPLE — **E50KL200** (levers listed on page 218-219).

Push and Wobble Operated Switches
- Catalog Number of Complete Switch
  EXAMPLE — **10316H282**

BASIC CLASSIFICATIONS

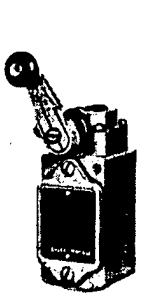
Type L — Single pole, die cast zinc alloy case, meets NEMA 1, 4 and 13 requirements — Watertight, Dusttight & Oiltight.

Type LX — Single and double pole, cast aluminum case meets NEMA 7 Class I Groups BCD and NEMA 9 Class II Groups EFG requirements — Hazardous Locations Gas/Dust.

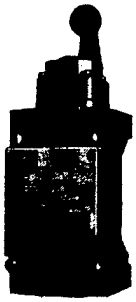
Type CX — Single and double pole, die cast aluminum body and die cast zinc alloy head, meets NEMA 1, 4, 7 Class I Groups BCD and NEMA 9 Class II Groups EFG and 13 requirements — Watertight, Dusttight, Oiltight and Hazardous Locations Gas/Dust.

Type CB — Single and double pole, silicon bronze body and head, meets NEMA 1, 4, 4X and 13 requirements — Watertight, Dusttight, Oiltight and Corrosion Resistant.

Type CBX — Single and double pole, silicon bronze body and head meets NEMA 1, 4, 4X, 7 Class I Groups BCD and NEMA 9 Class II Groups EFG and 13 requirements — Watertight, Dusttight, Oiltight, Corrosion Resistant and Hazardous Locations Gas/Dust.



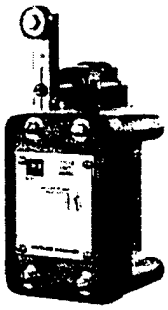
Type L



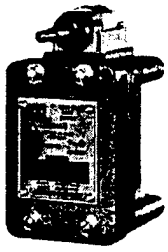
Type LX



Type CX



Type CB



Type CBX

ELECTRICAL DATA — Maximum Contact Ratings — Per Pole

A-c Volts	Current, Amperes			Voltamperes		D-c Volts	D-c Current, Amperes
	Make	Break	Cont. ❸	Make	Break		
ALL SWITCHES 1 NO-1NC							
	NEMA A600 Rating						
120	60	6	10	7200	720	120	0.2
240	30	3				240	0.1
480	15	1.5					
600	12	1.2					
ALL OTHER SWITCHES							
120	30	3	10	3600	360	120	0.1
240	15	1.5				240	0.05
480	7.5	0.75					
600	6	0.60					

OPERATING TEMPERATURE❶

Limit Switch	Temperature Range	
	Low	High
Standard	−20°F (−29°C)	200°F (93°C)
Time Delay	32°F (0°C)	150°F (65°C)

❶ Temperature ranges below +32°F are based on absence of freezing moisture or water.

❸ Thermal rating. Valid only if switch does not have to make or break.

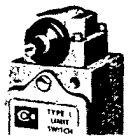
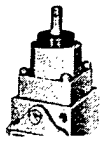
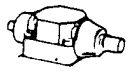
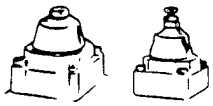
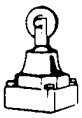
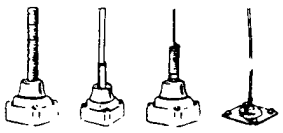
OPERATING DATA — NOMINAL

Operating Head	Degrees Travel Operate Contacts	Operating Torque	Degrees Total Travel	Min. Return Torque	Degrees Travel to Reset Contacts
SIDE ROTARY LEVER					
Std. Construction	10	3 In.-lb.	50	4.5 In.-oz.	4
Low Operating Force	20	1.3 In.-lb.	50	2.5 In.-oz.	8
Narrow Differential	5	6 In.-lb.	50	4.5 In.-oz.	2
Neutral Position	18	1.8 In.-lb.	50	2.5 In.-oz.	6
Maintained	50	1.5 In.-lb.	90	----	40
TOP ROTARY LEVER					
Std. Construction	20	1.1 In.-lb.	140	3.0 In.-oz.	12
Low Operating Force	20	0.75 In.-lb.	140	2.0 In.-oz.	12

Type of Operating Head	Travel To Operate Contacts	Force To Trip	Total Travel	Min. Return Force	Travel To Reset Contacts
PUSH OPERATED					
Top Push	.04 Inches	4 Lbs.	.28 Inches	8 oz.	.02 Inches
Side Push Spring Return	.07 Inches	4 Lbs.	.29 Inches	8 oz.	.03 Inches
Side Push Maintained	.20 Inches	5 Lbs.	.32 Inches	8 oz.	.13 Inches
WOBBLE OPERATED					
Wobble Spring	❷10 Degrees	1 In.-lb.	15 Degrees	2.4 In.-oz.	6 Degrees
Wobble Stick	❷10 Degrees	2 In.-lb.	15 Degrees	5-6 In.-oz.	6 Degrees
Cat Whisker	❷15 Degrees	0.63 In.-lb.	30 Degrees	2.4 In.-oz.	5 Degrees

❷ Travel with force applied at one inch radius. Applied at end of operator, travel is approximately 14° for spring 20° for nylon, 60° for wire and 30° for cat whisker.

COMPLETE NON PLUG-IN SWITCHES SINGLE POLE❶ 1NO-1NC (For Ordering Information, See previous pg.)

Operating Characteristics	OPERATING DATA — NOMINAL: Travel To Operate Contacts	Travel To Reset Contacts	Total Travel	Force To Operate Contacts	Minimum Return Force	Cat. No.	Price In Lots Under 100 (See Note)
							
SIDE ROTARY OPERATED						**10316**	
Standard	10°	4°	50°	3 in-lb.	4.5 in-oz	**H187**	$58.
Low Force	20°	8°	50°	1.5 in-lb	2.5 in-oz	**H812**	58.
							
TOP ROTARY OPERATED						**10316**	
Clockwise	20°	12°	140°	1.1 in-lb	3 in-oz	**H700**	62.
Counterclockwise	20°	12°	140°	1.1 in-lb	3 in-oz	**H701**	62.
							
SIDE PUSH OPERATED						**10316**	
Pushbutton	0.07 in	0.03 in	0.29 in	4 lb	8 oz	**H282**	68.
Adustable Pushbutton	0.07 in	0.03 in	0.29 in	4 lb	8 oz	**H621**	72.
							
Vertical Roller — 7/16 Dia.	0.07 in	0.03 in	0.29 in	4 lb	8 oz	**H284**	76.
— ¾ Dia.	0.07 in	0.03 in	0.29 in	4 lb	8 oz	**H872**	84.
Horizontal Roller — 7/16 Dia.	0.07 in	0.03 in	0.29 in	4 lb	8 oz	**H285**	76.
— ¾ Dia.	0.07 in	0.03 in	0.29 in	4 lb	8 oz	**H873**	84.
							
Maintained Pushbutton	0.20 in	0.13 in	0.32 in	5 lb	5 lb	**H294**	80.
							
TOP PUSH OPERATED						**10316**	
Pushbutton	0.04 in	0.02 in	0.28 in	4 lb	8 oz	**H281**	64.
Adustable Pushbutton	0.04 in	0.02 in	0.28 in	4 lb	8 oz	**H620**	68.
							
Roller — 7/16 Dia.	0.04 in	0.02 in	0.28 in	4 lb	8 oz	**H283**	68.
— ¾ Dia.	0.04 in	0.02 in	0.28 in	4 lb	8 oz	**H577**	76.
							
WOBBLE OPERATED						**10316**	
Spring	10°	6°	15°	1 in-lb	2.4 in-oz	**H299**	64.
Nylon Rod	10°	6°	15°	2 in-lb	2.4 in-oz	**H296**	64.
Wire	10°	6°	15°	2 in-lb	2.4 in-oz	**H484**	64.
Cat Whisker	15°	5°	30°	0.63 in-lb	1.7 in-oz	**H341**	48.

❶Contacts must be same polarity when both circuits are used.

8 POWER MONITORING

CURRENT TRANSDUCERS

Model	Description	Input:Output	List	Code
4CTV	CURRENT TO VOLTAGE	0-20amp:0-5VDC	158.33	A
4CMA	CURRENT TO CURRENT	0-20amp:4-20ma	213.89	A

AX0.5= 106.9

POTENTIAL TRANSFORMERS

Model	Voltage	Fused	List	Code
PT3-45-XXX ¤	Up to 4800:120	SINGLE	944.45	A
PT3-45-XXX ¤	Up to 4800:120	DUAL	944.45	A
3PT3-60-XXX ¤	Up to 4800:120	TRIPLE	1333.34	A
467-XXX ¤	Up to 600:120	NO	136.11	A
468-XXX ¤	Up to 600:120	NO	141.67	A

¤ See catalog for complete model number / non-stock item

VOLTAGE / PHASE LOSS TRANSDUCERS

Model	Description	Input:Output	List	Code
LVM-348-120	L TO N VOLTAGE MONITOR	90-150 3Ø VOLTS:4-20ma	486.12	A
LVM-348-240	L TO N VOLTAGE MONITOR	180-300 3Ø VOLTS:4-20ma	486.12	A
PVM-348	L TO L VOLTAGE MONITOR	185-530 3Ø VOLTS:4-20ma	486.12	A
LPVR-XXX	PHASE LOSS MONITOR	3Ø VOLTS:SPDT	486.12	A
258B	208V PHASE FAILURE	3Ø VOLTS:SPDT	208.34	A
A258B	480V PHASE FAILURE	3Ø VOLTS:SPDT	208.34	A
AMPHENOL-8	SOCKET FOR A258B/258B		15.97	A
PFB-239	PHASE LOSS MODULE FOR USE WITH WHU-238	3Ø VOLTS:SPST	177.78	A

XXX - Specify Voltage (See catalog for complete number.)

NEW WT SERIES WATT TRANSDUCERS

Model	Voltage	Current	Output	List	Code
WT-5	120-600V	3CT/5amp	PULSE/4-20ma	883.34	A
WT-1	120-600V	3CT/1amp	PULSE/4-20ma	883.34	A
WT-5C*	120-600V	3CT/5amp	PULSE	744.45	A
WT-1C*	120-600V	3CT/1amp	PULSE	744.45	A

OPTIONS

Model	Description	List	Code
K1 OPTION (1)	CONSUMPTION METERING	125.00	A
K2 OPTION** (1)	CONSUMPTION/DEMAND METERING	402.78	A
SW OPTION (1)	SHORTING SWITCH & COVER (MOUNTED & WIRED)	202.78	A

(1) Options apply only to WT-5 & WT-1 (Not applicable to WT-5C or WT-1C.)

* Non-stock items - normal delivery is 4 weeks. ** Separate 24VDC power supply may be required.

SETPOINT LED READOUT

CALIBRATION / INDICATION

Model	Description	Accuracy	Range	List	Code
CLC-100	4-20ma/VOLTAGE CALIBRATION MTR.	±1%		1080.56	B
CLC-100-PW1	ABOVE w/PWM CALIBRATING OPTION	±1%		1483.35	B
HM34	PORTABLE HUMIDITY/TEMPERATURE	±2% / ±1%	0-100%,4° to140°F	1097.23	B
TM99A	DIGITAL THERMOMETER	±.2°F	-40° to 300°F	280.56	B
SH66A	3 PROBE DIGITAL THERMOMETER	±.2°F	-40° to 300°F	408.34	B
LPI-1	LOOP POWERED LCD INDICATOR	±0.1%	SPECIFY	272.22	B
LPI-1E	LCD w/NEMA 4X ENCLOSURE	±0.1%	SPECIFY	347.23	B
LPI-2	LED INDICATOR	±0.1%	SPECIFY	272.22	B 0.5 = 136.11
LPI-2E	LED w/NEMA 4X ENCLOSURE	±0.1%	SPECIFY	347.23	B
ALD-1	LCD COUNTER DISPLAY			108.33	B

PLUS ENCLOSURE, POTEN. = 40

$176.11

CHART RECORDERS • **DICKSON**

Model	Description	List	Code
SC4	4" TEMPERATURE RECORDER	552.78	B
SC8	8" TEMPERATURE RECORDER	941.62	B
TH4	4" TEMPERATURE / HUMIDITY RECORDER	1250.01	B
TH8	8" TEMPERATURE / HUMIDITY RECORDER	1513.90	B
PR4	4" PRESSURE RECORDER	888.90	B
PR8	8" PRESSURE RECORDER	1277.79	B
001-20-09-4-00	MINI-GRAPH 4-20ma RECORDER	972.23	B
CIRCULAR CHARTS	4" CHART, BOX OF 100	38.89	B
	8" CHART, BOX OF 100	44.44	B
STRIP CHARTS	62' LONG, 2 1/2" WIDE - WITH BOX OF 6	150.00	B

CHART RECORDERS ARE NON-STOCK ITEMS - NORMAL DELIVERY IS 1-3 WEEKS.

Measurement ▼ Analysis ▼ Control

WATER MEASUREMENT & ANALYSIS

Nature originally provided life's "vital fluid" with certain key in gredients that were correctly balanced to support and maintain all life forms:

- ◆It was neither very acid nor very alkaline—pH
- ◆It ranged from fresh to very salty—Conductivity (TDS)
- ◆It contained the right amount of—Dissolved Oxygen (DO)
- ◆It could be clean & clear—Turbidity

Population, urbanization, industrialization, and pollution from all sources have altered this balance and brought us to a world-wide crisis. To resolve this crisis, we must now monitor, measure, analyze, and control water throughout its life cycle.

The following pages present the basic measurements in a simple WHAT - WHY - HOW format to provide a better understanding of these parameters to the many non-scientific people involved in today's day-to-day water analysis.

pH

WHAT?

pH is a number that exactly describes the degree of acidity or basicity (alkalinity) of an aqueous (water) solution. A good analogy can be made to the measurement of temperature. The terms "hot" and "cold" are very general terms which cannot be used with any degree of accuracy. What may be warm to one person may be hot to another. To avoid such ambiguities, the temperature scale was developed based upon the freezing (0 °C) and boiling (100 °C) points of water. Now, a temperature reading of 50 °C means the same to everyone and is scientifically accurate.

In the same way, the pH scale was developed. Centuries ago people discovered that certain materials possessed properties which were called acid, while others possessed other properties which were called basic. Between these two extremes was an area in which the materials showed neither acid or base properties, an area which was termed neutral.

Just as with hot and cold, the words acid and base (alkali) do not give us a value for scientific comparison. We need a scale on which we can all agree when discussing the degree of acidity or basicity. Years ago, Sorensen developed such a scale and came up with the symbol "pH" (p = negative logarithm, H= hydrogen ion).

- ◆An acid must have ionized (or free) hydrogen ions, H^+.
- ◆A base must have ionized (or free) hydroxyl ions, OH^-.
- ◆The pH is directly related to the ratio of the H^+ to OH^-. If the H^+ is greater than the OH^-, the material is acid. If the OH^- is greater than the H^+, the material is a base. If equal amounts are present, the material is a neutral salt.

Since pH is a logarithmic function, each pH unit change represents a change of 10 TIMES. A solution with a pH value of 2.00 is 100 times more acid than a solution with a pH value of 4. Likewise, pH 10 is 1000 times more basic (alkaline) than pH 7.

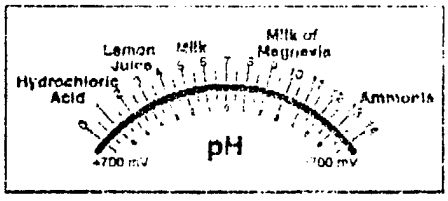


Figure 1

Do all acids and bases act the same? Unfortunately, they do not. The major difference arises from the amount of free H^+ and OH^- present in solution. For example, when hydrochloric acid is dissolved in water, all the hydrogen ions (H^+) are free in the solution. The same is true of sodium hydroxide and hydroxyl ions (OH^-). However, when acetic acid is dissolved in water, all of the hydrogen ions H^+ are not free (only about 1.3% of the total H^+ is free) and the pH is considerably higher (more basic) than would normally be expected. Thus, acetic acid (vinegar) is called a weak acid. A good example of a weak base is ammonium hydroxide (household ammonia). *A strong base (lye) can be just as harmful or destructive as a strong acid (hydrochloric).*

WHY?

If the pH in your body were lowered one pH unit, you would die. Living things grow and survive within specific pH environments. When the pH is not correct, sometimes within very narrow limits, their growth and survival are threatened. For example, wheat, corn, and other foodstuffs grow best in soil of a particular pH. To get the greatest yield, the farmer must condition his soil to achieve the proper pH. This explains, in part, why the yield-per-acre of American farmers has increased over the years. Soil science has shown the farmer how to provide optimum conditions for best yield.

Other areas of pH importance include:

- ◆Purification of drinking water depends on the correct pH.
- ◆In sugar manufacture, improper pH can result in formation of unwanted acids and very little sugar.
- ◆In sewage treatment, pH must be adjusted for proper operation. This is another reason why polluting sewers with spills of high acid or alkaline materials is undesirable.
- ◆Milk sours at a pH of 6.00 and lower (more acid). Good milk requires good pH control.

- ◆In old-fashioned jelly making, the pH must be below 4.0 (more acid). Otherwise, the jelly will not jell.

- ◆The brightness of chrome plating on auto bumpers is directly related to the pH of the plating solution.

HOW?

pH can be measured very accurately using a special pH electrode, electronics that amplify the electrode current to a usable level, and a meter to display the results.

pH Electrode

The pH electrode (probe) can be thought of as a small battery whose voltage changes as the pH of the solution in which it is inserted changes. It consists of two parts: a thin glass bulb sensitive to hydrogen ion, and a reference cell. The special nature of the glass bulb allows H^+ to pass through. This ability sets up a potential (voltage difference) due to the concentration difference between H^+ inside and outside the bulb. This bulb is then a measuring "half-cell". The other half is the reference portion of the electrode. It typically consists of a silver wire coated with silver chloride which is immersed in a saturated KCl gel. The reference cell produces a known voltage against which the measuring voltage is compared. Electrical contact to the sample solution (completing the electrical circuit) is made through an annular junction (typically porous ceramic) located just above the pH sensitive bulb. Together, the pH sensitive bulb and the reference cell constitute the complete probe.

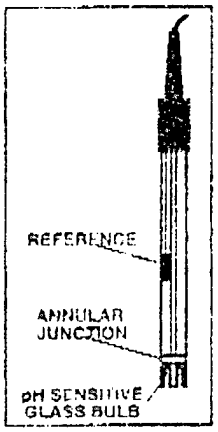


Figure 2

The voltage produced by the probe is a linear function of the pH. For example, at pH 7.00 (neutral) the probe produces zero volts while at pH 6.00 it produces +60 millivolts. Minus(-) 60 millivolts would be a pH of 8.00. Generally, a pH probe will produce about 60 millivolts for each change of one (1) pH unit. Thus, a probe voltage of +300 millivolts would indicate a pH value of 2.00 (300 divided by 60 = 5 units, 7 units minus 5 units = 2 units.)

Electronics & Display

Generally, the electronics and display (analog or digital) are combined in a single instrument case, collectively referred to as "the meter". Although the basic function of all meters is the same – providing the signal amplification, conditioning, and calibration for accurate and reliable display of the correct pH value—there can be considerable variation in packaging (field or laboratory use) and in overall accuracy and repeatability. Additional electronics and outputs can also be added to set levels at which pumps and alarms can be activated to alert or correct for "out-of-range" pH levels (controllers).

Like most of life, things are not always as simple as we would like. The temperature of the solution being measured has an affect on the accuracy of the pH reading; temperature affects the equilibrium constant of the solution and hence the amount of H^+ and OH^-. If your probe or meter does not have automatic temperature compensation (ATC), the manual temperature adjust must be set.

Buffers

Since the pH meter and probe are both electronic-type devices, you should have standard pH solution available which you can use to make sure that everything is calibrated and operating correctly. These solutions are called "standard buffers". A good buffer is a vital part of all pH measurements.

pH buffers are solutions of specific and very accurate pH values that resist change even when other materials are added. However, care should be taken to avoid contamination.

Always set the SET adjustment of the pH meter first, using a pH 7.00 buffer, regardless of the range you are measuring. This guarantees calibration of the meter to the true zero output of the probe. (Output varies among different probes, and with age.) The SLOPE adjustment is then made using a buffer with a value closest to your expected sample reading.

Conductivity - Resistivity

WHAT?

Conductivity is the term used to express the ability of a substance to conduct an electric current. Resistivity is the term used to express the lack of ability of a substance to conduct an electric current, i.e.,

Conductivity = 1/Resistivity

Both are directly related to the amount of total dissolved solids (TDS). These solids are basically salts. Although often confusing, the terms Conductivity, Salinity, TDS, Ion Concentration, Resistivity are all the same, or directly related measurements.

Terms of measurement are:
S = Siemens/cm = mho = 1/ohm
μ = micro = 10^{-6}
m = milli = 10^{-3}
Meg = 10^{6}
g = gram L = Liter
ppm = parts per million
ppt = parts per thousand
Ω = ohm = 1/mho

Measurement ▼ Analysis ▼ Control

WATER MEASUREMENT & ANALYSIS

Measurements are expressed as follows:

Conductivity	= µS or µmho mS or mmho
Salinity	= ppm or ppt TDS
Ion Concentration	= mg/L or g/L
Resistivity	= Megohms

100 µS = 100 µmhos = 10,000 ohms ≈ 50 ppm ≈ 50 mg/L

Some typical values:

Pure water
0.055 µS or µmhos = 18 Megohms

Distilled water:
0.5 µS or µmhos ≈ 0.25 ppm

Boiler water:
1 µS or µmhos ≈ 0.5 ppm

Good city water:
50 µS or µmhos ≈ 25 ppm

Potable water (max.):
1 mS or mmhos ≈ 500 ppm

Ocean water:
50 mS or mmhos ≈ 50 ppt

Nitric acid:
860 mS or mmhos ≈ 430 ppt

WHY?

A proper balance of conductivity is essential to humans, animals, plant life, and industry. Listed below are only a few of many examples:

In humans, it's taste up to a certain point! Ask anyone who has been lost at sea if they could survive on ocean water.

All marine life is dependent on a conductivity environment consistent with their species.

Healthy aquaculture depends upon water containing the "right" amount of salts.

In industry, a build-up of salts (conductivity) can ruin boilers and corrode pipes, fittings, and valves.

Measurement of conductivity offers a fast, reliable, inexpensive, and non-destructible means of establishing the ionic condition of a liquid. Not so incidentally, the conductivity of a substance significantly affects dissolved oxygen and pH measurements. Therefore, this information is essential to compensate other readings.

HOW?

As with pH, the basic components of measurements are a probe (detection), electronics (signal conditioning), and display (meter).

Unlike the pH probe, the typical conductivity probe has two electrodes with a voltage "potential" applied across them, i.e., coming from the electronics. The amount of current flow between the electrodes is governed by the conductivity (resistivity) of the sample solution between them. This signal is amplified and conditioned by the electronics to provide the display with the correct data in the proper form, i.e., µS, ppm, mg/L.

One drawback of conductivity is that it is a non-specific measurement; it cannot distinguish between different types of ions, giving instead a reading that is proportional to the combined effect of all ions present. Some ions contribute far more than others and multi-component mixtures may present problems. Common organic compounds such as alcohols, sugars, petroleum products, and soil products do not give usable conductivity measurements. Some materials may also reduce the measurement accuracy by coating the probe. Conductivity measurements have a relatively high temperature dependence to the measurement, requiring temperature compensation. In many cases, these considerations are not serious, or can be compensated so that quite accurate readings are obtained. Although rugged and very stable, conductivity probes should be checked periodically with a standard solution of known value.

Dissolved Oxygen

WHAT?

Oxygen itself needs little explanation! We know it is vital to life and supports all combustion. Dissolved oxygen, as the name implies, is the amount of oxygen naturally absorbed out of the air or forced (bubbled) into a liquid. It is typically measured in ppm (part per million) or % Sat (% of Saturation), where normal moist air is considered 100% oxygen saturated.

WHY?

Dissolved oxygen measurements are vital in many industries and important in laboratory research. Its pretty obvious that healthy marine life depends on an optimum supply of dissolved oxygen. Overall "life" conditions of lakes, rivers, and bays can be determined and monitored by DO measurements (before fish float to the surface). Therefore, proper monitoring is essential to an understanding of environmental parameters and to the growing aquaculture industry. In sewage treatment, the amount of residual organic matter can be determined by the change in oxygen level. The food industry monitors the amount of oxygen in canned goods and bottled products to avoid bacterial growth and spoilage.

HOW?

The practical measurement of dissolved oxygen requires considerably more care and attention than that of pH or conductivity. However, the basic components are the same: a probe for detec-

tion, electronics for signal amplification and conditioning, and meter to display the results.

Most oxygen probes are of the polarographic type, consisting of:

- Anode & Cathode (battery)
- Filling Solution (electrolyte)
- Membrane (permeable to O_2 molecules)
- Thermistor (temperature compensation)

In simplest terms, the oxygen molecules diffuse through the permeable membrane and cause a change in current flow between the anode and cathode. The current flow is proportional to the amount of oxygen present. Because of its major affect on accuracy, temperature is sensed as close as possible to the membrane surface. The electronics in the meter amplify, condition, and present the appropriate data to display the results as ppm or % Sat.

Turbidity

WHAT?

Turbidity is a physical property of water that refers to its degree of cloudiness or haziness. It is caused by the presence of small suspended particles of such materials as clay, silt, algae, organic and inorganic matter, and other microorganisms. When light interacts with these particles, light "scattering" occurs that produces a cloudy appearance to the human eye. (Milk is a good example of a very turbid material—it is opaque and appears "white" to the eye.)

WHY?

In addition to the obvious aesthetic effects, high levels of these small particles in drinking water can support the growth of harmful microorganisms and reduce the effectiveness of chlorination, creating a health hazard. Because of the hazards and for aesthetic reasons, high levels of suspended matter, as indicated by "turbidity", are generally regarded as unacceptable. A measure of turbidity, then, can be used to judge the general water quality, with limits and measurements imposed by the EPA.

HOW?

Light traveling through pure water or water containing completely dissolved substances passes straight through, producing no scattering. As light passes through water containing undissolved particles, it is "scattered" in many different directions, as shown in Figure 3, and not as much light passes straight through. The human eye perceives this diminished light as cloudiness.

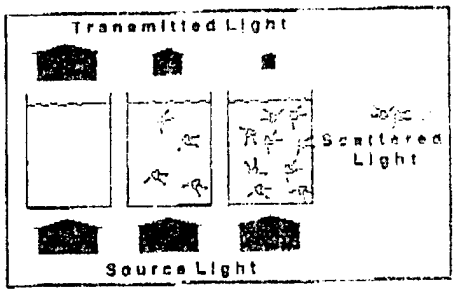


Figure 3

Instruments called turbidimeters (or nephelometers) are used to electronically measure the degree of scattering, displaying the results directly in arbitrary units called NTU's (Nephelometric Turbidity Units), typically over the 0-199 NTU range. To accomplish such measurements, see Figure 4, a highly regulated light source (tungsten lamp) is used to provide a steady source of visible light which is focused by a lens. As this light passes through a water sample, held in a special sample container called a "cuvette", some of the light is scattered in various directions by particles. The amount of light scattering is highly dependent upon the size and number of particles.

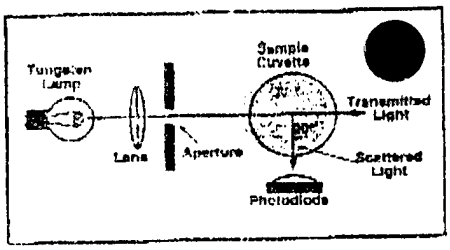


Figure 4

A light detector, i.e., a photodiode placed at right angles to the incident light beam senses the amount of scattered light and converts this light into an electrical signal. This signal is then displayed on a meter or digital display, generally calibrated to read out directly in NTU's (Nephelometric Turbidity Units).

Because the units of turbidity are quite arbitrary, it is absolutely essential that turbidimeters be calibrated against standards with known scattering properties. Basically, these are solutions of very special substances that scatter light in a predictable and repeatable fashion.

CONTENTS

Water Measurement & Analysis .2-5
pH Meters 6-7
Conductivity-TDS Meters 8-9
Dissolved Oxygen Meters 10-11
Water Analyzer 12-15
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pH Controllers/Recorders 18-19
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Model 91T/8201 Turbidimeter System

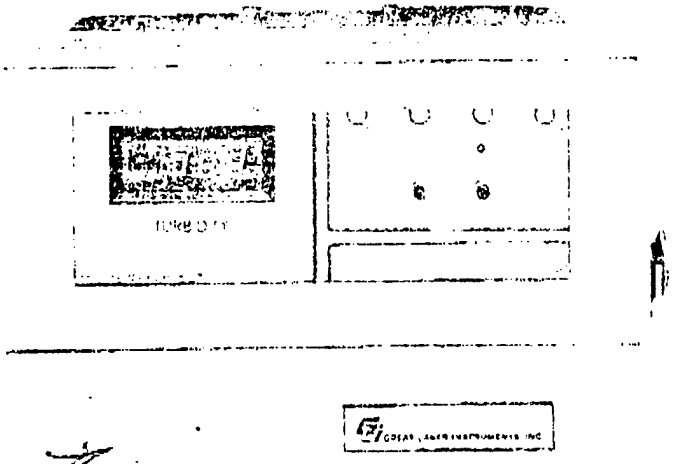
TURBIDITY

Data Sheet 91T/990
Supersedes 91T/1085

FEATURES

- EPA approved nephelometric measurement method
- Continuous and grab sample measurement capability
- Easy access plug-in circuit cards and terminal strips
- Modular construction simplifies field servicing
- Press-to-display setpoint values
- Switch selectable relay action - operates on increasing or decreasing reading
- Output range expansion

$775



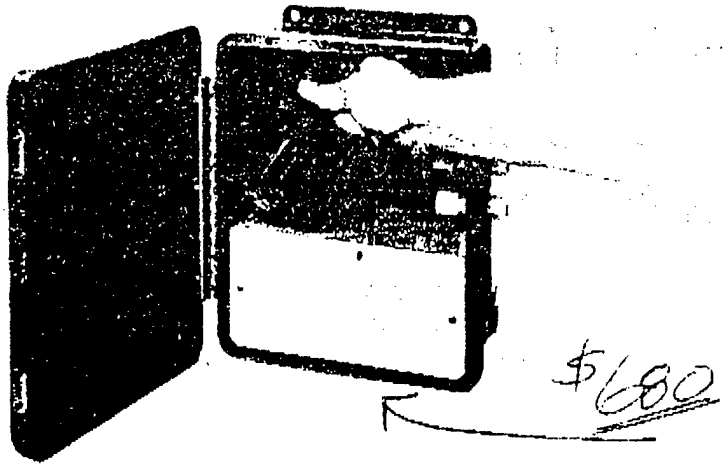
Model 91T Transmitter

Description:

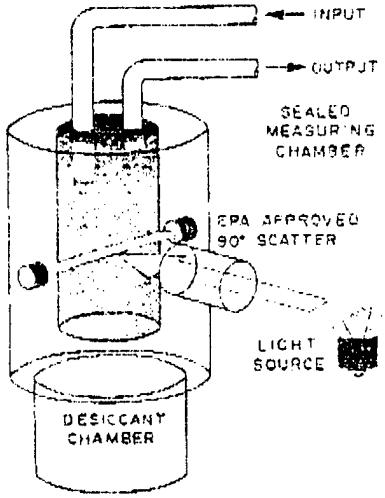
The Model 91T/8201 turbidimeter system is comprised of an industrial-grade quality transmitter and sensor that combine high measurement accuracy and low maintenance. The system is sensitive to minute changes in suspended solids concentration and measures to low levels. The system provides continuous measurement and may be used to analyze a grab sample. The Model 91T/8201 turbidimeter system features a bypass sensor with continuous sample flow for measurements up to 100 NTU's. The sample cuvette can be removed while "on line" for easy calibration. Typical applications include monitoring and control of potable water, filter break-through and product clarity.

The Model 91T transmitter is housed in a watertight, corrosion-resistant styrene enclosure for substantial environmental protection. Two stainless steel mounting brackets are included for panel, surface or pipe mounting. Plug-in circuit cards facilitate servicing. Transmitter options include meter, recorder or digital display, analog outputs and relay configurations. The Model 91T with meter or recorder display provides six selectable measuring ranges from 0-0.3 to 0-100 NTU's. The transmitter with digital display has selectable ranges of 0-1, 0-10 and 0-100 NTU's.

Model 8201 Sensor



$680



Model 8201 Sensor Optic Details

TOTAL SYSTEM COST $1455

SCHOTT GREAT LAKES INSTRUMENTS

The Model 8201 sensor is housed in a surface-mount NEMA 4X fiberglass enclosure. The sensor has a renewable desiccant cartridge to eliminate sample chamber condensation and maintain optical measurement integrity. Measurement methods are U.S. EPA approved (Storet 00076). High quality, stable photo cells are used. The outputs of the photo cells vary directly with the amount of scattered light dispersed by turbidity in the sample.

Measuring scales are in Nephelometric Turbidity Units (NTU) which correspond interchangeably with Formazin Turbidity Units (FTU). Calibration is referenced to standard formazin solutions.

MODEL 91T TRANSMITTER SPECIFICATIONS

Operational:

Measuring Ranges:	
Meter	0 to 0.3/1/3/10/30 and 100 NTU's
Digital	0 to 1/10 and 100 NTU's
Stability	0.5% of full scale per day, non-cumulative at 25°C
Linearity	Meter: ±1% of full scale Digital: ±0.25% of full scale
Display: Meter (standard)	4½" mirrored scale
Recorder (optional)	2¾" strip chart, single pen (inkless)
Digital (optional)	3½ digit LED, 0.5" high digits
Response Time	0.25, 2.5 or 25 seconds, selectable
Ambient Conditions	−30 to 50°C (−22 to 122°F), 0 to 100% R.H.
Relay Function (optional):	
Control and Alarm Setpoints	Continuously adjustable 0-100% of full scale with press-to-display setpoint feature
Control Deadband	Continuously adjustable 0-50% of full scale
Indicators	LED lights when relay energizes
Contact Rating (U.L.)	SPDT, 5A 115/230 VAC, 3A @ 30 VDC resistive

Note — Control or alarm relays operate on increasing or decreasing reading, switch selectable.

Sensor-to-Analyzer Distance	25 feet maximum without light source power module 300 feet maximum with light source power module

Electrical:

Power	98-132 VAC, 50 or 60 Hz (less than 40 VA) optional 205-275 VAC, 50 or 60 Hz, connections via terminal strip
Analog Outputs (standard)	One voltage and one current signal (isolated): 0-1 mA, 100 ohms maximum load 0-5 VDC, 1000 ohms minimum load One additional current signal (isolated): 4-20 mA, 625 ohms maximum load 0-20 mA, 625 ohms maximum load 10-50 mA, 250 ohms maximum load

Range Expand — The analog outputs can be made to represent a selected segment of the display range. This segment or "sub-interval span" cannot be smaller than 10% of the display range span, but may be positioned anywhere within that span.

Enclosure	NEMA 4X, styrene structural foam (with flame retardant additive), panel/surface/pipe mount
Net Weight	12 lbs. (5.5 kg) maximum

MODEL 8201 SENSOR SPECIFICATIONS

Wetted Materials	PVC (Teflon optional), glass, Viton, and polyethylene (stainless steel optional)
Maximum Flow Rate/Pressure	1 gpm/60 psig
Maximum Sample Temperature	50°C (122°F)
Installation Connections	¾" NPT female, PVC or stainless steel
Sample Configuration	Continuous flow vial, borosilicate glass, flat bottom, 2¾" (70 mm) long
Enclosure	NEMA 4X surface mount, fiberglass with stainless steel hardware
Net Weight	7.5 lbs. (3.4 kg)
Accessory Kit (included)	One spare vial, 2¾" long One grab sample cuvette with cap One light shield One spare lamp (with leads) One spare fuse One sealed vial of zero solution One accessory kit carrying case

ORDERING INFORMATION

MODEL NUMBER
91T: Transmitter for use with Model 8201 sensor only, in a NEMA 4X styrene structural foam enclosure which can be panel, surface or pipe mounted (brackets included).

DISPLAY
1 Meter, 4½" is standard (six ranges) ←
2 Recorder, in place of meter (six ranges)
3 Digital (three ranges)

ANALOG OUTPUTS (range expand included)
0-1 mA and 0-5VDC plus:
C 4-20 mA ←
D 0-20 mA
E 10-50 mA

NOTE — Since process sample is electrically isolated from transmitter, the analog output is effectively isolated.

LINE VOLTAGE
1 115 volts, 60 Hz. ←
2 240 volts, 50 Hz.
3 115 volts, 50 Hz.
4 240 volts, 60 Hz.

RELAYS
A None ←
B Two control relays (with adjustable deadband)
C Two alarm relays (with fixed deadband)
D Four relays: two control and two alarm relays

CONTROLLERS
0 None ←

N Standard instrument ←
K Special instrument

91T					0		Product Number

Choose one from each category

MODEL NUMBER
8201T: Bypass sensor for use to 100 NTU's in a NEMA 4X surface mount, fiberglass enclosure with integral 12 ft. cable and accessory kit.

Reserved categories

LIGHT SOURCE POWER
0 NOTE — When sensor-to-transmitter distance exceeds 25 feet, an accessory remote power module must be specified. This module, in surface mount fiberglass enclosure, requires independent power and permits up to 300 feet of separation.

WETTED MATERIALS
A PVC, glass ←
B Teflon, glass (must also specify Installation Connections option as 2)

INSTALLATION CONNECTIONS
1 PVC, ¼" NPT female ←
2 Stainless steel, ¼" NPT female

N Standard sensor ←
K Special sensor

8201T	1	A	0				Product Number

Choose one from each category.

MODEL 8201 SPARE PARTS

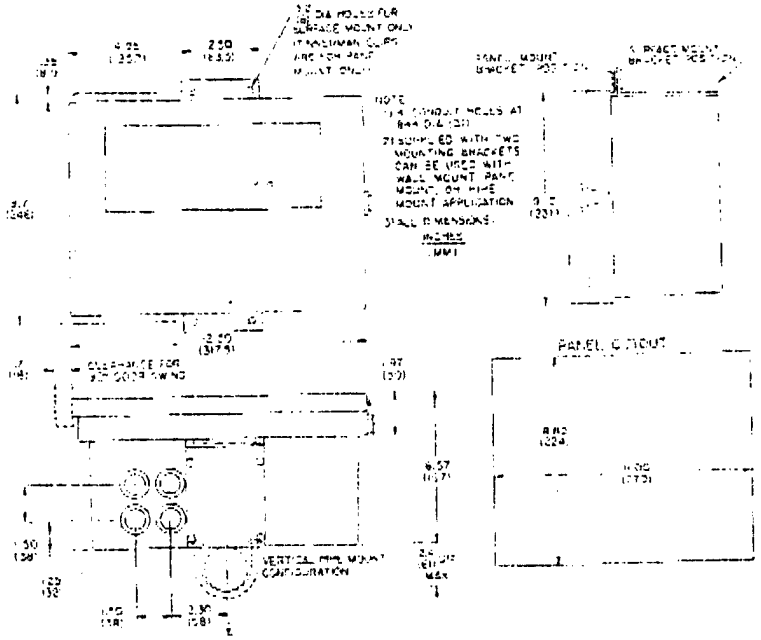
One Desiccant Cartridge	8201A2A2023
One Flow-thru Vial	99X3A1049
One Grab Sample Cuvette, with cap	8202A6A1001
One Light Shield	8201A6F1001
One Lamp (with leads)	8201A6A1000
One Sealed Vial of Zero Solution	99X1A1001
One Fuse, ½ A	99X1F0405

ACCESSORY REMOTE POWER MODULE

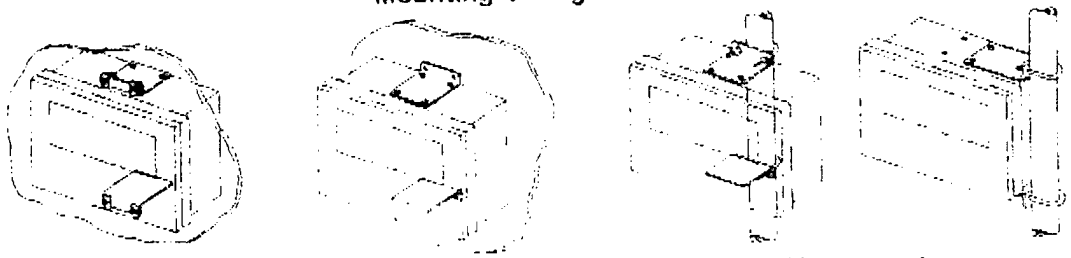
82S0A1A0N	115 volts, 50/60 Hz.
82S0A2A0N	230 volts, 50/60 Hz.

DIMENSIONS AND MOUNTING

Model 91T Transmitter Outline



Mounting Configurations

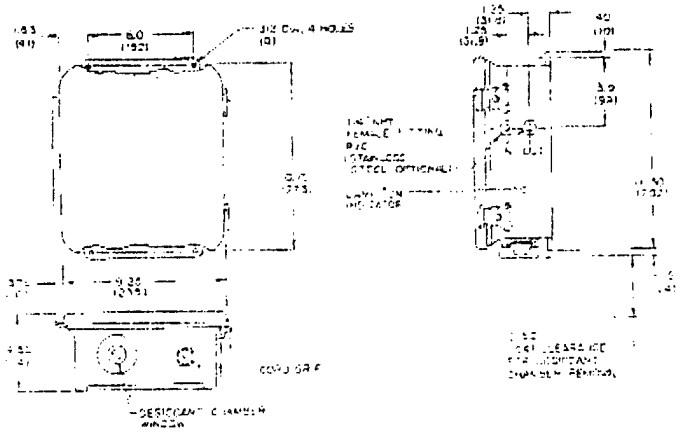


Panel-mount (tinnerman nuts included)

Surface-mount

Pipe-mount (U-bolts not included)

Model 8201 Sensor Outline



Represented By:

Great Lakes Instruments, Inc.
8855 N. 55th Street
Milwaukee, WI 53223

Telephone (414) 355-3601
Telefax (414) 355-8346
Telex 26-9685

GREAT LAKES INSTRUMENTS

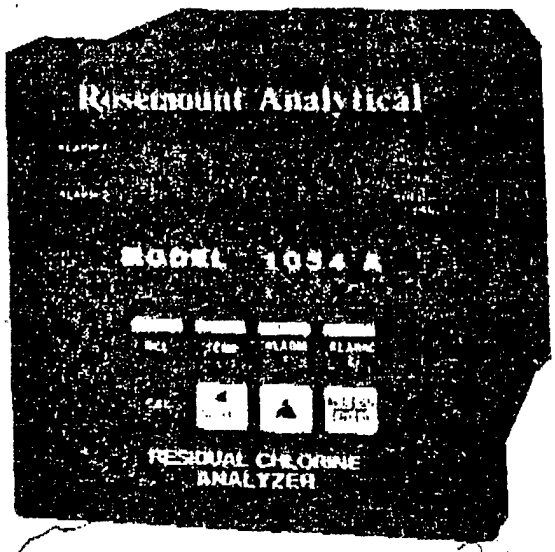
A Schott Group Company

Rosemount® Analytical

Model 1054A RCl
Free Residual Chlorine
Microprocessor Analyzer

COST $969.00

- *FM AND CSA APPROVED For Class I, Division 2, Gas Groups A, B, C, and D.*
- *SELF DIAGNOSTICS with a user selectable fault alarm.*
- *NEMA 4X (IP65) WEATHERPROOF CORROSION-RESISTANT ENCLOSURE.*
- *NO BATTERY BACK-UP REQUIRED. Non-volatile EEPROM memory.*
- *DUAL ALARMS WITH PROGRAMMABLE LOGIC. A third relay is provided with timer functions.*
- *HOLD OUTPUT FUNCTION is programmable to default to a preset or process value.*
- *KEYBOARD SECURITY is user selectable.*



REQUIRES A SEPARATE SENSOR

FEATURES AND APPLICATIONS

The Model 1054A Microprocessor Analyzers, with the appropriate sensor, are designed to continuously measure and control pH, ORP, conductivity, percent concentration, dissolved oxygen, or free residual chlorine, in industrial and municipal processes.

The Model 1054A is housed in a NEMA 4X (IP65) weatherproof corrosion-resistant, flame retardant enclosure suitable for panel, pipe or wall mounting. All functions are accessed through the front panel membrane keyboard which features tactile feedback. Measurement data may be read at any time, however, settings may be protected against accidental or unauthorized changes by a user selectable security code. The display indicates the measured value in engineering units as well as temperature, alarm status, hold output and fault conditions.

The 1054A transmits a user selected isolated current output is continuously expandable over the measurement range in either Direct or Reverse and can be displayed in milliamps or percent. Output dampening of 0-999 secs. is user selectable.

The hold output and relay defaults are user selectable. The hold output function allows manual control during routine sensor maintenance.

Dual alarms are a standard feature on the Model 1054A and are programmable for either high or low operation. Alarm 2 may be programmed as a fault alarm. Both alarms feature independent setpoints, adjustable hysteresis and time delay action. A dedicated interval timer with relay is also provided.

Automatic or manual temperature compensation is keyboard selectable. The process temperature is accurately measured at the sensor assembly and is read on the display. For greater accuracy, the temperature indication may be standardized to the process temperature. The temperature may be configured to read in °C or °F.

Calibration is easily accomplished by on-line standardization to a grab sample solution.

The Model 1054A Microprocessor Analyzer comes standard with an LCD display. An LED display is available as an option.

The Model 1054A's continuous self diagnostics alert the operator to ROM, EEPROM, temperature, measuring electrode and open wiring faults.

PHYSICAL SPECIFICATIONS - GENERAL

Panel Mount Enclosure: Black, ABS, NEMA 4X, IP65.
CSA Enclosure 4.
144 X 144 X 192mm
(5.7 X 5.7 X 7.5 inches)

Wall Mount Enclosure: NEMA 4X, Thermoplastic
300 X 330 X 190mm
(11.75 X 13 X 7.5 inches).

Front Panel: Membrane keypad with tactile feedback and user selectable security. Black and white on grey.

Digital Display: LCD, black on grey
Optional, red LED
Character Height: 18mm (0.7 inch)

Electrical Classification:
Group I Panel Mount Enclosure: FM and CSA:
Class I, Div. 2, Group A thru D.
28 VDC relays only.
Group II Wall Mount Enclosure: General Purpose

Power: 115 VAC, ± 10%, 50/60 Hz ± 6%, 4.0 W
230 VAC, ± 10%, 50/60 Hz ± 6%, 4.0 W

Current Output: Isolated, 0-20 mA or 4-20 mA
into 600 ohms maximum load, Direct or Reverse
Output Dampening: 0-999 seconds

Ambient Temperature: -10 to 65°C (14 to 149°F)

Ambient Humidity: 0-95%

Alarms: Dual, field selectable High/Low, High/High, Low/Low
Alarm 2 configurable as a fault alarm
Time Delay 0 to 254 seconds
Dual Setpoints, continuously adjustable
Hysteresis is adjustable up to 2 pH units or 25% full scale for low side/High Alarm and high side/Low Alarm

Interval Timer: Interval: 10 min. to 2999 days
On Counts: 1 to 60
On Duration: 1 to 299.9 seconds
Off Duration: 1 to 299.9 seconds
Wait Duration: 1 to 299.9 seconds
Controls dedicated relay

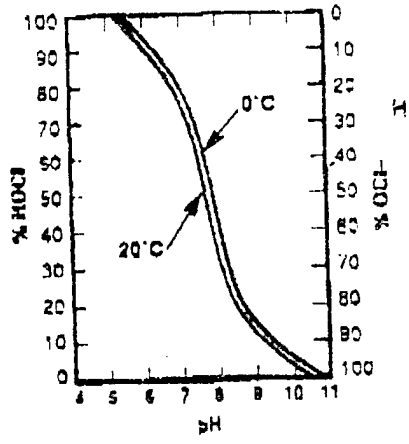
Relay Contacts: Epoxy Sealed Form A contacts, SPST, Normally Open.

	Resistive	Inductive
28 VDC	6.0 Amps	3.0 Amps
115 VAC	6.0 Amps	3.0 Amps
230 VAC	6.0 Amps	1.5 Amps

Weight/Shipping Weight: 1.1 kg/1.6 kg (2.5 lbs./3.5 lbs.)

The **Model 1054A Free Residual Chlorine Analyzer** measures free residual chlorine as hypochlorous acid (HOCl) and hypochlorite ion (OCl^-) over the full range of 0-20.0 mg/l. Free residual chlorine commonly exists as a pH and temperature dependent mixture of HOCl and OCl^- (see graph). The Model 1054A RCI provides both automatic temperature compensation and manual pH correction for accurate measurement. The patented* free residual chlorine sensor is a polarographic sensor that eliminates the need for wet chemical analysis and the maintenance associated with these analyzers.

* U.S. Patent No. 3,597,134
U.S. Patent No. 4,197,162
Canadian Patent No. 1,025,495



HOCl/OCl^- vs. pH

INSTRUMENT SPECIFICATIONS @ 25°C

Measurement Range: 0-20 mg/l (ppm)

Output Scale Expansion: Zero suppression: up to 90% full scale
Span: from 0% to 90% full scale

Accuracy: ±0.5% of measured range

Repeatability: ±0.25% of output range

Stability: ±0.25% of output range/month, non-cumulative

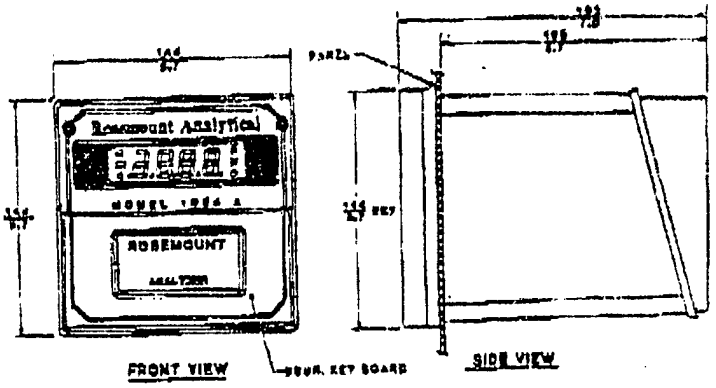
Temperature Coefficient: Input: ±0.03% of reading/°C
Output: ±0.04% of reading/°C

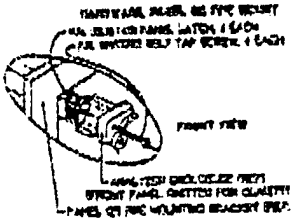
Temperature Compensation: 0 to 50°C (32 to 122°F)
(automatic or manual)

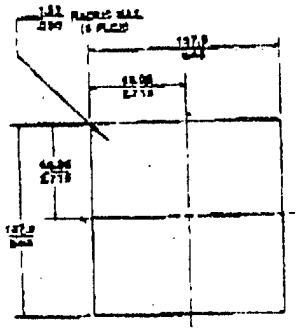
RECOMMENDED SENSOR:
Model 450 Sensor

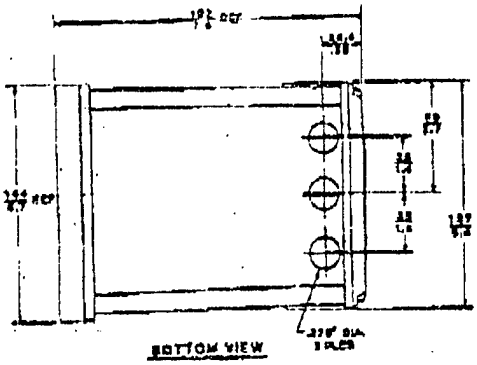
COST
$477.00

MOUNTING AND DIMENSIONAL DRAWING – ANALYZER



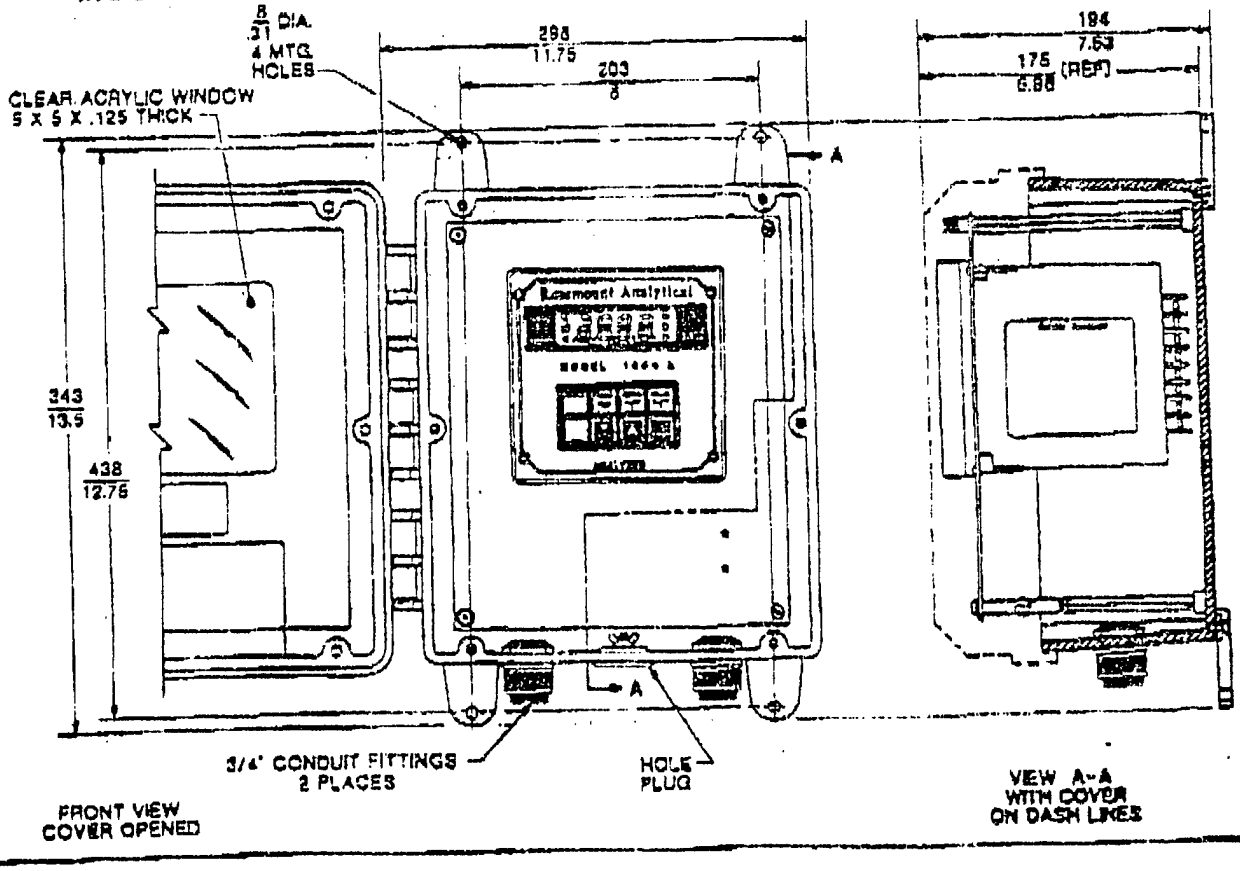






(DIMENSIONS SHOWN) MM / INCHES

MOUNTING AND DIMENSIONAL DRAWING – WALL MOUNT ENCLOSURE



ORDERING INFORMATION

The Model 1054A RCI Free Residual Chlorine Microprocessor Analyzer: Housed in a NEMA 4X corrosion resistant, weatherproof housing suitable for panel, pipe, or wall mounting. The analyzer operates on 115 VAC, 50/60 Hz power unless otherwise specified. Standard features include LCD digital display, isolated current outputs, dual programmable alarms and timer relay, default settings, and automatic and manual temperature compensation.

MODEL	
1054A RCI	MICROPROCESSOR ANALYZER (3.5 lbs./1.5 kg)

CODE	GROUP I: PANEL MOUNT ENCLOSURE OPTIONS (Select from either Group I or Group II, not both)
02	LED Display
05	230VAC, 50/60 Hz
07	Wall mounting bracket
08	2" pipe mounting bracket
11	Stainless steel tag (specify marking)

CODE	GROUP II: WALL MOUNT ENCLOSURE OPTIONS (Select from either Group I or Group II, not both)
20	LCD Display, 115VAC, 50/60 Hz
21	LCD Display, 230VAC, 50/60 Hz
51	Enclosure heater for Code 20
52	Enclosure heater for Code 21
11	Stainless steel tag (specify marking)

1054A RCI 05 – 07 – 11	EXAMPLE

NOTES:
SELECT OPTIONS FROM GROUP I OR GROUP II, NOT BOTH.

Rosemount Analytical Inc.
2400 Barranca Parkway
Irvine CA 92714
Tel (714) 863-1181
Telex 67-6357 UNILOC IRIN
Fax (714) 474-7250

BUILDING-BY-BUILDING
COST ESTIMATE BACKUP DATA

COST ESTIMATE

BUILDING 181

COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 181		ESTIMATOR KC	CHECKED BY CEL

BOILER & GENERATOR SYS. NO. MISC.		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	H/O/A & Control Relay		EA	3		26				77				
Analog Output														
Digital Input	Pressure Switch (Elec)	4	EA	2	9.6	26	$249			52	$208	$456		
	Pressure Switch (Plum)	4	EA	2	7.6	24	$186			51	$203	$390		
	Diff. Pressure Sw. (Filter)		EA	3		26				71				
	Level Switch		EA	4		26				136				
	Status Relay	4	EA	2	7.6	26	$197			41	$166	$363		
Analog Input	PSIG/PSID (Elec)		EA	3		26				202				
	PSIG/PSID (Plum)		EA	2		24				55				
	Amp.	3	EA	4	12.4	26	$319			122	$365	$684		
TOTAL THIS SHEET							$951				$941	$1,892		

COST ESTIMATE

BUILDING 183

COST ESTIMATE ANALYSIS

PROJECT: EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO.: DACA41-92-C-0098	EFFECTIVE PRICING: MARCH 1993	DATE PREPARED: 29-Mar-93
LOCATION: FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
BLDG. NO. 1903	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL

SEWAGE SYS. NO. SEW	TASK DESCRIPTION	Quantity No. Of Units	Quantity Unit Meas	LABOR MH/ Unit	LABOR Total Hrs	LABOR Unit Price	LABOR Cost	EQUIPMENT Unit Price	EQUIPMENT Cost	MATERIAL Unit Price	MATERIAL Cost	TOTAL	SHIPPING Unit Wt	SHIPPING Total Wt
Digital Output	H/O/A & Control Relay		EA	3		26				77				
Analog Output														
Digital Input	Pressure Switch (Elec)		EA	2		26				52				
	Pressure Switch (Plum)		EA	2		24				51				
	Diff. Pressure Sw. (Filter)		EA	3		26				71				
	Level Switch	1	EA	4	3.9	26	$101			136	$136	$237		
	Status Relay	2	EA	2	3.8	26	$98			41	$83	$181		
	Current Switch		EA	2		26				111				
Analog Input	PSIG/PSID (Elec)		EA	3		26				202				
	PSIG/PSID (Plum)		EA	2		24				55				
	Flow (Elec)		EA	3		26				737				
	Flow (Plum)		EA	2		24				86				
	Tubidity		EA	4		26				415				
TOTAL THIS SHEET							$199				$219	$418		

COST ESTIMATE

BUILDING 184

COST ESTIMATE ANALYSIS

PROJECT: EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO.: DACA41-92-C-0098	EFFECTIVE PRICING: MARCH 1993	DATE PREPARED: 29-Mar-93
LOCATION: FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
BLDG. NO.: 184	[ ] OTHER _____	ESTIMATOR: KC	CHECKED BY: CEL

SEWAGE SYS. NO. SEW	TASK DESCRIPTION	Quantity: No. Of Units	Quantity: Unit Meas	LABOR: MH/ Unit	LABOR: Total Hrs	LABOR: Unit Price	LABOR: Cost	EQUIPMENT: Unit Price	EQUIPMENT: Cost	MATERIAL: Unit Price	MATERIAL: Cost	TOTAL	SHIPPING: Unit Wt	SHIPPING: Total Wt
Digital Output	H/O/A & Control Relay		EA	3		26				77				
Analog Output														
Digital Input	Pressure Switch (Elec)		EA	2		26				52				
)I1-2	Pressure Switch (Plum)		EA	2		24				51				
)I6	Diff. Pressure Sw. (Filter)		EA	3		26				71				
)I10	Level Switch	1	EA	4	3.9	26	$101			136	$136	$237		
)I3	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
	Current Switch	2	EA	2	3.8	26	$98			111	$222	$320		
Analog Input	PSIG/PSID (Elec)		EA	3		26				202				
AI3-2	PSIG/PSID (Plum)		EA	2		24				55				
AI5-1	Flow (Elec)		EA	3		26				737				
AI5-2	Flow (Plum)		EA	2		24				86				
AI1-1	Temp. Water (Elec)	1	EA	3	3.1	26	$81			222	$222	$303		
AI1-1	Temp. Water (Elec)	1	EA	3	3.1	26	$81			222	$222	$303		
TOTAL THIS SHEET							$410				$843	$1,253		

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COST ESTIMATE

BUILDING 185

COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098		EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 185		ESTIMATOR KC	CHECKED BY CEL

SEWAGE LIFT STATION		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. SEW		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	H/O/A & Control Relay		EA	3		26				77				
Analog Output														
Digital Input	Pressure Switch (Elec)		EA	2		26				52				
	Pressure Switch (Plum)		EA	2		24				51				
	Diff. Pressure Sw. (Filter)		EA	3		26				71				
	Level Switch	1	EA	4	3.9	26	$101			136	$136	$237		
	Status Relay		EA	2		26				41				
	Current Switch	4	EA	2	7.6	26	$197			111	$443	$640		
Analog Input	PSIG/PSID (Elec)	2	EA	3	6.3	26	$161			202	$404	$566		
	PSIG/PSID (Plum)	2	EA	2	4.3	24	$104			55	$109	$213		
	Flow (Elec)		EA	3		26				737				
	Flow (Plum)		EA	2		24				86				
TOTAL THIS SHEET							$563				$1,093	$1,655		

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COST ESTIMATE

BUILDING 186

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL
BLDG. NO. 186			

SYS. NO. WATER	TASK DESCRIPTION	Quantity No. Of Units	Quantity Unit Meas	LABOR MH/ Unit	LABOR Total Hrs	LABOR Unit Price	LABOR Cost	EQUIPMENT Unit Price	EQUIPMENT Cost	MATERIAL Unit Price	MATERIAL Cost	TOTAL	SHIPPING Unit Wt	SHIPPING Total Wt
Digital Output	H/O/A & Control Relay		EA	3		26				77				
Analog Output														
Digital Input	Pressure Switch (Elec)		EA	2		26				52				
	Pressure Switch (Plum)		EA	2		24				51				
	Diff. Pressure Sw. (Filter)		EA	3		26				71				
	Level Switch	1	EA	4	3.9	26	$101			136	$136	$237		
	Status Relay	8	EA	2	15.3	26	$394			41	$332	$725		
	Current Switch	3	EA	2	5.7	26	$148			111	$332	$480		
Analog Input	PSIG/PSID (Elec)	2	EA	3	6.3	26	$161			202	$404	$566		
	PSIG/PSID (Plum)	2	EA	2	4.3	24	$104			55	$109	$213		
	Flow (Elec)		EA	3		26				737				
	Flow (Plum)		EA	2		24				86				
TOTAL THIS SHEET							$907				$1,314	$2,221		

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COST ESTIMATE

BUILDING 187

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 187		ESTIMATOR KC	CHECKED BY CEL

SYS. NO. SEW		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	H/O/A & Control Relay		EA	3		26				77				
Analog Output														
Digital Input	Pressure Switch (Elec)	2	EA	2	4.8	26	$124			52	$104	$228		
	Pressure Switch (Plum)	2	EA	2	3.8	24	$93			51	$102	$195		
	Diff. Pressure Sw. (Filter)		EA	3		26				71				
	Level Switch	3	EA	4	11.7	26	$302			136	$407	$710		
	Status Relay	5	EA	2	9.6	26	$246			41	$207	$453		
	Current Switch		EA	2		26				111				
Analog Input	PSIG/PSID (Elec)		EA	3		26				202				
	PSIG/PSID (Plum)		EA	2		24				55				
	Flow (Elec)		EA	3		26				737				
	Flow (Plum)		EA	2		24				86				
	Tubidity		EA	4		26				415				
TOTAL THIS SHEET							$766				$820	$1,586		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	☐ CODE A ☒ CODE B ☐ CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	☐ OTHER _____		
BLDG. NO. 187		ESTIMATOR KC	CHECKED BY CEL

SEWAGE LIFT STATION SYS. NO. WATER TASK DESCRIPTION		Quantity No. Of Units	 Unit Meas	LABOR MH/ Unit	 Total Hrs	 Unit Price	 Cost	EQUIPMENT Unit Price	 Cost	MATERIAL Unit Price	 Cost	TOTAL	SHIPPING Unit Wt	 Total Wt
Digital Output	H/O/A & Control Relay		EA	3		26				77				
Analog Output														
Digital Input	Pressure Switch (Elec)		EA	2		26				52				
	Pressure Switch (Plum)		EA	2		24				51				
	Diff. Pressure Sw. (Filter)		EA	3		26				71				
	Level Switch	1	EA	4	3.9	26	$101			136	$136	$237		
	Status Relay	4	EA	2	7.6	26	$197			41	$166	$363		
	Current Switch		EA	2		26				111				
Analog Input	PSIG/PSID (Elec)	2	EA	3	6.3	26	$161			202	$404	$566		
	PSIG/PSID (Plum)	2	EA	2	4.3	24	$104			55	$109	$213		
	Flow (Elec)		EA	3		26				737				
	Flow (Plum)		EA	2		24				86				
TOTAL THIS SHEET							$563				$815	$1,378		

COST ESTIMATE

BUILDING 193

COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 193		ESTIMATOR KC	CHECKED BY CEL

SEWAGE LIFT STATION		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. SEW		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	H/O/A & Control Relay	0	EA	3	0.0	26	$0			77	$0	$0		
	0			0	0.0	0	$0			0	$0	$0		
	0			0	0.0	0	$0			0	$0	$0		
	0			0	0.0	0	$0			0	$0	$0		
	0			0	0.0	0	$0			0	$0	$0		
	0			0	0.0	0	$0			0	$0	$0		
Analog Output	0			0	0.0	0	$0			0	$0	$0		
	0			0	0.0	0	$0			0	$0	$0		
	0			0	0.0	0	$0			0	$0	$0		
	0			0	0.0	0	$0			0	$0	$0		
Digital Input	Pressure Switch (Elec)	5	EA	2	12.1	26	$311			52	$259	$570		
	Pressure Switch (Plum)	5	EA	2	9.6	24	$233			51	$254	$487		
	Diff. Pressure Sw. (Filter)	0	EA	3	0.0	26	$0			71	$0	$0		
	Level Switch	2	EA	4	7.8	26	$202			136	$272	$473		
	Status Relay	3	EA	2	5.7	26	$148			41	$124	$272		
	0			0	0.0	0	$0			0	$0	$0		
	0			0	0.0	0	$0			0	$0	$0		
	0			0	0.0	0	$0			0	$0	$0		
	0			0	0.0	0	$0			0	$0	$0		
Analog Input	PSIG/PSID (Elec)	2	EA	3	6.3	26	$161			202	$404	$566		
	PSIG/PSID (Plum)	2	EA	2	4.3	24	$104			55	$109	$213		
	Flow (Elec)	0	EA	3	0.0	26	$0			737	$0	$0		
	Flow (Plum)	0	EA	2	0.0	24	$0			86	$0	$0		
	0			0	0.0	0	$0			0	$0	$0		
	0			0	0.0	0	$0			0	$0	$0		
				0	0.0	0	$0			0	$0	$0		
				0	0.0	0	$0			0	$0	$0		
	0			0	0.0	0	$0			0	$0	$0		
	0			0	0.0	0	$0			0	$0	$0		
	0			0	0.0	0	$0			0	$0	$0		
	0			0	0.0	0	$0			0	$0	$0		
TOTAL THIS SHEET							$1,158		$0		$1,423	$2,581		

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COST ESTIMATE

BUILDING 194

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 194		ESTIMATOR KC	CHECKED BY CEL

SEWAGE LIFT STATION SYS. NO. WATER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	H/O/A & Control Relay		EA	3		26				77				
Analog Output														
Digital Input	Pressure Switch (Elec)	6	EA	2	14.5	26	$373			52	$311	$684		
	Pressure Switch (Plum)	6	EA	2	11.5	24	$280			51	$305	$584		
	Diff. Pressure Sw. (Filter)		EA	3		26				71				
	Level Switch	1	EA	4	3.9	26	$101			136	$136	$237		
Analog Input	PSIG/PSID (Elec)	2	EA	3	6.3	26	$161			202	$404	$566		
	PSIG/PSID (Plum)	2	EA	2	4.3	24	$104			55	$109	$213		
	Flow (Elec)		EA	3		26				737				
	Flow (Plum)			2		24				86				
TOTAL THIS SHEET							$1,018				$1,266	$2,284		

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COST ESTIMATE

BUILDING 195

COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 31-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 195		ESTIMATOR KC	CHECKED BY CEL

SEWAGE LIFT STATION		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. WATER-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	H/O/A & Control Relay		EA	3		26				77				
Analog Output														
Digital Input	Pressure Switch (Elec)	6	EA	2	14.5	26	$373			52	$311	$684		
	Pressure Switch (Plum)	6	EA	2	11.5	24	$280			51	$305	$584		
	Diff. Pressure Sw. (Filter)		EA	3		26				71				
	Level Switch	1	EA	4	3.9	26	$101			136	$136	$237		
	Status Relay		EA	2		26				41				
Analog Input	PSIG/PSID (Elec)	6	EA	3	18.8	26	$483			202	$1,213	$1,697		
	PSIG/PSID (Plum)	6	EA	2	12.8	24	$311			55	$328	$639		
	Flow (Elec)	3	EA	3	9.4	26	$242			737	$2,210	$2,452		
	Flow (Plum)	3	EA	2	6.4	24	$155			86	$257	$413		
	CHLORINE	1	EA	9	9.1	26	$235			1461	$1,461	$1,696		
TOTAL THIS SHEET							$2,180				$6,221	$8,401		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 195		ESTIMATOR KC	CHECKED BY CEL

SEWAGE LIFT STATION		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. WATER-2		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	H/O/A & Control Relay		EA	3		26				77				
Analog Output														
Digital Input	Pressure Switch (Elec)		EA	2		26				52				
	Pressure Switch (Plum)		EA	2		24				51				
	Diff. Pressure Sw. (Filter)		EA	3		26				71				
	Level Switch	1	EA	4	3.9	26	$101			136	$136	$237		
	Status Relay		EA	2		26				41				
	End Position Switch		EA	2		26				69				
Analog Input	PSIG/PSID (Elec)	6	EA	3	18.8	26	$483			202	$1,213	$1,697		
	PSIG/PSID (Plum)	6	EA	2	12.8	24	$311			55	$328	$639		
	Position	8	EA	3	25.0	26	$645			191	$1,526	$2,171		
TOTAL THIS SHEET							$1,540				$3,204	$4,743		

COST ESTIMATE

BUILDING 196

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 196		ESTIMATOR KC	CHECKED BY CEL

SYS. NO.	SEW	Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
	TASK DESCRIPTION	No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	H/O/A & Control Relay		EA	3		26				77				
Analog Output														
Digital Input	Pressure Switch (Elec)		EA	2		26				52				
	Pressure Switch (Plum)		EA	2		24				51				
	Diff. Pressure Sw. (Filter)		EA	3		26				71				
	Level Switch	1	EA	4	3.9	26	$101			136	$136	$237		
	Status Relay	8	EA	2	15.3	26	$394			41	$332	$725		
	Current Switch	3	EA	2	5.7	26	$148			111	$332	$480		
Analog Input	PSIG/PSID (Elec)	2	EA	3	6.3	26	$161			202	$404	$566		
	PSIG/PSID (Plum)	2	EA	2	4.3	24	$104			55	$109	$213		
	Flow (Elec)		EA	3		26				737				
	Flow (Plum)		EA	2		24				86				
TOTAL THIS SHEET							$907				$1,314	$2,221		

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COST ESTIMATE

BUILDING 198

COST ESTIMATE ANALYSIS

PROJECT: EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
LOCATION: FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
BLDG. NO. 198	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL

SYS. NO. SEW	TASK DESCRIPTION	Quantity No. Of Units	Quantity Unit Meas	LABOR MH/ Unit	LABOR Total Hrs	LABOR Unit Price	LABOR Cost	EQUIPMENT Unit Price	EQUIPMENT Cost	MATERIAL Unit Price	MATERIAL Cost	TOTAL	SHIPPING Unit Wt	SHIPPING Total Wt
Digital Output	H/O/A & Control Relay		EA	3		26				77				
Analog Output														
Digital Input	Pressure Switch (Elec)		EA	2		26				52				
	Pressure Switch (Plum)		EA	2		24				51				
	Diff. Pressure Sw. (Filter)		EA	3		26				71				
	Level Switch	2	EA	4	7.8	26	$202			136	$272	$473		
	Status Relay		EA	2		26				41				
	Current Switch	1	EA	2	1.9	26	$49			111	$111	$160		
Analog Input	PSIG/PSID (Elec)	2	EA	3	6.3	26	$161			202	$404	$566		
	PSIG/PSID (Plum)	2	EA	2	4.3	24	$104			55	$109	$213		
	Flow (Elec)		EA	3		26				737				
	Flow (Plum)		EA	2		24				86				
	Tubidity		EA	4		26				415				
TOTAL THIS SHEET							$516				$896	$1,412		

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COST ESTIMATE

BUILDING 199

COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 199		ESTIMATOR KC	CHECKED BY CEL

SEWAGE SYS. NO. SEW		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	H/O/A & Control Relay		EA	3		26				77				
Analog Output														
Digital Input	Pressure Switch (Elec)		EA	2		26				52				
	Pressure Switch (Plum)		EA	2		24				51				
	Diff. Pressure Sw. (Filter)		EA	3		26				71				
	Level Switch	1	EA	4	3.9	26	$101			136	$136	$237		
	Status Relay		EA	2		26				41				
	Current Switch	1	EA	2	1.9	26	$49			111	$111	$160		
Analog Input	PSIG/PSID (Elec)		EA	3		26				202				
	PSIG/PSID (Plum)		EA	2		24				55				
	Flow (Elec)		EA	3		26				737				
	Flow (Plum)		EA	2		24				86				
TOTAL THIS SHEET							$150				$247	$397		

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COST ESTIMATE

BUILDING 320

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 25-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 320		ESTIMATOR KC	CHECKED BY CEL

SINGLE ZONE & VAV AHU SYS. NO. AHU-1 TASK DESCRIPTION		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	1	EA	3	3.1	26	$81			295	$295	$376		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Avg. Duct	1	EA	4	3.6	26	$93			190	$190	$283		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
TOTAL THIS SHEET							$944				$2,169	$3,113		

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COST ESTIMATE ANALYSIS

PROJECT: EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 25-Mar-93
LOCATION: FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
BLDG. NO. 320	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL

SINGLE ZONE & VAV AHU		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. AHU-2		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	1	EA	3	3.1	26	$81			295	$295	$376		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Avg. Duct	1	EA	4	3.6	26	$93			190	$190	$283		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
TOTAL THIS SHEET							$944				$2,169	$3,113		

COST ESTIMATE ANALYSIS

		INVITATION NO./CONTRACT NO. DACA41-92-C-0098		EFFECTIVE PRICING MARCH 1993	DATE PREPARED 16-Mar-93
PROJECT	EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C		DRAWING NO.	SHT OF
LOCATION	FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____			
BLDG. NO.	320			ESTIMATOR KC	CHECKED BY CEL

AIR COOLED DX COMPRESSOR		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. ACCU-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
Analog Input														
TOTAL THIS SHEET							$105				$85	$190		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 16-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 320		ESTIMATOR KC	CHECKED BY CEL

AIR COOLED DX COMPRESSOR		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. ACCU-2		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
Analog Input														
TOTAL THIS SHEET							$105				$85	$190		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 25-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 320		ESTIMATOR KC	CHECKED BY CEL

ELECTRIC DW HEATER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. DHW-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	H/O/A & Control Relay	1	EA	3	2.9	26	$75			77	$77	$152		
Analog Output														
Digital Input	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
Analog Input														
TOTAL THIS SHEET							$124				$118	$242		

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COST ESTIMATE

BUILDING 404

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 25-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 404		ESTIMATOR KC	CHECKED BY CEL

MULTIZONE AHU		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. AHU-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	6	EA	3	18.8	26	$483			295	$1,771	$2,255		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	5	EA	3	13.1	26	$338			174	$870	$1,208		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
	Temp. Avg. Duct	2	EA	4	7.3	26	$187			190	$380	$567		
	RH Space	1	EA	3	2.6	26	$68			240	$240	$307		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
TOTAL THIS SHEET							$1,711				$4,597	**$6,307**		

COST ESTIMATE ANALYSIS

PROJECT	EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 25-Mar-93
LOCATION	FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
BLDG. NO.	404	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL

AIR COOLED CHILLER SYS. NO. CH-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Pressure Switch (Elec)	1	EA	2	2.4	26	$62			52	$52	$114		
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
	Status Relay	2	EA	2	3.8	26	$98			41	$83	$181		
Analog Input	Temp. Water (Elec)	2	EA	3	6.3	26	$161			222	$444	$605		
	Temp. Water (Plum)	2	EA	2	4.3	24	$104			65	$130	$234		
TOTAL THIS SHEET							$528				$803	$1,331		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 25-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 404		ESTIMATOR KC	CHECKED BY CEL

HOT WATER BOILER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. BLR-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Electric)	1	EA	4	4.1	26	$106			295	$295	$402		
Digital Input	Pressure Switch (Elec)			2		26				52				
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
	Auxilary Contact	1	EA	2	1.9	26	$49			43	$43	$92		
	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
		1	EA											
Analog Input	Temp. Water (Elec)	2	EA	3	6.3	26	$161			222	$444	$605		
	Temp. Water (Plum)	2	EA	2	4.3	24	$104			65	$130	$234		
TOTAL THIS SHEET							$572				$1,048	$1,620		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 25-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 404		ESTIMATOR KC	CHECKED BY CEL

ELECTRIC DW HEATER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. DHW-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	H/O/A & Control Relay	1	EA	3	2.9	26	$75			77	$77	$152		
Analog Output														
Digital Input	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
Analog Input														
TOTAL THIS SHEET							$124				$118	$242		

COST ESTIMATE

BUILDING 498

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 25-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 498		ESTIMATOR KC	CHECKED BY CEL

MULTIZONE AHU		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. AHU-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	6	EA	3	18.8	26	$483			295	$1,771	$2,255		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	5	EA	3	13.1	26	$338			174	$870	$1,208		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
	Temp. Avg. Duct	2	EA	4	7.3	26	$187			190	$380	$567		
	RH Space	1	EA	3	2.6	26	$68			240	$240	$307		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
TOTAL THIS SHEET							$1,711				$4,597	**$6,307**		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 25-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 498		ESTIMATOR KC	CHECKED BY CEL

SINGLE ZONE & VAV AHU		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. AHU-2		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	6	EA	3	18.8	26	$483			295	$1,771	$2,255		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	2	EA	3	6.8	26	$176			71	$142	$318		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	5	EA	3	13.1	26	$338			174	$870	$1,208		
	Temp. Avg. Duct	2	EA	4	7.3	26	$187			190	$380	$567		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
	Temp. Duct	4	EA	3	12.5	26	$322			185	$739	$1,062		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
TOTAL THIS SHEET							$1,973				$4,989	$6,961		

COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 25-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 498		ESTIMATOR KC	CHECKED BY CEL

MULTIZONE AHU SYS. NO. AHU-3		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	6	EA	3	18.8	26	$483			295	$1,771	$2,255		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	5	EA	3	13.1	26	$338			174	$870	$1,208		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
	Temp. Avg. Duct	2	EA	4	7.3	26	$187			190	$380	$567		
	RH Space	1	EA	3	2.6	26	$68			240	$240	$307		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
TOTAL THIS SHEET							$1,711				$4,597	$6,307		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 25-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 498		ESTIMATOR KC	CHECKED BY CEL

AHU SYS. NO. AHU-4	TASK DESCRIPTION	Quantity No. Of Units	Quantity Unit Meas	LABOR MH/ Unit	LABOR Total Hrs	LABOR Unit Price	LABOR Cost	EQUIPMENT Unit Price	EQUIPMENT Cost	MATERIAL Unit Price	MATERIAL Cost	TOTAL	SHIPPING Unit Wt	SHIPPING Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$279				$462	$741		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 25-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 498		ESTIMATOR KC	CHECKED BY CEL

FAN COIL SYS. NO. FC-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	ACU (Fan Coil)	1	EA	4	3.6	26	$93			415	$415	$508		
Digital Input														
Analog Input	Temp. Space (RTD Only)	1	EA	3	2.6	26	$68			50	$50	$117		
TOTAL THIS SHEET							$217				$508	$725		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 25-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 498		ESTIMATOR KC	CHECKED BY CEL

FAN COIL SYS. NO. FC-2		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	ACU (Fan Coil)	1	EA	4	3.6	26	$93			415	$415	$508		
Digital Input														
Analog Input	Temp. Space (RTD Only)	1	EA	3	2.6	26	$68			50	$50	$117		
TOTAL THIS SHEET							$217				$508	$725		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 25-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 498		ESTIMATOR KC	CHECKED BY CEL

AIR COOLED DX COMPRESSOR		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. CH-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
Analog Input														
TOTAL THIS SHEET							$105				$85	$190		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 25-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 498		ESTIMATOR KC	CHECKED BY CEL

AIR COOLED DX COMPRESSOR		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. ACCU-2		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
Analog Input														
TOTAL THIS SHEET							$105				$85	$190		

COST ESTIMATE ANALYSIS

PROJECT	EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 25-Mar-93
LOCATION	FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
BLDG. NO.	498	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL

AIR COOLED DX COMPRESSOR		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO.	CH-3	No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK	DESCRIPTION	Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
Analog Input														
TOTAL THIS SHEET							$105				$85	$190		

COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 05-Apr-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 498		ESTIMATOR KC	CHECKED BY CEL

AIR COOLED DX COMPRESSOR SYS. NO. ACCU-4		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
Analog Input														
TOTAL THIS SHEET							$105				$85	$190		

COST ESTIMATE ANALYSIS

		INVITATION NO./CONTRACT NO. DACA41-92-C-0098		EFFECTIVE PRICING MARCH 1993	DATE PREPARED 25-Mar-93
PROJECT	EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C		DRAWING NO.	SHT OF
LOCATION	FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____			
BLDG. NO.	498			ESTIMATOR KC	CHECKED BY CEL

HOT WATER BOILER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO.	BLR-1	No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Electric)	1	EA	4	4.1	26	$106			295	$295	$402		
Digital Input	Pressure Switch (Elec)			2		26				52				
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
	Auxilary Contact	1	EA	2	1.9	26	$49			43	$43	$92		
	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
		1	EA											
Analog Input	Temp. Water (Elec)	2	EA	3	6.3	26	$161			222	$444	$605		
	Temp. Water (Plum)	2	EA	2	4.3	24	$104			65	$130	$234		
TOTAL THIS SHEET							$572				$1,048	**$1,620**		

COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 25-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 498		ESTIMATOR KC	CHECKED BY CEL

HOT WATER BOILER SYS. NO. BLR-2		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Electric)	1	EA	4	4.1	26	$106			295	$295	$402		
Digital Input	Pressure Switch (Elec)			2		26				52				
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
	Auxilary Contact	1	EA	2	1.9	26	$49			43	$43	$92		
	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
		1	EA											
Analog Input	Temp. Water (Elec)	2	EA	3	6.3	26	$161			222	$444	$605		
	Temp. Water (Plum)	2	EA	2	4.3	24	$104			65	$130	$234		
TOTAL THIS SHEET							$572				$1,048	$1,620		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 25-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 498		ESTIMATOR KC	CHECKED BY CEL

HOT WATER BOILER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. BLR-3		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Electric)	1	EA	4	4.1	26	$106			295	$295	$402		
Digital Input	Pressure Switch (Elec)			2		26				52				
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
	Auxilary Contact	1	EA	2	1.9	26	$49			43	$43	$92		
	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
		1	EA											
Analog Input	Temp. Water (Elec)	2	EA	3	6.3	26	$161			222	$444	$605		
	Temp. Water (Plum)	2	EA	2	4.3	24	$104			65	$130	$234		
TOTAL THIS SHEET							$572				$1,048	$1,620		

COST ESTIMATE

BUILDING 604

COST ESTIMATE ANALYSIS

PROJECT: EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO.: DACA41-92-C-0098	EFFECTIVE PRICING: MARCH 1993	DATE PREPARED: 25-Mar-93
LOCATION: FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
BLDG. NO. 604	[ ] OTHER _____	ESTIMATOR: KC	CHECKED BY: CEL

PUMP SYS. NO.	PUMP TASK DESCRIPTION	Quantity: No. Of Units	Quantity: Unit Meas	LABOR: MH/ Unit	LABOR: Total Hrs	LABOR: Unit Price	LABOR: Cost	EQUIPMENT: Unit Price	EQUIPMENT: Cost	MATERIAL: Unit Price	MATERIAL: Cost	TOTAL	SHIPPING: Unit Wt	SHIPPING: Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
Analog Input														
TOTAL THIS SHEET							$144				$114	$258		

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COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 604		ESTIMATOR KC	CHECKED BY CEL

WATER SYS. NO.	WATER TASK DESCRIPTION	Quantity No. Of Units	Quantity Unit Meas	LABOR MH/ Unit	LABOR Total Hrs	LABOR Unit Price	LABOR Cost	EQUIPMENT Unit Price	EQUIPMENT Cost	MATERIAL Unit Price	MATERIAL Cost	TOTAL	SHIPPING Unit Wt	SHIPPING Total Wt
Digital Output	H/O/A & Control Relay	1	EA	3	2.9	26	$75			77	$77	$152		
Analog Output														
Digital Input	Pressure Switch (Elec)	1	EA	2	2.4	26	$62			52	$52	$114		
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
	Diff. Pressure Sw. (Filter)	4	EA	3	13.6	26	$352			71	$284	$636		
	Level Switch		EA	4		26				136				
	Status Relay		EA	2		26				41				
	Current Switch		EA	2		26				111				
Analog Input	PSIG/PSID (Elec)		EA	3		26				202				
	PSIG/PSID (Plum)		EA	2		24				55				
	Flow (Elec)		EA	3		26				737				
	Flow (Plum)		EA	2		24				86				
	Tubidity		EA	4		26				415				
TOTAL THIS SHEET							$535				$463	$999		

COST ESTIMATE

BUILDING 625
AND TYPICAL FOR
658 & 825

COST ESTIMATE ANALYSIS

PROJECT: EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 25-Mar-93
LOCATION: FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
BLDG. NO. 625	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL

MULTIZONE AHU		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. AHU-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	6	EA	3	18.8	26	$483			295	$1,771	$2,255		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	5	EA	3	13.1	26	$338			174	$870	$1,208		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
	Temp. Avg. Duct	2	EA	4	7.3	26	$187			190	$380	$567		
	RH Space	1	EA	3	2.6	26	$68			240	$240	$307		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
TOTAL THIS SHEET							$1,711				$4,597	$6,307		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 25-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 625		ESTIMATOR KC	CHECKED BY CEL

PERIMETER RADIATION		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. RAD-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK	DESCRIPTION	Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output														
Analog Output	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
	ACU (Fan Coil)	1	EA	4	3.6	26	$93			415	$415	$508		
Digital Input														
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$309				$1,058	$1,367		

COST ESTIMATE ANALYSIS

PROJECT	EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 25-Mar-93
LOCATION	FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
BLDG. NO.	625	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL

STEAM HW CONVERTER SYS. NO. CV-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Electric)	1	EA	4	4.1	26	$106			295	$295	$402		
Digital Input	Pressure Switch (Elec)	1	EA	2	2.4	26	$62			52	$52	$114		
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
Analog Input	Temp. Water (Elec)	1	EA	3	3.1	26	$81			222	$222	$303		
	Temp. Water (Plum)	1	EA	2	2.1	24	$52			65	$65	$117		
TOTAL THIS SHEET							$403				$728	**$1,132**		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 25-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 625		ESTIMATOR KC	CHECKED BY CEL

AIR COOLED DX COMPRESSOR		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. CH-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
Analog Input														
TOTAL THIS SHEET							$105				$85	$190		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 25-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 625		ESTIMATOR KC	CHECKED BY CEL

ELECTRIC DW HEATER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. DHW-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	H/O/A & Control Relay	1	EA	3	2.9	26	$75			77	$77	$152		
Analog Output														
Digital Input	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
Analog Input														
TOTAL THIS SHEET							$124				$118	$242		

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COST ESTIMATE

BUILDING 627
AND TYPICAL FOR
628, 629, 634, 635, 651
652, 654, 659, AND 660

COST ESTIMATE ANALYSIS

PROJECT	EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 25-Mar-93
LOCATION	FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
BLDG. NO.	627	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL

SINGLE ZONE & VAV AHU SYS. NO. VAV-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	1	EA	3	3.1	26	$81			295	$295	$376		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Avg. Duct	1	EA	4	3.6	26	$93			190	$190	$283		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
TOTAL THIS SHEET							$944				$2,169	$3,113		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 25-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 627		ESTIMATOR KC	CHECKED BY CEL

SINGLE ZONE & VAV AHU		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. VAV-2		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	1	EA	3	3.1	26	$81			295	$295	$376		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Avg. Duct	1	EA	4	3.6	26	$93			190	$190	$283		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
TOTAL THIS SHEET							$944				$2,169	$3,113		

COST ESTIMATE ANALYSIS

PROJECT: EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 25-Mar-93
LOCATION: FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
BLDG. NO. 627	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL

STEAM HW CONVERTER SYS. NO. CV-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Electric)	1	EA	4	4.1	26	$106			295	$295	$402		
Digital Input	Pressure Switch (Elec)	1	EA	2	2.4	26	$62			52	$52	$114		
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
Analog Input	Temp. Water (Elec)	1	EA	3	3.1	26	$81			222	$222	$303		
	Temp. Water (Plum)	1	EA	2	2.1	24	$52			65	$65	$117		
TOTAL THIS SHEET							$403				$728	$1,132		

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COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 25-Mar-93
PROJECT EMCS FEASIBILITY STUDY	CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	OTHER _____		
BLDG. NO. 627		ESTIMATOR KC	CHECKED BY CEL

STEAM HW CONVERTER
SYS. NO. CV-2

TASK DESCRIPTION		Quantity No. Of Units	Quantity Unit Meas	LABOR MH/ Unit	LABOR Total Hrs	LABOR Unit Price	LABOR Cost	EQUIPMENT Unit Price	EQUIPMENT Cost	MATERIAL Unit Price	MATERIAL Cost	TOTAL	SHIPPING Unit Wt	SHIPPING Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Electric)	1	EA	4	4.1	26	$106			295	$295	$402		
Digital Input	Pressure Switch (Elec)	1	EA	2	2.4	26	$62			52	$52	$114		
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
Analog Input	Temp. Water (Elec)	1	EA	3	3.1	26	$81			222	$222	$303		
	Temp. Water (Plum)	1	EA	2	2.1	24	$52			65	$65	$117		
TOTAL THIS SHEET							$403				$728	$1,132		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 05-Apr-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 627		ESTIMATOR KC	CHECKED BY CEL

STEAM HW CONVERTER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. CV-3		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Electric)	1	EA	4	4.1	26	$106			295	$295	$402		
Digital Input	Pressure Switch (Elec)	1	EA	2	2.4	26	$62			52	$52	$114		
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
Analog Input	Temp. Water (Elec)	1	EA	3	3.1	26	$81			222	$222	$303		
	Temp. Water (Plum)	1	EA	2	2.1	24	$52			65	$65	$117		
TOTAL THIS SHEET							$403				$728	**$1,132**		

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PAGE

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 25-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 627		ESTIMATOR KC	CHECKED BY CEL

DUAL TEMP WATER PUMP		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. CWP-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Pressure Switch (Elec)	1	EA	2	2.4	26	$62			52	$52	$114		
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Water (Elec)	2	EA	3	6.3	26	$161			222	$444	$605		
	Temp. Water (Plum)	2	EA	2	4.3	24	$104			65	$130	$234		
TOTAL THIS SHEET							$565				$1,068	$1,633		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 25-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL
BLDG. NO. 627			

PERIMETER RADIATION SYS. NO. RAD-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output														
Analog Output	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
	ACU (Fan Coil)	1	EA	4	3.6	26	$93			415	$415	$508		
Digital Input														
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$309				$1,058	$1,367		

DA FORM 5418-R, APR 85

COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 25-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 627		ESTIMATOR KC	CHECKED BY CEL

PERIMETER RADIATION SYS. NO. RAD-2		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output														
Analog Output	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
	ACU (Fan Coil)	1	EA	4	3.6	26	$93			415	$415	$508		
Digital Input														
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$309				$1,058	$1,367		

COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 25-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 627		ESTIMATOR KC	CHECKED BY CEL

PERIMETER RADIATION SYS. NO. RAD-3		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output														
Analog Output	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
	ACU (Fan Coil)	1	EA	4	3.6	26	$93			415	$415	$508		
Digital Input														
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$309				$1,058	$1,367		

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COST ESTIMATE

BUILDING 630
AND TYPICAL FOR
653, 657, 820, 836, 1027

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 25-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 630Z1		ESTIMATOR KC	CHECKED BY CEL

AHU SYS. NO. HV-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$360				$757	**$1,117**		

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COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098		EFFECTIVE PRICING MARCH 1993	DATE PREPARED 25-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 630Z1		ESTIMATOR KC	CHECKED BY CEL

AHU / SYS. NO. HV-2	TASK DESCRIPTION	Quantity No. Of Units	Quantity Unit Meas	LABOR MH/ Unit	LABOR Total Hrs	LABOR Unit Price	LABOR Cost	EQUIPMENT Unit Price	EQUIPMENT Cost	MATERIAL Unit Price	MATERIAL Cost	TOTAL	SHIPPING Unit Wt	SHIPPING Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$360				$757	$1,117		

COST ESTIMATE ANALYSIS

PROJECT	EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 25-Mar-93
LOCATION	FT. LEONARD WOOD, MISSOURI	☐ CODE A ☒ CODE B ☐ CODE C	DRAWING NO.	SHT OF
BLDG. NO.	630Z1	☐ OTHER _____	ESTIMATOR KC	CHECKED BY CEL

DUAL TEMP WATER PUMP		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO.	DTW PUMP	No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Pressure Switch (Elec)	1	EA	2	2.4	26	$62			52	$52	$114		
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Water (Elec)	2	EA	3	6.3	26	$161			222	$444	$605		
	Temp. Water (Plum)	2	EA	2	4.3	24	$104			65	$130	$234		
TOTAL THIS SHEET							$565				$1,068	**$1,633**		

COST ESTIMATE ANALYSIS

		INVITATION NO./CONTRACT NO. DACA41-92-C-0098		EFFECTIVE PRICING MARCH 1993	DATE PREPARED 25-Mar-93
PROJECT	EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C		DRAWING NO.	SHT OF
LOCATION	FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____			
BLDG. NO.	630Z1			ESTIMATOR KC	CHECKED BY CEL

STEAM HW CONVERTER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. CV-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Electric)	1	EA	4	4.1	26	$106			295	$295	$402		
Digital Input	Pressure Switch (Elec)	1	EA	2	2.4	26	$62			52	$52	$114		
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
Analog Input	Temp. Water (Elec)	1	EA	3	3.1	26	$81			222	$222	$303		
	Temp. Water (Plum)	1	EA	2	2.1	24	$52			65	$65	$117		
TOTAL THIS SHEET							$403				$728	$1,132		

COST ESTIMATE ANALYSIS

PROJECT: EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO.: DACA41-92-C-0098	EFFECTIVE PRICING: MARCH 1993	DATE PREPARED: 25-Mar-93
LOCATION: FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
BLDG. NO.: 630Z2	[ ] OTHER _____	ESTIMATOR: KC	CHECKED BY: CEL

SINGLE ZONE & VAV AHU		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. AHU-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	1	EA	3	3.1	26	$81			295	$295	$376		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Avg. Duct	1	EA	4	3.6	26	$93			190	$190	$283		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
TOTAL THIS SHEET							$944				$2,169	$3,113		

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COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 25-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 630Z2		ESTIMATOR KC	CHECKED BY CEL

SINGLE ZONE & VAV AHU		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. AHU-2		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	1	EA	3	3.1	26	$81			295	$295	$376		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Avg. Duct	1	EA	4	3.6	26	$93			190	$190	$283		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
TOTAL THIS SHEET							$944				$2,169	$3,113		

COST ESTIMATE

BUILDINGS 636 & 741

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 25-Mar-93
PROJECT EMCS FEASIBILITY STUDY	☐ CODE A ☒ CODE B ☐ CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	☐ OTHER _____		
BLDG. NO. 636		ESTIMATOR KC	CHECKED BY CEL

FAN COIL SYS. NO. FC-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	ACU (Fan Coil)	1	EA	4	3.6	26	$93			415	$415	$508		
Digital Input														
Analog Input	Temp. Space (RTD Only)	1	EA	3	2.6	26	$68			50	$50	$117		
TOTAL THIS SHEET							$217				$508	$725		

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COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 25-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 636		ESTIMATOR KC	CHECKED BY CEL

AIR COOLED CHILLER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. CH-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Pressure Switch (Elec)	1	EA	2	2.4	26	$62			52	$52	$114		
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
	Status Relay	2	EA	2	3.8	26	$98			41	$83	$181		
Analog Input	Temp. Water (Elec)	2	EA	3	6.3	26	$161			222	$444	$605		
	Temp. Water (Plum)	2	EA	2	4.3	24	$104			65	$130	$234		
TOTAL THIS SHEET							$528				$803	$1,331		

COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 25-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER		
BLDG. NO. 636		ESTIMATOR KC	CHECKED BY CEL

STEAM HW CONVERTER SYS. NO. CV-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Electric)	1	EA	4	4.1	26	$106			295	$295	$402		
Digital Input	Pressure Switch (Elec)	1	EA	2	2.4	26	$62			52	$52	$114		
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
Analog Input	Temp. Water (Elec)	1	EA	3	3.1	26	$81			222	$222	$303		
	Temp. Water (Plum)	1	EA	2	2.1	24	$52			65	$65	$117		
TOTAL THIS SHEET							$403				$728	$1,132		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 25-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 636		ESTIMATOR KC	CHECKED BY CEL

UNIT HEATER SYS. NO. UH-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Auxilary Contact	1	EA	2	1.9	26	$49			43	$43	$92		
Analog Input	Temp. Space	1	EA	3	2.6	26	$68			174	$174	$242		
TOTAL THIS SHEET							$173				$260	$433		

COST ESTIMATE

BUILDING 637

COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 637		ESTIMATOR KC	CHECKED BY CEL

SINGLE ZONE & VAV AHU		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO.	AHU-1	No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	1	EA	3	3.1	26	$81			295	$295	$376		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Avg. Duct	1	EA	4	3.6	26	$93			190	$190	$283		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
TOTAL THIS SHEET							$944				$2,169	**$3,113**		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 637		ESTIMATOR KC	CHECKED BY CEL

AIR COOLED DX COMPRESSOR		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. DX-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
Analog Input														
TOTAL THIS SHEET							$105				$85	$190		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 637		ESTIMATOR KC	CHECKED BY CEL

STEAM HW CONVERTER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. CV-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Electric)	1	EA	4	4.1	26	$106			295	$295	$402		
Digital Input	Pressure Switch (Elec)	1	EA	2	2.4	26	$62			52	$52	$114		
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
Analog Input	Temp. Water (Elec)	1	EA	3	3.1	26	$81			222	$222	$303		
	Temp. Water (Plum)	1	EA	2	2.1	24	$52			65	$65	$117		
TOTAL THIS SHEET							$403				$728	$1,132		

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COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 637		ESTIMATOR KC	CHECKED BY CEL

STEAM HW CONVERTER SYS. NO. CV-2		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Electric)	1	EA	4	4.1	26	$106			295	$295	$402		
Digital Input	Pressure Switch (Elec)	1	EA	2	2.4	26	$62			52	$52	$114		
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
Analog Input	Temp. Water (Elec)	1	EA	3	3.1	26	$81			222	$222	$303		
	Temp. Water (Plum)	1	EA	2	2.1	24	$52			65	$65	$117		
TOTAL THIS SHEET							$403				$728	$1,132		

COST ESTIMATE ANALYSIS

PROJECT	EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
LOCATION	FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
BLDG. NO.	637	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL

FAN COIL SYS. NO. FC-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	ACU (Fan Coil)	1	EA	4	3.6	26	$93			415	$415	$508		
Digital Input														
Analog Input	Temp. Space (RTD Only)	1	EA	3	2.6	26	$68			50	$50	$117		
TOTAL THIS SHEET							$217				$508	$725		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 637		ESTIMATOR KC	CHECKED BY CEL

AIR COOLED CHILLER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. CH-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Pressure Switch (Elec)	1	EA	2	2.4	26	$62			52	$52	$114		
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
	Status Relay	2	EA	2	3.8	26	$98			41	$83	$181		
Analog Input	Temp. Water (Elec)	2	EA	3	6.3	26	$161			222	$444	$605		
	Temp. Water (Plum)	2	EA	2	4.3	24	$104			65	$130	$234		
TOTAL THIS SHEET							$528				$803	$1,331		

COST ESTIMATE

BUILDING 638
AND TYPICAL FOR
832 & 1018

COST ESTIMATE ANALYSIS

PROJECT: EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO.: DACA41-92-C-0098	EFFECTIVE PRICING: MARCH 1993	DATE PREPARED: 26-Mar-93
LOCATION: FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
BLDG. NO. 638	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL

MULTIZONE AHU		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. AHU-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK	DESCRIPTION	Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	6	EA	3	18.8	26	$483			295	$1,771	$2,255		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	5	EA	3	13.1	26	$338			174	$870	$1,208		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
	Temp. Avg. Duct	2	EA	4	7.3	26	$187			190	$380	$567		
	RH Space	1	EA	3	2.6	26	$68			240	$240	$307		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
TOTAL THIS SHEET							$1,711				$4,597	**$6,307**		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 638		ESTIMATOR KC	CHECKED BY CEL

AIR COOLED DX COMPRESSOR		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. DX-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
Analog Input														
TOTAL THIS SHEET							$105				$85	$190		

COST ESTIMATE

BUILDING 639

COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098		EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 639		ESTIMATOR KC	CHECKED BY CEL

MULTIZONE AHU		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. AHU-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK	DESCRIPTION	Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	6	EA	3	18.8	26	$483			295	$1,771	$2,255		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	5	EA	3	13.1	26	$338			174	$870	$1,208		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
	Temp. Avg. Duct	2	EA	4	7.3	26	$187			190	$380	$567		
	RH Space	1	EA	3	2.6	26	$68			240	$240	$307		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
TOTAL THIS SHEET							$1,711				$4,597	**$6,307**		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 639		ESTIMATOR KC	CHECKED BY CEL

AIR COOLED DX COMPRESSOR SYS. NO. DX-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
Analog Input														
TOTAL THIS SHEET							$105				$85	$190		

COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 639		ESTIMATOR KC	CHECKED BY CEL

AHU SYS. NO. FC-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$360				$757	**$1,117**		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 639		ESTIMATOR KC	CHECKED BY CEL

AIR COOLED DX COMPRESSOR		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. DX-2		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
Analog Input														
TOTAL THIS SHEET							$105				$85	$190		

COST ESTIMATE ANALYSIS

		INVITATION NO./CONTRACT NO. DACA41-92-C-0098		EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT	EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C		DRAWING NO.	SHT OF
LOCATION	FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____			
BLDG. NO.	639			ESTIMATOR KC	CHECKED BY CEL

AIR COOLED DX COMPRESSOR SYS. NO. DX-3		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
Analog Input														
TOTAL THIS SHEET							$105				$85	$190		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 639		ESTIMATOR KC	CHECKED BY CEL

ELECTRIC DW HEATER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. DHW-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	H/O/A & Control Relay	1	EA	3	2.9	26	$75			77	$77	$152		
Analog Output														
Digital Input	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
Analog Input														
TOTAL THIS SHEET							$124				$118	$242		

COST ESTIMATE

BUILDING 650
AND TYPICAL FOR
732, 740, 750, 753,
822, 838, 842, 1022, & 1023

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 650		ESTIMATOR KC	CHECKED BY CEL

MULTIZONE AHU		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. AHU-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	6	EA	3	18.8	26	$483			295	$1,771	$2,255		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	5	EA	3	13.1	26	$338			174	$870	$1,208		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
	Temp. Avg. Duct	2	EA	4	7.3	26	$187			190	$380	$567		
	RH Space	1	EA	3	2.6	26	$68			240	$240	$307		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
TOTAL THIS SHEET							$1,711				$4,597	**$6,307**		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 650		ESTIMATOR KC	CHECKED BY CEL

PERIMETER RADIATION SYS. NO. RAD-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output														
Analog Output	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
	ACU (Fan Coil)	1	EA	4	3.6	26	$93			415	$415	$508		
Digital Input														
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$309				$1,058	$1,367		

COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 650		ESTIMATOR KC	CHECKED BY CEL

STEAM HW CONVERTER SYS. NO. CV-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK	DESCRIPTION	No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Electric)	1	EA	4	4.1	26	$106			295	$295	$402		
Digital Input	Pressure Switch (Elec)	1	EA	2	2.4	26	$62			52	$52	$114		
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
Analog Input	Temp. Water (Elec)	1	EA	3	3.1	26	$81			222	$222	$303		
	Temp. Water (Plum)	1	EA	2	2.1	24	$52			65	$65	$117		
TOTAL THIS SHEET							$403				$728	**$1,132**		

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COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 650		ESTIMATOR KC	CHECKED BY CEL

AIR COOLED CHILLER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. CH-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Pressure Switch (Elec)	1	EA	2	2.4	26	$62			52	$52	$114		
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
	Status Relay	2	EA	2	3.8	26	$98			41	$83	$181		
Analog Input	Temp. Water (Elec)	2	EA	3	6.3	26	$161			222	$444	$605		
	Temp. Water (Plum)	2	EA	2	4.3	24	$104			65	$130	$234		
TOTAL THIS SHEET							$528				$803	$1,331		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 650		ESTIMATOR KC	CHECKED BY CEL

ELECTRIC DW HEATER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. DHW-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	H/O/A & Control Relay	1	EA	3	2.9	26	$75			77	$77	$152		
Analog Output														
Digital Input	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
Analog Input														
TOTAL THIS SHEET							$124				$118	$242		

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COST ESTIMATE

BUILDING 655
AND TYPICAL FOR
626, 633, 656, 733, 734,
751, 752, 823, 824, 840, AND 841

COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 655		ESTIMATOR KC	CHECKED BY CEL

STEAM HW CONVERTER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. CV-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Electric)	1	EA	4	4.1	26	$106			295	$295	$402		
Digital Input	Pressure Switch (Elec)	1	EA	2	2.4	26	$62			52	$52	$114		
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
Analog Input	Temp. Water (Elec)	1	EA	3	3.1	26	$81			222	$222	$303		
	Temp. Water (Plum)	1	EA	2	2.1	24	$52			65	$65	$117		
TOTAL THIS SHEET							$403				$728	$1,132		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	☐ CODE A ☒ CODE B ☐ CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	☐ OTHER _____		
BLDG. NO. 655		ESTIMATOR KC	CHECKED BY CEL

PERIMETER RADIATION		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. RD-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output														
Analog Output	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
	ACU (Fan Coil)	1	EA	4	3.6	26	$93			415	$415	$508		
Digital Input														
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$309				$1,058	$1,367		

COST ESTIMATE ANALYSIS

		INVITATION NO./CONTRACT NO. DACA41-92-C-0098		EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT	EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C		DRAWING NO.	SHT OF
LOCATION	FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____			
BLDG. NO.	655			ESTIMATOR KC	CHECKED BY CEL

ELECTRIC DW HEATER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. DHW-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	H/O/A & Control Relay	1	EA	3	2.9	26	$75			77	$77	$152		
Digital Input	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
TOTAL THIS SHEET							$124				$118	$242		

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PAGE

COST ESTIMATE

BUILDING 673
AND TYPICAL FOR
672, 680, 681, 772, 773,
780, 781, 872, 873, 880,
881, 990, 991, 998, AND 999

COST ESTIMATE ANALYSIS

		INVITATION NO./CONTRACT NO. DACA41-92-C-0098		EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT	EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C		DRAWING NO.	SHT OF
LOCATION	FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____			
BLDG. NO.	673			ESTIMATOR KC	CHECKED BY CEL

UNIT HEATER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO.	UH-1	No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK	DESCRIPTION	Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Auxilary Contact	1	EA	2	1.9	26	$49			43	$43	$92		
Analog Input	Temp. Space	1	EA	3	2.6	26	$68			174	$174	$242		
TOTAL THIS SHEET							$173				$260	$433		

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PAGE

COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 673		ESTIMATOR KC	CHECKED BY CEL

UNIT HEATER SYS. NO. UH-2		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Auxilary Contact	1	EA	2	1.9	26	$49			43	$43	$92		
Analog Input	Temp. Space	1	EA	3	2.6	26	$68			174	$174	$242		
TOTAL THIS SHEET							$173				$260	$433		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 673		ESTIMATOR KC	CHECKED BY CEL

ELECTRIC DW HEATER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. DHW-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	H/O/A & Control Relay	1	EA	3	2.9	26	$75			77	$77	$152		
Analog Output														
Digital Input	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
Analog Input														
TOTAL THIS SHEET							$124				$118	**$242**		

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PAGE

COST ESTIMATE

BUILDING 730
AND TYPICAL FOR
731, 736, 737, AND 738

COST ESTIMATE ANALYSIS

PROJECT: EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO.: DACA41-92-C-0098	EFFECTIVE PRICING: MARCH 1993	DATE PREPARED: 26-Mar-93
LOCATION: FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
BLDG. NO.: 730	[ ] OTHER _____	ESTIMATOR: KC	CHECKED BY: CEL

PERIMETER RADIATION		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. RAD-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output														
Analog Output	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
	ACU (Fan Coil)	1	EA	4	3.6	26	$93			415	$415	$508		
Digital Input														
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$309				$1,058	$1,367		

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COST ESTIMATE ANALYSIS

		INVITATION NO./CONTRACT NO. DACA41-92-C-0098		EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT	EMCS FEASIBILITY STUDY	☐ CODE A ☒ X CODE B ☐ CODE C		DRAWING NO.	SHT OF
LOCATION	FT. LEONARD WOOD, MISSOURI	☐ OTHER			
BLDG. NO.	730			ESTIMATOR KC	CHECKED BY CEL

PERIMETER RADIATION SYS. NO. RAD-2		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output														
Analog Output	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
	ACU (Fan Coil)	1	EA	4	3.6	26	$93			415	$415	$508		
Digital Input														
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$309				$1,058	$1,367		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 730		ESTIMATOR KC	CHECKED BY CEL

STEAM HW CONVERTER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. CV-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Electric)	1	EA	4	4.1	26	$106			295	$295	$402		
Digital Input	Pressure Switch (Elec)	1	EA	2	2.4	26	$62			52	$52	$114		
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
Analog Input	Temp. Water (Elec)	1	EA	3	3.1	26	$81			222	$222	$303		
	Temp. Water (Plum)	1	EA	2	2.1	24	$52			65	$65	$117		
TOTAL THIS SHEET							$403				$728	$1,132		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 730		ESTIMATOR KC	CHECKED BY CEL

STEAM HW CONVERTER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. CV-2		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Electric)	1	EA	4	4.1	26	$106			295	$295	$402		
Digital Input	Pressure Switch (Elec)	1	EA	2	2.4	26	$62			52	$52	$114		
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
Analog Input	Temp. Water (Elec)	1	EA	3	3.1	26	$81			222	$222	$303		
	Temp. Water (Plum)	1	EA	2	2.1	24	$52			65	$65	$117		
TOTAL THIS SHEET							$403				$728	$1,132		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER		
BLDG. NO. 730		ESTIMATOR KC	CHECKED BY CEL

VENTIALTION FAN		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. EX-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
Analog Input														
TOTAL THIS SHEET							$144				$114	$258		

COST ESTIMATE ANALYSIS

PROJECT	EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
LOCATION	FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
BLDG. NO.	730	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL

VENTIALTION FAN SYS. NO. EX-2		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
Analog Input														
TOTAL THIS SHEET							$144				$114	$258		

COST ESTIMATE

BUILDINGS 735 & 739
SAME AS BUILDING 630,
WITH 3 ADDITIONAL H&Vs

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 25-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 735		ESTIMATOR KC	CHECKED BY CEL

AHU SYS. NO. HV-3		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK	DESCRIPTION	No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$360				$757	$1,117		

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COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 25-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 735		ESTIMATOR KC	CHECKED BY CEL

AHU SYS. NO. HV-4		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$360				$757	$1,117		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 25-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 735		ESTIMATOR KC	CHECKED BY CEL

AHU / SYS. NO. HV-5	TASK DESCRIPTION	Quantity No. Of Units	Quantity Unit Meas	LABOR MH/ Unit	LABOR Total Hrs	LABOR Unit Price	LABOR Cost	EQUIPMENT Unit Price	EQUIPMENT Cost	MATERIAL Unit Price	MATERIAL Cost	TOTAL	SHIPPING Unit Wt	SHIPPING Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$360				$757	$1,117		

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COST ESTIMATE

BUILDING 768

COST ESTIMATE ANALYSIS

		INVITATION NO./CONTRACT NO. DACA41-92-C-0098		EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT	EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C		DRAWING NO.	SHT OF
LOCATION	FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____			
BLDG. NO.	768			ESTIMATOR KC	CHECKED BY CEL

SINGLE ZONE & VAV AHU		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO.	AHU-1	No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	1	EA	3	3.1	26	$81			295	$295	$376		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Avg. Duct	1	EA	4	3.6	26	$93			190	$190	$283		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
TOTAL THIS SHEET							$944				$2,169	$3,113		

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COST ESTIMATE ANALYSIS

PROJECT	EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
LOCATION	FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
BLDG. NO.	768	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL

SINGLE ZONE & VAV AHU		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. AHU-2		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	1	EA	3	3.1	26	$81			295	$295	$376		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Avg. Duct	1	EA	4	3.6	26	$93			190	$190	$283		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
TOTAL THIS SHEET							$944				$2,169	$3,113		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 768		ESTIMATOR KC	CHECKED BY CEL

SINGLE ZONE & VAV AHU		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. AHU-3		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	1	EA	3	3.1	26	$81			295	$295	$376		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Avg. Duct	1	EA	4	3.6	26	$93			190	$190	$283		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
TOTAL THIS SHEET							$944				$2,169	$3,113		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 768		ESTIMATOR KC	CHECKED BY CEL

SINGLE ZONE & VAV AHU SYS. NO. AHU-4 TASK DESCRIPTION		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	1	EA	3	3.1	26	$81			295	$295	$376		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Avg. Duct	1	EA	4	3.6	26	$93			190	$190	$283		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
TOTAL THIS SHEET							$944				$2,169	**$3,113**		

COST ESTIMATE ANALYSIS

PROJECT: EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
LOCATION: FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
BLDG. NO. 768	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL

AIR COOLED DX COMPRESSOR SYS. NO. ACCU-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
Analog Input														
TOTAL THIS SHEET							$105				$85	$190		

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COST ESTIMATE ANALYSIS

PROJECT: EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
LOCATION: FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
BLDG. NO. 768	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL

AIR COOLED DX COMPRESSOR SYS. NO. ACCU-2		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
Analog Input														
TOTAL THIS SHEET							$105				$85	$190		

COST ESTIMATE ANALYSIS

PROJECT: EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
LOCATION: FT. LEONARD WOOD, MISSOURI	☐ CODE A ☒ CODE B ☐ CODE C	DRAWING NO.	SHT OF
BLDG. NO. 768	☐ OTHER _____	ESTIMATOR KC	CHECKED BY CEL

AIR COOLED DX COMPRESSOR SYS. NO. ACCU-3		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
Analog Input														
TOTAL THIS SHEET							$105				$85	$190		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	☐ CODE A ☒ CODE B ☐ CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	☐ OTHER _____		
BLDG. NO. 768		ESTIMATOR KC	CHECKED BY CEL

AIR COOLED DX COMPRESSOR SYS. NO. ACCU-4		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
Analog Input														
TOTAL THIS SHEET							$105				$85	$190		

COST ESTIMATE ANALYSIS

PROJECT: EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO.: DACA41-92-C-0098	EFFECTIVE PRICING: MARCH 1993	DATE PREPARED: 26-Mar-93
LOCATION: FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
BLDG. NO.: 768	[ ] OTHER _____	ESTIMATOR: KC	CHECKED BY: CEL

HOT WATER BOILER SYS. NO. BLR-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Electric)	1	EA	4	4.1	26	$106			295	$295	$402		
Digital Input	Pressure Switch (Elec)			2		26				52				
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
	Auxilary Contact	1	EA	2	1.9	26	$49			43	$43	$92		
	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
		1	EA											
Analog Input	Temp. Water (Elec)	2	EA	3	6.3	26	$161			222	$444	$605		
	Temp. Water (Plum)	2	EA	2	4.3	24	$104			65	$130	$234		
TOTAL THIS SHEET							$572				$1,048	$1,620		

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COST ESTIMATE ANALYSIS

PROJECT: EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
LOCATION: FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
BLDG. NO. 768	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL

ELECTRIC DW HEATER
SYS. NO. DHW-1

TASK DESCRIPTION		Quantity No. Of Units	Quantity Unit Meas	LABOR MH/ Unit	LABOR Total Hrs	LABOR Unit Price	LABOR Cost	EQUIPMENT Unit Price	EQUIPMENT Cost	MATERIAL Unit Price	MATERIAL Cost	TOTAL	SHIPPING Unit Wt	SHIPPING Total Wt
Digital Output	H/O/A & Control Relay	1	EA	3	2.9	26	$75			77	$77	$152		
Analog Output														
Digital Input	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
Analog Input														
TOTAL THIS SHEET							$124				$118	$242		

COST ESTIMATE

BUILDING 802

COST ESTIMATE ANALYSIS

		INVITATION NO./CONTRACT NO. DACA41-92-C-0098		EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT	EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C		DRAWING NO.	SHT OF
LOCATION	FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____			
BLDG. NO.	802			ESTIMATOR KC	CHECKED BY CEL

AHU SYS. NO. ACU-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$360				$757	**$1,117**		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 802		ESTIMATOR KC	CHECKED BY CEL

AHU SYS. NO. ACU-2		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$360				$757	**$1,117**		

COST ESTIMATE ANALYSIS

		INVITATION NO./CONTRACT NO. DACA41-92-C-0098		EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT	EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C		DRAWING NO.	SHT OF
LOCATION	FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____			
BLDG. NO.	802			ESTIMATOR KC	CHECKED BY CEL

AIR COOLED DX COMPRESSOR		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. DX-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
Analog Input														
TOTAL THIS SHEET							$105				$85	**$190**		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 802		ESTIMATOR KC	CHECKED BY CEL

AIR COOLED DX COMPRESSOR		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. DX-2		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
Analog Input														
TOTAL THIS SHEET							$105				$85	$190		

COST ESTIMATE

BUILDING 819
AND TYPICAL FOR
815 THRU 818, AND 827 THRU 831

COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	☐ CODE A ☒ CODE B ☐ CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	☐ OTHER _____		
BLDG. NO. 819		ESTIMATOR KC	CHECKED BY CEL

STEAM HW CONVERTER SYS. NO. CV-1 TASK DESCRIPTION		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Electric)	1	EA	4	4.1	26	$106			295	$295	$402		
Digital Input	Pressure Switch (Elec)	1	EA	2	2.4	26	$62			52	$52	$114		
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
Analog Input	Temp. Water (Elec)	1	EA	3	3.1	26	$81			222	$222	$303		
	Temp. Water (Plum)	1	EA	2	2.1	24	$52			65	$65	$117		
TOTAL THIS SHEET							$403				$728	$1,132		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	☐ CODE A ☒ CODE B ☐ CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	☐ OTHER _____		
BLDG. NO. 819		ESTIMATOR KC	CHECKED BY CEL

STEAM HW CONVERTER SYS. NO. CV-2		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Electric)	1	EA	4	4.1	26	$106			295	$295	$402		
Digital Input	Pressure Switch (Elec)	1	EA	2	2.4	26	$62			52	$52	$114		
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
Analog Input	Temp. Water (Elec)	1	EA	3	3.1	26	$81			222	$222	$303		
	Temp. Water (Plum)	1	EA	2	2.1	24	$52			65	$65	$117		
TOTAL THIS SHEET							$403				$728	$1,132		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	☐ CODE A ☒ CODE B ☐ CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	☐ OTHER _____		
BLDG. NO. 819		ESTIMATOR KC	CHECKED BY CEL

STEAM HW CONVERTER SYS. NO. CV-3		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Electric)	1	EA	4	4.1	26	$106			295	$295	$402		
Digital Input	Pressure Switch (Elec)	1	EA	2	2.4	26	$62			52	$52	$114		
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
Analog Input	Temp. Water (Elec)	1	EA	3	3.1	26	$81			222	$222	$303		
	Temp. Water (Plum)	1	EA	2	2.1	24	$52			65	$65	$117		
TOTAL THIS SHEET							$403				$728	$1,132		

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COST ESTIMATE ANALYSIS

PROJECT EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
BLDG. NO. 819	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL

VENTIALTION FAN SYS. NO. EF-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
Analog Input														
TOTAL THIS SHEET							$144				$114	$258		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 819		ESTIMATOR KC	CHECKED BY CEL

VENTIALTION FAN SYS. NO. EF-2		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
Analog Input														
TOTAL THIS SHEET							$144				$114	$258		

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COST ESTIMATE

BUILDING 826

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL
BLDG. NO. 826			

AHU SYS. NO. HV-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$360				$757	**$1,117**		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER		
BLDG. NO. 826		ESTIMATOR KC	CHECKED BY CEL

AHU SYS. NO. HV-2		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$360				$757	$1,117		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL
BLDG. NO. 826			

AHU SYS. NO. HV-3	TASK DESCRIPTION	Quantity No. Of Units	Quantity Unit Meas	LABOR MH/ Unit	LABOR Total Hrs	LABOR Unit Price	LABOR Cost	EQUIPMENT Unit Price	EQUIPMENT Cost	MATERIAL Unit Price	MATERIAL Cost	TOTAL	SHIPPING Unit Wt	SHIPPING Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$360				$757	**$1,117**		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	CODE A X CODE B CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	OTHER		
BLDG. NO. 826		ESTIMATOR KC	CHECKED BY CEL

AHU SYS. NO. HV-4		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$360				$757	$1,117		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 826		ESTIMATOR KC	CHECKED BY CEL

AHU SYS. NO. HV-5		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK	DESCRIPTION	No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$360				$757	$1,117		

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COST ESTIMATE

BUILDING 837

COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 02-Apr-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 837		ESTIMATOR KC	CHECKED BY CEL

SINGLE ZONE & VAV AHU		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. AHU-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	1	EA	3	3.1	26	$81			295	$295	$376		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Avg. Duct	1	EA	4	3.6	26	$93			190	$190	$283		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
TOTAL THIS SHEET							$944				$2,169	$3,113		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 02-Apr-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 837		ESTIMATOR KC	CHECKED BY CEL

SINGLE ZONE & VAV AHU		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. AHU-2		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	1	EA	3	3.1	26	$81			295	$295	$376		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Avg. Duct	1	EA	4	3.6	26	$93			190	$190	$283		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
TOTAL THIS SHEET							$944				$2,169	$3,113		

COST ESTIMATE ANALYSIS

PROJECT: EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO.: DACA41-92-C-0098	EFFECTIVE PRICING: MARCH 1993	DATE PREPARED: 02-Apr-93
LOCATION: FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
BLDG. NO.: 837	[ ] OTHER _____	ESTIMATOR: KC	CHECKED BY: CEL

STEAM HW CONVERTER SYS. NO. CV-1 TASK DESCRIPTION		Quantity No. Of Units	 Unit Meas	LABOR MH/ Unit	 Total Hrs	 Unit Price	 Cost	EQUIPMENT Unit Price	 Cost	MATERIAL Unit Price	 Cost	TOTAL	SHIPPING Unit Wt	 Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Electric)	1	EA	4	4.1	26	$106			295	$295	$402		
Digital Input	Pressure Switch (Elec)	1	EA	2	2.4	26	$62			52	$52	$114		
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
Analog Input	Temp. Water (Elec)	1	EA	3	3.1	26	$81			222	$222	$303		
	Temp. Water (Plum)	1	EA	2	2.1	24	$52			65	$65	$117		
TOTAL THIS SHEET							$403				$728	$1,132		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 02-Apr-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 837		ESTIMATOR KC	CHECKED BY CEL

DUAL TEMP WATER PUMP		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. CHW PUMP		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Pressure Switch (Elec)	1	EA	2	2.4	26	$62			52	$52	$114		
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Water (Elec)	2	EA	3	6.3	26	$161			222	$444	$605		
	Temp. Water (Plum)	2	EA	2	4.3	24	$104			65	$130	$234		
TOTAL THIS SHEET							$565				$1,068	$1,633		

COST ESTIMATE

BUILDING 844

COST ESTIMATE ANALYSIS

		INVITATION NO./CONTRACT NO. DACA41-92-C-0098		EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT	EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C		DRAWING NO.	SHT OF
LOCATION	FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____			
BLDG. NO.	844			ESTIMATOR KC	CHECKED BY CEL

FAN COIL		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO.	FC-1	No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	ACU (Fan Coil)	1	EA	4	3.6	26	$93			415	$415	$508		
Digital Input														
Analog Input	Temp. Space (RTD Only)	1	EA	3	2.6	26	$68			50	$50	$117		
TOTAL THIS SHEET							$217				$508	**$725**		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	☐ CODE A ☒ CODE B ☐ CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	☐ OTHER _____		
BLDG. NO. 844		ESTIMATOR KC	CHECKED BY CEL

PERIMETER RADIATION		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. RAD-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output														
Analog Output	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
	ACU (Fan Coil)	1	EA	4	3.6	26	$93			415	$415	$508		
Digital Input														
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$309				$1,058	$1,367		

COST ESTIMATE ANALYSIS

		INVITATION NO./CONTRACT NO. DACA41-92-C-0098		EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT	EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C		DRAWING NO.	SHT OF
LOCATION	FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____			
BLDG. NO.	844			ESTIMATOR KC	CHECKED BY CEL

AIR COOLED CHILLER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. CH-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Digital Input	Pressure Switch (Elec)	1	EA	2	2.4	26	$62			52	$52	$114		
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
	Status Relay	2	EA	2	3.8	26	$98			41	$83	$181		
Analog Input	Temp. Water (Elec)	2	EA	3	6.3	26	$161			222	$444	$605		
	Temp. Water (Plum)	2	EA	2	4.3	24	$104			65	$130	$234		
TOTAL THIS SHEET							$528				$803	**$1,331**		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 844		ESTIMATOR KC	CHECKED BY CEL

STEAM HW CONVERTER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. CV-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK	DESCRIPTION	Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Electric)	1	EA	4	4.1	26	$106			295	$295	$402		
Digital Input	Pressure Switch (Elec)	1	EA	2	2.4	26	$62			52	$52	$114		
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
Analog Input	Temp. Water (Elec)	1	EA	3	3.1	26	$81			222	$222	$303		
	Temp. Water (Plum)	1	EA	2	2.1	24	$52			65	$65	$117		
TOTAL THIS SHEET							$403				$728	$1,132		

COST ESTIMATE ANALYSIS

		INVITATION NO./CONTRACT NO. DACA41-92-C-0098		EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT	EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C		DRAWING NO.	SHT OF
LOCATION	FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____			
BLDG. NO.	844			ESTIMATOR KC	CHECKED BY CEL

ELECTRIC DW HEATER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO.	DHW-1	No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK	DESCRIPTION	Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	H/O/A & Control Relay	1	EA	3	2.9	26	$75			77	$77	$152		
Analog Output														
Digital Input	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
Analog Input														
TOTAL THIS SHEET							$124				$118	$242		

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COST ESTIMATE

BUILDING 1012
1013 THRU 1016, 1028, AND 1029

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 1012		ESTIMATOR KC	CHECKED BY CEL

FAN COIL SYS. NO. FC-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	ACU (Fan Coil)	1	EA	4	3.6	26	$93			415	$415	$508		
Digital Input														
Analog Input	Temp. Space (RTD Only)	1	EA	3	2.6	26	$68			50	$50	$117		
TOTAL THIS SHEET							$217				$508	**$725**		

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COST ESTIMATE ANALYSIS

		INVITATION NO./CONTRACT NO. DACA41-92-C-0098		EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT	EMCS FEASIBILITY STUDY	☐ CODE A ☒ CODE B ☐ CODE C		DRAWING NO.	SHT OF
LOCATION	FT. LEONARD WOOD, MISSOURI	☐ OTHER _____			
BLDG. NO.	1012			ESTIMATOR KC	CHECKED BY CEL

FAN COIL SYS. NO. FC-2		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	ACU (Fan Coil)	1	EA	4	3.6	26	$93			415	$415	$508		
Digital Input														
Analog Input	Temp. Space (RTD Only)	1	EA	3	2.6	26	$68			50	$50	$117		
TOTAL THIS SHEET							$217				$508	$725		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 1012		ESTIMATOR KC	CHECKED BY CEL

FAN COIL SYS. NO. FC-3		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	ACU (Fan Coil)	1	EA	4	3.6	26	$93			415	$415	$508		
Digital Input														
Analog Input	Temp. Space (RTD Only)	1	EA	3	2.6	26	$68			50	$50	$117		
TOTAL THIS SHEET							$217				$508	**$725**		

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COST ESTIMATE ANALYSIS

		INVITATION NO./CONTRACT NO. DACA41-92-C-0098		EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT	EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C		DRAWING NO.	SHT OF
LOCATION	FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____			
BLDG. NO.	1012			ESTIMATOR KC	CHECKED BY CEL

STEAM HW CONVERTER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO.	CV-1	No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Electric)	1	EA	4	4.1	26	$106			295	$295	$402		
Digital Input	Pressure Switch (Elec)	1	EA	2	2.4	26	$62			52	$52	$114		
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
Analog Input	Temp. Water (Elec)	1	EA	3	3.1	26	$81			222	$222	$303		
	Temp. Water (Plum)	1	EA	2	2.1	24	$52			65	$65	$117		
TOTAL THIS SHEET							$403				$728	$1,132		

COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 1012		ESTIMATOR KC	CHECKED BY CEL

STEAM HW CONVERTER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. CV-2		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Electric)	1	EA	4	4.1	26	$106			295	$295	$402		
Digital Input	Pressure Switch (Elec)	1	EA	2	2.4	26	$62			52	$52	$114		
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
Analog Input	Temp. Water (Elec)	1	EA	3	3.1	26	$81			222	$222	$303		
	Temp. Water (Plum)	1	EA	2	2.1	24	$52			65	$65	$117		
TOTAL THIS SHEET							$403				$728	**$1,132**		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	☐ CODE A ☒ CODE B ☐ CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	☐ OTHER _____		
BLDG. NO. 1012		ESTIMATOR KC	CHECKED BY CEL

STEAM HW CONVERTER SYS. NO. CV-3		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Electric)	1	EA	4	4.1	26	$106			295	$295	$402		
Digital Input	Pressure Switch (Elec)	1	EA	2	2.4	26	$62			52	$52	$114		
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
Analog Input	Temp. Water (Elec)	1	EA	3	3.1	26	$81			222	$222	$303		
	Temp. Water (Plum)	1	EA	2	2.1	24	$52			65	$65	$117		
TOTAL THIS SHEET							$403				$728	$1,132		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 1012		ESTIMATOR KC	CHECKED BY CEL

STEAM HW CONVERTER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. CV-4		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Electric)	1	EA	4	4.1	26	$106			295	$295	$402		
Digital Input	Pressure Switch (Elec)	1	EA	2	2.4	26	$62			52	$52	$114		
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
Analog Input	Temp. Water (Elec)	1	EA	3	3.1	26	$81			222	$222	$303		
	Temp. Water (Plum)	1	EA	2	2.1	24	$52			65	$65	$117		
TOTAL THIS SHEET							$403				$728	**$1,132**		

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COST ESTIMATE

BUILDING 1025

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 1025		ESTIMATOR KC	CHECKED BY CEL

AHU SYS. NO. AHU-1	TASK DESCRIPTION	Quantity No. Of Units	Quantity Unit Meas	LABOR MH/ Unit	LABOR Total Hrs	LABOR Unit Price	LABOR Cost	EQUIPMENT Unit Price	EQUIPMENT Cost	MATERIAL Unit Price	MATERIAL Cost	TOTAL	SHIPPING Unit Wt	SHIPPING Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$360				$757	**$1,117**		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 1025		ESTIMATOR KC	CHECKED BY CEL

PERIMETER RADIATION		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. RAD-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output														
Analog Output	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
	ACU (Fan Coil)	1	EA	4	3.6	26	$93			415	$415	$508		
Digital Input														
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$309				$1,058	**$1,367**		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 1025		ESTIMATOR KC	CHECKED BY CEL

STEAM HW CONVERTER SYS. NO. CV-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Electric)	1	EA	4	4.1	26	$106			295	$295	$402		
Digital Input	Pressure Switch (Elec)	1	EA	2	2.4	26	$62			52	$52	$114		
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
Analog Input	Temp. Water (Elec)	1	EA	3	3.1	26	$81			222	$222	$303		
	Temp. Water (Plum)	1	EA	2	2.1	24	$52			65	$65	$117		
TOTAL THIS SHEET							$403				$728	$1,132		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 1025		ESTIMATOR KC	CHECKED BY CEL

ELECTRIC DW HEATER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. DHW-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	H/O/A & Control Relay	1	EA	3	2.9	26	$75			77	$77	$152		
Analog Output														
Digital Input	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
Analog Input														
TOTAL THIS SHEET							$124				$118	$242		

COST ESTIMATE

BUILDING 1350

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 1350		ESTIMATOR KC	CHECKED BY CEL

AHU SYS. NO. AHU-2	TASK DESCRIPTION	Quantity No. Of Units	Quantity Unit Meas	LABOR MH/ Unit	LABOR Total Hrs	LABOR Unit Price	LABOR Cost	EQUIPMENT Unit Price	EQUIPMENT Cost	MATERIAL Unit Price	MATERIAL Cost	TOTAL	SHIPPING Unit Wt	SHIPPING Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$360				$757	**$1,117**		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 1350		ESTIMATOR KC	CHECKED BY CEL

MULTIZONE AHU		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. AHU-3		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	6	EA	3	18.8	26	$483			295	$1,771	$2,255		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	5	EA	3	13.1	26	$338			174	$870	$1,208		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
	Temp. Avg. Duct	2	EA	4	7.3	26	$187			190	$380	$567		
	RH Space	1	EA	3	2.6	26	$68			240	$240	$307		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
TOTAL THIS SHEET							$1,711				$4,597	$6,307		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 1350		ESTIMATOR KC	CHECKED BY CEL

AHU SYS. NO. AHU-4	TASK DESCRIPTION	Quantity No. Of Units	Quantity Unit Meas	LABOR MH/ Unit	LABOR Total Hrs	LABOR Unit Price	LABOR Cost	EQUIPMENT Unit Price	EQUIPMENT Cost	MATERIAL Unit Price	MATERIAL Cost	TOTAL	SHIPPING Unit Wt	SHIPPING Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$360				$757	**$1,117**		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 1350		ESTIMATOR KC	CHECKED BY CEL

SINGLE ZONE & VAV AHU		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. AHU-5		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	1	EA	3	3.1	26	$81			295	$295	$376		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Avg. Duct	1	EA	4	3.6	26	$93			190	$190	$283		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
TOTAL THIS SHEET							$944				$2,169	$3,113		

COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 1350		ESTIMATOR KC	CHECKED BY CEL

HOT WATER BOILER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. BLR-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Electric)	1	EA	4	4.1	26	$106			295	$295	$402		
Digital Input	Pressure Switch (Elec)			2		26				52				
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
	Auxilary Contact	1	EA	2	1.9	26	$49			43	$43	$92		
	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
		1	EA											
Analog Input	Temp. Water (Elec)	2	EA	3	6.3	26	$161			222	$444	$605		
	Temp. Water (Plum)	2	EA	2	4.3	24	$104			65	$130	$234		
TOTAL THIS SHEET							$572				$1,048	**$1,620**		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 1350		ESTIMATOR KC	CHECKED BY CEL

AIR COOLED DX COMPRESSOR SYS. NO. ACCU-3		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
Analog Input														
TOTAL THIS SHEET							$105				$85	$190		

COST ESTIMATE ANALYSIS

		INVITATION NO./CONTRACT NO. DACA41-92-C-0098		EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT	EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C		DRAWING NO.	SHT OF
LOCATION	FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____			
BLDG. NO.	1350			ESTIMATOR KC	CHECKED BY CEL

AIR COOLED DX COMPRESSOR		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO.	ACCU-5	No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK	DESCRIPTION	Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Digital Input	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
Analog Input														
TOTAL THIS SHEET							$105				$85	**$190**		

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COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 1350		ESTIMATOR KC	CHECKED BY CEL

ELECTRIC DW HEATER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. DHW-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	H/O/A & Control Relay	1	EA	3	2.9	26	$75			77	$77	$152		
Analog Output														
Digital Input	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
Analog Input														
TOTAL THIS SHEET							$124				$118	$242		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	☐ CODE A ☒ CODE B ☐ CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	☐ OTHER _____		
BLDG. NO. 1350		ESTIMATOR KC	CHECKED BY CEL

ELECTRIC DW HEATER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. DHW-2		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	H/O/A & Control Relay	1	EA	3	2.9	26	$75			77	$77	$152		
Digital Input	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
TOTAL THIS SHEET							$124				$118	$242		

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COST ESTIMATE

BUILDING 1382

COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 1382		ESTIMATOR KC	CHECKED BY CEL

HOT WATER BOILER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. BLR-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Electric)	1	EA	4	4.1	26	$106			295	$295	$402		
Digital Input	Pressure Switch (Elec)			2		26				52				
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
	Auxilary Contact	1	EA	2	1.9	26	$49			43	$43	$92		
	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
		1	EA											
Analog Input	Temp. Water (Elec)	2	EA	3	6.3	26	$161			222	$444	$605		
	Temp. Water (Plum)	2	EA	2	4.3	24	$104			65	$130	$234		
TOTAL THIS SHEET							$572				$1,048	$1,620		

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COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 1382		ESTIMATOR KC	CHECKED BY CEL

HOT WATER BOILER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. BLR-2		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Electric)	1	EA	4	4.1	26	$106			295	$295	$402		
Digital Input	Pressure Switch (Elec)			2		26				52				
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
	Auxiliary Contact	1	EA	2	1.9	26	$49			43	$43	$92		
	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
		1	EA											
Analog Input	Temp. Water (Elec)	2	EA	3	6.3	26	$161			222	$444	$605		
	Temp. Water (Plum)	2	EA	2	4.3	24	$104			65	$130	$234		
TOTAL THIS SHEET							$572				$1,048	$1,620		

COST ESTIMATE

BUILDING 1383

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 1383		ESTIMATOR KC	CHECKED BY CEL

UNIT HEATER SYS. NO. UH-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Auxilary Contact	1	EA	2	1.9	26	$49			43	$43	$92		
Analog Input	Temp. Space	1	EA	3	2.6	26	$68			174	$174	$242		
TOTAL THIS SHEET							$173				$260	$433		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 1383		ESTIMATOR KC	CHECKED BY CEL

UNIT HEATER SYS. NO. UH-2		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Auxilary Contact	1	EA	2	1.9	26	$49			43	$43	$92		
Analog Input	Temp. Space	1	EA	3	2.6	26	$68			174	$174	$242		
TOTAL THIS SHEET							$173				$260	$433		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 1383		ESTIMATOR KC	CHECKED BY CEL

UNIT HEATER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. UH-3		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Auxilary Contact	1	EA	2	1.9	26	$49			43	$43	$92		
Analog Input	Temp. Space	1	EA	3	2.6	26	$68			174	$174	$242		
TOTAL THIS SHEET							$173				$260	$433		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	☐ CODE A ☒ CODE B ☐ CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	☐ OTHER _____		
BLDG. NO. 1383		ESTIMATOR KC	CHECKED BY CEL

UNIT HEATER SYS. NO. UH-4		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Auxilary Contact	1	EA	2	1.9	26	$49			43	$43	$92		
Analog Input	Temp. Space	1	EA	3	2.6	26	$68			174	$174	$242		
TOTAL THIS SHEET							$173				$260	$433		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 1383		ESTIMATOR KC	CHECKED BY CEL

UNIT HEATER SYS. NO. UH-5		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Auxilary Contact	1	EA	2	1.9	26	$49			43	$43	$92		
Analog Input	Temp. Space	1	EA	3	2.6	26	$68			174	$174	$242		
TOTAL THIS SHEET							$173				$260	$433		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 1383		ESTIMATOR KC	CHECKED BY CEL

UNIT HEATER SYS. NO. UH-6		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Auxilary Contact	1	EA	2	1.9	26	$49			43	$43	$92		
Analog Input	Temp. Space	1	EA	3	2.6	26	$68			174	$174	$242		
TOTAL THIS SHEET							$173				$260	$433		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 26-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 1383		ESTIMATOR KC	CHECKED BY CEL

UNIT HEATER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. UH-7		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Auxilary Contact	1	EA	2	1.9	26	$49			43	$43	$92		
Analog Input	Temp. Space	1	EA	3	2.6	26	$68			174	$174	$242		
TOTAL THIS SHEET							$173				$260	$433		

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COST ESTIMATE

BUILDING 1390

COST ESTIMATE ANALYSIS

PROJECT: EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
LOCATION: FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
BLDG. NO. 1390	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL

AHU SYS. NO. hv-1 / TASK DESCRIPTION		Quantity No. Of Units	Quantity Unit Meas	LABOR MH/ Unit	LABOR Total Hrs	LABOR Unit Price	LABOR Cost	EQUIPMENT Unit Price	EQUIPMENT Cost	MATERIAL Unit Price	MATERIAL Cost	TOTAL	SHIPPING Unit Wt	SHIPPING Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$360				$757	$1,117		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 1390		ESTIMATOR KC	CHECKED BY CEL

AHU SYS. NO. HV-2		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$360				$757	$1,117		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 1390		ESTIMATOR KC	CHECKED BY CEL

AHU SYS. NO. HV-3		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$360				$757	$1,117		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 1390		ESTIMATOR KC	CHECKED BY CEL

FAN COIL SYS. NO. FC-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	ACU (Fan Coil)	1	EA	4	3.6	26	$93			415	$415	$508		
Digital Input														
Analog Input	Temp. Space (RTD Only)	1	EA	3	2.6	26	$68			50	$50	$117		
TOTAL THIS SHEET							$217				$508	$725		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 1390		ESTIMATOR KC	CHECKED BY CEL

PERIMETER RADIATION SYS. NO. RAD-1	TASK DESCRIPTION	Quantity No. Of Units	Quantity Unit Meas	LABOR MH/ Unit	LABOR Total Hrs	LABOR Unit Price	LABOR Cost	EQUIPMENT Unit Price	EQUIPMENT Cost	MATERIAL Unit Price	MATERIAL Cost	TOTAL	SHIPPING Unit Wt	SHIPPING Total Wt
Digital Output														
Analog Output	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
	ACU (Fan Coil)	1	EA	4	3.6	26	$93			415	$415	$508		
Digital Input														
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$309				$1,058	$1,367		

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COST ESTIMATE ANALYSIS

		INVITATION NO./CONTRACT NO. DACA41-92-C-0098		EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT	EMCS FEASIBILITY STUDY	☐ CODE A ☒ CODE B ☐ CODE C		DRAWING NO.	SHT OF
LOCATION	FT. LEONARD WOOD, MISSOURI	☐ OTHER _____			
BLDG. NO.	1390			ESTIMATOR KC	CHECKED BY CEL

HOT WATER BOILER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO.	BLR-1	No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Electric)	1	EA	4	4.1	26	$106			295	$295	$402		
Digital Input	Pressure Switch (Elec)			2		26				52				
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
	Auxilary Contact	1	EA	2	1.9	26	$49			43	$43	$92		
	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
		1	EA											
Analog Input	Temp. Water (Elec)	2	EA	3	6.3	26	$161			222	$444	$605		
	Temp. Water (Plum)	2	EA	2	4.3	24	$104			65	$130	$234		
TOTAL THIS SHEET							$572				$1,048	$1,620		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 1390		ESTIMATOR KC	CHECKED BY CEL

AHU SYS. NO. AC-1	TASK DESCRIPTION	Quantity No. Of Units	Quantity Unit Meas	LABOR MH/ Unit	LABOR Total Hrs	LABOR Unit Price	LABOR Cost	EQUIPMENT Unit Price	EQUIPMENT Cost	MATERIAL Unit Price	MATERIAL Cost	TOTAL	SHIPPING Unit Wt	SHIPPING Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$360				$757	$1,117		

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COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098		EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 1390		ESTIMATOR KC	CHECKED BY CEL

AIR COOLED DX COMPRESSOR		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. DX-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
Analog Input														
TOTAL THIS SHEET							$105				$85	$190		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 1390		ESTIMATOR KC	CHECKED BY CEL

ELECTRIC DW HEATER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. DHW-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	H/O/A & Control Relay	1	EA	3	2.9	26	$75			77	$77	$152		
Analog Output														
Digital Input	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
Analog Input														
TOTAL THIS SHEET							$124				$118	$242		

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COST ESTIMATE

BUILDING 1391

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 1391		ESTIMATOR KC	CHECKED BY CEL

UNIT HEATER SYS. NO. UH-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Auxilary Contact	1	EA	2	1.9	26	$49			43	$43	$92		
Analog Input	Temp. Space	1	EA	3	2.6	26	$68			174	$174	$242		
TOTAL THIS SHEET							$173				$260	$433		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 1391		ESTIMATOR KC	CHECKED BY CEL

UNIT HEATER SYS. NO. UH-2		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Auxilary Contact	1	EA	2	1.9	26	$49			43	$43	$92		
Analog Input	Temp. Space	1	EA	3	2.6	26	$68			174	$174	$242		
TOTAL THIS SHEET							$173				$260	$433		

COST ESTIMATE

BUILDING 1601

COST ESTIMATE ANALYSIS

PROJECT: EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO.: DACA41-92-C-0098	EFFECTIVE PRICING: MARCH 1993	DATE PREPARED: 31-Mar-93
LOCATION: FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
BLDG. NO.: 1601	[ ] OTHER _____	ESTIMATOR: KC	CHECKED BY: CEL

SYS. NO. SEW / TASK DESCRIPTION		Quantity: No. Of Units	Quantity: Unit Meas	LABOR: MH/ Unit	LABOR: Total Hrs	LABOR: Unit Price	LABOR: Cost	EQUIPMENT: Unit Price	EQUIPMENT: Cost	MATERIAL: Unit Price	MATERIAL: Cost	TOTAL	SHIPPING: Unit Wt	SHIPPING: Total Wt
Digital Output	H/O/A & Control Relay		EA	3		26				77				
Analog Output														
Digital Input	Pressure Switch (Elec)		EA	2		26				52				
	Pressure Switch (Plum)		EA	2		24				51				
	Diff. Pressure Sw. (Filter)		EA	3		26				71				
	Level Switch	1	EA	4	3.9	26	$101			136	$136	$237		
	Status Relay		EA	2		26				41				
	Current Switch		EA	2		26				111				
Analog Input	PSIG/PSID (Elec)	3	EA	3	9.4	26	$242			202	$607	$848		
	PSIG/PSID (Plum)	3	EA	2	6.4	24	$155			55	$164	$320		
	Flow (Elec)	4	EA	3	12.5	26	$322			737	$2,947	$3,269		
	Flow (Plum)	4	EA	2	8.5	24	$207			86	$343	$550		
	Tubidity	2	EA	9	18.3	26	$470			1470	$2,939	$3,410		
	Chlorine	1	EA	9	9.1	26	$235			1461	$1,461	$1,696		
TOTAL THIS SHEET							$1,733				$8,596	$10,329		

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COST ESTIMATE

BUILDING 1700

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL
BLDG. NO. 1700			

UNIT HEATER SYS. NO. UH-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Auxilary Contact	1	EA	2	1.9	26	$49			43	$43	$92		
Analog Input	Temp. Space	1	EA	3	2.6	26	$68			174	$174	$242		
TOTAL THIS SHEET							$173				$260	$433		

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COST ESTIMATE ANALYSIS

PROJECT: EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
LOCATION: FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
BLDG. NO. 1700	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL

UNIT HEATER SYS. NO. UH-2		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Auxilary Contact	1	EA	2	1.9	26	$49			43	$43	$92		
Analog Input	Temp. Space	1	EA	3	2.6	26	$68			174	$174	$242		
TOTAL THIS SHEET							$173				$260	$433		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL
BLDG. NO. 1700			

UNIT HEATER SYS. NO. UH-3		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Auxilary Contact	1	EA	2	1.9	26	$49			43	$43	$92		
Analog Input	Temp. Space	1	EA	3	2.6	26	$68			174	$174	$242		
TOTAL THIS SHEET							$173				$260	$433		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 1700		ESTIMATOR KC	CHECKED BY CEL

UNIT HEATER SYS. NO. UH-4		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Auxilary Contact	1	EA	2	1.9	26	$49			43	$43	$92		
Analog Input	Temp. Space	1	EA	3	2.6	26	$68			174	$174	$242		
TOTAL THIS SHEET							$173				$260	$433		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 1700		ESTIMATOR KC	CHECKED BY CEL

UNIT HEATER SYS. NO. UH-5		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Auxilary Contact	1	EA	2	1.9	26	$49			43	$43	$92		
Analog Input	Temp. Space	1	EA	3	2.6	26	$68			174	$174	$242		
TOTAL THIS SHEET							$173				$260	$433		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 1700		ESTIMATOR KC	CHECKED BY CEL

UNIT HEATER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. UH-6		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Auxilary Contact	1	EA	2	1.9	26	$49			43	$43	$92		
Analog Input	Temp. Space	1	EA	3	2.6	26	$68			174	$174	$242		
TOTAL THIS SHEET							$173				$260	$433		

COST ESTIMATE

BUILDING 1702
AND TYPICAL FOR
1701, 1706, AND 1707

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 16-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 1702		ESTIMATOR KC	CHECKED BY CEL

FAN COIL SYS. NO. FC-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	ACU (Fan Coil)	1	EA	4	3.6	26	$93			415	$415	$508		
Digital Input														
Analog Input	Temp. Space (RTD Only)	1	EA	3	2.6	26	$68			50	$50	$117		
TOTAL THIS SHEET							$217				$508	**$725**		

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COST ESTIMATE ANALYSIS

PROJECT	EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 16-Mar-93
LOCATION	FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
BLDG. NO.	1702	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL

AHU SYS. NO. HV-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK	DESCRIPTION	No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$279				$462	$741		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 16-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 1702		ESTIMATOR KC	CHECKED BY CEL

AHU SYS. NO. HV-2 / TASK DESCRIPTION		Quantity No. Of Units	Quantity Unit Meas	LABOR MH/ Unit	LABOR Total Hrs	LABOR Unit Price	LABOR Cost	EQUIPMENT Unit Price	EQUIPMENT Cost	MATERIAL Unit Price	MATERIAL Cost	TOTAL	SHIPPING Unit Wt	SHIPPING Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$279				$462	**$741**		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 16-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER		
BLDG. NO. 1702		ESTIMATOR KC	CHECKED BY CEL

AHU SYS. NO. HV-3		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$279				$462	$741		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 16-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 1702		ESTIMATOR KC	CHECKED BY CEL

AHU SYS. NO. HV-4		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$279				$462	**$741**		

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COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 16-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 1702		ESTIMATOR KC	CHECKED BY CEL

AHU SYS. NO. HV-5		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$279				$462	$741		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 16-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 1702		ESTIMATOR KC	CHECKED BY CEL

STEAM HW CONVERTER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. CV-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Electric)	1	EA	4	4.1	26	$106			295	$295	$402		
Digital Input	Pressure Switch (Elec)	1	EA	2	2.4	26	$62			52	$52	$114		
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
Analog Input	Temp. Water (Elec)	1	EA	3	3.1	26	$81			222	$222	$303		
	Temp. Water (Plum)	1	EA	2	2.1	24	$52			65	$65	$117		
TOTAL THIS SHEET							$403				$728	**$1,132**		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 1702		ESTIMATOR KC	CHECKED BY CEL

ELECTRIC DW HEATER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. DHW-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	H/O/A & Control Relay	1	EA	3	2.9	26	$75			77	$77	$152		
Analog Output														
Digital Input	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
Analog Input														
TOTAL THIS SHEET							$124				$118	$242		

COST ESTIMATE

BUILDING 1703 AND 1704

COST ESTIMATE ANALYSIS

PROJECT: EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
LOCATION: FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
BLDG. NO. 1703	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL

MULTIZONE AHU SYS. NO. AHU-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	6	EA	3	18.8	26	$483			295	$1,771	$2,255		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	5	EA	3	13.1	26	$338			174	$870	$1,208		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
	Temp. Avg. Duct	2	EA	4	7.3	26	$187			190	$380	$567		
	RH Space	1	EA	3	2.6	26	$68			240	$240	$307		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
TOTAL THIS SHEET							$1,711				$4,597	$6,307		

COST ESTIMATE ANALYSIS

PROJECT: EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
LOCATION: FT. LEONARD WOOD, MISSOURI	☐ CODE A ☒ CODE B ☐ CODE C ☐ OTHER	DRAWING NO.	SHT OF
BLDG. NO. 1703		ESTIMATOR KC	CHECKED BY CEL

FAN COIL SYS. NO. FC-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	ACU (Fan Coil)	1	EA	4	3.6	26	$93			415	$415	$508		
Digital Input														
Analog Input	Temp. Space (RTD Only)	1	EA	3	2.6	26	$68			50	$50	$117		
TOTAL THIS SHEET							$217				$508	$725		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 1703		ESTIMATOR KC	CHECKED BY CEL

DUAL TEMP WATER PUMP		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. CHW PUMP-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Digital Input	Pressure Switch (Elec)	1	EA	2	2.4	26	$62			52	$52	$114		
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Water (Elec)	2	EA	3	6.3	26	$161			222	$444	$605		
	Temp. Water (Plum)	2	EA	2	4.3	24	$104			65	$130	$234		
TOTAL THIS SHEET							$565				$1,068	$1,633		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 05-Apr-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 1703		ESTIMATOR KC	CHECKED BY CEL

STEAM HW CONVERTER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. CV-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Electric)	1	EA	4	4.1	26	$106			295	$295	$402		
Digital Input	Pressure Switch (Elec)	1	EA	2	2.4	26	$62			52	$52	$114		
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
Analog Input	Temp. Water (Elec)	1	EA	3	3.1	26	$81			222	$222	$303		
	Temp. Water (Plum)	1	EA	2	2.1	24	$52			65	$65	$117		
TOTAL THIS SHEET							$403				$728	**$1,132**		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 1703		ESTIMATOR KC	CHECKED BY CEL

DUAL TEMP WATER PUMP		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. CHW PUMP-2		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Pressure Switch (Elec)	1	EA	2	2.4	26	$62			52	$52	$114		
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Water (Elec)	2	EA	3	6.3	26	$161			222	$444	$605		
	Temp. Water (Plum)	2	EA	2	4.3	24	$104			65	$130	$234		
TOTAL THIS SHEET							$565				$1,068	$1,633		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 1703		ESTIMATOR KC	CHECKED BY CEL

ELECTRIC DW HEATER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. DHW-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	H/O/A Control Relay	1	EA	3	2.9	26	$75			77	$77	$152		
Analog Output														
Digital Input	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
Analog Input														
TOTAL THIS SHEET							$124				$118	$242		

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COST ESTIMATE

BUILDING 1705

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 1705		ESTIMATOR KC	CHECKED BY CEL

MULTIZONE AHU		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. AHU-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	6	EA	3	18.8	26	$483			295	$1,771	$2,255		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	5	EA	3	13.1	26	$338			174	$870	$1,208		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
	Temp. Avg. Duct	2	EA	4	7.3	26	$187			190	$380	$567		
	RH Space	1	EA	3	2.6	26	$68			240	$240	$307		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
TOTAL THIS SHEET							$1,711				$4,597	**$6,307**		

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COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 1705		ESTIMATOR KC	CHECKED BY CEL

AIR COOLED CHILLER SYS. NO. CH-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Digital Input	Pressure Switch (Elec)	1	EA	2	2.4	26	$62			52	$52	$114		
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
	Status Relay	2	EA	2	3.8	26	$98			41	$83	$181		
Analog Input	Temp. Water (Elec)	2	EA	3	6.3	26	$161			222	$444	$605		
	Temp. Water (Plum)	2	EA	2	4.3	24	$104			65	$130	$234		
TOTAL THIS SHEET							$528				$803	$1,331		

COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 1705		ESTIMATOR KC	CHECKED BY CEL

STEAM HW CONVERTER SYS. NO. CV-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Electric)	1	EA	4	4.1	26	$106			295	$295	$402		
Digital Input	Pressure Switch (Elec)	1	EA	2	2.4	26	$62			52	$52	$114		
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
Analog Input	Temp. Water (Elec)	1	EA	3	3.1	26	$81			222	$222	$303		
	Temp. Water (Plum)	1	EA	2	2.1	24	$52			65	$65	$117		
TOTAL THIS SHEET							$403				$728	$1,132		

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COST ESTIMATE

BUILDING 1711

COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 1711		ESTIMATOR KC	CHECKED BY CEL

MULTIZONE AHU SYS. NO. AHU-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	6	EA	3	18.8	26	$483			295	$1,771	$2,255		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	5	EA	3	13.1	26	$338			174	$870	$1,208		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
	Temp. Avg. Duct	2	EA	4	7.3	26	$187			190	$380	$567		
	RH Space	1	EA	3	2.6	26	$68			240	$240	$307		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
TOTAL THIS SHEET							$1,711				$4,597	$6,307		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	☐ CODE A ☒ CODE B ☐ CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	☐ OTHER _____		
BLDG. NO. 1711		ESTIMATOR KC	CHECKED BY CEL

STEAM HW CONVERTER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. CV-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Electric)	1	EA	4	4.1	26	$106			295	$295	$402		
Digital Input	Pressure Switch (Elec)	1	EA	2	2.4	26	$62			52	$52	$114		
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
Analog Input	Temp. Water (Elec)	1	EA	3	3.1	26	$81			222	$222	$303		
	Temp. Water (Plum)	1	EA	2	2.1	24	$52			65	$65	$117		
TOTAL THIS SHEET							$403				$728	$1,132		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 1711		ESTIMATOR KC	CHECKED BY CEL

DUAL TEMP WATER PUMP		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. CHW PUMP		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Pressure Switch (Elec)	1	EA	2	2.4	26	$62			52	$52	$114		
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Water (Elec)	2	EA	3	6.3	26	$161			222	$444	$605		
	Temp. Water (Plum)	2	EA	2	4.3	24	$104			65	$130	$234		
TOTAL THIS SHEET							$565				$1,068	$1,633		

COST ESTIMATE

BUILDING 1712

COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 1712		ESTIMATOR KC	CHECKED BY CEL

SINGLE ZONE & VAV AHU		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. AHU-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	1	EA	3	3.1	26	$81			295	$295	$376		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Avg. Duct	1	EA	4	3.6	26	$93			190	$190	$283		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
TOTAL THIS SHEET							$944				$2,169	$3,113		

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COST ESTIMATE ANALYSIS

PROJECT: EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
LOCATION: FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
BLDG. NO. 1712	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL

SINGLE ZONE & VAV AHU		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. AHU-2		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	1	EA	3	3.1	26	$81			295	$295	$376		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Avg. Duct	1	EA	4	3.6	26	$93			190	$190	$283		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
TOTAL THIS SHEET							$944				$2,169	$3,113		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 1712		ESTIMATOR KC	CHECKED BY CEL

SINGLE ZONE & VAV AHU		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. AHU-3		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	1	EA	3	3.1	26	$81			295	$295	$376		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Avg. Duct	1	EA	4	3.6	26	$93			190	$190	$283		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
TOTAL THIS SHEET							$944				$2,169	$3,113		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 1712		ESTIMATOR KC	CHECKED BY CEL

DUAL TEMP WATER PUMP / SYS. NO. CHW PUMP	TASK DESCRIPTION	Quantity No. Of Units	Quantity Unit Meas	LABOR MH/ Unit	LABOR Total Hrs	LABOR Unit Price	LABOR Cost	EQUIPMENT Unit Price	EQUIPMENT Cost	MATERIAL Unit Price	MATERIAL Cost	TOTAL	SHIPPING Unit Wt	SHIPPING Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Pressure Switch (Elec)	1	EA	2	2.4	26	$62			52	$52	$114		
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Water (Elec)	2	EA	3	6.3	26	$161			222	$444	$605		
	Temp. Water (Plum)	2	EA	2	4.3	24	$104			65	$130	$234		
TOTAL THIS SHEET							$565				$1,068	$1,633		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 1712		ESTIMATOR KC	CHECKED BY CEL

STEAM HW CONVERTER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. CV-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Electric)	1	EA	4	4.1	26	$106			295	$295	$402		
Digital Input	Pressure Switch (Elec)	1	EA	2	2.4	26	$62			52	$52	$114		
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
Analog Input	Temp. Water (Elec)	1	EA	3	3.1	26	$81			222	$222	$303		
	Temp. Water (Plum)	1	EA	2	2.1	24	$52			65	$65	$117		
TOTAL THIS SHEET							$403				$728	$1,132		

COST ESTIMATE ANALYSIS

PROJECT	EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO. DACA41-92-C-0098		EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
LOCATION	FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C		DRAWING NO.	SHT OF
BLDG. NO.	1712	[ ] OTHER _____		ESTIMATOR KC	CHECKED BY CEL

FAN COIL SYS. NO. FC-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	ACU (Fan Coil)	1	EA	4	3.6	26	$93			415	$415	$508		
Digital Input														
Analog Input	Temp. Space (RTD Only)	1	EA	3	2.6	26	$68			50	$50	$117		
TOTAL THIS SHEET							$217				$508	$725		

COST ESTIMATE ANALYSIS

PROJECT: EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
LOCATION: FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
BLDG. NO. 1712	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL

ELECTRIC DW HEATER SYS. NO. DHW-1 TASK DESCRIPTION		Quantity No. Of Units	 Unit Meas	LABOR MH/ Unit	 Total Hrs	 Unit Price	 Cost	EQUIPMENT Unit Price	 Cost	MATERIAL Unit Price	 Cost	TOTAL	SHIPPING Unit Wt	 Total Wt
Digital Output	H/O/A & Control Relay	1	EA	3	2.9	26	$75			77	$77	$152		
Analog Output														
Digital Input	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
Analog Input														
TOTAL THIS SHEET							$124				$118	$242		

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COST ESTIMATE

BUILDING 1714

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 1714		ESTIMATOR KC	CHECKED BY CEL

MULTIZONE AHU		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. AHU-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	6	EA	3	18.8	26	$483			295	$1,771	$2,255		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	5	EA	3	13.1	26	$338			174	$870	$1,208		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
	Temp. Avg. Duct	2	EA	4	7.3	26	$187			190	$380	$567		
	RH Space	1	EA	3	2.6	26	$68			240	$240	$307		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
TOTAL THIS SHEET							$1,711				$4,597	$6,307		

COST ESTIMATE ANALYSIS

PROJECT: EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
LOCATION: FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
BLDG. NO. 1714	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL

MULTIZONE AHU SYS. NO. AHU-2		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	6	EA	3	18.8	26	$483			295	$1,771	$2,255		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	5	EA	3	13.1	26	$338			174	$870	$1,208		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
	Temp. Avg. Duct	2	EA	4	7.3	26	$187			190	$380	$567		
	RH Space	1	EA	3	2.6	26	$68			240	$240	$307		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
TOTAL THIS SHEET							$1,711				$4,597	$6,307		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 1714		ESTIMATOR KC	CHECKED BY CEL

AHU SYS. NO. HV-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$360				$757	$1,117		

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COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	☐ CODE A ☒ CODE B ☐ CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	☐ OTHER _____		
BLDG. NO. 1714		ESTIMATOR KC	CHECKED BY CEL

AHU SYS. NO. HV-2		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$360				$757	$1,117		

COST ESTIMATE ANALYSIS

PROJECT	EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
LOCATION	FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
BLDG. NO.	1714	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL

AHU SYS. NO. HV-3		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$360				$757	$1,117		

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COST ESTIMATE ANALYSIS

PROJECT: EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
LOCATION: FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
BLDG. NO. 1714	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL

AHU SYS. NO. HV-4 / TASK DESCRIPTION		Quantity No. Of Units	Quantity Unit Meas	LABOR MH/ Unit	LABOR Total Hrs	LABOR Unit Price	LABOR Cost	EQUIPMENT Unit Price	EQUIPMENT Cost	MATERIAL Unit Price	MATERIAL Cost	TOTAL	SHIPPING Unit Wt	SHIPPING Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$360				$757	$1,117		

COST ESTIMATE ANALYSIS

PROJECT: EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
LOCATION: FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
BLDG. NO. 1714	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL

DUAL TEMP WATER PUMP		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. CHW PUMP		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Pressure Switch (Elec)	1	EA	2	2.4	26	$62			52	$52	$114		
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Water (Elec)	2	EA	3	6.3	26	$161			222	$444	$605		
	Temp. Water (Plum)	2	EA	2	4.3	24	$104			65	$130	$234		
TOTAL THIS SHEET							$565				$1,068	$1,633		

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COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	☐ CODE A ☒ CODE B ☐ CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	☐ OTHER _____		
BLDG. NO. 1714		ESTIMATOR KC	CHECKED BY CEL

STEAM HW CONVERTER SYS. NO. CV-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Electric)	1	EA	4	4.1	26	$106			295	$295	$402		
Digital Input	Pressure Switch (Elec)	1	EA	2	2.4	26	$62			52	$52	$114		
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
Analog Input	Temp. Water (Elec)	1	EA	3	3.1	26	$81			222	$222	$303		
	Temp. Water (Plum)	1	EA	2	2.1	24	$52			65	$65	$117		
TOTAL THIS SHEET							$403				$728	$1,132		

COST ESTIMATE

BUILDING 1720
AND TYPICAL FOR
1723, 1728, 1729, 1734,
1735, 1761, 1765, 1767,
1769, 1773, AND 1776

COST ESTIMATE ANALYSIS

PROJECT: EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
LOCATION: FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
BLDG. NO. 1720	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL

FAN COIL SYS. NO. FC-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	ACU (Fan Coil)	1	EA	4	3.6	26	$93			415	$415	$508		
Digital Input														
Analog Input	Temp. Space (RTD Only)	1	EA	3	2.6	26	$68			50	$50	$117		
TOTAL THIS SHEET							$217				$508	$725		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 1720		ESTIMATOR KC	CHECKED BY CEL

STEAM HW CONVERTER SYS. NO. CV-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Electric)	1	EA	4	4.1	26	$106			295	$295	$402		
Digital Input	Pressure Switch (Elec)	1	EA	2	2.4	26	$62			52	$52	$114		
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
Analog Input	Temp. Water (Elec)	1	EA	3	3.1	26	$81			222	$222	$303		
	Temp. Water (Plum)	1	EA	2	2.1	24	$52			65	$65	$117		
TOTAL THIS SHEET							$403				$728	$1,132		

COST ESTIMATE

BUILDING 1721
AND TYPICAL FOR
1727, 1736, 1760, 1770, AND 1772

COST ESTIMATE ANALYSIS

PROJECT: EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
LOCATION: FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
BLDG. NO. 1721	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL

SINGLE ZONE & VAV AHU		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. AHU-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	1	EA	3	3.1	26	$81			295	$295	$376		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Avg. Duct	1	EA	4	3.6	26	$93			190	$190	$283		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
TOTAL THIS SHEET							$944				$2,169	$3,113		

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COST ESTIMATE ANALYSIS

PROJECT: EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
LOCATION: FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
BLDG. NO. 1721	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL

STEAM HW CONVERTER SYS. NO. CONV-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Electric)	1	EA	4	4.1	26	$106			295	$295	$402		
Digital Input	Pressure Switch (Elec)	1	EA	2	2.4	26	$62			52	$52	$114		
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
Analog Input	Temp. Water (Elec)	1	EA	3	3.1	26	$81			222	$222	$303		
	Temp. Water (Plum)	1	EA	2	2.1	24	$52			65	$65	$117		
TOTAL THIS SHEET							$403				$728	$1,132		

COST ESTIMATE

BUILDING 1724
AND TYPICAL FOR
1722, 1725, 1726, 1730,
1731, 1732, 1733, 1762,
1763, 1764, 1766, 1768
1771, 1774, AND 1775

COST ESTIMATE ANALYSIS

PROJECT: EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
LOCATION: FT. LEONARD WOOD, MISSOURI	☐ CODE A ☒ CODE B ☐ CODE C ☐ OTHER _____	DRAWING NO.	SHT OF
BLDG. NO. 1724		ESTIMATOR KC	CHECKED BY CEL

FAN COIL SYS. NO. FC-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	ACU (Fan Coil)	1	EA	4	3.6	26	$93			415	$415	$508		
Digital Input														
Analog Input	Temp. Space (RTD Only)	1	EA	3	2.6	26	$68			50	$50	$117		
TOTAL THIS SHEET							$217				$508	$725		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 1724		ESTIMATOR KC	CHECKED BY CEL

STEAM HW CONVERTER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. CV-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Electric)	1	EA	4	4.1	26	$106			295	$295	$402		
Digital Input	Pressure Switch (Elec)	1	EA	2	2.4	26	$62			52	$52	$114		
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
Analog Input	Temp. Water (Elec)	1	EA	3	3.1	26	$81			222	$222	$303		
	Temp. Water (Plum)	1	EA	2	2.1	24	$52			65	$65	$117		
TOTAL THIS SHEET							$403				$728	$1,132		

COST ESTIMATE

BUILDING 1740

COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 1740		ESTIMATOR KC	CHECKED BY CEL

AHU SYS. NO. HV-1	TASK DESCRIPTION	Quantity No. Of Units	Quantity Unit Meas	LABOR MH/ Unit	LABOR Total Hrs	LABOR Unit Price	LABOR Cost	EQUIPMENT Unit Price	EQUIPMENT Cost	MATERIAL Unit Price	MATERIAL Cost	TOTAL	SHIPPING Unit Wt	SHIPPING Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$360				$757	$1,117		

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COST ESTIMATE ANALYSIS

PROJECT: EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
LOCATION: FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
BLDG. NO. 1740	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL

AHU SYS. NO. HV-2		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$360				$757	$1,117		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 1740		ESTIMATOR KC	CHECKED BY CEL

STEAM HW CONVERTER SYS. NO. CV-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Electric)	1	EA	4	4.1	26	$106			295	$295	$402		
Digital Input	Pressure Switch (Elec)	1	EA	2	2.4	26	$62			52	$52	$114		
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
Analog Input	Temp. Water (Elec)	1	EA	3	3.1	26	$81			222	$222	$303		
	Temp. Water (Plum)	1	EA	2	2.1	24	$52			65	$65	$117		
TOTAL THIS SHEET							$403				$728	$1,132		

COST ESTIMATE ANALYSIS

		INVITATION NO./CONTRACT NO. DACA41-92-C-0098		EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT	EMCS FEASIBILITY STUDY	☐ CODE A ☒ CODE B ☐ CODE C		DRAWING NO.	SHT OF
LOCATION	FT. LEONARD WOOD, MISSOURI	☐ OTHER _____			
BLDG. NO.	1740			ESTIMATOR KC	CHECKED BY CEL

MULTIZONE AHU		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO.	AHU-1	No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	6	EA	3	18.8	26	$483			295	$1,771	$2,255		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	5	EA	3	13.1	26	$338			174	$870	$1,208		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
	Temp. Avg. Duct	2	EA	4	7.3	26	$187			190	$380	$567		
	RH Space	1	EA	3	2.6	26	$68			240	$240	$307		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
TOTAL THIS SHEET							$1,711				$4,597	$6,307		

COST ESTIMATE ANALYSIS

PROJECT: EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 05-Apr-93
LOCATION: FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
BLDG. NO. 1740	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL

DUAL TEMP WATER PUMP
SYS. NO. CHW PUMP

TASK DESCRIPTION		Quantity No. Of Units	Quantity Unit Meas	LABOR MH/ Unit	LABOR Total Hrs	LABOR Unit Price	LABOR Cost	EQUIPMENT Unit Price	EQUIPMENT Cost	MATERIAL Unit Price	MATERIAL Cost	TOTAL	SHIPPING Unit Wt	SHIPPING Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Pressure Switch (Elec)	1	EA	2	2.4	26	$62			52	$52	$114		
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Water (Elec)	2	EA	3	6.3	26	$161			222	$444	$605		
	Temp. Water (Plum)	2	EA	2	4.3	24	$104			65	$130	$234		
TOTAL THIS SHEET							$565				$1,068	**$1,633**		

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COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 1740		ESTIMATOR KC	CHECKED BY CEL

MULTIZONE AHU SYS. NO. AHU-2		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	6	EA	3	18.8	26	$483			295	$1,771	$2,255		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	5	EA	3	13.1	26	$338			174	$870	$1,208		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
	Temp. Avg. Duct	2	EA	4	7.3	26	$187			190	$380	$567		
	RH Space	1	EA	3	2.6	26	$68			240	$240	$307		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
TOTAL THIS SHEET							$1,711				$4,597	$6,307		

COST ESTIMATE

BUILDING 1750

COST ESTIMATE ANALYSIS

PROJECT: EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
LOCATION: FT. LEONARD WOOD, MISSOURI	☐ CODE A ☒ CODE B ☐ CODE C	DRAWING NO.	SHT OF
BLDG. NO. 1750	☐ OTHER _____	ESTIMATOR KC	CHECKED BY CEL

MULTIZONE AHU		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. AHU-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	6	EA	3	18.8	26	$483			295	$1,771	$2,255		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	5	EA	3	13.1	26	$338			174	$870	$1,208		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
	Temp. Avg. Duct	2	EA	4	7.3	26	$187			190	$380	$567		
	RH Space	1	EA	3	2.6	26	$68			240	$240	$307		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
TOTAL THIS SHEET							$1,711				$4,597	$6,307		

COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 1750		ESTIMATOR KC	CHECKED BY CEL

MULTIZONE AHU SYS. NO. AHU-2		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	6	EA	3	18.8	26	$483			295	$1,771	$2,255		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	5	EA	3	13.1	26	$338			174	$870	$1,208		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
	Temp. Avg. Duct	2	EA	4	7.3	26	$187			190	$380	$567		
	RH Space	1	EA	3	2.6	26	$68			240	$240	$307		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
TOTAL THIS SHEET							$1,711				$4,597	$6,307		

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COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098		EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 1750		ESTIMATOR KC	CHECKED BY CEL

AHU SYS. NO. HV-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$360				$757	$1,117		

COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 1750		ESTIMATOR KC	CHECKED BY CEL

AHU SYS. NO. HV-2	TASK DESCRIPTION	Quantity No. Of Units	Quantity Unit Meas	LABOR MH/ Unit	LABOR Total Hrs	LABOR Unit Price	LABOR Cost	EQUIPMENT Unit Price	EQUIPMENT Cost	MATERIAL Unit Price	MATERIAL Cost	TOTAL	SHIPPING Unit Wt	SHIPPING Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$360				$757	$1,117		

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COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 1750		ESTIMATOR KC	CHECKED BY CEL

STEAM HW CONVERTER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. CV-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Electric)	1	EA	4	4.1	26	$106			295	$295	$402		
Digital Input	Pressure Switch (Elec)	1	EA	2	2.4	26	$62			52	$52	$114		
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
Analog Input	Temp. Water (Elec)	1	EA	3	3.1	26	$81			222	$222	$303		
	Temp. Water (Plum)	1	EA	2	2.1	24	$52			65	$65	$117		
TOTAL THIS SHEET							$403				$728	$1,132		

COST ESTIMATE

BUILDING 2100

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	☐ CODE A ☒ CODE B ☐ CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	☐ OTHER _____		
BLDG. NO. 2100		ESTIMATOR KC	CHECKED BY CEL

SINGLE ZONE & VAV AHU		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. AHU-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	1	EA	3	3.1	26	$81			295	$295	$376		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Avg. Duct	1	EA	4	3.6	26	$93			190	$190	$283		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
TOTAL THIS SHEET							$944				$2,169	$3,113		

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COST ESTIMATE ANALYSIS

PROJECT: EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
LOCATION: FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
BLDG. NO. 2100	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL

SINGLE ZONE & VAV AHU		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. AHU-2		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	1	EA	3	3.1	26	$81			295	$295	$376		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Avg. Duct	1	EA	4	3.6	26	$93			190	$190	$283		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
TOTAL THIS SHEET							$944				$2,169	$3,113		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 2100		ESTIMATOR KC	CHECKED BY CEL

SINGLE ZONE & VAV AHU		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. AHU-3		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	1	EA	3	3.1	26	$81			295	$295	$376		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Avg. Duct	1	EA	4	3.6	26	$93			190	$190	$283		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
TOTAL THIS SHEET							$944				$2,169	$3,113		

COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	OTHER _____		
BLDG. NO. 2100		ESTIMATOR KC	CHECKED BY CEL

SINGLE ZONE & VAV AHU		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. AHU-4		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	1	EA	3	3.1	26	$81			295	$295	$376		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Avg. Duct	1	EA	4	3.6	26	$93			190	$190	$283		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
TOTAL THIS SHEET							$944				$2,169	$3,113		

COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	☐ CODE A ☒ CODE B ☐ CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	☐ OTHER _____		
BLDG. NO. 2100		ESTIMATOR KC	CHECKED BY CEL

SINGLE ZONE & VAV AHU		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. AHU-5		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	1	EA	3	3.1	26	$81			295	$295	$376		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Avg. Duct	1	EA	4	3.6	26	$93			190	$190	$283		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
TOTAL THIS SHEET							$944				$2,169	$3,113		

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COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	☐ CODE A ☒ CODE B ☐ CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	☐ OTHER _____		
BLDG. NO. 2100		ESTIMATOR KC	CHECKED BY CEL

SINGLE ZONE & VAV AHU		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. AHU-6		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	1	EA	3	3.1	26	$81			295	$295	$376		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Avg. Duct	1	EA	4	3.6	26	$93			190	$190	$283		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
TOTAL THIS SHEET							$944				$2,169	$3,113		

COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 2100		ESTIMATOR KC	CHECKED BY CEL

SINGLE ZONE & VAV AHU
SYS. NO. AHU-7

TASK DESCRIPTION		Quantity No. Of Units	Quantity Unit Meas	LABOR MH/ Unit	LABOR Total Hrs	LABOR Unit Price	LABOR Cost	EQUIPMENT Unit Price	EQUIPMENT Cost	MATERIAL Unit Price	MATERIAL Cost	TOTAL	SHIPPING Unit Wt	SHIPPING Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	1	EA	3	3.1	26	$81			295	$295	$376		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Avg. Duct	1	EA	4	3.6	26	$93			190	$190	$283		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
TOTAL THIS SHEET							$944				$2,169	$3,113		

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COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 2100		ESTIMATOR KC	CHECKED BY CEL

SINGLE ZONE & VAV AHU		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. AHU-8		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	1	EA	3	3.1	26	$81			295	$295	$376		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Avg. Duct	1	EA	4	3.6	26	$93			190	$190	$283		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
TOTAL THIS SHEET							$944				$2,169	$3,113		

COST ESTIMATE ANALYSIS

PROJECT: EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO.: DACA41-92-C-0098	EFFECTIVE PRICING: MARCH 1993	DATE PREPARED: 27-Mar-93
LOCATION: FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
BLDG. NO. 2100	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL

SINGLE ZONE & VAV AHU		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. AHU-9		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	1	EA	3	3.1	26	$81			295	$295	$376		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Avg. Duct	1	EA	4	3.6	26	$93			190	$190	$283		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
TOTAL THIS SHEET							$944				$2,169	$3,113		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 2100		ESTIMATOR KC	CHECKED BY CEL

HOT WATER BOILER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. BLR-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Electric)	1	EA	4	4.1	26	$106			295	$295	$402		
Digital Input	Pressure Switch (Elec)			2		26				52				
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
	Auxilary Contact	1	EA	2	1.9	26	$49			43	$43	$92		
	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
		1	EA											
Analog Input	Temp. Water (Elec)	2	EA	3	6.3	26	$161			222	$444	$605		
	Temp. Water (Plum)	2	EA	2	4.3	24	$104			65	$130	$234		
TOTAL THIS SHEET							$572				$1,048	$1,620		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 2100		ESTIMATOR KC	CHECKED BY CEL

HOT WATER BOILER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. BLR-2		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Electric)	1	EA	4	4.1	26	$106			295	$295	$402		
Digital Input	Pressure Switch (Elec)			2		26				52				
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
	Auxilary Contact	1	EA	2	1.9	26	$49			43	$43	$92		
	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
		1	EA											
Analog Input	Temp. Water (Elec)	2	EA	3	6.3	26	$161			222	$444	$605		
	Temp. Water (Plum)	2	EA	2	4.3	24	$104			65	$130	$234		
TOTAL THIS SHEET							$572				$1,048	$1,620		

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COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 2100		ESTIMATOR KC	CHECKED BY CEL

AIR COOLED CHILLER SYS. NO. CH-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay	4	EA	3	11.6	26	$300			77	$306	$606		
Analog Output														
Digital Input	Pressure Switch (Elec)	1	EA	2	2.4	26	$62			52	$52	$114		
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
	Status Relay	2	EA	2	3.8	26	$98			41	$83	$181		
Analog Input	Temp. Water (Elec)	2	EA	3	6.3	26	$161			222	$444	$605		
	Temp. Water (Plum)	2	EA	2	4.3	24	$104			65	$130	$234		
TOTAL THIS SHEET							$828				$1,110	$1,937		

COST ESTIMATE ANALYSIS

		INVITATION NO./CONTRACT NO. DACA41-92-C-0098		EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT	EMCS FEASIBILITY STUDY	☐ CODE A ☒ CODE B ☐ CODE C		DRAWING NO.	SHT OF
LOCATION	FT. LEONARD WOOD, MISSOURI	☐ OTHER _____			
BLDG. NO.	2100			ESTIMATOR KC	CHECKED BY CEL

AIR COOLED CHILLER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO.	CH-2	No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay	4	EA	3	11.6	26	$300			77	$306	$606		
Analog Output														
Digital Input	Pressure Switch (Elec)	1	EA	2	2.4	26	$62			52	$52	$114		
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
	Status Relay	2	EA	2	3.8	26	$98			41	$83	$181		
Analog Input	Temp. Water (Elec)	2	EA	3	6.3	26	$161			222	$444	$605		
	Temp. Water (Plum)	2	EA	2	4.3	24	$104			65	$130	$234		
TOTAL THIS SHEET							$828				$1,110	$1,937		

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COST ESTIMATE

BUILDING 2105

COST ESTIMATE ANALYSIS

PROJECT: EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
LOCATION: FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
BLDG. NO. 2105	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL

SINGLE ZONE & VAV AHU		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. AHU-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	1	EA	3	3.1	26	$81			295	$295	$376		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Avg. Duct	1	EA	4	3.6	26	$93			190	$190	$283		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
TOTAL THIS SHEET							$944				$2,169	$3,113		

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COST ESTIMATE ANALYSIS

PROJECT: EMCS FEASIBILITY STUDY		INVITATION NO./CONTRACT NO. DACA41-92-C-0098		EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
LOCATION: FT. LEONARD WOOD, MISSOURI		[ ] CODE A [X] CODE B [ ] CODE C		DRAWING NO.	SHT OF
BLDG. NO. 2105		[ ] OTHER _____		ESTIMATOR KC	CHECKED BY CEL

SINGLE ZONE & VAV AHU		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. AHU-2		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	1	EA	3	3.1	26	$81			295	$295	$376		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Avg. Duct	1	EA	4	3.6	26	$93			190	$190	$283		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
TOTAL THIS SHEET							$944				$2,169	$3,113		

COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 2105		ESTIMATOR KC	CHECKED BY CEL

AHU SYS. NO. AHU-3	TASK DESCRIPTION	Quantity No. Of Units	Quantity Unit Meas	LABOR MH/ Unit	LABOR Total Hrs	LABOR Unit Price	LABOR Cost	EQUIPMENT Unit Price	EQUIPMENT Cost	MATERIAL Unit Price	MATERIAL Cost	TOTAL	SHIPPING Unit Wt	SHIPPING Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$360				$757	$1,117		

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COST ESTIMATE ANALYSIS

PROJECT: EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
LOCATION: FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
BLDG. NO. 2105	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL

AIR COOLED DX COMPRESSOR		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. ACCU-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
Analog Input														
TOTAL THIS SHEET							$105				$85	$190		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 2105		ESTIMATOR KC	CHECKED BY CEL

AIR COOLED DX COMPRESSOR		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. ACCU-2		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
Analog Input														
TOTAL THIS SHEET							$105				$85	$190		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 2105		ESTIMATOR KC	CHECKED BY CEL

STEAM BOILER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. BLR-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output														
Analog Output														
Digital Input	Auxilary Contact	1	EA	2	1.9	26	$49			43	$43	$92		
	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
Analog Input	PSIG/PSID (Elec)	1	EA	3	3.1	26	$81			202	$202	$283		
	PSIG/PSID (Plum)	1	EA	2	2.1	24	$52			55	$55	$107		
TOTAL THIS SHEET							$231				$341	$572		

COST ESTIMATE

BUILDING 2240

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 2240		ESTIMATOR KC	CHECKED BY CEL

AHU SYS. NO. AHU-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$360				$757	$1,117		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	☐ CODE A ☒ CODE B ☐ CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	☐ OTHER _____		
BLDG. NO. 2240		ESTIMATOR KC	CHECKED BY CEL

AIR COOLED DX COMPRESSOR SYS. NO. ACCU-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
Analog Input														
TOTAL THIS SHEET							$105				$85	$190		

COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 2240		ESTIMATOR KC	CHECKED BY CEL

UNIT HEATER SYS. NO. UH1&2	TASK DESCRIPTION	Quantity No. Of Units	Quantity Unit Meas	LABOR MH/ Unit	LABOR Total Hrs	LABOR Unit Price	LABOR Cost	EQUIPMENT Unit Price	EQUIPMENT Cost	MATERIAL Unit Price	MATERIAL Cost	TOTAL	SHIPPING Unit Wt	SHIPPING Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Auxilary Contact	1	EA	2	1.9	26	$49			43	$43	$92		
Analog Input	Temp. Space	1	EA	3	2.6	26	$68			174	$174	$242		
TOTAL THIS SHEET							$173				$260	$433		

COST ESTIMATE ANALYSIS

PROJECT: EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
LOCATION: FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
BLDG. NO. 2240	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL

UNIT HEATER SYS. NO. UH-3&4		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Auxilary Contact	1	EA	2	1.9	26	$49			43	$43	$92		
Analog Input	Temp. Space	1	EA	3	2.6	26	$68			174	$174	$242		
TOTAL THIS SHEET							$173				$260	$433		

COST ESTIMATE

BUILDING 2250

COST ESTIMATE ANALYSIS

PROJECT: EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
LOCATION: FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
BLDG. NO. 2250	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL

AHU SYS. NO. AHU-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$360				$757	$1,117		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	☐ CODE A ☒ CODE B ☐ CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	☐ OTHER _____		
BLDG. NO. 2250		ESTIMATOR KC	CHECKED BY CEL

FAN COIL SYS. NO. FC-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	ACU (Fan Coil)	1	EA	4	3.6	26	$93			415	$415	$508		
Digital Input														
Analog Input	Temp. Space (RTD Only)	1	EA	3	2.6	26	$68			50	$50	$117		
TOTAL THIS SHEET							$217				$508	$725		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 2250		ESTIMATOR KC	CHECKED BY CEL

PERIMETER RADIATION		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. RAD-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output														
Analog Output	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
	ACU (Fan Coil)	1	EA	4	3.6	26	$93			415	$415	$508		
Digital Input														
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$309				$1,058	$1,367		

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COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 2250		ESTIMATOR KC	CHECKED BY CEL

HOT WATER BOILER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. BLR-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Electric)	1	EA	4	4.1	26	$106			295	$295	$402		
Digital Input	Pressure Switch (Elec)			2		26				52				
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
	Auxilary Contact	1	EA	2	1.9	26	$49			43	$43	$92		
	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
		1	EA											
Analog Input	Temp. Water (Elec)	2	EA	3	6.3	26	$161			222	$444	$605		
	Temp. Water (Plum)	2	EA	2	4.3	24	$104			65	$130	$234		
TOTAL THIS SHEET							$572				$1,048	$1,620		

COST ESTIMATE

BUILDING 2273

COST ESTIMATE ANALYSIS

PROJECT: EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO.: DACA41-92-C-0098	EFFECTIVE PRICING: MARCH 1993	DATE PREPARED: 27-Mar-93
LOCATION: FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
BLDG. NO.: 2273	[ ] OTHER _____	ESTIMATOR: KC	CHECKED BY: CEL

SINGLE ZONE & VAV AHU		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. AHU-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	1	EA	3	3.1	26	$81			295	$295	$376		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Avg. Duct	1	EA	4	3.6	26	$93			190	$190	$283		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
TOTAL THIS SHEET							$944				$2,169	$3,113		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 2273		ESTIMATOR KC	CHECKED BY CEL

AIR COOLED DX COMPRESSOR		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. DX-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
Analog Input														
TOTAL THIS SHEET							$105				$85	$190		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL
BLDG. NO. 2273			

AHU SYS. NO. HV-1	TASK DESCRIPTION	Quantity No. Of Units	Quantity Unit Meas	LABOR MH/ Unit	LABOR Total Hrs	LABOR Unit Price	LABOR Cost	EQUIPMENT Unit Price	EQUIPMENT Cost	MATERIAL Unit Price	MATERIAL Cost	TOTAL	SHIPPING Unit Wt	SHIPPING Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$360				$757	$1,117		

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COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 2273		ESTIMATOR KC	CHECKED BY CEL

STEAM BOILER SYS. NO. BLR-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output														
Analog Output														
Digital Input	Auxiliary Contact	1	EA	2	1.9	26	$49			43	$43	$92		
	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
Analog Input	PSIG/PSID (Elec)	1	EA	3	3.1	26	$81			202	$202	$283		
	PSIG/PSID (Plum)	1	EA	2	2.1	24	$52			55	$55	$107		
TOTAL THIS SHEET							$231				$341	$572		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 02-Apr-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL
BLDG. NO. 2273			

ELECTRIC DW HEATER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. DHW-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	H/O/A & Control Relay	1	EA	3	2.9	26	$75			77	$77	$152		
Analog Output														
Digital Input	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
Analog Input														
TOTAL THIS SHEET							$124				$118	$242		

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COST ESTIMATE

BUILDING 2399

COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098		EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 2399		ESTIMATOR KC	CHECKED BY CEL

MULTIZONE AHU		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO.	AHU-1	No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	6	EA	3	18.8	26	$483			295	$1,771	$2,255		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	5	EA	3	13.1	26	$338			174	$870	$1,208		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
	Temp. Avg. Duct	2	EA	4	7.3	26	$187			190	$380	$567		
	RH Space	1	EA	3	2.6	26	$68			240	$240	$307		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
TOTAL THIS SHEET							$1,711				$4,597	$6,307		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 2399		ESTIMATOR KC	CHECKED BY CEL

AIR COOLED DX COMPRESSOR SYS. NO. ACCU-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
Analog Input														
TOTAL THIS SHEET							$105				$85	$190		

COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 2399		ESTIMATOR KC	CHECKED BY CEL

STEAM BOILER SYS. NO. BLR-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output														
Analog Output														
Digital Input	Auxilary Contact	1	EA	2	1.9	26	$49			43	$43	$92		
	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
Analog Input	PSIG/PSID (Elec)	1	EA	3	3.1	26	$81			202	$202	$283		
	PSIG/PSID (Plum)	1	EA	2	2.1	24	$52			55	$55	$107		
TOTAL THIS SHEET							$231				$341	$572		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	☐ CODE A ☒ CODE B ☐ CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	☐ OTHER _____		
BLDG. NO. 2399		ESTIMATOR KC	CHECKED BY CEL

ELECTRIC DW HEATER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. DHW-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	H/O/A & Control Relay	1	EA	3	2.9	26	$75			77	$77	$152		
Analog Output														
Digital Input	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
Analog Input														
TOTAL THIS SHEET							$124				$118	$242		

COST ESTIMATE

BUILDING 2574

COST ESTIMATE ANALYSIS

PROJECT: EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO.: DACA41-92-C-0098	EFFECTIVE PRICING: MARCH 1993	DATE PREPARED: 02-Apr-93
LOCATION: FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
BLDG. NO. 2574	[ ] OTHER _____	ESTIMATOR: KC	CHECKED BY: CEL

SYS. NO. WATER-2		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	H/O/A & Control Relay		EA	3		26				77				
Analog Output														
Digital Input	Pressure Switch (Elec)		EA	2		26				52				
	Pressure Switch (Plum)		EA	2		24				51				
	Diff. Pressure Sw. (Filter)		EA	3		26				71				
	Level Switch		EA	4		26				136				
	Status Relay	2	EA	2	3.8	26	$98			41	$83	$181		
	End Position Switch		EA	2		26				69				
Analog Input	PSIG/PSID (Elec)	2	EA	3	6.3	26	$161			202	$404	$566		
	PSIG/PSID (Plum)	2	EA	2	4.3	24	$104			55	$109	$213		
	Position		EA	3		26				191				
	Temp. Water (Elec)	9	EA	3	28.1	26	$725			222	$1,999	$2,724		
	Temp. Water (Plum)	9	EA	2	19.1	24	$466			65	$585	$1,052		
TOTAL THIS SHEET							$1,555				$3,181	**$4,736**		

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COST ESTIMATE

BUILDING 3210

COST ESTIMATE ANALYSIS

PROJECT: EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO.: DACA41-92-C-0098	EFFECTIVE PRICING: MARCH 1993	DATE PREPARED: 27-Mar-93
LOCATION: FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
BLDG. NO. 3210	[ ] OTHER _____	ESTIMATOR: KC	CHECKED BY: CEL

FAN COIL SYS. NO. FC-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	ACU (Fan Coil)	1	EA	4	3.6	26	$93			415	$415	$508		
Digital Input														
Analog Input	Temp. Space (RTD Only)	1	EA	3	2.6	26	$68			50	$50	$117		
TOTAL THIS SHEET							$217				$508	$725		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 3210		ESTIMATOR KC	CHECKED BY CEL

FAN COIL SYS. NO. FC-2		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	ACU (Fan Coil)	1	EA	4	3.6	26	$93			415	$415	$508		
Digital Input														
Analog Input	Temp. Space (RTD Only)	1	EA	3	2.6	26	$68			50	$50	$117		
TOTAL THIS SHEET							$217				$508	$725		

COST ESTIMATE

3211 3212, 3213, 3214
BUILDING 3215

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 3211		ESTIMATOR KC	CHECKED BY CEL

FAN COIL SYS. NO. FC-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	ACU (Fan Coil)	1	EA	4	3.6	26	$93			415	$415	$508		
Digital Input														
Analog Input	Temp. Space (RTD Only)	1	EA	3	2.6	26	$68			50	$50	$117		
TOTAL THIS SHEET							$217				$508	$725		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	☐ CODE A ☒ CODE B ☐ CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	☐ OTHER _____		
BLDG. NO. 3211		ESTIMATOR KC	CHECKED BY CEL

FAN COIL SYS. NO. FC-2		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	ACU (Fan Coil)	1	EA	4	3.6	26	$93			415	$415	$508		
Digital Input														
Analog Input	Temp. Space (RTD Only)	1	EA	3	2.6	26	$68			50	$50	$117		
TOTAL THIS SHEET							$217				$508	$725		

COST ESTIMATE ANALYSIS

PROJECT: EMCS FEASIBILITY STUDY		INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
LOCATION: FT. LEONARD WOOD, MISSOURI		[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
BLDG. NO. 3211		[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL

FAN COIL SYS. NO. FC-3		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	ACU (Fan Coil)	1	EA	4	3.6	26	$93			415	$415	$508		
Digital Input														
Analog Input	Temp. Space (RTD Only)	1	EA	3	2.6	26	$68			50	$50	$117		
TOTAL THIS SHEET							$217				$508	$725		

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COST ESTIMATE

BUILDING 4052

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL
BLDG. NO. 4052			

AHU SYS. NO. AHU-1	TASK DESCRIPTION	Quantity No. Of Units	Quantity Unit Meas	LABOR MH/ Unit	LABOR Total Hrs	LABOR Unit Price	LABOR Cost	EQUIPMENT Unit Price	EQUIPMENT Cost	MATERIAL Unit Price	MATERIAL Cost	TOTAL	SHIPPING Unit Wt	SHIPPING Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$360				$757	$1,117		

COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 4052		ESTIMATOR KC	CHECKED BY CEL

AIR COOLED DX COMPRESSOR SYS. NO. ACCU-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
Analog Input														
TOTAL THIS SHEET							$105				$85	$190		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	☐ CODE A ☒ CODE B ☐ CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	☐ OTHER _____		
BLDG. NO. 4052		ESTIMATOR KC	CHECKED BY CEL

ELECTRIC DW HEATER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. DHW-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	H/O/A & Control Relay	1	EA	3	2.9	26	$75			77	$77	$152		
Analog Output														
Digital Input	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
Analog Input														
TOTAL THIS SHEET							$124				$118	$242		

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COST ESTIMATE

BUILDING 4100 & 4101

COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL
BLDG. NO. 4100			

PERIMETER RADIATION SYS. NO. HWR-1	TASK DESCRIPTION	Quantity No. Of Units	Quantity Unit Meas	LABOR MH/ Unit	LABOR Total Hrs	LABOR Unit Price	LABOR Cost	EQUIPMENT Unit Price	EQUIPMENT Cost	MATERIAL Unit Price	MATERIAL Cost	TOTAL	SHIPPING Unit Wt	SHIPPING Total Wt
Digital Output														
Analog Output	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
	ACU (Fan Coil)	1	EA	4	3.6	26	$93			415	$415	$508		
Digital Input														
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$309				$1,058	$1,367		

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COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	☐ CODE A ☒ CODE B ☐ CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	☐ OTHER _____		
BLDG. NO. 4100		ESTIMATOR KC	CHECKED BY CEL

PERIMETER RADIATION SYS. NO. HWR-2		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output														
Analog Output	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
	ACU (Fan Coil)	1	EA	4	3.6	26	$93			415	$415	$508		
Digital Input														
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$309				$1,058	$1,367		

COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098		EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 4100		ESTIMATOR KC	CHECKED BY CEL

HOT WATER BOILER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. BLR-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Electric)	1	EA	4	4.1	26	$106			295	$295	$402		
Digital Input	Pressure Switch (Elec)			2		26				52				
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
	Auxilary Contact	1	EA	2	1.9	26	$49			43	$43	$92		
	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
		1	EA											
Analog Input	Temp. Water (Elec)	2	EA	3	6.3	26	$161			222	$444	$605		
	Temp. Water (Plum)	2	EA	2	4.3	24	$104			65	$130	$234		
TOTAL THIS SHEET							$572				$1,048	$1,620		

COST ESTIMATE

BUILDING 4102 & 4104

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 4102		ESTIMATOR KC	CHECKED BY CEL

PERIMETER RADIATION		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. HWR-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output														
Analog Output	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
	ACU (Fan Coil)	1	EA	4	3.6	26	$93			415	$415	$508		
Digital Input														
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$309				$1,058	$1,367		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 4102		ESTIMATOR KC	CHECKED BY CEL

PERIMETER RADIATION		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. HWR-2		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output														
Analog Output	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
	ACU (Fan Coil)	1	EA	4	3.6	26	$93			415	$415	$508		
Digital Input														
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$309				$1,058	$1,367		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098		EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	☐ CODE A ☒ CODE B ☐ CODE C		DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	☐ OTHER _____			
BLDG. NO. 4102			ESTIMATOR KC	CHECKED BY CEL

HOT WATER BOILER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. BLR-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Electric)	1	EA	4	4.1	26	$106			295	$295	$402		
Digital Input	Pressure Switch (Elec)			2		26				52				
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
	Auxilary Contact	1	EA	2	1.9	26	$49			43	$43	$92		
	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
		1	EA											
Analog Input	Temp. Water (Elec)	2	EA	3	6.3	26	$161			222	$444	$605		
	Temp. Water (Plum)	2	EA	2	4.3	24	$104			65	$130	$234		
TOTAL THIS SHEET							$572				$1,048	$1,620		

COST ESTIMATE

BUILDING 4103

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 4103		ESTIMATOR KC	CHECKED BY CEL

PERIMETER RADIATION SYS. NO. HWR-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output														
Analog Output	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
	ACU (Fan Coil)	1	EA	4	3.6	26	$93			415	$415	$508		
Digital Input														
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$309				$1,058	$1,367		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 4103		ESTIMATOR KC	CHECKED BY CEL

PERIMETER RADIATION SYS. NO. HWR-2	TASK DESCRIPTION	Quantity No. Of Units	Quantity Unit Meas	LABOR MH/ Unit	LABOR Total Hrs	LABOR Unit Price	LABOR Cost	EQUIPMENT Unit Price	EQUIPMENT Cost	MATERIAL Unit Price	MATERIAL Cost	TOTAL	SHIPPING Unit Wt	SHIPPING Total Wt
Digital Output														
Analog Output	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
	ACU (Fan Coil)	1	EA	4	3.6	26	$93			415	$415	$508		
Digital Input														
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$309				$1,058	$1,367		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 4103		ESTIMATOR KC	CHECKED BY CEL

HOT WATER BOILER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. BLR-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Electric)	1	EA	4	4.1	26	$106			295	$295	$402		
Digital Input	Pressure Switch (Elec)			2		26				52				
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
	Auxilary Contact	1	EA	2	1.9	26	$49			43	$43	$92		
	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
		1	EA											
Analog Input	Temp. Water (Elec)	2	EA	3	6.3	26	$161			222	$444	$605		
	Temp. Water (Plum)	2	EA	2	4.3	24	$104			65	$130	$234		
TOTAL THIS SHEET							$572				$1,048	$1,620		

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COST ESTIMATE

BUILDING 4109

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 4109		ESTIMATOR KC	CHECKED BY CEL

SINGLE ZONE & VAV AHU		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. ACU-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	1	EA	3	3.1	26	$81			295	$295	$376		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Avg. Duct	1	EA	4	3.6	26	$93			190	$190	$283		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
TOTAL THIS SHEET							$944				$2,169	$3,113		

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COST ESTIMATE ANALYSIS

PROJECT: EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
LOCATION: FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
BLDG. NO. 4109	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL

SINGLE ZONE & VAV AHU
SYS. NO. ACU-2

TASK DESCRIPTION		Quantity: No. Of Units	Quantity: Unit Meas	LABOR: MH/ Unit	LABOR: Total Hrs	LABOR: Unit Price	LABOR: Cost	EQUIPMENT: Unit Price	EQUIPMENT: Cost	MATERIAL: Unit Price	MATERIAL: Cost	TOTAL	SHIPPING: Unit Wt	SHIPPING: Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	1	EA	3	3.1	26	$81			295	$295	$376		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Avg. Duct	1	EA	4	3.6	26	$93			190	$190	$283		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
TOTAL THIS SHEET							$944				$2,169	$3,113		

COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098		EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 4109		ESTIMATOR KC	CHECKED BY CEL

SINGLE ZONE & VAV AHU		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. ACU-3		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	1	EA	3	3.1	26	$81			295	$295	$376		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Avg. Duct	1	EA	4	3.6	26	$93			190	$190	$283		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
TOTAL THIS SHEET							$944				$2,169	$3,113		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 4109		ESTIMATOR KC	CHECKED BY CEL

SINGLE ZONE & VAV AHU		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. ACU-4		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	1	EA	3	3.1	26	$81			295	$295	$376		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Avg. Duct	1	EA	4	3.6	26	$93			190	$190	$283		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
TOTAL THIS SHEET							$944				$2,169	$3,113		

COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 4109		ESTIMATOR KC	CHECKED BY CEL

MULTIZONE AHU		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. AHU-5		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	6	EA	3	18.8	26	$483			295	$1,771	$2,255		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	5	EA	3	13.1	26	$338			174	$870	$1,208		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
	Temp. Avg. Duct	2	EA	4	7.3	26	$187			190	$380	$567		
	RH Space	1	EA	3	2.6	26	$68			240	$240	$307		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
TOTAL THIS SHEET							$1,711				$4,597	$6,307		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 4109		ESTIMATOR KC	CHECKED BY CEL

HOT WATER BOILER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. BLR-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Electric)	1	EA	4	4.1	26	$106			295	$295	$402		
Digital Input	Pressure Switch (Elec)			2		26				52				
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
	Auxilary Contact	1	EA	2	1.9	26	$49			43	$43	$92		
	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
		1	EA											
Analog Input	Temp. Water (Elec)	2	EA	3	6.3	26	$161			222	$444	$605		
	Temp. Water (Plum)	2	EA	2	4.3	24	$104			65	$130	$234		
TOTAL THIS SHEET							$572				$1,048	$1,620		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 4109		ESTIMATOR KC	CHECKED BY CEL

AIR COOLED CHILLER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. CH-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay	4	EA	3	11.6	26	$300			77	$306	$606		
Analog Output														
Digital Input	Pressure Switch (Elec)	1	EA	2	2.4	26	$62			52	$52	$114		
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
	Status Relay	2	EA	2	3.8	26	$98			41	$83	$181		
Analog Input	Temp. Water (Elec)	2	EA	3	6.3	26	$161			222	$444	$605		
	Temp. Water (Plum)	2	EA	2	4.3	24	$104			65	$130	$234		
TOTAL THIS SHEET							$828				$1,110	$1,937		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 4109		ESTIMATOR KC	CHECKED BY CEL

AIR COOLED CHILLER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. CH-2		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay	4	EA	3	11.6	26	$300			77	$306	$606		
Analog Output														
Digital Input	Pressure Switch (Elec)	1	EA	2	2.4	26	$62			52	$52	$114		
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
	Status Relay	2	EA	2	3.8	26	$98			41	$83	$181		
Analog Input	Temp. Water (Elec)	2	EA	3	6.3	26	$161			222	$444	$605		
	Temp. Water (Plum)	2	EA	2	4.3	24	$104			65	$130	$234		
TOTAL THIS SHEET							$828				$1,110	$1,937		

COST ESTIMATE

BUILDING 4110
AND TYPICAL FOR
4111, 4112, 4113, 4114, AND 4115

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 4110		ESTIMATOR KC	CHECKED BY CEL

PERIMETER RADIATION		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. HWR-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output														
Analog Output	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
	ACU (Fan Coil)	1	EA	4	3.6	26	$93			415	$415	$508		
Digital Input														
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$309				$1,058	$1,367		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 4110		ESTIMATOR KC	CHECKED BY CEL

PERIMETER RADIATION SYS. NO. HWR-2	TASK DESCRIPTION	Quantity No. Of Units	Quantity Unit Meas	LABOR MH/ Unit	LABOR Total Hrs	LABOR Unit Price	LABOR Cost	EQUIPMENT Unit Price	EQUIPMENT Cost	MATERIAL Unit Price	MATERIAL Cost	TOTAL	SHIPPING Unit Wt	SHIPPING Total Wt
Digital Output														
Analog Output	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
	ACU (Fan Coil)	1	EA	4	3.6	26	$93			415	$415	$508		
Digital Input														
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$309				$1,058	$1,367		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 4110		ESTIMATOR KC	CHECKED BY CEL

HOT WATER BOILER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. BLR-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Electric)	1	EA	4	4.1	26	$106			295	$295	$402		
Digital Input	Pressure Switch (Elec)			2		26				52				
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
	Auxilary Contact	1	EA	2	1.9	26	$49			43	$43	$92		
	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
		1	EA											
Analog Input	Temp. Water (Elec)	2	EA	3	6.3	26	$161			222	$444	$605		
	Temp. Water (Plum)	2	EA	2	4.3	24	$104			65	$130	$234		
TOTAL THIS SHEET							$572				$1,048	$1,620		

COST ESTIMATE

BUILDING 5001

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 5001		ESTIMATOR KC	CHECKED BY CEL

FAN COIL SYS. NO. FC-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	ACU (Fan Coil)	1	EA	4	3.6	26	$93			415	$415	$508		
Digital Input														
Analog Input	Temp. Space (RTD Only)	1	EA	3	2.6	26	$68			50	$50	$117		
TOTAL THIS SHEET							$217				$508	$725		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 5001		ESTIMATOR KC	CHECKED BY CEL

PERIMETER RADIATION SYS. NO. RAD-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output														
Analog Output	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
	ACU (Fan Coil)	1	EA	4	3.6	26	$93			415	$415	$508		
Digital Input														
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$309				$1,058	$1,367		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 5001		ESTIMATOR KC	CHECKED BY CEL

HOT WATER BOILER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. BLR-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Electric)	1	EA	4	4.1	26	$106			295	$295	$402		
Digital Input	Pressure Switch (Elec)			2		26				52				
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
	Auxilary Contact	1	EA	2	1.9	26	$49			43	$43	$92		
	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
		1	EA											
Analog Input	Temp. Water (Elec)	2	EA	3	6.3	26	$161			222	$444	$605		
	Temp. Water (Plum)	2	EA	2	4.3	24	$104			65	$130	$234		
TOTAL THIS SHEET							$572				$1,048	$1,620		

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COST ESTIMATE

BUILDING 5002

COST ESTIMATE ANALYSIS

PROJECT	EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
LOCATION	FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
BLDG. NO.	5002	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL

AHU SYS. NO. AHU-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$360				$757	$1,117		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 5002		ESTIMATOR KC	CHECKED BY CEL

AHU SYS. NO. AHU-2	TASK DESCRIPTION	Quantity No. Of Units	Quantity Unit Meas	LABOR MH/ Unit	LABOR Total Hrs	LABOR Unit Price	LABOR Cost	EQUIPMENT Unit Price	EQUIPMENT Cost	MATERIAL Unit Price	MATERIAL Cost	TOTAL	SHIPPING Unit Wt	SHIPPING Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$360				$757	$1,117		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	☐ CODE A ☒ CODE B ☐ CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	☐ OTHER _____		
BLDG. NO. 5002		ESTIMATOR KC	CHECKED BY CEL

AIR COOLED DX COMPRESSOR		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. ACCU-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
Analog Input														
TOTAL THIS SHEET							$105				$85	$190		

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COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	☐ CODE A ☒ CODE B ☐ CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	☐ OTHER _____		
BLDG. NO. 5002		ESTIMATOR KC	CHECKED BY CEL

AIR COOLED DX COMPRESSOR SYS. NO. ACCU-2		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
Analog Input														
TOTAL THIS SHEET							$105				$85	$190		

COST ESTIMATE

BUILDING 5004

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 27-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 5004		ESTIMATOR KC	CHECKED BY CEL

SINGLE ZONE & VAV AHU		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. AHU-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	1	EA	3	3.1	26	$81			295	$295	$376		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Avg. Duct	1	EA	4	3.6	26	$93			190	$190	$283		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
TOTAL THIS SHEET							$944				$2,169	$3,113		

COST ESTIMATE ANALYSIS

PROJECT: EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO.: DACA41-92-C-0098	EFFECTIVE PRICING: MARCH 1993	DATE PREPARED: 27-Mar-93
LOCATION: FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
BLDG. NO.: 5004	[ ] OTHER _____	ESTIMATOR: KC	CHECKED BY: CEL

AIR COOLED DX COMPRESSOR		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. ACCU-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
Analog Input														
TOTAL THIS SHEET							$105				$85	$190		

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COST ESTIMATE

BUILDING 5007

COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 5007		ESTIMATOR KC	CHECKED BY CEL

SINGLE ZONE & VAV AHU		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. AHU-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	1	EA	3	3.1	26	$81			295	$295	$376		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Avg. Duct	1	EA	4	3.6	26	$93			190	$190	$283		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
TOTAL THIS SHEET							$944				$2,169	$3,113		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 5007		ESTIMATOR KC	CHECKED BY CEL

AIR COOLED DX COMPRESSOR		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. DX-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
Analog Input														
TOTAL THIS SHEET							$105				$85	$190		

COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 5007		ESTIMATOR KC	CHECKED BY CEL

UNIT HEATER SYS. NO. UH-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Auxilary Contact	1	EA	2	1.9	26	$49			43	$43	$92		
Analog Input	Temp. Space	1	EA	3	2.6	26	$68			174	$174	$242		
TOTAL THIS SHEET							$173				$260	$433		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 5007		ESTIMATOR KC	CHECKED BY CEL

UNIT HEATER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. UH-2		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Auxilary Contact	1	EA	2	1.9	26	$49			43	$43	$92		
Analog Input	Temp. Space	1	EA	3	2.6	26	$68			174	$174	$242		
TOTAL THIS SHEET							$173				$260	$433		

COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098		EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 5007		ESTIMATOR KC	CHECKED BY CEL

UNIT HEATER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. UH-3		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Auxilary Contact	1	EA	2	1.9	26	$49			43	$43	$92		
Analog Input	Temp. Space	1	EA	3	2.6	26	$68			174	$174	$242		
TOTAL THIS SHEET							$173				$260	$433		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 5007		ESTIMATOR KC	CHECKED BY CEL

UNIT HEATER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. UH-4		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Auxilary Contact	1	EA	2	1.9	26	$49			43	$43	$92		
Analog Input	Temp. Space	1	EA	3	2.6	26	$68			174	$174	$242		
TOTAL THIS SHEET							$173				$260	$433		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 5007		ESTIMATOR KC	CHECKED BY CEL

UNIT HEATER SYS. NO. UH-5		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Auxilary Contact	1	EA	2	1.9	26	$49			43	$43	$92		
Analog Input	Temp. Space	1	EA	3	2.6	26	$68			174	$174	$242		
TOTAL THIS SHEET							$173				$260	$433		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 5007		ESTIMATOR KC	CHECKED BY CEL

UNIT HEATER SYS. NO. UH-6		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Auxiliary Contact	1	EA	2	1.9	26	$49			43	$43	$92		
Analog Input	Temp. Space	1	EA	3	2.6	26	$68			174	$174	$242		
TOTAL THIS SHEET							$173				$260	$433		

COST ESTIMATE ANALYSIS

PROJECT: EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO.: DACA41-92-C-0098	EFFECTIVE PRICING: MARCH 1993	DATE PREPARED: 29-Mar-93
LOCATION: FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
BLDG. NO.: 5007	[ ] OTHER _____	ESTIMATOR: KC	CHECKED BY: CEL

UNIT HEATER SYS. NO. UH-7	TASK DESCRIPTION	Quantity: No. Of Units	Quantity: Unit Meas	LABOR: MH/ Unit	LABOR: Total Hrs	LABOR: Unit Price	LABOR: Cost	EQUIPMENT: Unit Price	EQUIPMENT: Cost	MATERIAL: Unit Price	MATERIAL: Cost	TOTAL	SHIPPING: Unit Wt	SHIPPING: Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Auxilary Contact	1	EA	2	1.9	26	$49			43	$43	$92		
Analog Input	Temp. Space	1	EA	3	2.6	26	$68			174	$174	$242		
TOTAL THIS SHEET							$173				$260	**$433**		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 5007		ESTIMATOR KC	CHECKED BY CEL

UNIT HEATER SYS. NO. UH-8		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Auxilary Contact	1	EA	2	1.9	26	$49			43	$43	$92		
Analog Input	Temp. Space	1	EA	3	2.6	26	$68			174	$174	$242		
TOTAL THIS SHEET							$173				$260	$433		

COST ESTIMATE ANALYSIS

PROJECT: EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
LOCATION: FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
BLDG. NO. 5007	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL

UNIT HEATER SYS. NO. UH-9		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Auxilary Contact	1	EA	2	1.9	26	$49			43	$43	$92		
Analog Input	Temp. Space	1	EA	3	2.6	26	$68			174	$174	$242		
TOTAL THIS SHEET							$173				$260	$433		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 5007		ESTIMATOR KC	CHECKED BY CEL

UNIT HEATER SYS. NO. UH-10		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Auxilary Contact	1	EA	2	1.9	26	$49			43	$43	$92		
Analog Input	Temp. Space	1	EA	3	2.6	26	$68			174	$174	$242		
TOTAL THIS SHEET							$173				$260	$433		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 5007		ESTIMATOR KC	CHECKED BY CEL

UNIT HEATER SYS. NO. UH-11		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Auxilary Contact	1	EA	2	1.9	26	$49			43	$43	$92		
Analog Input	Temp. Space	1	EA	3	2.6	26	$68			174	$174	$242		
TOTAL THIS SHEET							$173				$260	$433		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	☐ CODE A ☒ CODE B ☐ CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	☐ OTHER _____		
BLDG. NO. 5007		ESTIMATOR KC	CHECKED BY CEL

UNIT HEATER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. UH-12		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Auxilary Contact	1	EA	2	1.9	26	$49			43	$43	$92		
Analog Input	Temp. Space	1	EA	3	2.6	26	$68			174	$174	$242		
TOTAL THIS SHEET							$173				$260	$433		

COST ESTIMATE ANALYSIS

PROJECT: EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO.: DACA41-92-C-0098	EFFECTIVE PRICING: MARCH 1993	DATE PREPARED: 29-Mar-93
LOCATION: FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
BLDG. NO.: 5007	[ ] OTHER _____	ESTIMATOR: KC	CHECKED BY: CEL

UNIT HEATER SYS. NO. UH-13 / TASK DESCRIPTION		Quantity: No. Of Units	Quantity: Unit Meas	LABOR: MH/ Unit	LABOR: Total Hrs	LABOR: Unit Price	LABOR: Cost	EQUIPMENT: Unit Price	EQUIPMENT: Cost	MATERIAL: Unit Price	MATERIAL: Cost	TOTAL	SHIPPING: Unit Wt	SHIPPING: Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Auxilary Contact	1	EA	2	1.9	26	$49			43	$43	$92		
Analog Input	Temp. Space	1	EA	3	2.6	26	$68			174	$174	$242		
TOTAL THIS SHEET							$173				$260	$433		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 5007		ESTIMATOR KC	CHECKED BY CEL

ELECTRIC DW HEATER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. DHW-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	H/O/A & Control Relay	1	EA	3	2.9	26	$75			77	$77	$152		
Analog Output														
Digital Input	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
Analog Input														
TOTAL THIS SHEET							$124				$118	$242		

COST ESTIMATE

BUILDING 5265

COST ESTIMATE ANALYSIS

PROJECT: EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
LOCATION: FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
BLDG. NO. 5265	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL

AHU SYS. NO. AC-B-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$360				$757	$1,117		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 5265		ESTIMATOR KC	CHECKED BY CEL

AHU SYS. NO. AC-B-2		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$360				$757	$1,117		

COST ESTIMATE ANALYSIS

PROJECT: EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO.: DACA41-92-C-0098	EFFECTIVE PRICING: MARCH 1993	DATE PREPARED: 29-Mar-93
LOCATION: FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
BLDG. NO.: 5265	[ ] OTHER _____	ESTIMATOR: KC	CHECKED BY: CEL

SINGLE ZONE & VAV AHU SYS. NO. AC-D-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	1	EA	3	3.1	26	$81			295	$295	$376		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Avg. Duct	1	EA	4	3.6	26	$93			190	$190	$283		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
TOTAL THIS SHEET							$944				$2,169	$3,113		

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COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 5265		ESTIMATOR KC	CHECKED BY CEL

SINGLE ZONE & VAV AHU		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. AC-D-2		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	1	EA	3	3.1	26	$81			295	$295	$376		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Avg. Duct	1	EA	4	3.6	26	$93			190	$190	$283		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
TOTAL THIS SHEET							$944				$2,169	$3,113		

COST ESTIMATE ANALYSIS

PROJECT: EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
LOCATION: FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
BLDG. NO. 5265	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL

SINGLE ZONE & VAV AHU		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. AC-E-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	1	EA	3	3.1	26	$81			295	$295	$376		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Avg. Duct	1	EA	4	3.6	26	$93			190	$190	$283		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
TOTAL THIS SHEET							$944				$2,169	$3,113		

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COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 5265		ESTIMATOR KC	CHECKED BY CEL

SINGLE ZONE & VAV AHU SYS. NO. AC-G-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	1	EA	3	3.1	26	$81			295	$295	$376		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Avg. Duct	1	EA	4	3.6	26	$93			190	$190	$283		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
TOTAL THIS SHEET							$944				$2,169	$3,113		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 5265		ESTIMATOR KC	CHECKED BY CEL

SINGLE ZONE & VAV AHU		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. AC-G-2		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	1	EA	3	3.1	26	$81			295	$295	$376		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Avg. Duct	1	EA	4	3.6	26	$93			190	$190	$283		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
TOTAL THIS SHEET							$944				$2,169	$3,113		

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COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 5265		ESTIMATOR KC	CHECKED BY CEL

SINGLE ZONE & VAV AHU		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. AC-G-3		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	1	EA	3	3.1	26	$81			295	$295	$376		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Avg. Duct	1	EA	4	3.6	26	$93			190	$190	$283		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
TOTAL THIS SHEET							$944				$2,169	$3,113		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 5265		ESTIMATOR KC	CHECKED BY CEL

AHU SYS. NO. AC-K-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$360				$757	$1,117		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 5265		ESTIMATOR KC	CHECKED BY CEL

SINGLE ZONE & VAV AHU		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. AC-K-2		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	1	EA	3	3.1	26	$81			295	$295	$376		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Avg. Duct	1	EA	4	3.6	26	$93			190	$190	$283		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
TOTAL THIS SHEET							$944				$2,169	$3,113		

COST ESTIMATE ANALYSIS

PROJECT	EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
LOCATION	FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
BLDG. NO.	5265	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL

AHU SYS. NO. HV-A-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$360				$757	$1,117		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 5265		ESTIMATOR KC	CHECKED BY CEL

SINGLE ZONE & VAV AHU		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. HV-B-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	1	EA	3	3.1	26	$81			295	$295	$376		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Avg. Duct	1	EA	4	3.6	26	$93			190	$190	$283		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
TOTAL THIS SHEET							$944				$2,169	$3,113		

COST ESTIMATE ANALYSIS

		INVITATION NO./CONTRACT NO. DACA41-92-C-0098		EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT	EMCS FEASIBILITY STUDY	☐ CODE A ☒ CODE B ☐ CODE C		DRAWING NO.	SHT OF
LOCATION	FT. LEONARD WOOD, MISSOURI	☐ OTHER _____			
BLDG. NO.	5265			ESTIMATOR KC	CHECKED BY CEL

AHU SYS. NO. HV-C-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$360				$757	**$1,117**		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	☐ CODE A ☒ CODE B ☐ CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	☐ OTHER _____		
BLDG. NO. 5265		ESTIMATOR KC	CHECKED BY CEL

AHU SYS. NO. HV-D-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$360				$757	$1,117		

COST ESTIMATE ANALYSIS

PROJECT: EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
LOCATION: FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
BLDG. NO. 5265	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL

SINGLE ZONE & VAV AHU		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. HV-D-2		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	1	EA	3	3.1	26	$81			295	$295	$376		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Avg. Duct	1	EA	4	3.6	26	$93			190	$190	$283		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
TOTAL THIS SHEET							$944				$2,169	$3,113		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 5265		ESTIMATOR KC	CHECKED BY CEL

SINGLE ZONE & VAV AHU		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. HV-D-3		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	1	EA	3	3.1	26	$81			295	$295	$376		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Avg. Duct	1	EA	4	3.6	26	$93			190	$190	$283		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
TOTAL THIS SHEET							$944				$2,169	$3,113		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 5265		ESTIMATOR KC	CHECKED BY CEL

SINGLE ZONE & VAV AHU		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. HV-D-4		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	1	EA	3	3.1	26	$81			295	$295	$376		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Avg. Duct	1	EA	4	3.6	26	$93			190	$190	$283		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
TOTAL THIS SHEET							$944				$2,169	$3,113		

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COST ESTIMATE ANALYSIS

PROJECT: EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
LOCATION: FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
BLDG. NO. 5265	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL

SINGLE ZONE & VAV AHU
SYS. NO. HV-E-1

TASK DESCRIPTION		Quantity No. Of Units	Quantity Unit Meas	LABOR MH/ Unit	LABOR Total Hrs	LABOR Unit Price	LABOR Cost	EQUIPMENT Unit Price	EQUIPMENT Cost	MATERIAL Unit Price	MATERIAL Cost	TOTAL	SHIPPING Unit Wt	SHIPPING Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	1	EA	3	3.1	26	$81			295	$295	$376		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Avg. Duct	1	EA	4	3.6	26	$93			190	$190	$283		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
TOTAL THIS SHEET							$944				$2,169	$3,113		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	☐ CODE A ☒ CODE B ☐ CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	☐ OTHER _____		
BLDG. NO. 5265		ESTIMATOR KC	CHECKED BY CEL

SINGLE ZONE & VAV AHU		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. HV-G-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	1	EA	3	3.1	26	$81			295	$295	$376		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Avg. Duct	1	EA	4	3.6	26	$93			190	$190	$283		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
TOTAL THIS SHEET							$944				$2,169	$3,113		

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COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 5265		ESTIMATOR KC	CHECKED BY CEL

SINGLE ZONE & VAV AHU		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. HV-G-3		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	1	EA	3	3.1	26	$81			295	$295	$376		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Avg. Duct	1	EA	4	3.6	26	$93			190	$190	$283		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
TOTAL THIS SHEET							$944				$2,169	$3,113		

COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 5265		ESTIMATOR KC	CHECKED BY CEL

SINGLE ZONE & VAV AHU		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. HV-G-5		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	1	EA	3	3.1	26	$81			295	$295	$376		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Avg. Duct	1	EA	4	3.6	26	$93			190	$190	$283		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
TOTAL THIS SHEET							$944				$2,169	$3,113		

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COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 5265		ESTIMATOR KC	CHECKED BY CEL

AHU SYS. NO. HV-K-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$360				$757	$1,117		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 5265		ESTIMATOR KC	CHECKED BY CEL

FAN COIL SYS. NO. FC-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	ACU (Fan Coil)	1	EA	4	3.6	26	$93			415	$415	$508		
Digital Input														
Analog Input	Temp. Space (RTD Only)	1	EA	3	2.6	26	$68			50	$50	$117		
TOTAL THIS SHEET							$217				$508	$725		

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COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 5265		ESTIMATOR KC	CHECKED BY CEL

FAN COIL SYS. NO. FC-2		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	ACU (Fan Coil)	1	EA	4	3.6	26	$93			415	$415	$508		
Digital Input														
Analog Input	Temp. Space (RTD Only)	1	EA	3	2.6	26	$68			50	$50	$117		
TOTAL THIS SHEET							$217				$508	$725		

COST ESTIMATE ANALYSIS

		INVITATION NO./CONTRACT NO. DACA41-92-C-0098		EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT	EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C		DRAWING NO.	SHT OF
LOCATION	FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____			
BLDG. NO.	5265			ESTIMATOR KC	CHECKED BY CEL

DUAL TEMP WATER PUMP		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO.	CHW PUMP - 1	No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Pressure Switch (Elec)	1	EA	2	2.4	26	$62			52	$52	$114		
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Water (Elec)	2	EA	3	6.3	26	$161			222	$444	$605		
	Temp. Water (Plum)	2	EA	2	4.3	24	$104			65	$130	$234		
TOTAL THIS SHEET							$565				$1,068	$1,633		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 5265		ESTIMATOR KC	CHECKED BY CEL

DUAL TEMP WATER PUMP		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. CHW PUMP - 2		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Digital Input	Pressure Switch (Elec)	1	EA	2	2.4	26	$62			52	$52	$114		
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Water (Elec)	2	EA	3	6.3	26	$161			222	$444	$605		
	Temp. Water (Plum)	2	EA	2	4.3	24	$104			65	$130	$234		
TOTAL THIS SHEET							$565				$1,068	$1,633		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 5265		ESTIMATOR KC	CHECKED BY CEL

DUAL TEMP WATER PUMP		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO.	CHW PUMP - 3	No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Digital Input	Pressure Switch (Elec)	1	EA	2	2.4	26	$62			52	$52	$114		
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Water (Elec)	2	EA	3	6.3	26	$161			222	$444	$605		
	Temp. Water (Plum)	2	EA	2	4.3	24	$104			65	$130	$234		
TOTAL THIS SHEET							$565				$1,068	$1,633		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	☐ CODE A ☒ CODE B ☐ CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	☐ OTHER _____		
BLDG. NO. 5265		ESTIMATOR KC	CHECKED BY CEL

DUAL TEMP WATER PUMP		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. CHW PUMP -4		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Pressure Switch (Elec)	1	EA	2	2.4	26	$62			52	$52	$114		
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Water (Elec)	2	EA	3	6.3	26	$161			222	$444	$605		
	Temp. Water (Plum)	2	EA	2	4.3	24	$104			65	$130	$234		
TOTAL THIS SHEET							$565				$1,068	$1,633		

COST ESTIMATE ANALYSIS

PROJECT: EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
LOCATION: FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
BLDG. NO. 5265	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL

DUAL TEMP WATER PUMP
SYS. NO. CHW PUMP - 5

TASK DESCRIPTION		Quantity No. Of Units	Quantity Unit Meas	LABOR MH/ Unit	LABOR Total Hrs	LABOR Unit Price	LABOR Cost	EQUIPMENT Unit Price	EQUIPMENT Cost	MATERIAL Unit Price	MATERIAL Cost	TOTAL	SHIPPING Unit Wt	SHIPPING Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Pressure Switch (Elec)	1	EA	2	2.4	26	$62			52	$52	$114		
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Water (Elec)	2	EA	3	6.3	26	$161			222	$444	$605		
	Temp. Water (Plum)	2	EA	2	4.3	24	$104			65	$130	$234		
TOTAL THIS SHEET							$565				$1,068	$1,633		

COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 5265		ESTIMATOR KC	CHECKED BY CEL

STEAM HW CONVERTER SYS. NO. CV-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Electric)	1	EA	4	4.1	26	$106			295	$295	$402		
Digital Input	Pressure Switch (Elec)	1	EA	2	2.4	26	$62			52	$52	$114		
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
Analog Input	Temp. Water (Elec)	1	EA	3	3.1	26	$81			222	$222	$303		
	Temp. Water (Plum)	1	EA	2	2.1	24	$52			65	$65	$117		
TOTAL THIS SHEET							$403				$728	$1,132		

COST ESTIMATE ANALYSIS

PROJECT	EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
LOCATION	FT. LEONARD WOOD, MISSOURI	☐ CODE A ☒ CODE B ☐ CODE C ☐ OTHER _____	DRAWING NO.	SHT OF
BLDG. NO.	5265		ESTIMATOR KC	CHECKED BY CEL

STEAM HW CONVERTER SYS. NO. CV-2		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Electric)	1	EA	4	4.1	26	$106			295	$295	$402		
Digital Input	Pressure Switch (Elec)	1	EA	2	2.4	26	$62			52	$52	$114		
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
Analog Input	Temp. Water (Elec)	1	EA	3	3.1	26	$81			222	$222	$303		
	Temp. Water (Plum)	1	EA	2	2.1	24	$52			65	$65	$117		
TOTAL THIS SHEET							$403				$728	$1,132		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	☐ CODE A ☒ CODE B ☐ CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	☐ OTHER _____		
BLDG. NO. 5265		ESTIMATOR KC	CHECKED BY CEL

ELECTRIC DW HEATER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. DHW-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	H/O/A & Control Relay	1	EA	3	2.9	26	$75			77	$77	$152		
Analog Output														
Digital Input	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
Analog Input														
TOTAL THIS SHEET							$124				$118	$242		

COST ESTIMATE ANALYSIS

PROJECT	EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
LOCATION	FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
BLDG. NO.	5265	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL

ELECTRIC DW HEATER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO.	DHW-2	No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	H/O/A & Control Relay	1	EA	3	2.9	26	$75			77	$77	$152		
Analog Output														
Digital Input	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
Analog Input														
TOTAL THIS SHEET							$124				$118	$242		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 5265		ESTIMATOR KC	CHECKED BY CEL

ELECTRIC DW HEATER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. DHW-3		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Mess	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	H/O/A & Control Relay	1	EA	3	2.9	26	$75			77	$77	$152		
Analog Output														
Digital Input	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
Analog Input														
TOTAL THIS SHEET							$124				$118	$242		

COST ESTIMATE

BUILDING 5267

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 5267		ESTIMATOR KC	CHECKED BY CEL

TERMINAL REHEAT AHU		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. AHU-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Damper)	4	EA	3	12.5	26	$322			295	$1,181	$1,503		
	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	2	EA	3	6.8	26	$176			71	$142	$318		
Analog Input	Temp. Space	3	EA	3	7.9	26	$203			174	$522	$725		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
	Temp. Avg. Duct	1	EA	4	3.6	26	$93			190	$190	$283		
	RH Space	1	EA	3	2.6	26	$68			240	$240	$307		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
TOTAL THIS SHEET							$1,328				$3,244	$4,572		

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COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 5267		ESTIMATOR KC	CHECKED BY CEL

DUAL TEMP WATER PUMP SYS. NO. HW PUMP		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Pressure Switch (Elec)	1	EA	2	2.4	26	$62			52	$52	$114		
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Water (Elec)	2	EA	3	6.3	26	$161			222	$444	$605		
	Temp. Water (Plum)	2	EA	2	4.3	24	$104			65	$130	$234		
TOTAL THIS SHEET							$565				$1,068	$1,633		

COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 5267		ESTIMATOR KC	CHECKED BY CEL

DUAL TEMP WATER PUMP SYS. NO. CHW PUMP		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Pressure Switch (Elec)	1	EA	2	2.4	26	$62			52	$52	$114		
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Water (Elec)	2	EA	3	6.3	26	$161			222	$444	$605		
	Temp. Water (Plum)	2	EA	2	4.3	24	$104			65	$130	$234		
TOTAL THIS SHEET							$565				$1,068	$1,633		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 5267		ESTIMATOR KC	CHECKED BY CEL

ELECTRIC DW HEATER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. DHW-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	H/O/A & Control Relay	1	EA	3	2.9	26	$75			77	$77	$152		
Analog Output														
Digital Input	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
Analog Input														
TOTAL THIS SHEET							$124				$118	$242		

COST ESTIMATE

BUILDING 6150

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 6150		ESTIMATOR KC	CHECKED BY CEL

MULTIZONE AHU		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. HVAC-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	6	EA	3	18.8	26	$483			295	$1,771	$2,255		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	5	EA	3	13.1	26	$338			174	$870	$1,208		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
	Temp. Avg. Duct	2	EA	4	7.3	26	$187			190	$380	$567		
	RH Space	1	EA	3	2.6	26	$68			240	$240	$307		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
TOTAL THIS SHEET							$1,711				$4,597	**$6,307**		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 6150		ESTIMATOR KC	CHECKED BY CEL

AHU / SYS. NO. HV-1	TASK DESCRIPTION	Quantity No. Of Units	Quantity Unit Meas	LABOR MH/ Unit	LABOR Total Hrs	LABOR Unit Price	LABOR Cost	EQUIPMENT Unit Price	EQUIPMENT Cost	MATERIAL Unit Price	MATERIAL Cost	TOTAL	SHIPPING Unit Wt	SHIPPING Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$360				$757	$1,117		

COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098		EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	☐ CODE A ☒ CODE B ☐ CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	☐ OTHER _____		
BLDG. NO. 6150		ESTIMATOR KC	CHECKED BY CEL

FAN COIL SYS. NO. FC-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	ACU (Fan Coil)	1	EA	4	3.6	26	$93			415	$415	$508		
Digital Input														
Analog Input	Temp. Space (RTD Only)	1	EA	3	2.6	26	$68			50	$50	$117		
TOTAL THIS SHEET							$217				$508	$725		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 6150		ESTIMATOR KC	CHECKED BY CEL

AIR COOLED DX COMPRESSOR		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. ACCU-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
Analog Input														
TOTAL THIS SHEET							$105				$85	$190		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 6150		ESTIMATOR KC	CHECKED BY CEL

STEAM BOILER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. BLR-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output														
Analog Output														
Digital Input	Auxilary Contact	1	EA	2	1.9	26	$49			43	$43	$92		
	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
Analog Input	PSIG/PSID (Elec)	1	EA	3	3.1	26	$81			202	$202	$283		
	PSIG/PSID (Plum)	1	EA	2	2.1	24	$52			55	$55	$107		
TOTAL THIS SHEET							$231				$341	$572		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 6150		ESTIMATOR KC	CHECKED BY CEL

STEAM HW CONVERTER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. CV-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Electric)	1	EA	4	4.1	26	$106			295	$295	$402		
Digital Input	Pressure Switch (Elec)	1	EA	2	2.4	26	$62			52	$52	$114		
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
Analog Input	Temp. Water (Elec)	1	EA	3	3.1	26	$81			222	$222	$303		
	Temp. Water (Plum)	1	EA	2	2.1	24	$52			65	$65	$117		
TOTAL THIS SHEET							$403				$728	$1,132		

COST ESTIMATE ANALYSIS

PROJECT: EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO.: DACA41-92-C-0098	EFFECTIVE PRICING: MARCH 1993	DATE PREPARED: 29-Mar-93
LOCATION: FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
BLDG. NO. 6150	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL

ELECTRIC DW HEATER SYS. NO. DHW-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	H/O/A & Control Relay	1	EA	3	2.9	26	$75			77	$77	$152		
Analog Output														
Digital Input	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
Analog Input														
TOTAL THIS SHEET							$124				$118	$242		

COST ESTIMATE

BUILDING 6505

COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 6505		ESTIMATOR KC	CHECKED BY CEL

SEWAGE LIFT STATION		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. WATER		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	H/O/A & Control Relay		EA	3		26				77				
Analog Output														
Digital Input	Pressure Switch (Elec)	6	EA	2	14.5	26	$373			52	$311	$684		
	Pressure Switch (Plum)	6	EA	2	11.5	24	$280			51	$305	$584		
	Diff. Pressure Sw. (Filter)		EA	3		26				71				
	Level Switch	1	EA	4	3.9	26	$101			136	$136	$237		
	Status Relay		EA	2		26				41				
	Current Switch		EA	2		26				111				
Analog Input	PSIG/PSID (Elec)	2	EA	3	6.3	26	$161			202	$404	$566		
	PSIG/PSID (Plum)	2	EA	2	4.3	24	$104			55	$109	$213		
	Flow (Elec)	1	EA	3	3.1	26	$81			737	$737	$817		
	Flow (Plum)	1	EA	2	2.1	24	$52			86	$86	$138		
TOTAL THIS SHEET							$1,150				$2,088	$3,238		

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I/O SUMMARY

BUILDING 7391

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 7391		ESTIMATOR KC	CHECKED BY CEL

SINGLE ZONE & VAV AHU		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. AHU-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	1	EA	3	3.1	26	$81			295	$295	$376		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Avg. Duct	1	EA	4	3.6	26	$93			190	$190	$283		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
TOTAL THIS SHEET							$944				$2,169	$3,113		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 7391		ESTIMATOR KC	CHECKED BY CEL

SINGLE ZONE & VAV AHU		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. AHU-2		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	1	EA	3	3.1	26	$81			295	$295	$376		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Avg. Duct	1	EA	4	3.6	26	$93			190	$190	$283		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
TOTAL THIS SHEET							$944				$2,169	$3,113		

COST ESTIMATE ANALYSIS

PROJECT	EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
LOCATION	FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
BLDG. NO.	7391	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL

SINGLE ZONE & VAV AHU SYS. NO. AHU-3		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	1	EA	3	3.1	26	$81			295	$295	$376		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Avg. Duct	1	EA	4	3.6	26	$93			190	$190	$283		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
TOTAL THIS SHEET							$944				$2,169	$3,113		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 7391		ESTIMATOR KC	CHECKED BY CEL

SINGLE ZONE & VAV AHU SYS. NO. AHU-4		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	1	EA	3	3.1	26	$81			295	$295	$376		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Avg. Duct	1	EA	4	3.6	26	$93			190	$190	$283		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
TOTAL THIS SHEET							$944				$2,169	$3,113		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 7391		ESTIMATOR KC	CHECKED BY CEL

SINGLE ZONE & VAV AHU		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. AHU-5		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	1	EA	3	3.1	26	$81			295	$295	$376		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Avg. Duct	1	EA	4	3.6	26	$93			190	$190	$283		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
TOTAL THIS SHEET							$944				$2,169	$3,113		

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COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 7391		ESTIMATOR KC	CHECKED BY CEL

SINGLE ZONE & VAV AHU SYS. NO. AHU-6		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	1	EA	3	3.1	26	$81			295	$295	$376		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Avg. Duct	1	EA	4	3.6	26	$93			190	$190	$283		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
TOTAL THIS SHEET							$944				$2,169	$3,113		

COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
	DRAWING NO.	SHT OF
	ESTIMATOR KC	CHECKED BY CEL

PROJECT EMCS FEASIBILITY STUDY
LOCATION FT. LEONARD WOOD, MISSOURI
BLDG. NO. 7391

[ ] CODE A [X] CODE B [ ] CODE C
[ ] OTHER _____

SINGLE ZONE & VAV AHU		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. AHU-7		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay		EA	3		26				77				
Analog Output	CPA (Damper)	1	EA	3	3.1	26	$81			295	$295	$376		
	CPA (Valve)	2	EA	3	6.3	26	$161			295	$590	$752		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
	Diff. Pressure Sw. (Filter)	1	EA	3	3.4	26	$88			71	$71	$159		
	End Position Switch		EA	2		26				69				
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
	Temp. Avg. Duct	1	EA	4	3.6	26	$93			190	$190	$283		
	Position	1	EA	3	3.1	26	$81			191	$191	$271		
	Temp. Duct	2	EA	3	6.3	26	$161			185	$370	$531		
TOTAL THIS SHEET							$944				$2,169	$3,113		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	☐ CODE A ☒ CODE B ☐ CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	☐ OTHER _____		
BLDG. NO. 7391		ESTIMATOR KC	CHECKED BY CEL

AIR COOLED CHILLER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. CH-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
	H/O/A & Control Relay	4	EA	3	11.6	26	$300			77	$306	$606		
Analog Output														
Digital Input	Pressure Switch (Elec)	1	EA	2	2.4	26	$62			52	$52	$114		
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
	Status Relay	2	EA	2	3.8	26	$98			41	$83	$181		
Analog Input	Temp. Water (Elec)	2	EA	3	6.3	26	$161			222	$444	$605		
	Temp. Water (Plum)	2	EA	2	4.3	24	$104			65	$130	$234		
TOTAL THIS SHEET							$828				$1,110	$1,937		

COST ESTIMATE ANALYSIS

INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	OTHER _____		
BLDG. NO. 7391		ESTIMATOR KC	CHECKED BY CEL

HOT WATER BOILER SYS. NO. BLR-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Electric)	1	EA	4	4.1	26	$106			295	$295	$402		
Digital Input	Pressure Switch (Elec)			2		26				52				
	Pressure Switch (Plum)	1	EA	2	1.9	24	$47			51	$51	$97		
	Auxilary Contact	1	EA	2	1.9	26	$49			43	$43	$92		
	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
		1	EA											
Analog Input	Temp. Water (Elec)	2	EA	3	6.3	26	$161			222	$444	$605		
	Temp. Water (Plum)	2	EA	2	4.3	24	$104			65	$130	$234		
TOTAL THIS SHEET							$572				$1,048	$1,620		

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COST ESTIMATE

BUILDING 9000

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 9000		ESTIMATOR KC	CHECKED BY CEL

AHU SYS. NO. ACU-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$360				$757	$1,117		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 9000		ESTIMATOR KC	CHECKED BY CEL

AHU / SYS. NO. ACU-2	TASK DESCRIPTION	Quantity No. Of Units	Quantity Unit Meas	LABOR MH/ Unit	LABOR Total Hrs	LABOR Unit Price	LABOR Cost	EQUIPMENT Unit Price	EQUIPMENT Cost	MATERIAL Unit Price	MATERIAL Cost	TOTAL	SHIPPING Unit Wt	SHIPPING Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output	CPA (Valve)	1	EA	3	3.1	26	$81			295	$295	$376		
Digital Input	Diff. Pressure Sw. (Fan)	1	EA	3	3.4	26	$88			71	$71	$159		
Analog Input	Temp. Space	2	EA	3	5.3	26	$135			174	$348	$483		
TOTAL THIS SHEET							$360				$757	$1,117		

COST ESTIMATE ANALYSIS

PROJECT: EMCS FEASIBILITY STUDY	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
LOCATION: FT. LEONARD WOOD, MISSOURI	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
BLDG. NO. 9000	[ ] OTHER _____	ESTIMATOR KC	CHECKED BY CEL

AIR COOLED DX COMPRESSOR SYS. NO. ACCU-1		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
TASK DESCRIPTION		No. Of Units	Unit Meas	MH/ Unit	Total Hrs	Unit Price	Cost	Unit Price	Cost	Unit Price	Cost		Unit Wt	Total Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
Analog Input														
TOTAL THIS SHEET							$105				$85	$190		

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COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	[ ] CODE A [X] CODE B [ ] CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	[ ] OTHER _____		
BLDG. NO. 9000		ESTIMATOR KC	CHECKED BY CEL

AIR COOLED DX COMPRESSOR		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. ACCU-2		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	Control Relay	1	EA	2	2.2	26	$56			43	$43	$99		
Analog Output														
Digital Input	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
Analog Input														
TOTAL THIS SHEET							$105				$85	$190		

COST ESTIMATE ANALYSIS

	INVITATION NO./CONTRACT NO. DACA41-92-C-0098	EFFECTIVE PRICING MARCH 1993	DATE PREPARED 29-Mar-93
PROJECT EMCS FEASIBILITY STUDY	☐ CODE A ☒ CODE B ☐ CODE C	DRAWING NO.	SHT OF
LOCATION FT. LEONARD WOOD, MISSOURI	☐ OTHER _____		
BLDG. NO. 9000		ESTIMATOR KC	CHECKED BY CEL

ELECTRIC DW HEATER		Quantity		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
SYS. NO. DHW-1		No. Of	Unit	MH/	Total	Unit		Unit		Unit			Unit	Total
TASK DESCRIPTION		Units	Meas	Unit	Hrs	Price	Cost	Price	Cost	Price	Cost		Wt	Wt
Digital Output	H/O/A & Control Relay	1	EA	3	2.9	26	$75			77	$77	$152		
Analog Output														
Digital Input	Status Relay	1	EA	2	1.9	26	$49			41	$41	$91		
Analog Input														
TOTAL THIS SHEET							$124				$118	$242		

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APPENDIX H

FIELD SURVEY NOTES

FIELD SURVEY NOTES

BUILDINGS 181, 183, 184, 185, 186, 187, 193,
194, 195, 196, 198, & 199

FIELD SURVEY NOTES

TO: FILE, FT. LEONARD WOOD
FR: CARL LUNDSTROM
DT: 16 NOVEMBER 1992

RE: BLDG SEWAGE TREATMENT PLANT

Equipment to monitor status:

Bldg 181:

- 2 HW boilers
- 4 HW pumps
- 4 water pumps
- Status on generator
- Phases on electrical service
- Amps per phase

Bldg 183:

- Methane gas monitor
- Sump pump limit switch

Bldg 184:

- Temperature of sludge
- Status of 2 sludge pumps
- Gas monitor

Bldg 185:

- 4 sludge transfer pumps
- Old annunciator panel
- Central office for treatment plant

Bldg 187:

- 2 air compressors
- 2 bar screens
- 2 grit removers
- Water flow through channels
- 3 air blowers
- 2 grinders

Bldg 193:

- Secondary lift pumps, 5

- 2 air compressors
- Water level in wet well

Bldg 194:

- 4 pumps
- 2 wet well water levels

Bldg 195:

- Control drain valves on high level in filter
- Effluent flow
- chlorine feed rate
- 4 filter head pressure
- Water levels
- 2 compressors
- 2 back wash pumps
- 2 service water pumps
- water level in contact basin
- chlorine monitor alarm
- air tank pressure
- service water pressure
- 2 mixers

Bldg 196:

- 3 sludge pumps
- chemical feed rate, 6 pumps
- 2 clarifier drive units
- 2 mixers
- 4 flocculators

Bldg 198:

- Lift station pump status

Bldg 199:

- Sludge pump
- Water level

Every building needs a basement water high level alarm

FIELD SURVEY NOTES

BUILDING 320

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 320

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: BHS
CHECKED BY: CEL
FILE: 320BLG

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 320 BLDG NAME: ADMIN

ZONE NO.	1	FUNCTION: ADMIN							
OCCUPANCY HOURS:	M-F	800	TO	1700	SAT	0	TO	0	
	SUN	0	TO	0					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

REMARKS:

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 320

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 320AH1

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-1	AHU NO.	MECH. ROOM	LOCATION (RM)
ACCU-1	REF. SYS. SERVING AHU	ADMIN. OFFICE	SERVES AREA

UNIT TYPE:

X	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:	OIL-FIRED FURNANCE, NO. 2 OIL							

NAMEPLATE:

CARRIER					MFG.	OAU84-D25			MODEL
0.3	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
1100	CFM-HTG	1100	CFM-CLG	0%	MIN %OA	0%	MAX %OA	33%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM		HW	X	ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE	X	DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	800	800	800	800	800	0	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON: 0

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:	X	SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):	78	OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	N	(Y/N)							
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 320

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 320AH2

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-2	AHU NO.	MECH. ROOM	LOCATION (RM)
ACCU-2	REF. SYS. SERVING AHU	ADMIN. OFFICE	SERVES AREA

UNIT TYPE:

X	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:	OIL-FIRED FURNANCE, NO. 2 OIL							

NAMEPLATE:

CARRIER					MFG.	OAU84-D25			MODEL
0.3	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
1100	CFM-HTG	1100	CFM-CLG	0%	MIN %OA	0%	MAX %OA	33%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM		HW	X	ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE	X	DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	800	800	800	800	800	0	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON: 0

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:	X	SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):	78	OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	N	(Y/N)							
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 320

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 320CH1

REFRIGERATION EQUIPMENT SURVEY OBSERVATIONS

ACCU-1	CHILLER/COMPRESSOR NO.	OUTSIDE BLDG	LOCATION (RM)

UNIT TYPE:

	CENTRIFUGAL WITH WATER SIDE COOLING TOWER						OTHER
	RECIPROCATING WITH WATER SIDE COOLING TOWER					X	AHU'S SERVED AHU-1
	RECIPROCATING WITH AIR COOLED CONDENSING UNIT						
	ABSORBTION WITH WATER SIDE COOLING TOWER						
X	AIR COOLED CONDENSING UNIT						
	CHW	X	DX		OTHER		

NAMEPLATE:

CHILLER CARRIER	MFG.	338CC036500			MODEL				SERIAL NO.
230 VOLTS	12.8	MCA	3	PH	60	HZ	3	CAPACITY (TONS)	
CONDENSER FANS	MFG.				MODEL			1	# OF FANS
230 VOLTS	2	AMPS	1	PH	60	HZ	0.17	HP	
DTW PUMP	MFG.				MODEL				SERIAL NO.
VOLTS		AMPS		PH		HZ		HP	
CNW PUMP	MFG.				MODEL				SERIAL NO.
VOLTS		AMPS		PH		HZ		HP	
COMMENTS:									

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	800	800	800	800	800	0	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
0	0	0	0	1	1	1	1	1	0	0	0

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		CWS (oF)		CWR (oF)		CNWS (oF)		CNWR (oF)	
PANEL INDICATORS									
- PRESSURE		LITE-HI		LITE-LOW		GAUGES			
- TEMPERATURE		LITE-HI		LITE-LOW		GAUGES			
- OTHER									
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 320

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 320CH2

REFRIGERATION EQUIPMENT SURVEY OBSERVATIONS

ACCU-2	CHILLER/COMPRESSOR NO.	OUTSIDE BLDG	LOCATION (RM)

UNIT TYPE:

	CENTRIFUGAL WITH WATER SIDE COOLING TOWER						OTHER
	RECIPROCATING WITH WATER SIDE COOLING TOWER					X	AHU'S SERVED AHU-2
	RECIPROCATING WITH AIR COOLED CONDENSING UNIT						
	ABSORBTION WITH WATER SIDE COOLING TOWER						
X	AIR COOLED CONDENSING UNIT						
	CHW	X	DX		OTHER		

NAMEPLATE:

CHILLER CARRIER		MFG.	338CC036500			MODEL			SERIAL NO.
230	VOLTS	12.8	MCA	3	PH	60	HZ	3	CAPACITY (TONS)
CONDENSER FANS		MFG.				MODEL		1	# OF FANS
230	VOLTS	2	AMPS	1	PH	60	HZ	0.17	HP
DTW PUMP		MFG.				MODEL			SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP
CNW PUMP		MFG.				MODEL			SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP

COMMENTS:

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	800	800	800	800	800	0	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
0	0	0	0	1	1	1	1	1	0	0	0

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		CWS (oF)		CWR (oF)		CNWS (oF)		CNWR (oF)	
PANEL INDICATORS									
- PRESSURE		LITE-HI		LITE-LOW		GAUGES			
- TEMPERATURE		LITE-HI		LITE-LOW		GAUGES			
- OTHER									

COMMENTS:

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 320

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 320DHW1

DOMESTIC HW SURVEY OBSERVATIONS

DHW-1	BOILER/CONVERTER NO.	MECH. CLOSET	LOCATION (RM)
ELEC.	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	NO.2 OIL		NO.6 OIL		N.GAS	X	ELEC		FUELS:
	STM/HW		HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:
COMMENT:									

NAMEPLATE:

DAYTON	MFG.	3E111K	MODEL	1650	CAPACITY OUTPUT (WATTS)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)

DOMESTIC HW CIRCULATION PUMP: NONE

	HW PUMP 1 – HP		MFG.	MODEL
	HW PUMP 2 – HP		MFG.	MODEL
	HW PUMP 3 – HP		MFG.	MODEL

COMMENT:

DIMENSION:	20	DIAMETER (INCHES)	24	HEIGHT OR LENGTH (INCHES)	19 GALLON

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	800	800	800	800	800	0	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS				HW SUPPLY					
COMMENTS:									

FIELD SURVEY NOTES

BUILDING 404

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 404

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 404BLG

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 404 BLDG NAME: TELEPHONE EXCHANGE

ZONE NO.	1	FUNCTION: TELEPHONE OPERATIONS							
OCCUPANCY HOURS:	M-F	0	TO	2400	SAT	0	TO	2400	
	SUN	0	TO	2400					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

REMARKS: COMMUNICATIONS ROOM CONTAINS VARIOUS COMMUNICATION AND COMPUTER EQUIPMENT - MAIN FRAME COMPUTERS, MULTIPLEXERS, ETC.
FOUR BSC AC-UNITS ARE LOCATED IN THE COMMUNICATION ROOM, SERVED BY TWO ACCU's OUTSIDE BUILDING
FM RADIO CONTROL ON LCP, UNABLE TO DETERMINE IF CONTROL IS FOR AHU-1 OR REFRIGERATION COMPRESSOR
AHU-1 HAS AIRWASHER FOR HUMIDITY CONTROL

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 404

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 404AH1

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-1	AHU NO.	MECH. ROOM	LOCATION (RM)
CH-1	REF. SYS. SERVING AHU	ALL	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
X	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
4	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

THERMAL ENGINEERING					MFG.	MT-223HC			MODEL
5.0	SUPPLY FAN HP		MARATHON		MFG.	8A184TTDR7D43AAW			MODEL
	RET/EXH FAN HP				MFG.				MODEL
15000	CFM-HTG	15000	CFM-CLG	0%	MIN %OA	50%	MAX %OA	100%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE	X	DX		CW			LLSV	MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	YES,
REQUIRED START TIME	0	0	0	0	0	0	0	NO PINS
REQUIRED STOP TIME	2400	2400	2400	2400	2400	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC		ELECTRIC	X	ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	YES		NO					
COMMENTS:	ELECTRIC ACTUATORS; RETURN AND O.A. SHARE SAME DAMPER								

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 404

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 404CH1

REFRIGERATION EQUIPMENT SURVEY OBSERVATIONS

CH-1	CHILLER/COMPRESSOR NO.	MECH. ROOM	LOCATION (RM)

UNIT TYPE:

	CENTRIFUGAL WITH WATER SIDE COOLING TOWER						OTHER
X	RECIPROCATING WITH WATER SIDE COOLING TOWER					X	AHU'S SERVED AHU-1
	RECIPROCATING WITH AIR COOLED CONDENSING UNIT						
	ABSORBTION WITH WATER SIDE COOLING TOWER						
	AIR COOLED CONDENSING UNIT						
	CHW	X	DX		OTHER		

NAMEPLATE:

CHILLER	TRANE	MFG.	FC-25		MODEL	157815			SERIAL NO.
208	VOLTS	70	AMPS	3	PH	60	HZ	25	CAPACITY (TONS)
TOWER		MFG.			MODEL			1	# OF FANS
	VOLTS		AMPS		PH		HZ	3	HP
CW PUMP		MFG.			MODEL				SERIAL NO.
200	VOLTS	5.5	AMPS	3	PH	60	HZ	5	HP
CNW PUMP		MFG.			MODEL				SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP
COMMENTS:		WATER LOAD DX CHILLER							

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO TIMECLOCK
REQUIRED START TIME	0	0	0	0	0	0	0	
REQUIRED STOP TIME	2400	2400	2400	2400	2400	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
0	0	0	0	1	1	1	1	1	0	0	0

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		CWS (oF)		CWR (oF)		CNWS (oF)		CNWR (oF)	
PANEL INDICATORS									
- PRESSURE		LITE-HI		LITE-LOW		GAUGES			
- TEMPERATURE		LITE-HI		LITE-LOW		GAUGES			
- OTHER									

COMMENTS: GAUGES: EVAPORATOR PRESSURE, OIL PRESSURE, CONDENSER PRESSURE;
CONTROLS ARE IN FAIR CONDITION

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 404

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 404BLR1

BOILER & CONVERTER SURVEY OBSERVATIONS

BLR-1	BOILER/CONVERTER NO.	MECH. RM.	LOCATION (RM)
	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	STEAM		PSIG	X	HW		TEMP.		BOILER TYPE:
	NO.2 OIL		NO.6 OIL	X	N. GAS		ELEC		FUELS:
	STM/HW		HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:
X	SPACE HEAT		DHW		OTHER				USE:
COMMENT:							0.0%		% HTG AREA SERVED
									BB RADIATION ONLY

NAMEPLATE:

PARKE	MFG.	0-1008	MODEL	1008000	CAPACITY OUTPUT (BTUH)
				1260000	CAPACITY INPUT (BTUH)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)
					CAPACITY INPUT (BTUH)
0.5	HW PUMP 1 - HP	BELL & GOSSETT	MFG.		MODEL
	HW PUMP 2 - HP		MFG.		MODEL
	HW PUMP 3 - HP		MFG.		MODEL
COMMENT:					

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	0	0	0	0	0	0	0	
REQUIRED STOP TIME	2400	2400	2400	2400	2400	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC		ELECTRIC	X	ELEC'NIC		DDC	COMMENTS
SETPOINTS		PSIG		HW SUPPLY					
RESET CONTROL (oF)	185	HW HIGH	N	HW LOW	N	OA LOW	N	OA HIGH	
BURNER CONTROLS		O2 TRIM (Y/N)		OTHER					

COMMENTS: **CONTROLS ARE IN FAIR CONDITION**

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 404

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 404DHW1

DOMESTIC HW SURVEY OBSERVATIONS

DHW-1	BOILER/CONVERTER NO.	MECH RM	LOCATION (RM)
ELEC.	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	NO.2 OIL		NO.6 OIL		N.GAS	X	ELEC		FUELS:
	STM/HW		HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:
COMMENT:									

NAMEPLATE:

RHEEM STANDARD	MFG.	666H-30D	MODEL	4500	CAPACITY OUTPUT (WATTS)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)

DOMESTIC HW CIRCULATION PUMP: **NONE**

	HW PUMP 1 – HP		MFG.	MODEL
	HW PUMP 2 – HP		MFG.	MODEL
	HW PUMP 3 – HP		MFG.	MODEL

COMMENT:

DIMENSION:	18	DIAMETER (INCHES)	48	HEIGHT OR LENGTH (INCHES)	30 GALLON

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	0	0	0	0	0	0	
REQUIRED STOP TIME	2400	2400	2400	2400	2400	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS				HW SUPPLY					
COMMENTS:									

FIELD SURVEY NOTES

BUILDING 498

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 498

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 498BLG

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 498 BLDG NAME: OLD COMMISSARY

ZONE NO.	1	FUNCTION: ADMINISTRATION						
OCCUPANCY HOURS:	M-F	700	TO	1700	SAT	0	TO	0
	SUN	0	TO	0				
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F			
	SUMMER OCC	°F		UNOCC	°F			

ZONE NO.		FUNCTION:						
OCCUPANCY HOURS:	M-F		TO		SAT		TO	
	SUN		TO					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F			
	SUMMER OCC	°F		UNOCC	°F			

ZONE NO.		FUNCTION:						
OCCUPANCY HOURS:	M-F		TO		SAT		TO	
	SUN		TO					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F			
	SUMMER OCC	°F		UNOCC	°F			

REMARKS:

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 498

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 498AH1

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-1	AHU NO.	MEZZ. MECH. RM	LOCATION (RM)
ACCU-1	REF. SYS. SERVING AHU	PRODUCE PREP	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
X	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
4	NUMBER OF ZONES				OTHER				
	COMMENT:	PNEUMATIC ACTUATORS							

NAMEPLATE:

NO NAME PLATE					MFG.				MODEL
3.0	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
1730	CFM-HTG	1730	CFM-CLG	10%	MIN %OA	100%	MAX %OA	4.4%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE	X	DX		CW			X	MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	YES,
REQUIRED START TIME	0	700	700	700	700	700	0	NO PINS
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	YES		NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 498

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 498AH2

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-2	AHU NO.	MEZZ. MECH. RM	LOCATION (RM)
ACCU-1	REF. SYS. SERVING AHU	STORAGE	SERVES AREA

UNIT TYPE:

X	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:	DX COIL ONLY; LIQUID LINE IS CUT AND CAPPED							

NAMEPLATE:

CARRIER					MFG.	39AC 6033T8			MODEL
1.5	SUPPLY FAN HP		CENTURY		MFG.	SZ-184-SZ4-7			MODEL
	RET/EXH FAN HP				MFG.				MODEL
8000	CFM-HTG	0	CFM-CLG	0%	MIN %OA	0%	MAX %OA	0.0%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE	X	DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON:											
J	F	M	A	M	J	J	A	S	O	N	D
0	0	0	0	1	1	1	1	1	0	0	0

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT	X	OTHER	FACE & BYPASS
DEMAND LIMIT:	Y	YES		NO					DAMPERS
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 498

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 498AH3

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-3	AHU NO.	MEZZ. MECH. RM	LOCATION (RM)
ACCU-2	REF. SYS. SERVING AHU	MAIN STORE AREA	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
X	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
2	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

NO NAME PLATE					MFG.				MODEL
7.5	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
25000	CFM-HTG	25000	CFM-CLG	0%	MIN %OA	100%	MAX %OA	63.0%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE	X	DX		CW			X	MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
0	0	0	0	1	1	1	1	1	0	0	0

CONTROLS:

		PNEUMATIC		ELECTRIC	X	ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			JC 80 SYSTEM
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT	X	OTHER	
DEMAND LIMIT:	Y	YES		NO					
COMMENTS:	CEILING SPACE IS USED AS RETURN AIR PLENUM								

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 498

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 498AH4

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-4	AHU NO.	MEZZ. MECH. RM	LOCATION (RM)
ACCU-3	REF. SYS. SERVING AHU	MEAT PREP AREA	SERVES AREA

UNIT TYPE:

X	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

CARRIER					MFG.	39AC8D139 1-2			MODEL
3.0	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
0	CFM-HTG	1400	CFM-CLG	10%	MIN %OA	100%	MAX %OA	0.0%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE	X	DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
0	0	0	0	1	1	1	1	1	0	0	0

CONTROLS:

		PNEUMATIC		ELECTRIC	X	ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			JC 80 SYSTEM
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT	X	OTHER	
DEMAND LIMIT:	Y	YES		NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 498

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: BHS
CHECKED BY: CEL
FILE: 498FC1

AIR HANDLING UNIT SURVEY OBSERVATIONS

FC-1	AHU NO.	OFFICES	LOCATION (RM)
CH-1, BLR-1	REF. SYS. SERVING AHU	OFFICES	SERVES AREA

UNIT TYPE:

	SINGLE ZN	X	2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

INTERNATIONAL ENVIRONMENTAL CORP					MFG.	FSY10AYY C2 R5 CXX			MODEL
0.5	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
7200	CFM-HTG	7200	CFM-CLG	0%	MIN %OA	0%	MAX %OA	/wtc	% HTG AREA SERVED
COMMENT:	TOTAL CFM FOR 9 FAN COILS								

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		EVAP MEDIA		MOD VLV	HUMID.
	NONE		DX	X	CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (°F):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (°F):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	(Y/N)							
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 498

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 498FC2

AIR HANDLING UNIT SURVEY OBSERVATIONS

FC-2	AHU NO.	STORAGE	LOCATION (RM)
BLR-2	REF. SYS. SERVING AHU	STORAGE	SERVES AREA

UNIT TYPE:

	SINGLE ZN	X	2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:	4 HW UNIT HEATER FAN COILS							

NAMEPLATE:

NO NAME PLATE					MFG.				MODEL
1.3	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
4000	CFM-HTG	0	CFM-CLG	0%	MIN %OA	0%	MAX %OA	14.1%	% HTG AREA SERVED
COMMENT:	TOTAL CFM FOR 4 FAN COILS								

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		EVAP MEDIA		MOD VLV	HUMID.
X	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (°F):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (°F):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	N	(Y/N)							
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 498

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 498CH1

REFRIGERATION EQUIPMENT SURVEY OBSERVATIONS

CH-1	CHILLER/COMPRESSOR NO.	OUTSIDE BLDG	LOCATION (RM)

UNIT TYPE:

	CENTRIFUGAL WITH WATER SIDE COOLING TOWER						OTHER
	RECIPROCATING WITH WATER SIDE COOLING TOWER					X	AHU'S SERVED **9 FAN COIL UNITS**
X	RECIPROCATING WITH AIR COOLED CONDENSING UNIT						**(OFFICES)**
	ABSORBTION WITH WATER SIDE COOLING TOWER						
	AIR COOLED CONDENSING UNIT						
X	CHW		DX		OTHER		

NAMEPLATE:

CHILLER **TSI**	MFG.	**30AOCS15**			MODEL				SERIAL NO.
208 VOLTS	**53.5**	AMPS	**3**	PH	**60**	HZ	**14**	CAPACITY (TONS)	
CONDENSER FANS	MFG.				MODEL			**2**	# OF FANS
VOLTS		AMPS		PH		HZ	**1**	HP	
DTW PUMP	MFG.	**NO NAME PLATE**			MODEL				SERIAL NO.
VOLTS		AMPS		PH		HZ	**0.5**	HP	
CNW PUMP	MFG.				MODEL				SERIAL NO.
VOLTS		AMPS		PH		HZ		HP	
COMMENTS:									

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	**0**	**0**	**0**	**0**	**0**	**0**	**0**	TIMECLOCK?
PRESENT STOP TIME	**2400**	**2400**	**2400**	**2400**	**2400**	**2400**	**2400**	**NO TIMECLOCK**
REQUIRED START TIME	**0**	**700**	**700**	**700**	**700**	**700**	**0**	
REQUIRED STOP TIME	**0**	**1700**	**1700**	**1700**	**1700**	**1700**	**0**	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
0	**0**	**0**	**0**	**1**	**1**	**1**	**1**	**1**	**0**	**0**	**0**

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		CWS (oF)		CWR (oF)		CNWS (oF)		CNWR (oF)	
PANEL INDICATORS									
- PRESSURE		LITE-HI		LITE-LOW		GAUGES			
- TEMPERATURE		LITE-HI		LITE-LOW		GAUGES			
- OTHER									
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 498

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 498CH2

REFRIGERATION EQUIPMENT SURVEY OBSERVATIONS

ACCU-2	CHILLER/COMPRESSOR NO.	MEZZ. LEVEL	LOCATION (RM)

UNIT TYPE:

	CENTRIFUGAL WITH WATER SIDE COOLING TOWER						OTHER
	RECIPROCATING WITH WATER SIDE COOLING TOWER					X	AHU'S SERVED **AHU-1 & AHU-2**
X	RECIPROCATING WITH AIR COOLED CONDENSING UNIT						
	ABSORBTION WITH WATER SIDE COOLING TOWER						
	AIR COOLED CONDENSING UNIT						
	CHW	X	DX		OTHER		

NAMEPLATE:

CHILLER **CARRIER**	MFG.				MODEL				SERIAL NO.
	VOLTS		AMPS		PH		HZ	12	CAPACITY (TONS)
CONDENSER FANS	MFG.				MODEL			2	# OF FANS
	VOLTS		AMPS		PH		HZ	0.5	HP
DTW PUMP	MFG.				MODEL				SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP
CNW PUMP	MFG.				MODEL				SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP

COMMENTS:

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO TIMECLOCK
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
0	0	0	0	1	1	1	1	1	0	0	0

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC	DDC	COMMENTS
SETPOINTS		CWS (oF)		CWR (oF)		CNWS (oF)	CNWR (oF)	
PANEL INDICATORS								
- PRESSURE		LITE-HI		LITE-LOW		GAUGES		
- TEMPERATURE		LITE-HI		LITE-LOW		GAUGES		
- OTHER								

COMMENTS:

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 498

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 498CH3

REFRIGERATION EQUIPMENT SURVEY OBSERVATIONS

CH-3	CHILLER/COMPRESSOR NO.	OUTSIDE MER	LOCATION (RM)

UNIT TYPE:

	CENTRIFUGAL WITH WATER SIDE COOLING TOWER						OTHER
X	RECIPROCATING WITH WATER SIDE COOLING TOWER					X	AHU'S SERVED AHU-3
	RECIPROCATING WITH AIR COOLED CONDENSING UNIT						
	ABSORBTION WITH WATER SIDE COOLING TOWER						
	AIR COOLED CONDENSING UNIT						
	CHW	X	DX		OTHER		

NAMEPLATE:

CHILLER	CARRIER	MFG.	6L-63		MODEL	942286			SERIAL NO.
240	VOLTS		AMPS	3	PH	60	HZ	50	CAPACITY (TONS)
TOWER		MFG.	4431		MODEL			1	# OF FANS
	VOLTS		AMPS		PH		HZ	5	HP
DTW PUMP		MFG.			MODEL				SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP
CNW PUMP		MFG.			MODEL				SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP
COMMENTS:									

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO TIMECLOCK
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
0	0	0	0	1	1	1	1	1	0	0	0

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		CWS (oF)		CWR (oF)		CNWS (oF)		CNWR (oF)	
PANEL INDICATORS									
- PRESSURE		LITE-HI		LITE-LOW		GAUGES			
- TEMPERATURE		LITE-HI		LITE-LOW		GAUGES			
- OTHER									
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 498

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 498CH4

REFRIGERATION EQUIPMENT SURVEY OBSERVATIONS

ACCU-4	CHILLER/COMPRESSOR NO.	OUTSIDE MER	LOCATION (RM)

UNIT TYPE:

	CENTRIFUGAL WITH WATER SIDE COOLING TOWER						OTHER
	RECIPROCATING WITH WATER SIDE COOLING TOWER					X	AHU'S SERVED AHU-4
	RECIPROCATING WITH AIR COOLED CONDENSING UNIT						
	ABSORBTION WITH WATER SIDE COOLING TOWER						
X	AIR COOLED CONDENSING UNIT						
	CHW	X	DX		OTHER		

NAMEPLATE:

CHILLER BOHN		MFG.	CSB-15H1 BK			MODEL			SERIAL NO.
208	VOLTS		AMPS	3	PH	60	HZ	15	CAPACITY (TONS)
CONDENSER FANS		MFG.				MODEL		3	# OF FANS
	VOLTS		AMPS		PH		HZ	0.75	HP
DTW PUMP		MFG.				MODEL			SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP
CNW PUMP		MFG.				MODEL			SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP
COMMENTS:									

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO TIMECLOCK
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
0	0	0	0	1	1	1	1	1	0	0	0

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC	DDC	COMMENTS
SETPOINTS		CWS (oF)		CWR (oF)		CNWS (oF)	CNWR (oF)	
PANEL INDICATORS								
- PRESSURE		LITE-HI		LITE-LOW		GAUGES		
- TEMPERATURE		LITE-HI		LITE-LOW		GAUGES		
- OTHER								
COMMENTS:								

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 498

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 498BLR1

BOILER & CONVERTER SURVEY OBSERVATIONS

BLR-1	BOILER/CONVERTER NO.	MECH. RM.	LOCATION (RM)
	SOURCE OF HEATING (PLANT)	OFFICE FAN COIL UNITS	SERVES AREA

UNIT TYPE:

	STEAM		PSIG	X	HW		TEMP.		BOILER TYPE:
	NO.2 OIL		NO.6 OIL	X	PROPANE		ELEC		FUELS:
	STM/HW		HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:
X	SPACE HEAT		DHW		OTHER				USE:
COMMENT:							0.0%	% HTG AREA SERVED	
								BB RADIATION ONLY	

NAMEPLATE:

HYDROTHERM	MFG.	HYDRO-PULSE M-150C	MODEL	135000	CAPACITY OUTPUT (BTUH)
				168750	CAPACITY INPUT (BTUH)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)
					CAPACITY INPUT (BTUH)
0.5	HW PUMP 1 - HP	BELL & GOSSETT	MFG.		MODEL
	HW PUMP 2 - HP		MFG.		MODEL
	HW PUMP 3 - HP		MFG.		MODEL
COMMENT:					

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		PSIG		HW SUPPLY					
RESET CONTROL (oF)	N	HW HIGH	N	HW LOW	N	OA LOW	N	OA HIGH	
BURNER CONTROLS		O2 TRIM (Y/N)		OTHER					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 498

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 498BLR2

BOILER & CONVERTER SURVEY OBSERVATIONS

BLR-2	BOILER/CONVERTER NO.	MECH. RM.	LOCATION (RM)
	SOURCE OF HEATING (PLANT)	STORAGE FAN COIL UNITS	SERVES AREA

UNIT TYPE:

	STEAM		PSIG	X	HW		TEMP.		BOILER TYPE:
	NO.2 OIL		NO.6 OIL	X	PROPANE		ELEC		FUELS:
	STM/HW		HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:
X	SPACE HEAT		DHW		OTHER				USE:
COMMENT:							0.0%		% HTG AREA SERVED
									BB RADIATION ONLY

NAMEPLATE:

HYDROTHERM	MFG.	HYDRO-PULSE M-150C	MODEL	135000	CAPACITY OUTPUT (BTUH)
				168750	CAPACITY INPUT (BTUH)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)
					CAPACITY INPUT (BTUH)
0.5	HW PUMP 1 - HP	BELL & GOSSETT	MFG.		MODEL
	HW PUMP 2 - HP		MFG.		MODEL
	HW PUMP 3 - HP		MFG.		MODEL
COMMENT:					

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		PSIG		HW SUPPLY					
RESET CONTROL (oF)	N	HW HIGH	N	HW LOW	N	OA LOW	N	OA HIGH	
BURNER CONTROLS		O2 TRIM (Y/N)		OTHER					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 498

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 498BLR3

BOILER & CONVERTER SURVEY OBSERVATIONS

BLR-3	BOILER/CONVERTER NO.	MECH. RM.	LOCATION (RM)
	SOURCE OF HEATING (PLANT)	OFFICES & MAIN STORE	SERVES AREA

UNIT TYPE:

	STEAM		PSIG	X	HW		TEMP.		BOILER TYPE:
	NO.2 OIL		NO.6 OIL	X	PROPANE		ELEC		FUELS:
	STM/HW		HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:
X	SPACE HEAT		DHW		OTHER				USE:
COMMENT:		SERVES AHU-1 & AHU-3					0.0%		% HTG AREA SERVED
									BB RADIATION ONLY

NAMEPLATE:

PEERLESS	MFG.	G-TOSFDA-WUP	MODEL	1228000	CAPACITY OUTPUT (BTUH)
				1535000	CAPACITY INPUT (BTUH)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)
					CAPACITY INPUT (BTUH)
0.5	HW PUMP 1 - HP		MFG.		MODEL
	HW PUMP 2 - HP		MFG.		MODEL
	HW PUMP 3 - HP		MFG.		MODEL
COMMENT:					

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		PSIG		HW SUPPLY					
RESET CONTROL (oF)	N	HW HIGH	N	HW LOW	N	OA LOW	N	OA HIGH	
BURNER CONTROLS		O2 TRIM (Y/N)		OTHER					
COMMENTS:									

FIELD SURVEY NOTES

BUILDING 604

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 604

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: BHS
CHECKED BY: CEL
FILE: 604BLG

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 604 BLDG NAME: WALLACE POOL

ZONE NO.	1	FUNCTION: POOL							
OCCUPANCY HOURS:	M-F	1230	TO	1900	SAT	1100	TO	1900	
	SUN	1100	TO	1900					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

REMARKS:
30 HP POOL PUMP, 200V, 90 AMP, 3 PHASE, 60 HZ
NO NAMEPLATE ON PUMP
CHEMICAL FEEDS
FOUR FILTER TANKS, NO PRESSURE GAUGES

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 604

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: CEL
CHECKED BY: CEL
FILE: 604PUMP

BOILER & CONVERTER SURVEY OBSERVATIONS

PUMP	BOILER/CONVERTER NO.	MER	LOCATION (RM)
NONE	SOURCE OF HEATING (PLANT)	POOL	SERVES AREA

UNIT TYPE:

	STEAM		PSIG		HW		TEMP.		BOILER TYPE:
	NO.2 OIL		NO.6 OIL		N.GAS		ELEC		FUELS:
	STM/HW		HTHW/HW		HTHW/STM	X	OTHER		CONVERTER TYPE:
	SPACE HEAT		DHW		OTHER				USE:
COMMENT:	POOL PUMP						0%		% HTG AREA SERVED
									BB RADIATION ONLY

NAMEPLATE:

	MFG.		MODEL		CAPACITY OUTPUT (BTUH)
					CAPACITY INPUT (BTUH)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)
					CAPACITY INPUT (BTUH)
30	HW PUMP 1 – HP		MFG.		MODEL
	HW PUMP 2 – HP		MFG.		MODEL
	HW PUMP 3 – HP		MFG.		MODEL
COMMENT:					

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	0	0	0	0	0	0	0	
REQUIRED STOP TIME	2400	2400	2400	2400	2400	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
				1	1	1	1	1			

CONTROLS:

		PNEUMATIC		ELECTRIC		ELEC'NIC	DDC	COMMENTS
SETPOINTS		PSIG		HW SUPPLY				NONE
RESET CONTROL (oF)		HW HIGH		HW LOW		OA LOW	OA HIGH	
BURNER CONTROLS		O2 TRIM (Y/N)		OTHER				
COMMENTS:								

FIELD SURVEY NOTES

BUILDING 625
AND TYPICAL FOR
658 & 825

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 625

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: JDR
CHECKED BY: CEL
FILE: 625BLG

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 625 BLDG NAME: BAT. HQ

ZONE NO.	1		FUNCTION: ADMIN						
OCCUPANCY HOURS:	M-F	700	TO	1700	SAT	800	TO	1600	
	SUN	800	TO	1600					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.			FUNCTION:						
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.			FUNCTION:						
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

REMARKS:
A. TIME CLOCK FOR AHU HAS PINS, IS WORKING
B. DAMPER ACTUATORS ARE CONNECTED AND WORKING
C. CONTROLS ARE IN OK CONDITION
D. HW LINES IN MECH ROOM ARE NOT INSULATED
E. CONDENSATE LINES AND TANKS ARE NOT INSULATED

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 625

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: DR
CHECKED BY: CEL
FILE: 625AH1

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-1	AHU NO.	MECH. RM.	LOCATION (RM)
ACCU-1	REF. SYS. SERVING AHU	ALL	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
X	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
5	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

WORTHINGTON					MFG.	CM-18.00			MODEL
7.5	SUPPLY FAN HP		DAYTON		MFG.	2N985G			MODEL
	RET/EXH FAN HP				MFG.				MODEL
9430	CFM-HTG	9430	CFM-CLG	17%	MIN %OA	100%	MAX %OA	73.5%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		EVAP MEDIA		MOD VLV	HUMID.
	NONE	X	DX		CW			X	MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	800	700	700	700	700	700	800	TIMECLOCK?
PRESENT STOP TIME	1600	1700	1700	1700	1700	1700	1600	YES
REQUIRED START TIME	800	700	700	700	700	700	800	
REQUIRED STOP TIME	1600	1700	1700	1700	1700	1700	1600	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			DAMPERS CONNECTED
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	& WORKING
OTHER SETPOINTS (oF):	N/A	HOT DECK	N/A	COLD DECK	N/A	MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	YES		NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 625

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: BHS
CHECKED BY: CEL
FILE: 625RD1

PERIMETER RADIATION SURVEY OBSERVATIONS

RAD-1	PER RAD NO.	MECH. RM.	LOCATION (RM)
	SOURCE OF HEATING	ALL	SERVES AREA

UNIT TYPE:

	STEAM	X	HW		ELECTRIC				
	OTHER								
	COMMENT:								

NAMEPLATE:

	HW PUMP 1 - HP		MFG.		MODEL
	HW PUMP 2 - HP		MFG.		MODEL
	HW PUMP 3 - HP		MFG.		MODEL
	HW PUMP 4 - HP		MFG.		MODEL
COMMENT:				26.5%	% AREA HEATING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	800	700	700	700	700	700	800	
REQUIRED STOP TIME	1600	1700	1700	1700	1700	1700	1600	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	0	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
RADIATION CONTROL	X	NONE		2-WAY VLV		3-WAY VLV		OTHER	
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
RESET CONTROL (oF):		HW HIGH		HW LOW		OA LOW		OA HIGH	
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 625

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: DR
CHECKED BY: CEL
FILE: 625CV1

BOILER & CONVERTER SURVEY OBSERVATIONS

CV-1	BOILER/CONVERTER NO.	MECH. RM.	LOCATION (RM)
C.P.	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	STEAM		PSIG		HW		TEMP.	BOILER TYPE:
	NO.2 OIL		NO.6 OIL		N.GAS		ELEC	FUELS:
X	STM/HW		HTHW/HW		HTHW/STM		OTHER	CONVERTER TYPE:
X	SPACE HEAT		DHW		OTHER			USE:
COMMENT:								% HTG AREA SERVED
								BB RADIATION ONLY

NAMEPLATE:

N/A	MFG.	N/A	MODEL	290000	CAPACITY OUTPUT (BTUH)
				305263	CAPACITY INPUT (BTUH)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)
					CAPACITY INPUT (BTUH)

0.75	HW PUMP 1 - HP	DUNHAM-BUSH	MFG.	1A5C431-2	MODEL
	HW PUMP 2 - HP		MFG.		MODEL
	HW PUMP 3 - HP		MFG.		MODEL

COMMENT:

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	800	700	700	700	700	700	800	
REQUIRED STOP TIME	1600	1700	1700	1700	1700	1700	1600	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	0	0	0	0	0	0	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		PSIG	N/A	HW SUPPLY					
RESET CONTROL (oF)		HW HIGH		HW LOW		OA LOW		OA HIGH	
BURNER CONTROLS		O2 TRIM (Y/N)		OTHER					

COMMENTS:

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 625

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: DR
CHECKED BY: CEL
FILE: 625CH1

REFRIGERATION EQUIPMENT SURVEY OBSERVATIONS

CH-1	CHILLER/COMPRESSOR NO.	OUTSIDE MECH. RM.	LOCATION (RM)

UNIT TYPE:

	CENTRIFUGAL WITH WATER SIDE COOLING TOWER						OTHER
	RECIPROCATING WITH WATER SIDE COOLING TOWER					AHU-1	AHU'S SERVED
	RECIPROCATING WITH AIR COOLED CONDENSING UNIT						
	ABSORBTION WITH WATER SIDE COOLING TOWER						
X	AIR COOLED CONDENSING UNIT						
	CHW	X	DX		OTHER		

NAMEPLATE:

CHILLER WEATHER K		MFG.	4172-2-40B			MODEL	18211203541			SERIAL NO.
230	VOLTS	140	AMPS	3	PH	60	HZ	30	CAPACITY (TONS)	
TOWER		MFG.				MODEL			2	# OF FANS
230	VOLTS	8.4	AMPS	3	PH	60	HZ	3	HP each	
CW PUMP		MFG.				MODEL				SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP	
CHW PUMP		MFG.				MODEL				SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP	
COMMENTS:										

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	800	700	700	700	700	700	800	TIMECLOCK?
PRESENT STOP TIME	1600	1700	1700	1700	1700	1700	1600	YES
REQUIRED START TIME	800	700	700	700	700	700	800	
REQUIRED STOP TIME	1600	1700	1700	1700	1700	1700	1600	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
0	0	0	0	1	1	1	1	1	0	0	0

CONTROLS:

		PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		CWS (oF)		CWR (oF)		CNWS (oF)		CNWR (oF)	
PANEL INDICATORS									
- PRESSURE		LITE-HI		LITE-LOW		GAUGES			
- TEMPERATURE		LITE-HI		LITE-LOW		GAUGES			
- OTHER									
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 625

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: DR
CHECKED BY: CEL
FILE: 625DHW

DOMESTIC HW SURVEY OBSERVATIONS

DHW-1	BOILER/CONVERTER NO.	MER	LOCATION (RM)
ELEC	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	NO.2 OIL		NO.6 OIL		N.GAS	X	ELEC		FUELS:
	STM/HW		HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:
COMMENT:									

NAMEPLATE:

	MFG.		MODEL	1.65	CAPACITY OUTPUT (BTUH,KW)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH,KW)
DOMESTIC HW CIRCULATION PUMP:					
	HW PUMP 1 – HP		MFG.		MODEL
	HW PUMP 2 – HP		MFG.		MODEL
	HW PUMP 3 – HP		MFG.		MODEL
COMMENT:					

DIMENSION:	14	DIAMETER (INCHS)	18	HEIGHT OR LENGTH (INCHES)	6 GALLON

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	800	700	700	700	700	700	800	
REQUIRED STOP TIME	1600	1700	1700	1700	1700	1700	1600	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC	DDC	COMMENTS
SETPOINTS				HW SUPPLY				
COMMENTS:								

FIELD SURVEY NOTES

BUILDING 627
AND TYPICAL FOR
628, 629, 634, 635, 651
652, 654, 659, AND 660

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 627

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 627BLG

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 627 BLDG NAME: BARRACKS WITH A/C

ZONE NO.	1	FUNCTION: QUARTERS							
OCCUPANCY HOURS:	M-F	0	TO	2400	SAT	0	TO	2400	
	SUN	0	TO	2400					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

REMARKS: AHU CONTROLS ARE PNEUMATIC AND IN GOOD CONDITION
TIME CLOCK IS PRESENT, BUT PINS ARE MISSING
THREE ZONES FOR HW BASEBOARD HEATING

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 627

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: CEL
CHECKED BY: CEL
FILE: 627VAV1

AIR HANDLING UNIT SURVEY OBSERVATIONS

VAV-1	AHU NO.	MER	LOCATION (RM)
C.PLANT	REF. SYS. SERVING AHU	SOUTH	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION	X	VAV
	NUMBER OF ZONES		45		OTHER	VAV BOXES			
	COMMENT:								

NAMEPLATE:

					MFG.				MODEL
15.0	SUPPLY FAN HP		MARATHON		MFG.	DD254TTDR7343CCW			MODEL
3.0	RET/EXH FAN HP		RELIANCE		MFG.	P18K13AMZ			MODEL
13574	CFM-HTG	13547	CFM-CLG	10%	MIN %OA	100%	MAX %OA	0.0%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		EVAP MEDIA		MOD VLV	HUMID.
	NONE		DX	X	CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	YES
REQUIRED START TIME	0	0	0	0	0	0	0	NO PINS IN TC
REQUIRED STOP TIME	2400	2400	2400	2400	2400	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
				1	1	1	1	1			

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:	X	SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (°F):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (°F):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:		YES		NO					
COMMENTS:	MANUAL OA DAMPER POSITION, LINKAGE GOOD								

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 627

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: CEL
CHECKED BY: CEL
FILE: 627VAV2

AIR HANDLING UNIT SURVEY OBSERVATIONS

VAV-2	AHU NO.	MER	LOCATION (RM)
C.PLANT	REF. SYS. SERVING AHU	NORTH	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION	X	VAV
	NUMBER OF ZONES		45		OTHER	VAV BOXES			
	COMMENT:								

NAMEPLATE:

					MFG.				MODEL
15.0	SUPPLY FAN HP		MARATHON		MFG.	DD254TTDR7343CCW			MODEL
3.0	RET/EXH FAN HP		RELIANCE		MFG.	P18K13AMZ			MODEL
13574	CFM-HTG	13547	CFM-CLG	10%	MIN %OA	100%	MAX %OA	0.0%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		EVAP MEDIA		MOD VLV	HUMID.
	NONE		DX	X	CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	YES
REQUIRED START TIME	0	0	0	0	0	0	0	NO PINS IN TC
REQUIRED STOP TIME	2400	2400	2400	2400	2400	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
				1	1	1	!	!			

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:	X	SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (°F):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (°F):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:		YES		NO					
COMMENTS:	MANUAL OA DAMPER POSITION, LINKAGE GOOD								

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 627

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: CMD
CHECKED BY: CEL
FILE: 627CV1

BOILER & CONVERTER SURVEY OBSERVATIONS

CV-1	BOILER/CONVERTER NO.	MER	LOCATION (RM)
C. PLANT	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	STEAM		PSIG		HW		TEMP.		BOILER TYPE:
	NO.2 OIL		NO.6 OIL		N.GAS		ELEC		FUELS:
X	STM/HW		HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:
X	SPACE HEAT		DHW		OTHER				USE:
COMMENT:							0%		% HTG AREA SERVED
									BB RADIATION ONLY

NAMEPLATE:

DANHAM-BUSH	MFG.	SCA-82	MODEL	936000	CAPACITY OUTPUT (BTUH)	
				936000	CAPACITY INPUT (BTUH)	
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)	
					CAPACITY INPUT (BTUH)	
0.75	HW PUMP 1 - HP	GE	MFG.	5K38MG567		MODEL
	HW PUMP 2 - HP		MFG.			MODEL
	HW PUMP 3 - HP		MFG.			MODEL
COMMENT:						

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	YES - NO PINS
REQUIRED START TIME	0	0	0	0	0	0	0	
REQUIRED STOP TIME	2400	2400	2400	2400	2400	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1						1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		PSIG		HW SUPPLY					
RESET CONTROL (oF)	160	HW HIGH	80	HW LOW	65	OA LOW	0	OA HIGH	
BURNER CONTROLS		O2 TRIM (Y/N)		OTHER					

COMMENTS: CONTROLS IN GOOD CONDITION

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 627

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: CMD
CHECKED BY: CEL
FILE: 627CV2

BOILER & CONVERTER SURVEY OBSERVATIONS

CV-2	BOILER/CONVERTER NO.	MER	LOCATION (RM)
C. PLANT	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	STEAM		PSIG		HW		TEMP.		BOILER TYPE:
	NO.2 OIL		NO.6 OIL		N.GAS		ELEC		FUELS:
X	STM/HW		HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:
X	SPACE HEAT		DHW		OTHER				USE:
COMMENT:							0%		% HTG AREA SERVED
									BB RADIATION ONLY

NAMEPLATE:

DANHAM-BUSH	MFG.	SCA-82	MODEL	933000	CAPACITY OUTPUT (BTUH)
				933000	CAPACITY INPUT (BTUH)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)
					CAPACITY INPUT (BTUH)

0.75	HW PUMP 1 - HP	GE	MFG.	5K43GG3265	MODEL
	HW PUMP 2 - HP		MFG.		MODEL
	HW PUMP 3 - HP		MFG.		MODEL

COMMENT:

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	YES - NO PINS
REQUIRED START TIME	0	0	0	0	0	0	0	
REQUIRED STOP TIME	2400	2400	2400	2400	2400	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1						1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		PSIG		HW SUPPLY					
RESET CONTROL (oF)	160	HW HIGH	80	HW LOW	65	OA LOW	0	OA HIGH	
BURNER CONTROLS		O2 TRIM (Y/N)		OTHER					

COMMENTS: CONTROLS IN GOOD CONDITION

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 627

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: CMD
CHECKED BY: CEL
FILE: 627CV3

BOILER & CONVERTER SURVEY OBSERVATIONS

CV-3	BOILER/CONVERTER NO.	MER	LOCATION (RM)
C. PLANT	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	STEAM		PSIG		HW		TEMP.		BOILER TYPE:
	NO.2 OIL		NO.6 OIL		N.GAS		ELEC		FUELS:
X	STM/HW		HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:
X	SPACE HEAT		DHW		OTHER				USE:
COMMENT:							0%	% HTG AREA SERVED	
								BB RADIATION ONLY	

NAMEPLATE:

DANHAM-BUSH	MFG.	SCA-42	MODEL	936000	CAPACITY OUTPUT (BTUH)
				936000	CAPACITY INPUT (BTUH)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)
					CAPACITY INPUT (BTUH)
0.75	HW PUMP 1 - HP	GE	MFG.		MODEL
	HW PUMP 2 - HP		MFG.		MODEL
	HW PUMP 3 - HP		MFG.		MODEL
COMMENT:					

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	YES - NO PINS
REQUIRED START TIME	0	0	0	0	0	0	0	
REQUIRED STOP TIME	2400	2400	2400	2400	2400	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1						1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		PSIG		HW SUPPLY					
RESET CONTROL (oF)	160	HW HIGH	80	HW LOW	65	OA LOW	0	OA HIGH	
BURNER CONTROLS		O2 TRIM (Y/N)		OTHER					
COMMENTS:	CONTROLS IN GOOD CONDITION								

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 627

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: CMD
CHECKED BY: CEL
FILE: 627CWP

REFRIGERATION EQUIPMENT SURVEY OBSERVATIONS

CWP-1	CHILLER/COMPRESSOR NO.	MER	LOCATION (RM)

UNIT TYPE:

	CENTRIFUGAL WITH WATER SIDE COOLING TOWER					X	OTHER **CHW PUMP**
	RECIPROCATING WITH WATER SIDE COOLING TOWER						AHU'S SERVED
	RECIPROCATING WITH AIR COOLED CONDENSING UNIT						
	ABSORBTION WITH WATER SIDE COOLING TOWER						
	AIR COOLED CONDENSING UNIT						
X	CHW		DX		OTHER		

NAMEPLATE:

CHILLER		MFG.				MODEL				SERIAL NO.
	VOLTS		AMPS		PH		HZ		CAPACITY (TONS)	
TOWER		MFG.				MODEL				# OF FANS
	VOLTS		AMPS		PH		HZ		HP each	
CW PUM**MARATHON**		MFG.	**KVA145TTDR7644AEW**			MODEL				SERIAL NO.
208	VOLTS	**6.3**	AMPS	**3**	PH	**60**	HZ	**2**	HP	
CNW PUMP		MFG.				MODEL				SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP	
COMMENTS:										

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	**0**	**0**	**0**	**0**	**0**	**0**	**0**	TIMECLOCK?
PRESENT STOP TIME	**2400**	**2400**	**2400**	**2400**	**2400**	**2400**	**2400**	
REQUIRED START TIME	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
REQUIRED STOP TIME	**2400**	**2400**	**2400**	**2400**	**2400**	**2400**	**2400**	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
				1	**1**	**1**	**1**	**1**			

CONTROLS:

		PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		CWS (oF)		CWR (oF)		CNWS (oF)		CNWR (oF)	**NONE**
PANEL INDICATORS									
- PRESSURE		LITE-HI		LITE-LOW		GAUGES			
- TEMPERATURE		LITE-HI		LITE-LOW		GAUGES			
- OTHER									
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 627

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: CMD
CHECKED BY: CEL
FILE: 627RAD1

PERIMETER RADIATION SURVEY OBSERVATIONS

RAD-1	PER RAD NO.	NORTH	LOCATION (RM)
CONV-1	SOURCE OF HEATING	NORTH	SERVES AREA

UNIT TYPE:

	STEAM	X	HW		ELECTRIC				
	OTHER								
	COMMENT:								

NAMEPLATE:

	HW PUMP 1 - HP		MFG.		MODEL
	HW PUMP 2 - HP		MFG.		MODEL
	HW PUMP 3 - HP		MFG.		MODEL
	HW PUMP 4 - HP		MFG.		MODEL
COMMENT:	SEE CONVERTER			40.0%	% AREA HEATING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	0	0	0	0	0	0	0	
REQUIRED STOP TIME	2400	2400	2400	2400	2400	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1						1	1	1

CONTROLS:

		PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
RADIATION CONTROL:		NONE		2-WAY VLV		3-WAY VLV		OTHER	NO CONTROL
SPACE SETPOINT (°F):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
RESET CONTROL (°F):		HW HIGH		HW LOW		OA LOW		OA HIGH	
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 627

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: CMD
CHECKED BY: CEL
FILE: 627RAD2

PERIMETER RADIATION SURVEY OBSERVATIONS

RAD-2	PER RAD NO.	NORTH	LOCATION (RM)
CONV-2	SOURCE OF HEATING	NORTH	SERVES AREA

UNIT TYPE:

	STEAM	X	HW		ELECTRIC				
	OTHER								
	COMMENT:								

NAMEPLATE:

	HW PUMP 1 - HP		MFG.		MODEL
	HW PUMP 2 - HP		MFG.		MODEL
	HW PUMP 3 - HP		MFG.		MODEL
	HW PUMP 4 - HP		MFG.		MODEL
COMMENT:	SEE CONVERTER			40.0%	% AREA HEATING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	0	0	0	0	0	0	0	
REQUIRED STOP TIME	2400	2400	2400	2400	2400	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1						1	1	1

CONTROLS:

		PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
RADIATION CONTROL:		NONE		2-WAY VLV		3-WAY VLV		OTHER	NO CONTROL
SPACE SETPOINT (°F):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
RESET CONTROL (°F):		HW HIGH		HW LOW		OA LOW		OA HIGH	
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 627

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: CMD
CHECKED BY: CEL
FILE: 627RAD3

PERIMETER RADIATION SURVEY OBSERVATIONS

RAD-3	PER RAD NO.	**OTHER**	LOCATION (RM)
CONV-3	SOURCE OF HEATING	OTHER	SERVES AREA

UNIT TYPE:

	STEAM	X	HW		ELECTRIC				
	OTHER								
	COMMENT:								

NAMEPLATE:

	HW PUMP 1 - HP		MFG.		MODEL
	HW PUMP 2 - HP		MFG.		MODEL
	HW PUMP 3 - HP		MFG.		MODEL
	HW PUMP 4 - HP		MFG.		MODEL
COMMENT:	SEE CONVERTER			**20.0%**	% AREA HEATING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	**0**	**0**	**0**	**0**	**0**	**0**	**0**	TIMECLOCK?
PRESENT STOP TIME	**2400**	**2400**	**2400**	**2400**	**2400**	**2400**	**2400**	
REQUIRED START TIME	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
REQUIRED STOP TIME	**2400**	**2400**	**2400**	**2400**	**2400**	**2400**	**2400**	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	**1**	**1**	**1**						**1**	**1**	**1**

CONTROLS:

		PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
RADIATION CONTROL:		NONE		2-WAY VLV		3-WAY VLV		OTHER	NO CONTROL
SPACE SETPOINT (°F):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
RESET CONTROL (°F):		HW HIGH		HW LOW		OA LOW		OA HIGH	
COMMENTS:									

FIELD SURVEY NOTES

BUILDING 673
AND TYPICAL FOR
672, 680, 681, 772, 773,
780, 781, 872, 873, 880,
881, 990, 991, 998, AND 999

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 673

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 673BLG

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 673 BLDG NAME: MOTOR POOL

ZONE NO.	1	FUNCTION: VEHICLE MAINTENANCE							
OCCUPANCY HOURS:	M-F	700	TO	1700	SAT	0	TO	0	
	SUN	0	TO	0					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

REMARKS: TWO OIL-FIRED FORCED AIR FURNANCES
ELECTRIC CONTROLS

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 673

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: DR
CHECKED BY: CEL
FILE: 673UH1

AIR HANDLING UNIT SURVEY OBSERVATIONS

UH-1	AHU NO.	EAST	LOCATION (RM)
NONE	REF. SYS. SERVING AHU	EAST	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC	X	UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

FORCED AIR FURNACE				MFG.	CA-25			MODEL
1.5	SUPPLY FAN HP			MFG.				MODEL
	RET/EXH FAN HP			MFG.				MODEL
2200	CFM-HTG	0	CFM-CLG	0%	MIN %OA	0%	MAX %OA	50%	% HTG AREA SERVED
COMMENT:									

COILS:

	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE	X	FUEL OIL		HW		ELEC		MOD VLV	HEATING
	NONE		STM		HW		ELEC		MOD VLV	REHEAT
	NONE		STM		HW		EVAP MEDIA		MOD VLV	HUMID.
	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1						1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (°F):	74.6	OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (°F):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:		MIN OA (Y/N)		MAX OA (Y/N)		RA (Y/N)		EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	YES		NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 673

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: DR
CHECKED BY: CEL
FILE: 673UH2

AIR HANDLING UNIT SURVEY OBSERVATIONS

UH-2	AHU NO.	WEST	LOCATION (RM)
NONE	REF. SYS. SERVING AHU	WEST	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC	X	UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

FORCED AIR FURNACE				MFG.	CA-25			MODEL
1.5	SUPPLY FAN HP			MFG.				MODEL
	RET/EXH FAN HP			MFG.				MODEL
2200	CFM-HTG	0	CFM-CLG	0%	MIN %OA	0%	MAX %OA	50%	% HTG AREA SERVED
COMMENT:									

COILS:

	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE	X	FUEL OIL		HW		ELEC		MOD VLV	HEATING
	NONE		STM		HW		ELEC		MOD VLV	REHEAT
	NONE		STM		HW		EVAP MEDIA		MOD VLV	HUMID.
	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1						1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (°F):	74.6	OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (°F):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:		MIN OA (Y/N)		MAX OA (Y/N)		RA (Y/N)		EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	YES		NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 673

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: DR
CHECKED BY: CEL
FILE: 673DHW

DOMESTIC HW SURVEY OBSERVATIONS

DHW-1	BOILER/CONVERTER NO.	MER	LOCATION (RM)
ELEC	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	NO.2 OIL		NO.6 OIL		N.GAS	X	ELEC		FUELS:
	STM/HW		HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:
COMMENT:									

NAMEPLATE:

RUUD	MFG.		MODEL	1.5	CAPACITY OUTPUT (~~BTUH~~,KW)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH,KW)
DOMESTIC HW CIRCULATION PUMP:					
	HW PUMP 1 – HP		MFG.		MODEL
	HW PUMP 2 – HP		MFG.		MODEL
	HW PUMP 3 – HP		MFG.		MODEL
COMMENT:					

DIMENSION:	18	DIAMETER (INCHS)	34	HEIGHT OR LENGTH (INCHES)	GALLON

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0						TIMECLOCK?
PRESENT STOP TIME	2400	2400						NO
REQUIRED START TIME	0	700						
REQUIRED STOP TIME	0	1700						

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS				HW SUPPLY					
COMMENTS:									

FIELD SURVEY NOTES

BUILDING 730
AND TYPICAL FOR
731, 736, 737, AND 738

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 730

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 730BLG

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 730 BLDG NAME: BARRACKS WITHOUT A/C

ZONE NO.	1	FUNCTION: QUARTERS							
OCCUPANCY HOURS:	M-F	0	TO	2400	SAT	0	TO	2400	
	SUN	0	TO	2400					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

REMARKS: PNEUMATIC CONTROLS; TIMECLOCK PRESENT, BUT HAS NO PINS
TWO ZONES FOR HW BASEBOARD HEATING
TWO LARGE EXHAUST FANS FOR VENTILATION

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 730

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: CMD
CHECKED BY: CEL
FILE: 730RAD1

PERIMETER RADIATION SURVEY OBSERVATIONS

RAD-1	PER RAD NO.	NORTH	LOCATION (RM)
CONV-1	SOURCE OF HEATING	NORTH	SERVES AREA

UNIT TYPE:

	STEAM	X	HW		ELECTRIC				
	OTHER								
	COMMENT:								

NAMEPLATE:

	HW PUMP 1 - HP		MFG.		MODEL
	HW PUMP 2 - HP		MFG.		MODEL
	HW PUMP 3 - HP		MFG.		MODEL
	HW PUMP 4 - HP		MFG.		MODEL
COMMENT:	SEE CONVERTER			50.0%	% AREA HEATING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	0	0	0	0	0	0	0	
REQUIRED STOP TIME	2400	2400	2400	2400	2400	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1						1	1	1

CONTROLS:

		PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
RADIATION CONTROL:		NONE		2-WAY VLV		3-WAY VLV		OTHER	NO CONTROL
SPACE SETPOINT (°F):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
RESET CONTROL (°F):		HW HIGH		HW LOW		OA LOW		OA HIGH	

COMMENTS:

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 730

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: CMD
CHECKED BY: CEL
FILE: 730RAD2

PERIMETER RADIATION SURVEY OBSERVATIONS

RAD-2	PER RAD NO.	**NORTH**	LOCATION (RM)
CONV-2	SOURCE OF HEATING	NORTH	SERVES AREA

UNIT TYPE:

	STEAM	X	HW		ELECTRIC				
	OTHER								
	COMMENT:								

NAMEPLATE:

	HW PUMP 1 - HP		MFG.		MODEL
	HW PUMP 2 - HP		MFG.		MODEL
	HW PUMP 3 - HP		MFG.		MODEL
	HW PUMP 4 - HP		MFG.		MODEL
COMMENT:	SEE CONVERTER			**50.0%**	% AREA HEATING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	**0**	**0**	**0**	**0**	**0**	**0**	**0**	TIMECLOCK?
PRESENT STOP TIME	**2400**	**2400**	**2400**	**2400**	**2400**	**2400**	**2400**	
REQUIRED START TIME	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
REQUIRED STOP TIME	**2400**	**2400**	**2400**	**2400**	**2400**	**2400**	**2400**	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	**1**	**1**	**1**						**1**	**1**	**1**

CONTROLS:

		PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
RADIATION CONTROL:		NONE		2-WAY VLV		3-WAY VLV		OTHER	NO CONTROL
SPACE SETPOINT (°F):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
RESET CONTROL (°F):		HW HIGH		HW LOW		OA LOW		OA HIGH	
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 730

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: CMD
CHECKED BY: CEL
FILE: 730CV1

BOILER & CONVERTER SURVEY OBSERVATIONS

CV-1	BOILER/CONVERTER NO.	MER	LOCATION (RM)
C. PLANT	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	STEAM		PSIG		HW		TEMP.		BOILER TYPE:
	NO.2 OIL		NO.6 OIL		N.GAS		ELEC		FUELS:
X	STM/HW		HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:
X	SPACE HEAT		DHW		OTHER				USE:
COMMENT:							0%		% HTG AREA SERVED
									BB RADIATION ONLY

NAMEPLATE:

	MFG.		MODEL	936000	CAPACITY OUTPUT (BTUH)
				936000	CAPACITY INPUT (BTUH)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)
					CAPACITY INPUT (BTUH)
0.75	HW PUMP 1 - HP	BALDOR	MFG.	JM3463	MODEL
	HW PUMP 2 - HP		MFG.		MODEL
	HW PUMP 3 - HP		MFG.		MODEL
COMMENT:					

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	0	0	0	0	0	0	0	
REQUIRED STOP TIME	2400	2400	2400	2400	2400	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1						1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		PSIG		HW SUPPLY					
RESET CONTROL (oF)	160	HW HIGH	80	HW LOW	65	OA LOW	0	OA HIGH	
BURNER CONTROLS		O2 TRIM (Y/N)		OTHER					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 730

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: CMD
CHECKED BY: CEL
FILE: 730CV2

BOILER & CONVERTER SURVEY OBSERVATIONS

CV-2	BOILER/CONVERTER NO.	MER	LOCATION (RM)
C. PLANT	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	STEAM		PSIG		HW		TEMP.		BOILER TYPE:
	NO.2 OIL		NO.6 OIL		N.GAS		ELEC		FUELS:
X	STM/HW		HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:
X	SPACE HEAT		DHW		OTHER				USE:
COMMENT:							0%		% HTG AREA SERVED
									BB RADIATION ONLY

NAMEPLATE:

	MFG.		MODEL	936000	CAPACITY OUTPUT (BTUH)
				936000	CAPACITY INPUT (BTUH)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)
					CAPACITY INPUT (BTUH)
0.75	HW PUMP 1 – HP	BALDOR	MFG.	JM3463	MODEL
	HW PUMP 2 – HP		MFG.		MODEL
	HW PUMP 3 – HP		MFG.		MODEL
COMMENT:					

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	0	0	0	0	0	0	0	
REQUIRED STOP TIME	2400	2400	2400	2400	2400	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1						1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		PSIG		HW SUPPLY					
RESET CONTROL (oF)	160	HW HIGH	80	HW LOW	65	OA LOW	0	OA HIGH	
BURNER CONTROLS		O2 TRIM (Y/N)		OTHER					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 730

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: CMD
CHECKED BY: CEL
FILE: 730EX1

AIR HANDLING UNIT SURVEY OBSERVATIONS

EX-1	AHU NO.	MER	LOCATION (RM)
NONE	REF. SYS. SERVING AHU	ALL	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES			X	OTHER	VENT FAN FOR BLDG			
	COMMENT:								

NAMEPLATE:

					MFG.				MODEL
	SUPPLY FAN HP				MFG.				MODEL
20.0	RET/EXH FAN HP		CENTURY		MFG.	SC-286U-FC5-5			MODEL
0	CFM-HTG	0	CFM-CLG	0%	MIN %OA	0%	MAX %OA	0.0%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		EVAP MEDIA		MOD VLV	HUMID.
X	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	0	0	0	0	0	0	
REQUIRED STOP TIME	2400	2400	2400	2400	2400	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
				1	1	1	1	1			

CONTROLS:

		PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			NONE
SPACE SETPOINT (°F):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (°F):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:		MIN OA (Y/N)		MAX OA (Y/N)		RA (Y/N)		EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	X	YES		NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 730

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: CMD
CHECKED BY: CEL
FILE: 730EX2

AIR HANDLING UNIT SURVEY OBSERVATIONS

EX-2	AHU NO.	MER	LOCATION (RM)
NONE	REF. SYS. SERVING AHU	ALL	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES			X	OTHER	VENT FAN FOR BLDG			
	COMMENT:								

NAMEPLATE:

					MFG.				MODEL
	SUPPLY FAN HP				MFG.				MODEL
20.0	RET/EXH FAN HP		CENTURY		MFG.	SC-286U-FC5-5			MODEL
0	CFM-HTG	0	CFM-CLG	0%	MIN %OA	0%	MAX %OA	0.0%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		EVAP MEDIA		MOD VLV	HUMID.
X	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	0	0	0	0	0	0	
REQUIRED STOP TIME	2400	2400	2400	2400	2400	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
				1	1	1	1	1			

CONTROLS:

		PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			NONE
SPACE SETPOINT (°F):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (°F):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:		MIN OA (Y/N)		MAX OA (Y/N)		RA (Y/N)		EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	X	YES		NO					
COMMENTS:									

FIELD SURVEY NOTES

BUILDINGS 735 & 739
SAME AS BUILDING 630,
WITH 3 ADDITIONAL H&Vs

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 735

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: CMD
CHECKED BY: CEL
FILE: 735HV3

AIR HANDLING UNIT SURVEY OBSERVATIONS

HV-3	AHU NO.	ATTIC WEST	LOCATION (RM)
	REF. SYS. SERVING AHU	KITCHEN	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR	X	H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

					MFG.				MODEL
2.0	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
1000	CFM-HTG	0	CFM-CLG	100%	MIN %OA	100%	MAX %OA	10%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
X	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	300	300	300	300	300	300	300	
REQUIRED STOP TIME	2000	2000	2000	2000	2000	2000	2000	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1						1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:		MIN OA (Y/N)		MAX OA (Y/N)		RA (Y/N)		EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:		YES	X	NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 735

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: CMD
CHECKED BY: CEL
FILE: 735HV4

AIR HANDLING UNIT SURVEY OBSERVATIONS

HV-4	AHU NO.	ATTIC WEST	LOCATION (RM)
	REF. SYS. SERVING AHU	KITCHEN	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR	X	H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

					MFG.				MODEL
2.0	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
1000	CFM-HTG	0	CFM-CLG	100%	MIN %OA	100%	MAX %OA	10%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
X	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	300	300	300	300	300	300	300	
REQUIRED STOP TIME	2000	2000	2000	2000	2000	2000	2000	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1						1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:		MIN OA (Y/N)		MAX OA (Y/N)		RA (Y/N)		EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:		YES	X	NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 735

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: CMD
CHECKED BY: CEL
FILE: 735HV5

AIR HANDLING UNIT SURVEY OBSERVATIONS

HV-5	AHU NO.	ATTIC EAST	LOCATION (RM)
	REF. SYS. SERVING AHU	KITCHEN	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR	X	H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

					MFG.				MODEL
2.0	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
1000	CFM-HTG	0	CFM-CLG	100%	MIN %OA	100%	MAX %OA	10%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
X	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	300	300	300	300	300	300	300	
REQUIRED STOP TIME	2000	2000	2000	2000	2000	2000	2000	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1						1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:		MIN OA (Y/N)		MAX OA (Y/N)		RA (Y/N)		EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:		YES	X	NO					
COMMENTS:									

FIELD SURVEY NOTES

BUILDING 768

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 768

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 768BLG

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 768 BLDG NAME: KANELL HALL

ZONE NO.	1	FUNCTION: CLASSROOMS						
OCCUPANCY HOURS:	M-F	500	TO	2200	SAT	500	TO	2200
	SUN	500	TO	2200				
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F			
	SUMMER OCC	°F		UNOCC	°F			

ZONE NO.		FUNCTION:						
OCCUPANCY HOURS:	M-F		TO		SAT		TO	
	SUN		TO					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F			
	SUMMER OCC	°F		UNOCC	°F			

ZONE NO.		FUNCTION:						
OCCUPANCY HOURS:	M-F		TO		SAT		TO	
	SUN		TO					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F			
	SUMMER OCC	°F		UNOCC	°F			

REMARKS:

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 768

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 768AH1

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-1	AHU NO.	ABOVE RESTROOM CEILING	LOCATION (RM)
ACCU-1	REF. SYS. SERVING AHU	ALL	SERVES AREA

UNIT TYPE:

X	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

TRANE					MFG.				MODEL
5.0	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
4000	CFM-HTG	4000	CFM-CLG	10%	MIN %OA	100%	MAX %OA	31%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE	X	DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	500	500	500	500	500	500	500	
REQUIRED STOP TIME	2200	2200	2200	2200	2200	2200	2200	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
	Y	MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:		YES	N	NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 768

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 768AH2

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-2	AHU NO.	ABOVE RESTROOM CEILING	LOCATION (RM)
ACCU-2	REF. SYS. SERVING AHU	ALL	SERVES AREA

UNIT TYPE:

X	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

TRANE					MFG.				MODEL
5.0	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
4000	CFM-HTG	4000	CFM-CLG	10%	MIN %OA	100%	MAX %OA	31%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE	X	DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	500	500	500	500	500	500	500	
REQUIRED STOP TIME	2200	2200	2200	2200	2200	2200	2200	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
	Y	MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:		YES	N	NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 768

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 768AH3

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-3	AHU NO.	ABOVE RESTROOM CEILING	LOCATION (RM)
ACCU-3	REF. SYS. SERVING AHU	ALL	SERVES AREA

UNIT TYPE:

X	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR	H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION	VAV
	NUMBER OF ZONES				OTHER			
	COMMENT:							

NAMEPLATE:

TRANE					MFG.			MODEL
5.0	SUPPLY FAN HP				MFG.			MODEL
	RET/EXH FAN HP				MFG.			MODEL
4000	CFM-HTG	4000	CFM-CLG	10%	MIN %OA	100%	MAX %OA	31%	% HTG AREA SERVED
COMMENT:								

COILS:

X	NONE		STM		HW		ELEC	MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	MOD VLV	HEATING
X	NONE		STM		HW		ELEC	MOD VLV	REHEAT
X	NONE		STM		HW		ELEC	MOD VLV	HUMID.
	NONE	X	DX		CW			MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	500	500	500	500	500	500	500	
REQUIRED STOP TIME	2200	2200	2200	2200	2200	2200	2200	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
	Y	MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:		YES	N	NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 768

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 768AH4

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-4	AHU NO.	MECH. ROOM	LOCATION (RM)
ACCU-4	REF. SYS. SERVING AHU	ALL	SERVES AREA

UNIT TYPE:

X	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

TRANE					MFG.	CCD803ANBG			MODEL
1.0	SUPPLY FAN HP		MARATHON		MFG.	TVB56C17D5321A			MODEL
	RET/EXH FAN HP				MFG.				MODEL
1000	CFM-HTG	1000	CFM-CLG	100%	MIN %OA	100%	MAX %OA	8%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE	X	DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	500	500	500	500	500	500	500	
REQUIRED STOP TIME	2200	2200	2200	2200	2200	2200	2200	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:		YES	N	NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 768

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 768CH1

REFRIGERATION EQUIPMENT SURVEY OBSERVATIONS

ACCU-1	CHILLER/COMPRESSOR NO.	OUTSIDE BUILDING	LOCATION (RM)

UNIT TYPE:

	CENTRIFUGAL WITH WATER SIDE COOLING TOWER						OTHER
	RECIPROCATING WITH WATER SIDE COOLING TOWER					X	AHU'S SERVED AHU-1
X	RECIPROCATING WITH AIR COOLED CONDENSING UNIT						
	ABSORBTION WITH WATER SIDE COOLING TOWER						
	AIR COOLED CONDENSING UNIT						
	CHW	X	DX		OTHER		

NAMEPLATE:

CHILLER TRANE		MFG.	BTA180P-993-L-B			MODEL	B15143851D		SERIAL NO.
460	VOLTS	28.2	AMPS	3	PH	60	HZ	16.75	CAPACITY (TONS)
CONDENSER FANS		MFG.				MODEL		3	# OF FANS
230	VOLTS	2.1	AMPS	1	PH	60	HZ	0.5	HP
CW PUMP		MFG.				MODEL			SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP
CNW PUMP		MFG.				MODEL			SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP
COMMENTS:									

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	500	500	500	500	500	500	500	
REQUIRED STOP TIME	2200	2200	2200	2200	2200	2200	2200	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
0	0	0	0	1	1	1	1	1	0	0	0

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC	DDC	COMMENTS
SETPOINTS		CWS (oF)		CWR (oF)		CNWS (oF)	CNWR (oF)	
PANEL INDICATORS								
- PRESSURE		LITE-HI		LITE-LOW		GAUGES		
- TEMPERATURE		LITE-HI		LITE-LOW		GAUGES		
- OTHER								
COMMENTS:								

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 768

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 768CH2

REFRIGERATION EQUIPMENT SURVEY OBSERVATIONS

ACCU-2	CHILLER/COMPRESSOR NO.	OUTSIDE BUILDING	LOCATION (RM)

UNIT TYPE:

	CENTRIFUGAL WITH WATER SIDE COOLING TOWER						OTHER
	RECIPROCATING WITH WATER SIDE COOLING TOWER					X	AHU'S SERVED AHU-2
X	RECIPROCATING WITH AIR COOLED CONDENSING UNIT						
	ABSORBTION WITH WATER SIDE COOLING TOWER						
	AIR COOLED CONDENSING UNIT						
	CHW	X	DX		OTHER		

NAMEPLATE:

CHILLER TRANE		MFG.	BTA180P-993-L-B			MODEL	B15143851D		SERIAL NO.
460	VOLTS	28.2	AMPS	3	PH	60	HZ	16.75	CAPACITY (TONS)
CONDENSER FANS		MFG.				MODEL		3	# OF FANS
230	VOLTS	2.1	AMPS	1	PH	60	HZ	0.5	HP
CW PUMP		MFG.				MODEL			SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP
CNW PUMP		MFG.				MODEL			SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP

COMMENTS:

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	500	500	500	500	500	500	500	
REQUIRED STOP TIME	2200	2200	2200	2200	2200	2200	2200	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
0	0	0	0	1	1	1	1	1	0	0	0

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		CWS (oF)		CWR (oF)		CNWS (oF)		CNWR (oF)	
PANEL INDICATORS									
- PRESSURE		LITE-HI		LITE-LOW		GAUGES			
- TEMPERATURE		LITE-HI		LITE-LOW		GAUGES			
- OTHER									

COMMENTS:

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 768

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 768CH3

REFRIGERATION EQUIPMENT SURVEY OBSERVATIONS

ACCU-3	CHILLER/COMPRESSOR NO.	OUTSIDE BUILDING	LOCATION (RM)

UNIT TYPE:

	CENTRIFUGAL WITH WATER SIDE COOLING TOWER						OTHER
	RECIPROCATING WITH WATER SIDE COOLING TOWER					X	AHU'S SERVED AHU-3
X	RECIPROCATING WITH AIR COOLED CONDENSING UNIT						
	ABSORBTION WITH WATER SIDE COOLING TOWER						
	AIR COOLED CONDENSING UNIT						
	CHW	X	DX		OTHER		

NAMEPLATE:

CHILLER	TRANE	MFG.	BTA180P-993-L-B			MODEL	B15143851D			SERIAL NO.
460	VOLTS	28.2	AMPS	3	PH	60	HZ	16.75	CAPACITY (TONS)	
CONDENSER FANS		MFG.				MODEL			3	# OF FANS
230	VOLTS	2.1	AMPS	1	PH	60	HZ	0.5	HP	
CW PUMP		MFG.				MODEL				SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP	
CNW PUMP		MFG.				MODEL				SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP	
COMMENTS:										

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	500	500	500	500	500	500	500	
REQUIRED STOP TIME	2200	2200	2200	2200	2200	2200	2200	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
0	0	0	0	1	1	1	1	1	0	0	0

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		CWS (oF)		CWR (oF)		CNWS (oF)		CNWR (oF)	
PANEL INDICATORS									
- PRESSURE		LITE-HI		LITE-LOW		GAUGES			
- TEMPERATURE		LITE-HI		LITE-LOW		GAUGES			
- OTHER									
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 768

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 768CH4

REFRIGERATION EQUIPMENT SURVEY OBSERVATIONS

ACCU-4	CHILLER/COMPRESSOR NO.	OUTSIDE BUILDING	LOCATION (RM)

UNIT TYPE:

	CENTRIFUGAL WITH WATER SIDE COOLING TOWER						OTHER
	RECIPROCATING WITH WATER SIDE COOLING TOWER					X	AHU'S SERVED AHU-4
X	RECIPROCATING WITH AIR COOLED CONDENSING UNIT						
	ABSORBTION WITH WATER SIDE COOLING TOWER						
	AIR COOLED CONDENSING UNIT						
	CHW	X	DX		OTHER		

NAMEPLATE:

CHILLER	TRANE	MFG.	BTD730A100B0			MODEL				SERIAL NO.
230	VOLTS	15	AMPS	1	PH	60	HZ	2.25	CAPACITY (TONS)	
CONDENSER FANS		MFG.				MODEL			1	# OF FANS
230	VOLTS	1	AMPS	1	PH	60	HZ	0.25	HP	
CW PUMP		MFG.				MODEL				SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP	
CNW PUMP		MFG.				MODEL				SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP	

COMMENTS:

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	500	500	500	500	500	500	500	
REQUIRED STOP TIME	2200	2200	2200	2200	2200	2200	2200	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
0	0	0	0	1	1	1	1	1	0	0	0

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		CWS (oF)		CWR (oF)		CNWS (oF)		CNWR (oF)	
PANEL INDICATORS									
- PRESSURE		LITE-HI		LITE-LOW		GAUGES			
- TEMPERATURE		LITE-HI		LITE-LOW		GAUGES			
- OTHER									

COMMENTS:

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 768

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 768CV1

BOILER & CONVERTER SURVEY OBSERVATIONS

BLR-1	BOILER/CONVERTER NO.	MECH. RM.	LOCATION (RM)
	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	STEAM		PSIG	X	HW		TEMP.		BOILER TYPE:
X	NO.2 OIL		NO.6 OIL		N.GAS		ELEC		FUELS:
	STM/HW		HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:
X	SPACE HEAT		DHW		OTHER				USE:
COMMENT:							0%	% HTG AREA SERVED	
								BB RADIATION ONLY	

NAMEPLATE:

AJAX	MFG.		MODEL	600000	CAPACITY OUTPUT (BTUH)
				480000	CAPACITY INPUT (BTUH)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)
					CAPACITY INPUT (BTUH)
0.75	HW PUMP 1 -- HP		MFG.		MODEL
	HW PUMP 2 -- HP		MFG.		MODEL
	HW PUMP 3 -- HP		MFG.		MODEL
COMMENT:					

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	500	500	500	500	500	500	500	
REQUIRED STOP TIME	2200	2200	2200	2200	2200	2200	2200	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		PSIG	175	HW SUPPLY					
RESET CONTROL (oF):		HW HIGH		HW LOW		OA LOW		OA HIGH	
BURNER CONTROLS		O2 TRIM (Y/N)		OTHER					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 768

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 768DHW1

DOMESTIC HW SURVEY OBSERVATIONS

DHW-1	BOILER/CONVERTER NO.	MECH RM	LOCATION (RM)
ELEC.	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	NO.2 OIL		NO.6 OIL		N.GAS	X	ELEC		FUELS:
	STM/HW		HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:
COMMENT:									

NAMEPLATE:

RUUD	MFG.	RP30P4-1	MODEL	4500	CAPACITY OUTPUT (WATTS)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)

DOMESTIC HW CIRCULATION PUMP: **NONE**

	HW PUMP 1 - HP		MFG.		MODEL
	HW PUMP 2 - HP		MFG.		MODEL
	HW PUMP 3 - HP		MFG.		MODEL

COMMENT:

DIMENSION:	DIAMETER (INCHES)		HEIGHT OR LENGTH (INCHES)	40 GALLON

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	500	500	500	500	500	500	500	
REQUIRED STOP TIME	2200	2200	2200	2200	2200	2200	2200	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS				HW SUPPLY					
COMMENTS:									

FIELD SURVEY NOTES

BUILDING 630
AND TYPICAL FOR
653, 657, 820, 836, 1027

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 630

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: cmd
CHECKED BY: CEL
FILE: 630BLG

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 630 BLDG NAME: MESS HALL

ZONE NO.	1	FUNCTION: DINING HALL							
OCCUPANCY HOURS:	M-F	500	TO	1900	SAT	500	TO	1900	
	SUN	500	TO	1900					
PRESENT TEMP	WINTER OCC	72.4 °F		UNOCC	72.4 °F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.	2	FUNCTION: KITCHEN							
OCCUPANCY HOURS:	M-F	300	TO	2000	SAT	300	TO	2000	
	SUN	300	TO	2000					
PRESENT TEMP	WINTER OCC	75.5 °F		UNOCC	75.5 °F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

REMARKS:
A. SERVE 2700 MEALS PER DAY
B. DHW CONVERTER, STM VALVE ACTUATOR DISCONNECTED FROM VALVE BODY
C. DHW CIRC. PUMP NOT WORKING
D. TIME CLOCK FOR AHU-1 NO PINS
E. BARBER COLEMAN ELECTRIC CONTROLS

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 630

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: CMD
CHECKED BY: CEL
FILE: 630HV1

AIR HANDLING UNIT SURVEY OBSERVATIONS

HV-1	AHU NO.	ATTIC WEST	LOCATION (RM)
	REF. SYS. SERVING AHU	KITCHEN	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR	X	H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	OTHER				OTHER				
	COMMENT:								

NAMEPLATE:

N/A				MFG.				MODEL
5.0	SUPPLY FAN HP	N/A		MFG.				MODEL
	RET/EXH FAN HP			MFG.				MODEL
1800	CFM-HTG	0	CFM-CLG	100%	MIN %OA	100%	MAX %OA	50%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
X	NONE		STM		HW		ELEC		MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	300	300	300	300	300	300	300	
REQUIRED STOP TIME	2000	2000	2000	2000	2000	2000	2000	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:		MIN OA (Y/N)		MAX OA (Y/N)		RA (Y/N)		EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:		YES	N	NO					
COMMENTS:	BARBER COLEMAN CONTROLS								

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 630

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: CMD
CHECKED BY: CEL
FILE: 630HV2

AIR HANDLING UNIT SURVEY OBSERVATIONS

HV-2	AHU NO.	ATTIC EAST	LOCATION (RM)
	REF. SYS. SERVING AHU	KITCHEN	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR	X	H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	OTHER				OTHER				
	COMMENT:								

NAMEPLATE:

N/A					MFG.				MODEL
3.0	SUPPLY FAN HP		MARATHON		MFG.	SVE162TTDF			MODEL
	RET/EXH FAN HP				MFG.				MODEL
1800	CFM-HTG	0	CFM-CLG	100%	MIN %OA	100%	MAX %OA	50%	% HTG AREA SERVED
COMMENT:			(SF) 208V, 3PH, 9.4A, 1730 RPM						

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
X	NONE		STM		HW		ELEC		MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	300	300	300	300	300	300	300	
REQUIRED STOP TIME	2000	2000	2000	2000	2000	2000	2000	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)		RA (Y/N)		EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:		YES	N	NO					
COMMENTS:		BARBER COLEMAN CONTROLS							

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 630

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: CMD
CHECKED BY: CEL
FILE: 630PMP

REFRIGERATION EQUIPMENT SURVEY OBSERVATIONS

CHW PUMP	CHILLER/COMPRESSOR NO.	MECH. ROOM	LOCATION (RM)

UNIT TYPE:

	CENTRIFUGAL WITH WATER SIDE COOLING TOWER						OTHER
	RECIPROCATING WITH WATER SIDE COOLING TOWER						AHU'S SERVED
	RECIPROCATING WITH AIR COOLED CONDENSING UNIT						
	ABSORBTION WITH WATER SIDE COOLING TOWER						
	AIR COOLED CONDENSING UNIT						
	CHW		DX	X	OTHER		**CHW PUMP ONLY**

NAMEPLATE:

CHILLER		MFG.				MODEL				SERIAL NO.
	VOLTS		AMPS		PH		HZ		CAPACITY (TONS)	
TOWER		MFG.				MODEL				# OF FANS
	VOLTS		AMPS		PH		HZ		HP	
CW PUM**HOWELL**		MFG.	**2247AD3**			MODEL				SERIAL NO.
208	VOLTS	**13**	AMPS	**3**	PH	**60**	HZ	**5**	HP	
CNW PUMP		MFG.				MODEL				SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP	
COMMENTS:										

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	**0**	**0**	**0**	**0**	**0**	**0**	**0**	TIMECLOCK?
PRESENT STOP TIME	**2400**	**2400**	**2400**	**2400**	**2400**	**2400**	**2400**	
REQUIRED START TIME	**500**	**500**	**500**	**500**	**500**	**500**	**500**	
REQUIRED STOP TIME	**1900**	**1900**	**1900**	**1900**	**1900**	**1900**	**1900**	

MONTHS ON:											
J	F	M	A	M	J	J	A	S	O	N	D
0	**0**	**0**	**0**	**1**	**1**	**1**	**1**	**1**	**0**	**0**	**0**

CONTROLS:

		PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		CWS (oF)		CWR (oF)		CNWS (oF)		CNWR (oF)	**NONE**
PANEL INDICATORS									
- PRESSURE		LITE-HI		LITE-LOW		GAUGES			
- TEMPERATURE		LITE-HI		LITE-LOW		GAUGES			
- OTHER									
COMMENTS:									

EMC ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 630

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: CMD
CHECKED BY: CEL
FILE: 630CV1

BOILER & CONVERTER SURVEY OBSERVATIONS

CV-1	BOILER/CONVERTER NO.	MECH RM	LOCATION (RM)
	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	STEAM		PSIG		HW		TEMP.	BOILER TYPE:
	NO.2 OIL		NO.6 OIL		N.GAS		ELEC	FUELS:
X	STM/HW		HTHW/HW		HTHW/STM		OTHER	CONVERTER TYPE:
X	SPACE HEAT		DHW		OTHER			USE:
COMMENT:								% HTG AREA SERVED
								BB RADIATION ONLY

NAMEPLATE:

N/A	MFG.		MODEL	1300000	CAPACITY OUTPUT (BTUH)
				1300000	CAPACITY INPUT (BTUH)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)
					CAPACITY INPUT (BTUH)
1.5	HW PUMP 1 – HP	MARATHON	MFG.	LVL145TDDR795330WFL	MODEL
	HW PUMP 2 – HP		MFG.		MODEL
	HW PUMP 3 – HP		MFG.		MODEL
COMMENT:	200V, 5.5A, 3PH, 1745 RPM				

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	300	300	300	300	300	300	300	
REQUIRED STOP TIME	2000	2000	2000	2000	2000	2000	2000	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC	DDC	COMMENTS
SETPOINTS		PSIG		HW SUPPLY				
RESET CONTROL (oF):		HW HIGH		HW LOW		OA LOW	OA HIGH	
BURNER CONTROLS		O2 TRIM (Y/N)		OTHER				
COMMENTS:								

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 630

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: CMD
CHECKED BY: CEL
FILE: 630AH1

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-1	AHU NO.	ATTIC WEST	LOCATION (RM)
	REF. SYS. SERVING AHU	DINING ROOM	SERVES AREA

UNIT TYPE:

X	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR	X	H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

N/A					MFG.				MODEL
15.0	SUPPLY FAN HP		CENTURY		MFG.		323576-03		MODEL
	RET/EXH FAN HP				MFG.				MODEL
2800	CFM-HTG	2800	CFM-CLG	10%	MIN %OA	100%	MAX %OA	50%	% HTG AREA SERVED
COMMENT:		(SF) 200-208V, 40 A, 3 PH							

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE		DX	X	CW			X	MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	YES
REQUIRED START TIME	500	500	500	500	500	500	500	
REQUIRED STOP TIME	1900	1900	1900	1900	1900	1900	1900	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			TIMECLOCK HAS NO PINS
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	YES		NO					
COMMENTS:	BARBER COLEMAN CONTROLS, ELECTRIC VALVE ACTUATORS, HOA								

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 630

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY:
CHECKED BY: CEL
FILE: 630AH2

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-2	AHU NO.	ATTIC EAST	LOCATION (RM)
C.P.	REF. SYS. SERVING AHU	DINING ROOM	SERVES AREA

UNIT TYPE:

X	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHERS				
	COMMENT:								

NAMEPLATE:

N/A					MFG.				MODEL
15.0	SUPPLY FAN HP		CENTURY		MFG.		323576-03		MODEL
	RET/EXH FAN HP				MFG.				MODEL
2800	CFM-HTG	2800	CFM-CLG	10%	MIN %OA	100%	MAX %OA	50%	% HTG AREA SERVED
COMMENT:		(SF) 200							

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE		DX	X	CW			X	MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	YES, NO PINS
REQUIRED START TIME	500	500	500	500	500	500	500	
REQUIRED STOP TIME	1900	1900	1900	1900	1900	1900	1900	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	YES		NO					
COMMENTS:	BARBER								

FIELD SURVEY NOTES

BUILDINGS 636 & 741

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 636

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 636BLG

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 636 BLDG NAME: BRIGADE HQ

ZONE NO.	1	FUNCTION: ADMINISTRATION							
OCCUPANCY HOURS:	M-F	600	TO	1900	SAT	800	TO	1600	
	SUN	1200	TO	1600					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

REMARKS:

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 636

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 636FC1

AIR HANDLING UNIT SURVEY OBSERVATIONS

FC-1	AHU NO.	1ST & 2ND FLOORS	LOCATION (RM)
C.P.	REF. SYS. SERVING AHU	ALL	SERVES AREA

UNIT TYPE:

	SINGLE ZN	X	2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

HERMAN NELSON					MFG.	MAGING4041-60			MODEL
3.8	SUPPLY FAN HP				MFG.				MODEL
0.0	RET/EXH FAN HP				MFG.				MODEL
13450	CFM-HTG	13450	CFM-CLG	15%	MIN %OA	100%	MAX %OA	70.0%	% HTG AREA SERVED
COMMENT:	TOTAL CFM FOR ALL FAN COILS; TWO-PIPE FAN COIL IN EACH ROOM;								

COILS:

X	NONE		STM		HW		ELEC	MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	MOD VLV	HEATING
X	NONE		STM		HW		ELEC	MOD VLV	REHEAT
X	NONE		STM		HW		EVAP MEDIA	MOD VLV	HUMID.
	NONE		DX	X	CW			MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	1200	600	600	600	600	600	800	
REQUIRED STOP TIME	1600	1900	1900	1900	1900	1900	1600	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:	X	SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (°F):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (°F):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	Y	MIN OA (Y/N)	Y	MAX OA (Y/N)		RA (Y/N)		EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:		YES	N	NO					
COMMENTS:	CONTROLS: LOW, MED, HIGH, ON/OFF								

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 636

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 636CH1

REFRIGERATION EQUIPMENT SURVEY OBSERVATIONS

CH-1	CHILLER/COMPRESSOR NO.	OUTSIDE BLDG	LOCATION (RM)

UNIT TYPE:

	CENTRIFUGAL WITH WATER SIDE COOLING TOWER		OTHER
X	RECIPROCATING WITH WATER SIDE COOLING TOWER	X	AHU'S SERVED FC-1
	RECIPROCATING WITH AIR COOLED CONDENSING UNIT		
	ABSORBTION WITH WATER SIDE COOLING TOWER		
	AIR COOLED CONDENSING UNIT		

X	CHW		DX		OTHER		

NAMEPLATE:

CHILLER	TSI	MFG.	30AOCS35			MODEL	8-90-A21429			SERIAL NO.
208	VOLTS	112	AMPS	3	PH	60	HZ	30	CAPACITY (TONS)	
CONDENSER FANS		MFG.				MODEL			3	# OF FANS
208	VOLTS	4.6	AMPS	3	PH	60	HZ	1	HP	
DTW PUMP		MFG.	NO NAME PLATE			MODEL				SERIAL NO.
208	VOLTS	5.4	AMPS	3	PH	60	HZ	1.5	HP	
CNW PUMP		MFG.				MODEL				SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP	

COMMENTS:

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO TIMECLOCK
REQUIRED START TIME	800	600	600	600	600	600	1200	
REQUIRED STOP TIME	1600	1900	1900	1900	1900	1900	1600	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
0	0	0	0	1	1	1	1	1	0	0	0

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		CWS (oF)		CWR (oF)		CNWS (oF)		CNWR (oF)	
PANEL INDICATORS									
- PRESSURE		LITE-HI		LITE-LOW		GAUGES			
- TEMPERATURE		LITE-HI		LITE-LOW		GAUGES			
- OTHER									

COMMENTS: FM RADIO CONTROL

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 636

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 636CV1

BOILER & CONVERTER SURVEY OBSERVATIONS

CV-1	BOILER/CONVERTER NO.	MECH. RM.	LOCATION (RM)
C.P.	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	STEAM		PSIG		HW		TEMP.	BOILER TYPE:
	NO.2 OIL		NO.6 OIL		N.GAS		ELEC	FUELS:
X	STM/HW		HTHW/HW		HTHW/STM		OTHER	CONVERTER TYPE:
	SPACE HEAT		DHW		OTHER			USE:
COMMENT:							0%	% HTG AREA SERVED
								BB RADIATION ONLY

NAMEPLATE:

NO NAME PLATE	MFG.		MODEL	520600	CAPACITY OUTPUT (BTUH)
				520600	CAPACITY INPUT (BTUH)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)
					CAPACITY INPUT (BTUH)
5	DTW PUMP 1 – HP	BELL & GOSSETT	MFG.	1-1/2 8C	MODEL
	HW PUMP 2 – HP		MFG.		MODEL
	HW PUMP 3 – HP		MFG.		MODEL
COMMENT:					

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	YES, NO PINS
REQUIRED START TIME	800	600	600	600	600	600	1200	
REQUIRED STOP TIME	1600	1900	1900	1900	1900	1900	1600	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		PSIG		HW SUPPLY					
RESET CONTROL (oF)		HW HIGH		HW LOW		OA LOW		OA HIGH	
BURNER CONTROLS		O2 TRIM (Y/N)		OTHER					
COMMENTS:	2 BARBER COLMAN ELEC./PNEUMATIC TRANSDUCERS,								
	HAS O.A. TEMPERATURE RESET								

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 636

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 636UH1

AIR HANDLING UNIT SURVEY OBSERVATIONS

UH-1	AHU NO.	BASEMENT	LOCATION (RM)
CV-1	REF. SYS. SERVING AHU	BASEMENT	SERVES AREA

UNIT TYPE:

	SINGLE ZN	X	2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

HW FAN COILS - HORIZONTAL					MFG.				MODEL
0.5	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
2200	CFM-HTG	0	CFM-CLG	0%	MIN %OA	0%	MAX %OA	30%	% HTG AREA SERVED
COMMENT:									

COILS:

	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		FUEL OIL	X	HW		ELEC		MOD VLV	HEATING
	NONE		STM		HW		ELEC		MOD VLV	REHEAT
	NONE		STM		HW		EVAP MEDIA		MOD VLV	HUMID.
	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	800	600	600	600	600	600	1200	
REQUIRED STOP TIME	1600	1900	1900	1900	1900	1900	1600	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (°F):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (°F):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:		MIN OA (Y/N)		MAX OA (Y/N)		RA (Y/N)		EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:		YES		NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 636

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 636DHW1

DOMESTIC HW SURVEY OBSERVATIONS

DHW-1	BOILER/CONVERTER NO.	MECH RM.	LOCATION (RM)
	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	NO.2 OIL		NO.6 OIL		N.GAS	X	ELEC		FUELS:
	STM/HW		HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:

COMMENT:

NAMEPLATE:

STATE	MFG.	CW61MS2K	MODEL	1.65	CAPACITY OUTPUT (KW)
	MFG.		MODEL		CAPACITY OUTPUT (KW)

DOMESTIC HW CIRCULATION PUMP: NO

	HW PUMP 1 – HP		MFG.	MODEL
	HW PUMP 2 – HP		MFG.	MODEL
	HW PUMP 3 – HP		MFG.	MODEL

COMMENT:

DIMENSION:	12	DIAMETER (INCHES)	18	HEIGHT OR LENGTH (INCHES)	6 GALLON

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO TIMECLOCK
REQUIRED START TIME	800	600	600	600	600	600	1200	
REQUIRED STOP TIME	1600	1900	1900	1900	1900	1900	1600	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS				HW SUPPLY					

COMMENTS:

FIELD SURVEY NOTES

BUILDING 637

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 637

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 637BLG

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 637 BLDG NAME: CHAPEL

ZONE NO.	1	FUNCTION: CHURCH							
OCCUPANCY HOURS:	M-F	1900	TO	2000	SAT	1900	TO	2000	
	SUN	700	TO	1200					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.	2	FUNCTION: ADMINISTRATION OFFICES							
OCCUPANCY HOURS:	M-F	700	TO	1700	SAT	1900	TO	2000	
	SUN	700	TO	1200					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

REMARKS:

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 637

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 637AH1

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-1	AHU NO.	MECH. ROOM	LOCATION (RM)
DX-1	REF. SYS. SERVING AHU	CHAPEL SANCTUARY (ZN1)	SERVES AREA

UNIT TYPE:

X	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

DUNHAM-BUSH					MFG.	VAH603			MODEL
10.0	SUPPLY FAN HP		NO NAME PLATE		MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
6970	CFM-HTG	6970	CFM-CLG	10%	MIN %OA	100%	MAX %OA	100%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE	X	DX		CW			X	MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	YES,
REQUIRED START TIME	700	1900	1900	1900	1900	1900	1900	NO PINS
REQUIRED STOP TIME	1200	2000	2000	2000	2000	2000	2000	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			PNEUMATIC
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	ACTUATORS
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	YES		NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 637

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 637CH1

REFRIGERATION EQUIPMENT SURVEY OBSERVATIONS

DX-1	CHILLER/COMPRESSOR NO.	OUTSIDE BLDG	LOCATION (RM)

UNIT TYPE:

	CENTRIFUGAL WITH WATER SIDE COOLING TOWER		OTHER		
	RECIPROCATING WITH WATER SIDE COOLING TOWER	X	AHU'S SERVED	AHU-1	(ZN1)
X	RECIPROCATING WITH AIR COOLED CONDENSING UNIT				
	ABSORBTION WITH WATER SIDE COOLING TOWER				
	AIR COOLED CONDENSING UNIT				
	CHW X DX OTHER				

NAMEPLATE:

CHILLER McQUAY	MFG.	STO30A1500		MODEL	5SC0803600			SERIAL NO.	
230 VOLTS	61.8	AMPS	3 PH	60	HZ	30	CAPACITY (TONS)		
CONDENSER FANS	MFG.			MODEL			4	# OF FANS	
230 VOLTS	4	AMPS	3 PH	60	HZ	1	HP		
DTW PUMP	MFG.			MODEL				SERIAL NO.	
VOLTS		AMPS	PH		HZ		HP		
CNW PUMP	MFG.			MODEL				SERIAL NO.	
VOLTS		AMPS	PH		HZ		HP		
COMMENTS:									

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO TIMECLOCK
REQUIRED START TIME	700	1900	1900	1900	1900	1900	1900	
REQUIRED STOP TIME	1200	2000	2000	2000	2000	2000	2000	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
0	0	0	0	1	1	1	1	1	0	0	0

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		CWS (oF)		CWR (oF)		CNWS (oF)		CNWR (oF)	
PANEL INDICATORS									
- PRESSURE		LITE-HI		LITE-LOW		GAUGES			
- TEMPERATURE		LITE-HI		LITE-LOW		GAUGES			
- OTHER									
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 637

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 637CV1

BOILER & CONVERTER SURVEY OBSERVATIONS

CV-1	BOILER/CONVERTER NO.	MECH. RM.	LOCATION (RM)
C. PLANT	SOURCE OF HEATING (PLANT)	CHAPEL SANCTUARY (ZN1)	SERVES AREA

UNIT TYPE:

X	STEAM		PSIG		HW		TEMP.		BOILER TYPE:
	NO.2 OIL		NO.6 OIL		N.GAS		ELEC		FUELS:
	STM/HW	X	HTHW/HW		HTHW/STM		OTHER	S&T	CONVERTER TYPE:
	SPACE HEAT		DHW		OTHER				USE:
COMMENT:							0%	% HTG AREA SERVED	
								BB RADIATION ONLY	

NAMEPLATE:

NO NAME PLATE	MFG.		MODEL	475000	CAPACITY OUTPUT (BTUH)
				475000	CAPACITY INPUT (BTUH)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)
					CAPACITY INPUT (BTUH)

1	HW PUMP 1 – HP	CENTURY	MFG.	NO NAME PLATE	MODEL
	HW PUMP 2 – HP		MFG.		MODEL
1	COND. PUMP – HP	DAYTON	MFG.	NO NAME PLATE	MODEL

COMMENT:

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO TIMECLOCK
REQUIRED START TIME	700	1900	1900	1900	1900	1900	1900	
REQUIRED STOP TIME	1200	2000	2000	2000	2000	2000	2000	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		PSIG		HW SUPPLY					
RESET CONTROL (oF)		HW HIGH		HW LOW		OA LOW		OA HIGH	
BURNER CONTROLS		O2 TRIM (Y/N)		OTHER					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 637

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 637CV2

BOILER & CONVERTER SURVEY OBSERVATIONS

CV-2	BOILER/CONVERTER NO.	MECH. RM.	LOCATION (RM)
C. PLANT	SOURCE OF HEATING (PLANT)	OFFICE AREA (ZN2)	SERVES AREA

UNIT TYPE:

	STEAM		PSIG		HW		TEMP.		BOILER TYPE:
	NO.2 OIL		NO.6 OIL		N.GAS		ELEC		FUELS:
X	STM/HW		HTHW/HW		HTHW/STM		OTHER	S&T	CONVERTER TYPE:
	SPACE HEAT		DHW		OTHER				USE:

COMMENT:	EXP. TANK IS WATER LOGGED	0%	% HTG AREA SERVED
	DUAL TEMPERATURE SYSTEM		BB RADIATION ONLY

NAMEPLATE:

NO NAME PLATE	MFG.		MODEL	120000	CAPACITY OUTPUT (BTUH)
				120000	CAPACITY INPUT (BTUH)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)
					CAPACITY INPUT (BTUH)

0.75	HW PUMP 1 – HP	NO NAME PLATE	MFG.		MODEL
	HW PUMP 2 – HP		MFG.		MODEL
	COND. PUMP – HP		MFG.		MODEL

COMMENT: PUMP AND CONVERTER ARE VERY OLD

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO TIMECLOCK
REQUIRED START TIME	700	700	700	700	700	700	1900	
REQUIRED STOP TIME	1200	1700	1700	1700	1700	1700	2000	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		PSIG		HW SUPPLY					
RESET CONTROL (oF)		HW HIGH		HW LOW		OA LOW		OA HIGH	
BURNER CONTROLS		O2 TRIM (Y/N)		OTHER					

COMMENTS:

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 637

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 637FC1

AIR HANDLING UNIT SURVEY OBSERVATIONS

FC-1	AHU NO.	OFFICE AREA (ZN2)	LOCATION (RM)
CH-1	REF. SYS. SERVING AHU	OFFICE AREA (ZN2)	SERVES AREA

UNIT TYPE:

	SINGLE ZN	X	2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

DUNHAM-BUSH				MFG.	NO NAME PLATE			MODEL
2.3	SUPPLY FAN HP			MFG.				MODEL
0.0	RET/EXH FAN HP			MFG.				MODEL
4785	CFM-HTG	4785	CFM-CLG	0%	MIN %OA		MAX %OA	100.0%	% HTG AREA SERVED
COMMENT:	TOTAL CFM FOR ALL FAN COILS; TWO-PIPE FAN COIL IN EACH ROOM;								

COILS:

X	NONE		STM		HW		ELEC	MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	MOD VLV	HEATING
X	NONE		STM		HW		ELEC	MOD VLV	REHEAT
X	NONE		STM		HW		EVAP MEDIA	MOD VLV	HUMID.
	NONE		DX	X	CW			MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK' NO
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	CONTROLLED BY
REQUIRED START TIME	700	700	700	700	700	700	1900	OCCUPANT
REQUIRED STOP TIME	1200	1700	1700	1700	1700	1700	2000	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (°F):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (°F):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:		MIN OA (Y/N)		MAX OA (Y/N)		RA (Y/N)		EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:		YES	N	NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 637

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 637CH2

REFRIGERATION EQUIPMENT SURVEY OBSERVATIONS

CH-1	CHILLER/COMPRESSOR NO.	OUTSIDE BLDG	LOCATION (RM)

UNIT TYPE:

	CENTRIFUGAL WITH WATER SIDE COOLING TOWER						OTHER
	RECIPROCATING WITH WATER SIDE COOLING TOWER					X	AHU'S SERVED FC-1 (ZN2)
X	RECIPROCATING WITH AIR COOLED CONDENSING UNIT						
	ABSORBTION WITH WATER SIDE COOLING TOWER						
	AIR COOLED CONDENSING UNIT						
X	CHW		DX		OTHER		

NAMEPLATE:

CHILLER McQUAY		MFG.	ALR020A			MODEL	5SC0714100			SERIAL NO.
208	VOLTS	80	AMPS	3	PH	60	HZ	20	CAPACITY (TONS)	
CONDENSER FANS		MFG.				MODEL			3	# OF FANS
208	VOLTS	4.4	AMPS	1	PH	60	HZ	0.75	HP	
DTW PUMP		MFG.	NO NAME PLATE			MODEL				SERIAL NO.
	VOLTS		AMPS		PH		HZ	0.75	HP	
CNW PUMP		MFG.				MODEL				SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP	

COMMENTS:

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO TIMECLOCK
REQUIRED START TIME	700	700	700	700	700	700	1900	
REQUIRED STOP TIME	1200	1700	1700	1700	1700	1700	2000	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
0	0	0	0	1	1	1	1	1	0	0	0

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		CWS (oF)		CWR (oF)		CNWS (oF)		CNWR (oF)	
PANEL INDICATORS									
- PRESSURE		LITE-HI		LITE-LOW		GAUGES			
- TEMPERATURE		LITE-HI		LITE-LOW		GAUGES			
- OTHER									

COMMENTS: HAS FM SWITCH AND FLOW SWITCH

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 637

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 637DHW1

DOMESTIC HW SURVEY OBSERVATIONS

DHW-1	BOILER/CONVERTER NO.	MECH RM NO. 2	LOCATION (RM)
ELEC.	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	NO.2 OIL		NO.6 OIL		N.GAS	X	ELEC		FUELS:
	STM/HW		HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:

COMMENT:

NAMEPLATE:

NATIONAL	MFG.	NO NAME PLATE	MODEL	4500	CAPACITY OUTPUT (WATTS)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)

DOMESTIC HW CIRCULATION PUMP: NONE

	HW PUMP 1 – HP		MFG.	MODEL
	HW PUMP 2 – HP		MFG.	MODEL
	HW PUMP 3 – HP		MFG.	MODEL

COMMENT:

DIMENSION:	20	DIAMETER (INCHES)	36	HEIGHT OR LENGTH (INCHES)	30 GALLON

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	700	700	700	700	1700	1700	1900	
REQUIRED STOP TIME	1200	2000	2000	2000	2000	2000	2000	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS				HW SUPPLY					

COMMENTS:

FIELD SURVEY NOTES

BUILDING 638
AND TYPICAL FOR
832 & 1018

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 638 BLDG NAME: CLINIC

ZONE NO.	1	FUNCTION: MEDICAL PROVISION						
OCCUPANCY HOURS:	M-F	600	TO	1500	SAT	700	TO	1300
	SUN	800	TO	1200				
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F			
	SUMMER OCC	°F		UNOCC	°F			

ZONE NO.		FUNCTION:						
OCCUPANCY HOURS:	M-F		TO		SAT		TO	
	SUN		TO					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F			
	SUMMER OCC	°F		UNOCC	°F			

ZONE NO.		FUNCTION:						
OCCUPANCY HOURS:	M-F		TO		SAT		TO	
	SUN		TO					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F			
	SUMMER OCC	°F		UNOCC	°F			

REMARKS:

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 638

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 638AH1

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-1	AHU NO.	MECH. ROOM	LOCATION (RM)
DX-1	REF. SYS. SERVING AHU	ALL	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
X	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
3	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

DUNHAM-BUSH					MFG.	MZ-32-1			MODEL
3.0	SUPPLY FAN HP		WESTINGHOUSE		MFG.	ABDP			MODEL
	RET/EXH FAN HP				MFG.				MODEL
3720	CFM-HTG	3720	CFM-CLG	10%	MIN %OA	100%	MAX %OA	100%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE	X	STM		HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE	X	DX		CW			X	MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	500	500	500	500	500	500	500	TIMECLOCK?
PRESENT STOP TIME	1200	1700	1700	1700	1700	1700	1500	YES
REQUIRED START TIME	800	600	600	600	600	600	700	
REQUIRED STOP TIME	1200	1500	1500	1500	1500	1500	1300	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:	X	SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):	70	OCC HEAT		UNOCC HEAT	78	OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	Y	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	YES		NO					
COMMENTS:	CONTROLS ARE IN GOOD CONDITION								

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 638

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 638CH1

REFRIGERATION EQUIPMENT SURVEY OBSERVATIONS

DX-1	CHILLER/COMPRESSOR NO.	OUTSIDE BLDG	LOCATION (RM)

UNIT TYPE:

	CENTRIFUGAL WITH WATER SIDE COOLING TOWER						OTHER
	RECIPROCATING WITH WATER SIDE COOLING TOWER					X	AHU'S SERVED AHU-1 (ZN1)
	RECIPROCATING WITH AIR COOLED CONDENSING UNIT						
	ABSORBTION WITH WATER SIDE COOLING TOWER						
X	AIR COOLED CONDENSING UNIT						
	CHW	X	DX		OTHER		

NAMEPLATE:

CHILLER WEBSTER	MFG.	A20A		MODEL	51039			SERIAL NO.	
208 VOLTS	62	AMPS	3	PH	60	HZ	10	CAPACITY (TONS)	
CONDENSER FANS	MFG.			MODEL			1	# OF FANS	
208 VOLTS	7.5	AMPS	3	PH	60	HZ	2	HP	
DTW PUMP	MFG.			MODEL				SERIAL NO.	
VOLTS		AMPS		PH		HZ		HP	
CNW PUMP	MFG.			MODEL				SERIAL NO.	
VOLTS		AMPS		PH		HZ		HP	

COMMENTS:

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO TIMECLOCK
REQUIRED START TIME	800	600	600	600	600	600	700	
REQUIRED STOP TIME	1200	1500	1500	1500	1500	1500	1300	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
0	0	0	0	1	1	1	1	1	0	0	0

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		CWS (oF)		CWR (oF)		CNWS (oF)		CNWR (oF)	
PANEL INDICATORS									
- PRESSURE		LITE-HI		LITE-LOW		GAUGES			
- TEMPERATURE		LITE-HI		LITE-LOW		GAUGES			
- OTHER									

COMMENTS: FM RADIO CONTROL

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 638

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 638DHW1

DOMESTIC HW SURVEY OBSERVATIONS

DHW-1	BOILER/CONVERTER NO.	MECH RM	LOCATION (RM)
C. PLANT	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	NO.2 OIL		NO.6 OIL		N.GAS	X	ELEC		FUELS:
X	STM/HW		HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:
COMMENT:									

NAMEPLATE:

	MFG.	NO NAME PLATE	MODEL		CAPACITY OUTPUT (WATTS)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)

DOMESTIC HW CIRCULATION PUMP: NONE

	HW PUMP 1 – HP		MFG.	MODEL
	HW PUMP 2 – HP		MFG.	MODEL
	HW PUMP 3 – HP		MFG.	MODEL

COMMENT:

DIMENSION:	26	DIAMETER (INCHES)	64	HEIGHT OR LENGTH (INCHES)	GALLON

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	800	600	600	600	600	600	700	
REQUIRED STOP TIME	1200	1500	1500	1500	1500	1500	1300	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS				HW SUPPLY					
COMMENTS:									

FIELD SURVEY NOTES

BUILDING 639

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 639 BLDG NAME: PX

ZONE NO.	1		FUNCTION: STORE/SNACK BAR						
OCCUPANCY HOURS:	M-F	1700	TO	2000	SAT	1700	TO	2000	
	SUN	1300	TO	2000					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.	2		FUNCTION: GAME ROOM						
OCCUPANCY HOURS:	M-F	1700	TO	2000	SAT	1700	TO	2000	
	SUN	1300	TO	2000					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.			FUNCTION:						
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

REMARKS:

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 639

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 639AH1

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-1	AHU NO.	MECH. RM.	LOCATION (RM)
DX-1	REF. SYS. SERVING AHU	STORE/ SNACK BAR	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
X	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
3	NUMBER OF ZONES				OTHER				
	COMMENT:	PNEUMATIC ACTUATORS							

NAMEPLATE:

DUNHAM-BUSH					MFG.	N2-64-1			MODEL
3.0	SUPPLY FAN HP		DAYTON		MFG.	2N983-0			MODEL
	RET/EXH FAN HP				MFG.				MODEL
6000	CFM-HTG	6000	CFM-CLG	10%	MIN %OA	100%	MAX %OA	100%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE	X	STM		HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE	X	DX		CW			X	MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	YES
REQUIRED START TIME	1700	1700	1700	1700	1700	1700	1300	NO PINS
REQUIRED STOP TIME	2000	2000	2000	2000	2000	2000	2000	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	YES		NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 639

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 639CH1

REFRIGERATION EQUIPMENT SURVEY OBSERVATIONS

DX-1	CHILLER/COMPRESSOR NO.	MECH. ROOM	LOCATION (RM)

UNIT TYPE:

	CENTRIFUGAL WITH WATER SIDE COOLING TOWER						OTHER
	RECIPROCATING WITH WATER SIDE COOLING TOWER					X	AHU'S SERVED AHU-1
X	RECIPROCATING WITH AIR COOLED CONDENSING UNIT						
	ABSORBTION WITH WATER SIDE COOLING TOWER						
	AIR COOLED CONDENSING UNIT						
	CHW	X	DX		OTHER		

NAMEPLATE:

CHILLER CARRIER	MFG.	38ADO24520			MODEL	P29319			SERIAL NO.
230 VOLTS	76	AMPS	3	PH	60	HZ	20.5	CAPACITY (TONS)	
TOWER	MFG.				MODEL				# OF FANS
VOLTS		AMPS		PH		HZ		HP	
CW PUMP	MFG.				MODEL				SERIAL NO.
VOLTS		AMPS		PH		HZ		HP	
CNW PUMP	MFG.				MODEL				SERIAL NO.
VOLTS		AMPS		PH		HZ		HP	
COMMENTS:	FM RADIO CONTROL								

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	1700	1700	1700	1700	1700	1700	1300	
REQUIRED STOP TIME	2000	2000	2000	2000	2000	2000	2000	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
0	0	0	0	1	1	1	1	1	0	0	0

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		CWS (oF)		CWR (oF)		CNWS (oF)		CNWR (oF)	
PANEL INDICATORS									
- PRESSURE		LITE-HI		LITE-LOW		GAUGES			
- TEMPERATURE		LITE-HI		LITE-LOW		GAUGES			
- OTHER									

COMMENTS:

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 639

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: BHS
CHECKED BY: CEL
FILE: 639FC1

AIR HANDLING UNIT SURVEY OBSERVATIONS

FC-1	AHU NO.	GAME ROOM	LOCATION (RM)
C.P.	REF. SYS. SERVING AHU	GAME ROOM	SERVES AREA

UNIT TYPE:

	SINGLE ZN	X	2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

CLIMATE CONTROL					MFG.	8-DHU331000			MODEL
0.5	SUPPLY FAN HP				MFG.				MODEL
0.0	RET/EXH FAN HP				MFG.				MODEL
1000	CFM-HTG	1000	CFM-CLG	0%	MIN %OA		MAX %OA	50.0%	% HTG AREA SERVED
COMMENT:	TOTAL HP AND CFM FOR TWO FAN COILS								

COILS:

X	NONE		STM		HW		ELEC	MOD VLV	PREHEAT
	NONE	X	STM		HW		ELEC	MOD VLV	HEATING
X	NONE		STM		HW		ELEC	MOD VLV	REHEAT
X	NONE		STM		HW		EVAP MEDIA	MOD VLV	HUMID.
	NONE	X	DX		CW			MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO TIMECLOCK
REQUIRED START TIME	1700	1700	1700	1700	1700	1700	1300	
REQUIRED STOP TIME	2000	2000	2000	2000	2000	2000	2000	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:	X	SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (°F):	72	OCC HEAT	72	UNOCC HEAT		OCC COOL		UNOCC COOL	72° MEASURED
OTHER SETPOINTS (°F):		HOT DECK		COLD DECK	N	MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)	Y	RA (Y/N)		EA (Y/N)	
	N	MA CONTROL	N	ECONO-DB	N	ECONO-ENT		OTHER	
DEMAND LIMIT:		YES	N	NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 639

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 639CH2

REFRIGERATION EQUIPMENT SURVEY OBSERVATIONS

DX-2	CHILLER/COMPRESSOR NO.	OUTSIDE BLDG	LOCATION (RM)

UNIT TYPE:

	CENTRIFUGAL WITH WATER SIDE COOLING TOWER						OTHER
	RECIPROCATING WITH WATER SIDE COOLING TOWER					X	AHU'S SERVED FC-1
X	RECIPROCATING WITH AIR COOLED CONDENSING UNIT						
	ABSORBTION WITH WATER SIDE COOLING TOWER						
	AIR COOLED CONDENSING UNIT						
	CHW	X	DX		OTHER		

NAMEPLATE:

CHILLER --->		MFG.	CLIMATE CONTROL			MODEL	NOs. NOT LEGIBLE		SERIAL NO.
230	VOLTS	15.2	AMPS	3	PH	60	HZ	3.5	CAPACITY (TONS)
TOWER		MFG.				MODEL			# OF FANS
	VOLTS		AMPS		PH		HZ		HP
CW PUMP		MFG.				MODEL			SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP
CNW PUMP		MFG.				MODEL			SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP

COMMENTS: TOTAL OF TWO ACCUs, FM RADIO CONTROL ON EACH UNIT

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	1700	1700	1700	1700	1700	1700	1300	
REQUIRED STOP TIME	2000	2000	2000	2000	2000	2000	2000	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
0	0	0	0	1	1	1	1	1	0	0	0

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		CWS (oF)		CWR (oF)		CNWS (oF)		CNWR (oF)	
PANEL INDICATORS									
- PRESSURE		LITE-HI		LITE-LOW		GAUGES			
- TEMPERATURE		LITE-HI		LITE-LOW		GAUGES			
- OTHER									

COMMENTS:

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 639

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 639DHW1

DOMESTIC HW SURVEY OBSERVATIONS

DHW-1	BOILER/CONVERTER NO.	MECH RM	LOCATION (RM)
ELEC.	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	NO.2 OIL		NO.6 OIL		N.GAS	X	ELEC		FUELS:
	STM/HW		HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:
COMMENT:									

NAMEPLATE:

DAYTON	MFG.	3E202L	MODEL	4500	CAPACITY OUTPUT (WATTS)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)
DOMESTIC HW CIRCULATION PUMP:		NONE			
	HW PUMP 1 – HP		MFG.		MODEL
	HW PUMP 2 – HP		MFG.		MODEL
	HW PUMP 3 – HP		MFG.		MODEL
COMMENT:					

DIMENSION:	22	DIAMETER (INCHES)	48	HEIGHT OR LENGTH (INCHES)	40 GALLON

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	1700	1700	1700	1700	1700	1700	1300	
REQUIRED STOP TIME	2000	2000	2000	2000	2000	2000	2000	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS				HW SUPPLY					
COMMENTS:									

FIELD SURVEY NOTES

BUILDING 650
AND TYPICAL FOR
732, 740, 750, 753,
822, 838, 842, 1022, & 1023

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 650

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: JDR
CHECKED BY: CEL
FILE: 650BLG

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 650 BLDG NAME: BAT. HQ

ZONE NO.	1		FUNCTION: ADMIN						
OCCUPANCY HOURS:	M-F	500	TO	1800	SAT	700	TO	1400	
	SUN	0	TO	0					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.			FUNCTION:						
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.			FUNCTION:						
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

REMARKS: A. TIME CLOCK FOR AHU HAS PINS, BUT IS NOT CONNECT TO STARTER CIRCUIT

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 650

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: DR
CHECKED BY: CEL
FILE: 650AH1

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-1	AHU NO.	MECH. RM.	LOCATION (RM)
ACCU-1	REF. SYS. SERVING AHU	ALL	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
X	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
5	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

MCQUAY					MFG.	LML122E1			MODEL
10.0	SUPPLY FAN HP		MAGNETEC		MFG.	-357717			MODEL
	RET/EXH FAN HP				MFG.				MODEL
9430	CFM-HTG	9430	CFM-CLG	17%	MIN %OA	100%	MAX %OA	73.5%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		EVAP MEDIA		MOD VLV	HUMID.
	NONE	X	DX		CW			X	MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	YES
REQUIRED START TIME	0	500	500	500	500	500	700	NOT CONNECTED
REQUIRED STOP TIME	0	1800	1800	1800	1800	1800	1400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			DAMPERS CONNECTED
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	& WORKING
OTHER SETPOINTS (oF):	N/A	HOT DECK	N/A	COLD DECK	N/A	MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	YES		NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 650

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: BHS
CHECKED BY: CEL
FILE: 650RD1

PERIMETER RADIATION SURVEY OBSERVATIONS

RAD-1	PER RAD NO.	MECH. RM.	LOCATION (RM)
	SOURCE OF HEATING	ALL	SERVES AREA

UNIT TYPE:

	STEAM	X	HW		ELECTRIC				
	OTHER								
	COMMENT:								

NAMEPLATE:

	HW PUMP 1 - HP		MFG.		MODEL
	HW PUMP 2 - HP		MFG.		MODEL
	HW PUMP 3 - HP		MFG.		MODEL
	HW PUMP 4 - HP		MFG.		MODEL
COMMENT:				26.5%	% AREA HEATING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	500	500	500	500	500	700	
REQUIRED STOP TIME	0	1800	1800	1800	1800	1800	1400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	0	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
RADIATION CONTROL	X	NONE		2-WAY VLV		3-WAY VLV		OTHER	
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
RESET CONTROL (oF):		HW HIGH		HW LOW		OA LOW		OA HIGH	
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 650

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: DR
CHECKED BY: CEL
FILE: 650CV1

BOILER & CONVERTER SURVEY OBSERVATIONS

CV-1	BOILER/CONVERTER NO.	MECH. RM.	LOCATION (RM)
C.P.	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	STEAM		PSIG		HW		TEMP.	BOILER TYPE:
	NO.2 OIL		NO.6 OIL		N.GAS		ELEC	FUELS:
X	STM/HW		HTHW/HW		HTHW/STM		OTHER	CONVERTER TYPE:
X	SPACE HEAT		DHW		OTHER			USE:
COMMENT:								% HTG AREA SERVED
								BB RADIATION ONLY

NAMEPLATE:

N/A	MFG.	N/A	MODEL	290000	CAPACITY OUTPUT (BTUH)
				305263	CAPACITY INPUT (BTUH)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)
					CAPACITY INPUT (BTUH)
0.75	HW PUMP 1 - HP	DUNHAM-BUSH	MFG.	1A5C431-2	MODEL
	HW PUMP 2 - HP		MFG.		MODEL
	HW PUMP 3 - HP		MFG.		MODEL
COMMENT:					

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	500	500	500	500	500	700	
REQUIRED STOP TIME	0	1800	1800	1800	1800	1800	1400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	0	0	0	0	0	0	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		PSIG	N/A	HW SUPPLY					
RESET CONTROL (oF)		HW HIGH		HW LOW		OA LOW		OA HIGH	
BURNER CONTROLS		O2 TRIM (Y/N)		OTHER					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 650

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: DR
CHECKED BY: CEL
FILE: 650CH1

REFRIGERATION EQUIPMENT SURVEY OBSERVATIONS

CH-1	CHILLER/COMPRESSOR NO.	OUTSIDE MECH. RM.	LOCATION (RM)

UNIT TYPE:

	CENTRIFUGAL WITH WATER SIDE COOLING TOWER						OTHER
	RECIPROCATING WITH WATER SIDE COOLING TOWER					AHU-1	AHU'S SERVED
	RECIPROCATING WITH AIR COOLED CONDENSING UNIT						
	ABSORBTION WITH WATER SIDE COOLING TOWER						
X	AIR COOLED CONDENSING UNIT						
	CHW	X	DX		OTHER		

NAMEPLATE:

CHILLER	MCQUAY	MFG.	STO30A1S		MODEL	359A815G11			SERIAL NO.
230	VOLTS	140	AMPS	3	PH	60	HZ	30	CAPACITY (TONS)
TOWER		MFG.			MODEL			3	# OF FANS
230	VOLTS	8.4	AMPS	3	PH	60	HZ	1	HP each
CW PUMP		MFG.			MODEL				SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP
CNW PUMP		MFG.			MODEL				SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP

COMMENTS:

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	YES
REQUIRED START TIME	0	500	500	500	500	500	700	
REQUIRED STOP TIME	0	1800	1800	1800	1800	1800	1400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
0	0	0	0	1	1	1	1	1	0	0	0

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		CWS (oF)		CWR (oF)		CNWS (oF)		CNWR (oF)	
PANEL INDICATORS									
- PRESSURE		LITE-HI		LITE-LOW		GAUGES			
- TEMPERATURE		LITE-HI		LITE-LOW		GAUGES			
- OTHER									

COMMENTS:

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 650

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: DR
CHECKED BY: CEL
FILE: 650DHW

DOMESTIC HW SURVEY OBSERVATIONS

DHW-1	BOILER/CONVERTER NO.	MER	LOCATION (RM)
ELEC	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	NO.2 OIL		NO.6 OIL		N.GAS	X	ELEC		FUELS:
	STM/HW		HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:

COMMENT:

NAMEPLATE:

	MFG.		MODEL	1.65	CAPACITY OUTPUT (BTUH,KW)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH,KW)

DOMESTIC HW CIRCULATION PUMP:				
	HW PUMP 1 – HP		MFG.	MODEL
	HW PUMP 2 – HP		MFG.	MODEL
	HW PUMP 3 – HP		MFG.	MODEL

COMMENT:

DIMENSION:	14	DIAMETER (INCHS)	18	HEIGHT OR LENGTH (INCHES)	6 GALLON

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	500	500	500	500	500	700	
REQUIRED STOP TIME	0	1800	1800	1800	1800	1800	1400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS				HW SUPPLY					

COMMENTS:

FIELD SURVEY NOTES

BUILDING 655
AND TYPICAL FOR
626, 633, 656, 733, 734,
751, 752, 823, 824, 840, AND 841

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 655

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 655BLG

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 655 BLDG NAME: ADMINISTRATION/SUPPLY

ZONE NO.	1	FUNCTION: COMPANY ADMINISTRATION/SUPPLY							
OCCUPANCY HOURS:	M-F	500	TO	1900	SAT	500	TO	1900	
	SUN	500	TO	1900					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

REMARKS:

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 655

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: BHS
CHECKED BY: CEL
FILE: 655CV1

BOILER & CONVERTER SURVEY OBSERVATIONS

CV-1	BOILER/CONVERTER NO.	MECH. RM.	LOCATION (RM)
C.P.	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	STEAM		PSIG		HW		TEMP.	BOILER TYPE:
	NO.2 OIL		NO.6 OIL		N.GAS		ELEC	FUELS:
X	STM/HW		HTHW/HW		HTHW/STM		OTHER	CONVERTER TYPE:
	SPACE HEAT		DHW		OTHER			USE:
COMMENT:								% HTG AREA SERVED
								BB RADIATION ONLY

NAMEPLATE:

DUNHAM-BUSH	MFG.	FC-62-2	MODEL	520000	CAPACITY OUTPUT (BTUH)
				547368	CAPACITY INPUT (BTUH)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)
					CAPACITY INPUT (BTUH)

0.75	HW PUMP 1 - HP	GENERAL ELECTRIC	MFG.	5K38ND567	MODEL
	HW PUMP 2 - HP		MFG.		MODEL
	HW PUMP 3 - HP		MFG.		MODEL

COMMENT:

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	500	500	500	500	500	500	500	
REQUIRED STOP TIME	1900	1900	1900	1900	1900	1900	1900	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		PSIG		HW SUPPLY					
RESET CONTROL (oF)	180	HW HIGH	90	HW LOW	65	OA LOW	0	OA HIGH	
BURNER CONTROLS		O2 TRIM (Y/N)		OTHER					

COMMENTS: **TIMECLOCK HAS NO PINS**

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 655

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: BHS
CHECKED BY: CEL
FILE: 655RD1

PERIMETER RADIATION SURVEY OBSERVATIONS

RD-1	PER RAD NO.	MECH. RM.	LOCATION (RM)
	SOURCE OF HEATING	ALL	SERVES AREA

UNIT TYPE:

	STEAM	X	HW		ELECTRIC				
	OTHER								
	COMMENT:								

NAMEPLATE:

	HW PUMP 1 - HP		MFG.		MODEL
	HW PUMP 2 - HP		MFG.		MODEL
	HW PUMP 3 - HP		MFG.		MODEL
	HW PUMP 4 - HP		MFG.		MODEL
COMMENT:				100.0%	% AREA HEATING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	500	500	500	500	500	500	500	
REQUIRED STOP TIME	1900	1900	1900	1900	1900	1900	1900	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
RADIATION CONTROL	X	NONE		2-WAY VLV		3-WAY VLV		OTHER	
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
RESET CONTROL (oF):		HW HIGH		HW LOW		OA LOW		OA HIGH	
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 655

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 655DHW1

DOMESTIC HW SURVEY OBSERVATIONS

DHW-1	BOILER/CONVERTER NO.	MECH RM.	LOCATION (RM)
	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	NO.2 OIL		NO.6 OIL		N.GAS	X	ELEC		FUELS:
	STM/HW		HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:
COMMENT:									

NAMEPLATE:

NATIONAL	MFG.	JRU829	MODEL		CAPACITY OUTPUT (KW)
	MFG.		MODEL		CAPACITY OUTPUT (KW)

DOMESTIC HW CIRCULATION PUMP:		YES			
1/25	HW PUMP 1 – HP	TACO	MFG.	008-F3	MODEL
	HW PUMP 2 – HP		MFG.		MODEL
	HW PUMP 3 – HP		MFG.		MODEL
COMMENT:					

DIMENSION:	24" DIA	DIMENSION (INCHS)	48"	HEIGHT OR LENGTH (INCHES)	40 GALLON

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK' NO
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	500	500	500	500	500	500	500	
REQUIRED STOP TIME	1900	1900	1900	1900	1900	1900	1900	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS				HW SUPPLY					
COMMENTS:	ELEC. SENSOR SET @ 150 F (AQUASTAT TYPE)								

FIELD SURVEY NOTES

BUILDING 802

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 802 BLDG NAME: DAY CARE

ZONE NO.	1	FUNCTION: DAY CARE						
OCCUPANCY HOURS:	M-F	800	TO	1900	SAT	0	TO	0
	SUN	0	TO	0				
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F			
	SUMMER OCC	°F		UNOCC	°F			

ZONE NO.		FUNCTION:						
OCCUPANCY HOURS:	M-F		TO		SAT		TO	
	SUN		TO					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F			
	SUMMER OCC	°F		UNOCC	°F			

ZONE NO.		FUNCTION:						
OCCUPANCY HOURS:	M-F		TO		SAT		TO	
	SUN		TO					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F			
	SUMMER OCC	°F		UNOCC	°F			

REMARKS:

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 802

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 802AH1

AIR HANDLING UNIT SURVEY OBSERVATIONS

ACU-1	AHU NO.	ROOFTOP	LOCATION (RM)
DX-1	REF. SYS. SERVING AHU	ALL	SERVES AREA

UNIT TYPE:

X	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:	GAS-FIRED HEATING							

NAMEPLATE:

CARRIER					MFG.				MODEL
1.5	SUPPLY FAN HP		NO NAME PLATE		MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
2700	CFM-HTG	2700	CFM-CLG	15%	MIN %OA	15%	MAX %OA	50%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM		HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE	X	DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	0	800	800	800	800	800	0	
REQUIRED STOP TIME	0	1900	1900	1900	1900	1900	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:		YES	N	NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 802

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 802AH2

AIR HANDLING UNIT SURVEY OBSERVATIONS

ACU-2	AHU NO.	ROOFTOP	LOCATION (RM)
DX-2	REF. SYS. SERVING AHU	ALL	SERVES AREA

UNIT TYPE:

X	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:	GAS-FIRED HEATING							

NAMEPLATE:

CARRIER					MFG.				MODEL
1.5	SUPPLY FAN HP		NO NAME PLATE		MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
2700	CFM-HTG	2700	CFM-CLG	15%	MIN %OA	15%	MAX %OA	50%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM		HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE	X	DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	0	800	800	800	800	800	0	
REQUIRED STOP TIME	0	1900	1900	1900	1900	1900	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:		YES	N	NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 802

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 802CH1

REFRIGERATION EQUIPMENT SURVEY OBSERVATIONS

DX-1	CHILLER/COMPRESSOR NO.	ROOFTOP ACU	LOCATION (RM)

UNIT TYPE:

	CENTRIFUGAL WITH WATER SIDE COOLING TOWER						OTHER
	RECIPROCATING WITH WATER SIDE COOLING TOWER					X	AHU'S SERVED AC-1
	RECIPROCATING WITH AIR COOLED CONDENSING UNIT						
	ABSORBTION WITH WATER SIDE COOLING TOWER						
X	AIR COOLED CONDENSING UNIT						
	CHW	X	DX		OTHER		

NAMEPLATE:

CHILLER	CARRIER	MFG.	50RQ008400KB		MODEL	K986002			SERIAL NO.
200	VOLTS	164	MCA	3	PH	60	HZ	8.4	CAPACITY (TONS)
CONDENSER FANS		MFG.			MODEL				# OF FANS
	VOLTS		AMPS		PH		HZ		HP
DTW PUMP		MFG.			MODEL				SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP
CNW PUMP		MFG.			MODEL				SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP
COMMENTS:									

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	0	800	800	800	800	800	0	
REQUIRED STOP TIME	0	1900	1900	1900	1900	1900	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		CWS (oF)		CWR (oF)		CNWS (oF)		CNWR (oF)	
PANEL INDICATORS									
- PRESSURE		LITE-HI		LITE-LOW		GAUGES			
- TEMPERATURE		LITE-HI		LITE-LOW		GAUGES			
- OTHER									
COMMENTS:	RADIO CONTROL ON AC UNIT								

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 802

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 802CH2

REFRIGERATION EQUIPMENT SURVEY OBSERVATIONS

DX-2	CHILLER/COMPRESSOR NO.	ROOFTOP ACU	LOCATION (RM)

UNIT TYPE:

	CENTRIFUGAL WITH WATER SIDE COOLING TOWER						OTHER
	RECIPROCATING WITH WATER SIDE COOLING TOWER					X	AHU'S SERVED AC-2
	RECIPROCATING WITH AIR COOLED CONDENSING UNIT						
	ABSORBTION WITH WATER SIDE COOLING TOWER						
X	AIR COOLED CONDENSING UNIT						
	CHW	X	DX		OTHER		

NAMEPLATE:

CHILLER CARRIER		MFG.	50RQ008400KB			MODEL	K986002		SERIAL NO.
200	VOLTS	164	MCA	3	PH	60	HZ	8.4	CAPACITY (TONS)
CONDENSER FANS		MFG.				MODEL			# OF FANS
	VOLTS		AMPS		PH		HZ		HP
DTW PUMP		MFG.				MODEL			SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP
CNW PUMP		MFG.				MODEL			SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP

COMMENTS:

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	0	800	800	800	800	800	0	
REQUIRED STOP TIME	0	1900	1900	1900	1900	1900	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		CWS (oF)		CWR (oF)		CNWS (oF)		CNWR (oF)	
PANEL INDICATORS									
- PRESSURE		LITE-HI		LITE-LOW		GAUGES			
- TEMPERATURE		LITE-HI		LITE-LOW		GAUGES			
- OTHER									

COMMENTS:

FIELD SURVEY NOTES

BUILDING 819
AND TYPICAL FOR
815 THRU 818, AND 827 THRU 831

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 819

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 819BLG

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 819 BLDG NAME: BARRACKS WITHOUT A/C

ZONE NO.	1	FUNCTION: QUARTERS							
OCCUPANCY HOURS:	M-F	0	TO	2400	SAT	0	TO	2400	
	SUN	0	TO	2400					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

REMARKS: PNEUMATIC CONTROLS; TIMECLOCK PRESENT, BUT HAS NO PINS
THREE ZONES FOR HW BASEBOARD HEATING
TWO LARGE EXHAUST FANS FOR VENTILATION

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 819

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: KC
CHECKED BY: CEL
FILE: 819CV1

BOILER & CONVERTER SURVEY OBSERVATIONS

CV-1	BOILER/CONVERTER NO.	MECH. RM.	LOCATION (RM)
C.P.	SOURCE OF HEATING (PLANT)		SERVES AREA

UNIT TYPE:

	STEAM		PSIG		HW		TEMP.		BOILER TYPE:
	NO.2 OIL		NO.6 OIL		N.GAS		ELEC		FUELS:
X	STM/HW		HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:
	SPACE HEAT		DHW		OTHER				USE:
COMMENT:									% HTG AREA SERVED
									BB RADIATION ONLY

NAMEPLATE:

DUNNHAM-BUSH	MFG.	NA	MODEL	688790	CAPACITY OUTPUT (BTUH)
					CAPACITY INPUT (BTUH)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)
					CAPACITY INPUT (BTUH)
0.75	HW PUMP 1 - HP	CENTURY	MFG.	8-142003-20	MODEL
	HW PUMP 2 - HP		MFG.		MODEL
	HW PUMP 3 - HP		MFG.		MODEL
COMMENT:	PUMP STARTER HAS H-O-A SWITCH				

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCKYES
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO PINS
REQUIRED START TIME	0	0	0	0	0	0	0	
REQUIRED STOP TIME	2400	2400	2400	2400	2400	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1							1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		PSIG		HW SUPPLY					
RESET CONTROL (oF)	160	HW HIGH	80	HW LOW	60	OA LOW	0	OA HIGH	
BURNER CONTROLS	NA	O2 TRIM (Y/N)		OTHER					
COMMENTS:	HAS OA TEMPERATURE RESET CONTROL								

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 819

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: KC
CHECKED BY: CEL
FILE: 819CV2

BOILER & CONVERTER SURVEY OBSERVATIONS

CV-2	BOILER/CONVERTER NO.	MECH RM.	LOCATION (RM)
C.P.	SOURCE OF HEATING (PLANT)		SERVES AREA

UNIT TYPE:

	STEAM		PSIG		HW		TEMP.		BOILER TYPE:
	NO.2 OIL		NO.6 OIL		N.GAS		ELEC		FUELS:
X	STM/HW		HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:
	SPACE HEAT		DHW		OTHER				USE:
COMMENT:									% HTG AREA SERVED
									BB RADIATION ONLY

NAMEPLATE:

DUNNHAM-BUSH	MFG.	NA	MODEL	543420	CAPACITY OUTPUT (BTUH)	
					CAPACITY INPUT (BTUH)	
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)	
					CAPACITY INPUT (BTUH)	
0.75	HW PUMP 1 - HP	GE	MFG.	5K38NO567		MODEL
	HW PUMP 2 - HP		MFG.			MODEL
	HW PUMP 3 - HP		MFG.			MODEL
COMMENT:	PUMP STARTER HAS H-O-A SWITCH					

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCKYES
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO PINS
REQUIRED START TIME	0	0	0	0	0	0	0	
REQUIRED STOP TIME	2400	2400	2400	2400	2400	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1							1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		PSIG		HW SUPPLY					
RESET CONTROL (oF)	160	HW HIGH	80	HW LOW	60	OA LOW	0	OA HIGH	
BURNER CONTROLS	NA	O2 TRIM (Y/N)		OTHER					
COMMENTS:	HAS OA TEMPERATURE RESET CONTROL								

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 819

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: KC
CHECKED BY: CEL
FILE: 819CV3

BOILER & CONVERTER SURVEY OBSERVATIONS

CV-3	BOILER/CONVERTER NO.	MECH RM.	LOCATION (RM)
C.P.	SOURCE OF HEATING (PLANT)		SERVES AREA

UNIT TYPE:

	STEAM		PSIG		HW		TEMP.	BOILER TYPE:
	NO.2 OIL		NO.6 OIL		N.GAS		ELEC	FUELS:
X	STM/HW		HTHW/HW		HTHW/STM		OTHER	CONVERTER TYPE:
	SPACE HEAT		DHW		OTHER			USE:
COMMENT:								% HTG AREA SERVED
								BB RADIATION ONLY

NAMEPLATE:

DUNNHAM-BUSH	MFG.	NA	MODEL	159140	CAPACITY OUTPUT (BTUH)
					CAPACITY INPUT (BTUH)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)
					CAPACITY INPUT (BTUH)
0.75	HW PUMP 1 - HP	NO NAME PLATE	MFG.		MODEL
	HW PUMP 2 - HP		MFG.		MODEL
	HW PUMP 3 - HP		MFG.		MODEL
COMMENT:	PUMP STARTER HAS H-O-A SWITCH				

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK YES
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO PINS
REQUIRED START TIME	0	0	0	0	0	0	0	
REQUIRED STOP TIME	2400	2400	2400	2400	2400	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1							1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		PSIG		HW SUPPLY					
RESET CONTROL (oF)	160	HW HIGH	80	HW LOW	60	OA LOW	0	OA HIGH	
BURNER CONTROLS	NA	O2 TRIM (Y/N)		OTHER					
COMMENTS:	HAS OA TEMPERATURE RESET CONTROL								

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 819

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: KC
CHECKED BY: CEL
FILE: 819EF1

AIR HANDLING UNIT SURVEY OBSERVATIONS

EF-1	AHU NO.	MR-1	LOCATION (RM)
NA	REF. SYS. SERVING AHU	HALF	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES		EXH. FAN		OTHER				
	COMMENT:								

NAMEPLATE:

PEERLE				MFG.	600			MODEL
NA	SUPPLY FAN HP			MFG.	NA			MODEL
20.0	RET/EXH FAN HP		GE	MFG.	5K4286A22			MODEL
	CFM-HTG		CFM-CLG		MIN %OA		MAX %OA	% HTG AREA SERVED
COMMENT:								

COILS:

X	NONE		STM		HW		ELEC	MOD VLV	PREHEAT
X	NONE		STM		HW		ELEC	MOD VLV	HEATING
X	NONE		STM		HW		ELEC	MOD VLV	REHEAT
X	NONE		STM		HW		ELEC	MOD VLV	HUMID.
X	NONE		DX		CW			MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK NO
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	0	0	0	0	0	0	0	
REQUIRED STOP TIME	2400	2400	2400	2400	2400	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
				1	1	1	1				

CONTROLS:

		PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			NO CONTROL
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
	N	MA CONTROL	N	ECONO-DB	N	ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	YES		NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 819

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: KC
CHECKED BY: CEL
FILE: 819EF2

AIR HANDLING UNIT SURVEY OBSERVATIONS

EF-2	AHU NO.	MR-2	LOCATION (RM)
NA	REF. SYS. SERVING AHU	HALF	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES		EXH. FAN		OTHER				
	COMMENT:								

NAMEPLATE:

PEERLE				MFG.	600			MODEL
NA	SUPPLY FAN HP			MFG.	NA			MODEL
20.0	RET/EXH FAN HP		GE	MFG.	5K4286A22			MODEL
	CFM-HTG		CFM-CLG		MIN %OA		MAX %OA	% HTG AREA SERVED
COMMENT:								

COILS:

X	NONE		STM		HW		ELEC	MOD VLV	PREHEAT
X	NONE		STM		HW		ELEC	MOD VLV	HEATING
X	NONE		STM		HW		ELEC	MOD VLV	REHEAT
X	NONE		STM		HW		ELEC	MOD VLV	HUMID.
X	NONE		DX		CW			MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	0	0	0	0	0	0	
REQUIRED STOP TIME	2400	2400	2400	2400	2400	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
				1	1	1	1				

CONTROLS:

		PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			NO CONTROLS
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
	N	MA CONTROL	N	ECONO-DB	N	ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	YES		NO					
COMMENTS:									

FIELD SURVEY NOTES

BUILDING 826

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 826

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 826BLG

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 826 BLDG NAME: GYMNASIUM

ZONE NO.	1	FUNCTION: GYMNASIUM							
OCCUPANCY HOURS:	M-F	430	TO	2000	SAT	1200	TO	1700	
	SUN	1200	TO	1700					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

REMARKS:

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 826

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: KBC
CHECKED BY: CEL
FILE: 826HV1

AIR HANDLING UNIT SURVEY OBSERVATIONS

HV-1	AHU NO.	MAIN GYM SE	LOCATION (RM)
	REF. SYS. SERVING AHU	MAIN GYM	SERVES AREA

UNIT TYPE:

X	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR	X	H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
1	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

					MFG.				MODEL
1.5	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
8500	CFM-HTG		CFM-CLG	100%	MIN %OA	100%	MAX %OA	20.0%	% HTG AREA SERVED
COMMENT:		UNIT NOT ACCESSIBLE EXCEPT BY A VERY TALL LADDER							

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		EVAP MEDIA		MOD VLV	HUMID.
X	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	1200	430	430	430	430	430	1200	
REQUIRED STOP TIME	1700	2000	2000	2000	2000	2000	1700	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (°F):	69	OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (°F):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)		EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:		YES	X	NO					
COMMENTS:	T-STAT COVERS LOCKED								

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 826

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: KBC
CHECKED BY: CEL
FILE: 826HV2

AIR HANDLING UNIT SURVEY OBSERVATIONS

HV-2	AHU NO.	MAIN GYM SW	LOCATION (RM)
	REF. SYS. SERVING AHU	MAIN GYM	SERVES AREA

UNIT TYPE:

X	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR	X	H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
1	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

					MFG.				MODEL
1.5	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
8500	CFM-HTG		CFM-CLG	100%	MIN %OA	100%	MAX %OA	20.0%	% HTG AREA SERVED
COMMENT:		UNIT NOT ACCESSIBLE EXCEPT BY A VERY TALL LADDER							

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		EVAP MEDIA		MOD VLV	HUMID.
X	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	1200	430	430	430	430	430	1200	
REQUIRED STOP TIME	1700	2000	2000	2000	2000	2000	1700	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (°F):	69	OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (°F):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)		EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:		YES	X	NO					
COMMENTS:	T-STAT COVERS LOCKED								

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 826

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: KBC
CHECKED BY: CEL
FILE: 826HV3

AIR HANDLING UNIT SURVEY OBSERVATIONS

HV-3	AHU NO.	MAIN GYM NE	LOCATION (RM)
	REF. SYS. SERVING AHU	MAIN GYM	SERVES AREA

UNIT TYPE:

X	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR	X	H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
1	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

					MFG.				MODEL
1.5	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
8500	CFM-HTG		CFM-CLG	100%	MIN %OA	100%	MAX %OA	20.0%	% HTG AREA SERVED
COMMENT:		UNIT NOT ACCESSIBLE EXCEPT BY A VERY TALL LADDER							

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		EVAP MEDIA		MOD VLV	HUMID.
X	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	1200	430	430	430	430	430	1200	
REQUIRED STOP TIME	1700	2000	2000	2000	2000	2000	1700	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (°F):	69	OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (°F):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)		EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:		YES	X	NO					
COMMENTS:	T-STAT COVERS LOCKED								

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 826

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: KBC
CHECKED BY: CEL
FILE: 826HV4

AIR HANDLING UNIT SURVEY OBSERVATIONS

HV-4	AHU NO.	MAIN GYM NW	LOCATION (RM)
	REF. SYS. SERVING AHU	MAIN GYM	SERVES AREA

UNIT TYPE:

X	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR	X	H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
1	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

					MFG.				MODEL
1.5	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
8500	CFM-HTG		CFM-CLG	100%	MIN %OA	100%	MAX %OA	20.0%	% HTG AREA SERVED
COMMENT:		UNIT NOT ACCESSIBLE EXCEPT BY A VERY TALL LADDER							

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		EVAP MEDIA		MOD VLV	HUMID.
X	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	1200	430	430	430	430	430	1200	
REQUIRED STOP TIME	1700	2000	2000	2000	2000	2000	1700	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (°F):	69	OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (°F):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)		EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:		YES	X	NO					
COMMENTS:	T-STAT COVERS LOCKED								

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 826

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: KBC
CHECKED BY: CEL
FILE: 826HV5

AIR HANDLING UNIT SURVEY OBSERVATIONS

HV-5	AHU NO.	EXERCISE RM.	LOCATION (RM)
	REF. SYS. SERVING AHU	EXERCISE RM. / HANDBALL	SERVES AREA

UNIT TYPE:

X	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR	X	H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
1	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

					MFG.				MODEL
1.5	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
8500	CFM-HTG		CFM-CLG	100%	MIN %OA	100%	MAX %OA	20.0%	% HTG AREA SERVED
COMMENT:		UNIT NOT ACCESSIBLE EXCEPT BY A VERY TALL LADDER							

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		EVAP MEDIA		MOD VLV	HUMID.
X	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	1200	430	430	430	430	430	1200	
REQUIRED STOP TIME	1700	2000	2000	2000	2000	2000	1700	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (°F):	72	OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (°F):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)		EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:		YES	X	NO					
COMMENTS:	T-STAT COVERS LOCKED								

FIELD SURVEY NOTES

BUILDING 837

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 837

EMC NO.: #3204-000
DATE: Apr-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 837BLG

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 837 BLDG NAME: BAND TRAINING

ZONE NO.	1	FUNCTION: BAND TRAINING							
OCCUPANCY HOURS:	M-F	700	TO	1700	SAT	0	TO	0	
	SUN	0	TO	0					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

REMARKS: SIMILAR TO BUILDING 1750
AHUs HAVE PNEUMATIC ACTUATORS, R.A. AND O.A. DAMPERS SHARE ONE ACTUATOR
HVs HAVE FACE AND BYPASS DAMPERS, TWO HEATING CONTROL VALVES

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 837

EMC NO.: #3204-000
DATE: Apr-93
PREPARED BY: CMD
CHECKED BY: CEL
FILE: 837AH1

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-1	AHU NO.	ATTIC WEST	LOCATION (RM)
	REF. SYS. SERVING AHU	DINING ROOM	SERVES AREA

UNIT TYPE:

X	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR	X	H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

N/A					MFG.				MODEL
15.0	SUPPLY FAN HP		CENTURY		MFG.	323576-03			MODEL
	RET/EXH FAN HP				MFG.				MODEL
2800	CFM-HTG	2800	CFM-CLG	10%	MIN %OA	100%	MAX %OA	50%	% HTG AREA SERVED
COMMENT:	(SF) 200-208V, 40 A, 3 PH								

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE		DX	X	CW			X	MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	YES
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			TIMECLOCK HAS NO PINS
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	YES		NO					
COMMENTS:	BARBER COLEMAN CONTROLS, ELECTRIC VALVE ACTUATORS, HOA								

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 837

EMC NO.: #3204-000
DATE: Apr-93
PREPARED BY:
CHECKED BY: CEL
FILE: 837AH2

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-2	AHU NO.	ATTIC EAST	LOCATION (RM)
C.P.	REF. SYS. SERVING AHU	DINING ROOM	SERVES AREA

UNIT TYPE:

X	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHERS				
	COMMENT:								

NAMEPLATE:

N/A					MFG.				MODEL
15.0	SUPPLY FAN HP		CENTURY		MFG.	323576-03			MODEL
	RET/EXH FAN HP				MFG.				MODEL
2800	CFM-HTG	2800	CFM-CLG	10%	MIN %OA	100%	MAX %OA	50%	% HTG AREA SERVED
COMMENT:		(SF) 200							

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE		DX	X	CW			X	MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	YES, NO PINS
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	YES		NO					
COMMENTS:	BARBER								

EMC ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 837

EMC NO.: #3204.000
DATE: Apr-93
PREPARED BY: CMD
CHECKED BY: CEL
FILE: 837CV1

BOILER & CONVERTER SURVEY OBSERVATIONS

CV-1	BOILER/CONVERTER NO.	MECH RM	LOCATION (RM)
	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	STEAM		PSIG		HW		TEMP.		BOILER TYPE:
	NO.2 OIL		NO.6 OIL		N.GAS		ELEC		FUELS:
X	STM/HW		HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:
X	SPACE HEAT		DHW		OTHER				USE:
COMMENT:									% HTG AREA SERVED
									BB RADIATION ONLY

NAMEPLATE:

N/A		MFG.		MODEL	1300000	CAPACITY OUTPUT (BTUH)
					1300000	CAPACITY INPUT (BTUH)
		MFG.		MODEL		CAPACITY OUTPUT (BTUH)
						CAPACITY INPUT (BTUH)
1.5	HW PUMP 1 - HP	MARATHON		MFG.	LVL145TDDR795330WFL	MODEL
	HW PUMP 2 - HP			MFG.		MODEL
	HW PUMP 3 - HP			MFG.		MODEL
COMMENT:		200V, 5.5A, 3PH, 1745 RPM				

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		PSIG		HW SUPPLY					
RESET CONTROL (oF)		HW HIGH		HW LOW		OA LOW		OA HIGH	
BURNER CONTROLS		O2 TRIM (Y/N)		OTHER					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 837

EMC NO.: #3204-000
DATE: Apr-93
PREPARED BY: PG/wtc
CHECKED BY: CEL
FILE: 837PMP

REFRIGERATION EQUIPMENT SURVEY OBSERVATIONS

CHW PUMP	CHILLER/COMPRESSOR NO.	MECH. ROOM	LOCATION (RM)

UNIT TYPE:

	CENTRIFUGAL WITH WATER SIDE COOLING TOWER						OTHER
	RECIPROCATING WITH WATER SIDE COOLING TOWER						AHU'S SERVED
	RECIPROCATING WITH AIR COOLED CONDENSING UNIT						
	ABSORBTION WITH WATER SIDE COOLING TOWER						
	AIR COOLED CONDENSING UNIT						
	CHW		DX	X	OTHER		CHW PUMP ONLY

NAMEPLATE:

CHILLER		MFG.				MODEL				SERIAL NO.
	VOLTS		AMPS		PH		HZ		CAPACITY (TONS)	
TOWER		MFG.				MODEL				# OF FANS
	VOLTS		AMPS		PH		HZ		HP	
CW PUM	HOWELL	MFG.	2247AD3			MODEL				SERIAL NO.
208	VOLTS	13	AMPS	3	PH	60	HZ	5	HP	
CNW PUMP		MFG.				MODEL				SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP	

COMMENTS:

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
0	0	0	0	1	1	1	1	1	0	0	0

CONTROLS:

		PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		CWS (oF)		CWR (oF)		CNWS (oF)		CNWR (oF)	NONE
PANEL INDICATORS									
- PRESSURE		LITE-HI		LITE-LOW		GAUGES			
- TEMPERATURE		LITE-HI		LITE-LOW		GAUGES			
- OTHER									

COMMENTS:

/wtc

FIELD SURVEY NOTES

BUILDING 844

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 844

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 844BLG

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 844 BLDG NAME: BRIGADE HQ

ZONE NO.	1	FUNCTION: ADMINISTRATION							
OCCUPANCY HOURS:	M-F	700	TO	1700	SAT	0	TO	0	
	SUN	0	TO	0					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

REMARKS:

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 844

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 844FC1

AIR HANDLING UNIT SURVEY OBSERVATIONS

FC-1	AHU NO.	THROUGHOUT BLDG	LOCATION (RM)
CH-1	REF. SYS. SERVING AHU	ALL	SERVES AREA

UNIT TYPE:

	SINGLE ZN	X	2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:	FAN COIL PER ROOM							

NAMEPLATE:

					MFG.				MODEL
3.4	SUPPLY FAN HP				MFG.				MODEL
0.0	RET/EXH FAN HP				MFG.				MODEL
10500	CFM-HTG	37800	CFM-CLG	15%	MIN %OA	15%	MAX %OA	70.0%	% HTG AREA SERVED
COMMENT:	TOTAL CFM FOR 27 FAN COILS								

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		EVAP MEDIA		MOD VLV	HUMID.
	NONE		DX	X	CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:	X	SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (°F):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (°F):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:		MIN OA (Y/N)		MAX OA (Y/N)		RA (Y/N)		EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:		YES	X	NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 844

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 844RAD1

PERIMETER RADIATION SURVEY OBSERVATIONS

RAD-1	PER RAD NO.	BASM., 1, & 2 FLOORS	LOCATION (RM)
CV-1	SOURCE OF HEATING	STAIRWELLS & STORAGE	SERVES AREA

UNIT TYPE:

	STEAM	X	HW		ELECTRIC				
	OTHER								
	COMMENT:								

NAMEPLATE:

	HW PUMP 1 - HP		MFG.		MODEL
	HW PUMP 2 - HP		MFG.		MODEL
	HW PUMP 3 - HP		MFG.		MODEL
	HW PUMP 4 - HP		MFG.		MODEL
COMMENT:				30.0%	% AREA HEATING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1						1	1	1

CONTROLS:

		PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
RADIATION CONTROL:		NONE		2-WAY VLV		3-WAY VLV		OTHER	
SPACE SETPOINT (°F):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
RESET CONTROL (°F):		HW HIGH		HW LOW		OA LOW		OA HIGH	
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 844

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 844CH1

REFRIGERATION EQUIPMENT SURVEY OBSERVATIONS

CH-1	CHILLER/COMPRESSOR NO.	MECH. ROOM	LOCATION (RM)

UNIT TYPE:

	CENTRIFUGAL WITH WATER SIDE COOLING TOWER						OTHER
	RECIPROCATING WITH WATER SIDE COOLING TOWER					X	AHU'S SERVED FC-1
X	RECIPROCATING WITH AIR COOLED CONDENSING UNIT						
	ABSORBTION WITH WATER SIDE COOLING TOWER						
	AIR COOLED CONDENSING UNIT						
X	CHW		DX		OTHER		

NAMEPLATE:

CHILLER	TSI	MFG.	CAUCS25			MODEL	7819			SERIAL NO.
230	VOLTS	88.5	AMPS	3	PH	60	HZ	21.3	CAPACITY (TONS)	
TOWER		MFG.				MODEL			2	# OF FANS
230	VOLTS	4.6	AMPS	3	PH	60	HZ	1	HP	
CW PUMP		MFG.				MODEL				SERIAL NO.
	VOLTS		AMPS		PH		HZ	1.5	HP	
CNW PUMP		MFG.				MODEL				SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP	
COMMENTS:										

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	YES, NO PINS
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
0	0	0	0	1	1	1	1	1	0	0	0

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		CWS (oF)		CWR (oF)		CNWS (oF)		CNWR (oF)	
PANEL INDICATORS									
- PRESSURE		LITE-HI		LITE-LOW		GAUGES			
- TEMPERATURE		LITE-HI		LITE-LOW		GAUGES			
- OTHER									

COMMENTS: **FM RADIO CONTROL SWITCH INSTALLED**

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 844

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 844CV1

BOILER & CONVERTER SURVEY OBSERVATIONS

CV-1	BOILER/CONVERTER NO.	MECH. RM.	LOCATION (RM)
C. PLANT	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	STEAM		PSIG		HW		TEMP.	BOILER TYPE:
	NO.2 OIL		NO.6 OIL		N.GAS		ELEC	FUELS:
X	STM/HW		HTHW/HW		HTHW/STM		OTHER	CONVERTER TYPE:
	SPACE HEAT		DHW		OTHER			USE:
COMMENT:							30%	% HTG AREA SERVED
								BB RADIATION ONLY

NAMEPLATE:

NO NAME PLATE	MFG.		MODEL	526408	CAPACITY OUTPUT (BTUH)
				526408	CAPACITY INPUT (BTUH)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)
					CAPACITY INPUT (BTUH)

1.5	DTW PUMP 1 - HP	CENTURY	MFG.	8-125198-2	MODEL
	HW PUMP 2 - HP		MFG.		MODEL
	HW PUMP 3 - HP		MFG.		MODEL

COMMENT: DTW PUMP WITH H-O-A

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	YES, NO PINS
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		PSIG		HW SUPPLY					
RESET CONTROL (oF)		HW HIGH		HW LOW		OA LOW		OA HIGH	
BURNER CONTROLS		O2 TRIM (Y/N)		OTHER					

COMMENTS: HAS O.A. TEMPERATURE RESET
MANUAL SUMMER/WINTER CHANGEOVER
BLDG UNDER RENOVATION, WILL HAVE NEW FAN COILS

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 844

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 844DHW1

DOMESTIC HW SURVEY OBSERVATIONS

DHW-1	BOILER/CONVERTER NO.	MECH RM	LOCATION (RM)
ELEC.	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	NO.2 OIL		NO.6 OIL		N.GAS	X	ELEC		FUELS:
	STM/HW		HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:
COMMENT:									

NAMEPLATE:

A.O. SMITH	MFG.	GES 30 780	MODEL	4500	CAPACITY OUTPUT (WATTS)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)

DOMESTIC HW CIRCULATION PUMP: NONE

	HW PUMP 1 – HP		MFG.		MODEL
	HW PUMP 2 – HP		MFG.		MODEL
	HW PUMP 3 – HP		MFG.		MODEL

COMMENT:

DIMENSION:	20	DIAMETER (INCHES)	48	HEIGHT OR LENGTH (INCHES)	40 GALLON

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS				HW SUPPLY					
COMMENTS:									

FIELD SURVEY NOTES

BUILDING 1012
1013 THRU 1016, 1028, AND 1029

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 1012 BLDG NAME: BARRACKS WITH A/C

ZONE NO.	1	FUNCTION: QUARTERS							
OCCUPANCY HOURS:	M-F	0	TO	2400	SAT	0	TO	2400	
	SUN	0	TO	2400					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

REMARKS: SIMILAR IN CONSTRUCTION TO BLDG 627
FAN COIL UNITS PROVIDE HEATING AND COOLING

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1012

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: cel
CHECKED BY: CEL
FILE: 1012FC1

AIR HANDLING UNIT SURVEY OBSERVATIONS

FC-1	AHU NO.	SOUTH	LOCATION (RM)
C.PLANT	REF. SYS. SERVING AHU	SOUTH	SERVES AREA

UNIT TYPE:

	SINGLE ZN	X	2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES		40		OTHER	FAN COILS TOTAL			
	COMMENT:								

NAMEPLATE:

NA					MFG.	NA			MODEL
4.0	SUPPLY FAN HP		NA		MFG.	NA			MODEL
	RET/EXH FAN HP				MFG.				MODEL
9640	CFM-HTG	9640	CFM-CLG	10%	MIN %OA	10%	MAX %OA	40.0%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		EVAP MEDIA		MOD VLV	HUMID.
	NONE		DX	X	CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	0	0	0	0	0	0	0	
REQUIRED STOP TIME	2400	2400	2400	2400	2400	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (°F):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (°F):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	X	YES		NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1012

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: CEL
CHECKED BY: CEL
FILE: 1012FC2

AIR HANDLING UNIT SURVEY OBSERVATIONS

FC-2	AHU NO.	NORTH	LOCATION (RM)
C.PLANT	REF. SYS. SERVING AHU	NORTH	SERVES AREA

UNIT TYPE:

	SINGLE ZN	X	2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES		37		OTHER	FAN COILS TOTAL			
	COMMENT:								

NAMEPLATE:

NA				MFG.	NA			MODEL
3.7	SUPPLY FAN HP	NA		MFG.	NA			MODEL
	RET/EXH FAN HP			MFG.				MODEL
6569	CFM-HTG	6569	CFM-CLG	10%	MIN %OA	10%	MAX %OA	30.0%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		EVAP MEDIA		MOD VLV	HUMID.
	NONE		DX	X	CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	0	0	0	0	0	0	0	
REQUIRED STOP TIME	2400	2400	2400	2400	2400	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (°F):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (°F):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	X	YES		NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1012

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: CEL
CHECKED BY: CEL
FILE: 1012FC3

AIR HANDLING UNIT SURVEY OBSERVATIONS

FC-3	AHU NO.	DAYROOMS	LOCATION (RM)
C.PLANT	REF. SYS. SERVING AHU	DAYROOMS	SERVES AREA

UNIT TYPE:

	SINGLE ZN	X	2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES		14		OTHER	FAN COILS TOTAL			
	COMMENT:								

NAMEPLATE:

NA					MFG.	NA			MODEL
1.4	SUPPLY FAN HP		NA		MFG.	NA			MODEL
	RET/EXH FAN HP				MFG.				MODEL
3417	CFM-HTG	3417	CFM-CLG	10%	MIN %OA	10%	MAX %OA	15.0%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		EVAP MEDIA		MOD VLV	HUMID.
	NONE		DX	X	CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	0	0	0	0	0	0	0	
REQUIRED STOP TIME	2400	2400	2400	2400	2400	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (°F):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (°F):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	X	YES		NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1012

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: BS
CHECKED BY: CEL
FILE: 1012CV1

BOILER & CONVERTER SURVEY OBSERVATIONS

CV1	BOILER/CONVERTER NO.	MER	LOCATION (RM)
C.PLANT	SOURCE OF HEATING (PLANT)		SERVES AREA

UNIT TYPE:

	STEAM		PSIG		HW		TEMP.		BOILER TYPE:
	NO.2 OIL		NO.6 OIL		N.GAS		ELEC		FUELS:
	STM/HW	X	HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:
X	SPACE HEAT		DHW		OTHER				USE:
COMMENT:							0%	% HTG AREA SERVED	
								BB RADIATION ONLY	

NAMEPLATE:

NA	MFG.	NA	MODEL	688790	CAPACITY OUTPUT (BTUH)
				688790	CAPACITY INPUT (BTUH)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)
					CAPACITY INPUT (BTUH)
0.75	HW PUMP 1 – HP	MOTOR-RELIANCE	MFG.	P14G319M-BU	MODEL
	HW PUMP 2 – HP		MFG.		MODEL
	HW PUMP 3 – HP		MFG.		MODEL
COMMENT:					

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	0	0	0	0	0	0	
REQUIRED STOP TIME	2400	2400	2400	2400	2400	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1							1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		PSIG	135	HW SUPPLY					
RESET CONTROL (oF):		HW HIGH		HW LOW		OA LOW		OA HIGH	
BURNER CONTROLS		O2 TRIM (Y/N)		OTHER					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1012

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: BS
CHECKED BY: CEL
FILE: 1012CV2

BOILER & CONVERTER SURVEY OBSERVATIONS

CV2	BOILER/CONVERTER NO.	MER	LOCATION (RM)
C.PLANT	SOURCE OF HEATING (PLANT)		SERVES AREA

UNIT TYPE:

	STEAM		PSIG		HW		TEMP.		BOILER TYPE:
	NO.2 OIL		NO.6 OIL		N.GAS		ELEC		FUELS:
	STM/HW	X	HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:
X	SPACE HEAT		DHW		OTHER				USE:
COMMENT:							0%		% HTG AREA SERVED
									BB RADIATION ONLY

NAMEPLATE:

NA	MFG.	NA	MODEL	543420	CAPACITY OUTPUT (BTUH)
				543420	CAPACITY INPUT (BTUH)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)
					CAPACITY INPUT (BTUH)
0.75	HW PUMP 1 – HP	MOTOR–RELIANCE	MFG.	P18G5105B	MODEL
	HW PUMP 2 – HP		MFG.		MODEL
	HW PUMP 3 – HP		MFG.		MODEL
COMMENT:					

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	0	0	0	0	0	0	
REQUIRED STOP TIME	2400	2400	2400	2400	2400	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1							1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		PSIG	135	HW SUPPLY					
RESET CONTROL (oF)		HW HIGH		HW LOW		OA LOW		OA HIGH	
BURNER CONTROLS		O2 TRIM (Y/N)		OTHER					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1012

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: BS
CHECKED BY: CEL
FILE: 1012CV3

BOILER & CONVERTER SURVEY OBSERVATIONS

CV3	BOILER/CONVERTER NO.	MER	LOCATION (RM)
C.PLANT	SOURCE OF HEATING (PLANT)		SERVES AREA

UNIT TYPE:

	STEAM		PSIG		HW		TEMP.	BOILER TYPE:
	NO.2 OIL		NO.6 OIL		N.GAS		ELEC	FUELS:
	STM/HW	X	HTHW/HW		HTHW/STM		OTHER	CONVERTER TYPE:
X	SPACE HEAT		DHW		OTHER			USE:
COMMENT:							0%	% HTG AREA SERVED
								BB RADIATION ONLY

NAMEPLATE:

NA	MFG.	NA	MODEL	159140	CAPACITY OUTPUT (BTUH)
				159140	CAPACITY INPUT (BTUH)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)
					CAPACITY INPUT (BTUH)

0.75	HW PUMP 1 – HP	MOTOR-CENTURY	MFG.	8-332974-2	MODEL
	HW PUMP 2 – HP		MFG.		MODEL
	HW PUMP 3 – HP		MFG.		MODEL

COMMENT:

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	0	0	0	0	0	0	
REQUIRED STOP TIME	2400	2400	2400	2400	2400	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1							1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		PSIG	135	HW SUPPLY					
RESET CONTROL (oF):		HW HIGH		HW LOW		OA LOW		OA HIGH	
BURNER CONTROLS		O2 TRIM (Y/N)		OTHER					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1012

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: BS
CHECKED BY: CEL
FILE: 1012CV4

BOILER & CONVERTER SURVEY OBSERVATIONS

CV4	BOILER/CONVERTER NO.	MER	LOCATION (RM)
C.PLANT	SOURCE OF HEATING (PLANT)		SERVES AREA

UNIT TYPE:

	STEAM		PSIG		HW		TEMP.	BOILER TYPE:
	NO.2 OIL		NO.6 OIL		N.GAS		ELEC	FUELS:
	STM/HW	X	HTHW/HW		HTHW/STM		OTHER	CONVERTER TYPE:
X	SPACE HEAT		DHW		OTHER			USE:
COMMENT:							15%	% HTG AREA SERVED
								BB RADIATION ONLY

NAMEPLATE:

NA	MFG.	NA	MODEL	257000	CAPACITY OUTPUT (BTUH)
				257000	CAPACITY INPUT (BTUH)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)
					CAPACITY INPUT (BTUH)
0.75	HW PUMP 1 – HP	MOTOR-BALDOR	MFG.	35A360-87	MODEL
	HW PUMP 2 – HP		MFG.		MODEL
	HW PUMP 3 – HP		MFG.		MODEL
COMMENT:					

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	0	0	0	0	0	0	
REQUIRED STOP TIME	2400	2400	2400	2400	2400	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1							1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		PSIG	135	HW SUPPLY					
RESET CONTROL (oF)		HW HIGH		HW LOW		OA LOW		OA HIGH	
BURNER CONTROLS		O2 TRIM (Y/N)		OTHER					
COMMENTS:									

FIELD SURVEY NOTES

BUILDING 1025

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1025

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1025BLG

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 1025 BLDG NAME: ADMINISTRATION/SUPPLY

ZONE NO.	1	FUNCTION: COMPANY ADMINISTRATION / SUPPLY							
OCCUPANCY HOURS:	M-F	500	TO	1700	SAT	500	TO	1700	
	SUN	500	TO	1700					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

REMARKS: SAME AS BUILDING 655 , EXCEPT ADMINISTRATION OFFICES HAVE A/C

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1025

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1025AH1

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-1	AHU NO.	MECH. ROOM	LOCATION (RM)
C. PLANT	REF. SYS. SERVING AHU	ADMINISTRATION OFFICES	SERVES AREA

UNIT TYPE:

X	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:	NO CW PUMP							

NAMEPLATE:

NO NAME PLATE					MFG.				MODEL
3.0	SUPPLY FAN HP		NO NAME PLATE		MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
0	CFM-HTG	5930	CFM-CLG	10%	MIN %OA	100%	MAX %OA	0%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM		HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE		DX	X	CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	500	500	500	500	500	0	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON: 0

J	F	M	A	M	J	J	A	S	O	N	D
0	0	0	0	1	1	1	1	1	0	0	0

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:		YES	N	NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1025

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1025RAD1

PERIMETER RADIATION SURVEY OBSERVATIONS

RAD-1	PER RAD NO.	THROUGHOUT BLDG	LOCATION (RM)
CV-1	SOURCE OF HEATING	ALL	SERVES AREA

UNIT TYPE:

	STEAM	X	HW		ELECTRIC				
	OTHER								
	COMMENT:								

NAMEPLATE:

	HW PUMP 1 - HP		MFG.		MODEL
	HW PUMP 2 - HP		MFG.		MODEL
	HW PUMP 3 - HP		MFG.		MODEL
	HW PUMP 4 - HP		MFG.		MODEL
COMMENT:				100.0%	% AREA HEATING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	500	500	500	500	500	0	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
RADIATION CONTROL	X	NONE		2-WAY VLV		3-WAY VLV		OTHER	
SPACE SETPOINT (°F):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
RESET CONTROL (°F):		HW HIGH		HW LOW		OA LOW		OA HIGH	
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1025

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1025CV1

BOILER & CONVERTER SURVEY OBSERVATIONS

CV-1	BOILER/CONVERTER NO.	MECH. RM.	LOCATION (RM)
C. PLANT	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	STEAM		PSIG		HW		TEMP.		BOILER TYPE:
	NO.2 OIL		NO.6 OIL		N.GAS		ELEC		FUELS:
	STM/HW	X	HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:
X	SPACE HEAT		DHW		OTHER				USE:
COMMENT:							100%	% HTG AREA SERVED	
								BB RADIATION ONLY	

NAMEPLATE:

NO NAME PLATE	MFG.		MODEL	520000	CAPACITY OUTPUT (BTUH)
				520000	CAPACITY INPUT (BTUH)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)
					CAPACITY INPUT (BTUH)

1.5	HW PUMP 1 - HP	DUNHAM-BUSH	MFG.	NO. A9D61-1A	MODEL
	HW PUMP 2 - HP		MFG.		MODEL
	HW PUMP 3 - HP		MFG.		MODEL

COMMENT:

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT	
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK'	NO
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400		
REQUIRED START TIME	0	500	500	500	500	500	0		
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0		

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		PSIG		HW SUPPLY					
RESET CONTROL (oF)		HW HIGH		HW LOW		OA LOW		OA HIGH	
BURNER CONTROLS		O2 TRIM (Y/N)		OTHER					

COMMENTS: ELEC. ACTUATOR
O.A. TEMPERATURE CUT OFF ABOVE 65 °F

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1025

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1025DHW1

DOMESTIC HW SURVEY OBSERVATIONS

DHW-1	BOILER/CONVERTER NO.	MECH RM	LOCATION (RM)
ELEC.	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	NO.2 OIL		NO.6 OIL		N.GAS	X	ELEC		FUELS:
	STM/HW		HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:
COMMENT:									

NAMEPLATE:

STATE	MFG.		MODEL	4700	CAPACITY OUTPUT (WATTS)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)

DOMESTIC HW CIRCULATION PUMP: YES

0.083	HW PUMP 1 – HP	BELL & GOSSETT	MFG.		MODEL
	HW PUMP 2 – HP		MFG.		MODEL
	HW PUMP 3 – HP		MFG.		MODEL

COMMENT:

DIMENSION:	30	DIAMETER (INCHES)	60	HEIGHT OR LENGTH (INCHES)	82	GALLON

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	500	500	500	500	500	0	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS				HW SUPPLY					
COMMENTS:									

FIELD SURVEY NOTES

BUILDING 1350

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1350

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1350BLG

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 1350 BLDG NAME: RESERVE CENTER

ZONE NO.	1	FUNCTION: KITCHEN / DINING							
OCCUPANCY HOURS:	M-F	500	TO	1900	SAT	500	TO	1900	
	SUN	500	TO	1900					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.	2	FUNCTION: OFFICES / CLASSROOMS							
OCCUPANCY HOURS:	M-F	700	TO	1800	SAT	0	TO	0	
	SUN	0	TO	0					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

REMARKS:

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1350

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1350AH2

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-2	AHU NO.	ROOF	LOCATION (RM)
BLR-1	REF. SYS. SERVING AHU	KITCHEN	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR	X	H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

TRANE					MFG.				MODEL
1.0	SUPPLY FAN HP		MARATHON		MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
1870	CFM-HTG	0	CFM-CLG	100%	MIN %OA	100%	MAX %OA	3.7%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
X	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	500	500	500	500	500	500	500	
REQUIRED STOP TIME	1900	1900	1900	1900	1900	1900	1900	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:	X	SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
	N	MA CONTROL	N	ECONO-DB	N	ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	(Y / N)							
COMMENTS:	ON/OFF CONTROLS								

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1350

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1350AH3

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-3	AHU NO.	MECH. ROOM	LOCATION (RM)
ACCU-3	REF. SYS. SERVING AHU	CLASSROOM AREA	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
X	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
4	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

TRANE					MFG.				MODEL
3.0	SUPPLY FAN HP		MARATHON		MFG.		5VH182TTDR7627AC		MODEL
	RET/EXH FAN HP				MFG.				MODEL
3080	CFM-HTG	3080	CFM-CLG	20%	MIN %OA	100%	MAX %OA	24.6%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE	X	DX		CW			X	MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1800	1800	1800	1800	1800	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:	X	SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):	75	HOT DECK	65	COLD DECK	65	MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	Y	EA (Y/N)	
	Y	MA CONTROL	Y	ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	(Y / N)							
COMMENTS:	BARBER COLMAN CONTROLS; ZONE CONTROL SET TO 70 °F								

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1350

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1350AH4

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-4	AHU NO.	ROOF	LOCATION (RM)
BLR-1	REF. SYS. SERVING AHU	DINING AREA	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR	X	H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

TRANE					MFG.				MODEL
3.0	SUPPLY FAN HP		MARATHON		MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
3720	CFM-HTG	0	CFM-CLG	18%	MIN %OA	100%	MAX %OA	12.6%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
X	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	700	700	700	700	700	700	700	
REQUIRED STOP TIME	1900	1900	1900	1900	1900	1900	1900	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
	Y	MA CONTROL	Y	ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	(Y / N)							
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1350

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1350AH5

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-5	AHU NO.	ROOF	LOCATION (RM)
ACCU-5	REF. SYS. SERVING AHU	OFFICE AREA	SERVES AREA

UNIT TYPE:

X	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

TRANE					MFG.				MODEL
5.0	SUPPLY FAN HP		MARATHON		MFG.		5VL184TTDR7627ACL		MODEL
	RET/EXH FAN HP				MFG.				MODEL
3800	CFM-HTG	3800	CFM-CLG	25%	MIN %OA	100%	MAX %OA	32.3%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE	X	DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1800	1800	1800	1800	1800	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
	N	MA CONTROL	Y	ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	(Y / N)							
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1350

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1350BLR

BOILER & CONVERTER SURVEY OBSERVATIONS

BLR-1	BOILER/CONVERTER NO.	MECH. RM.	LOCATION (RM)
	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	STEAM		PSIG	X	HW		TEMP.	BOILER TYPE:
	NO.2 OIL		NO.6 OIL	X	LP GAS		ELEC	FUELS:
	STM/HW		HTHW/HW		HTHW/STM		OTHER	CONVERTER TYPE:
X	SPACE HEAT		DHW		OTHER			USE:
COMMENT:							0.0%	% HTG AREA SERVED
								BB RADIATION ONLY

NAMEPLATE:

BURNHAM	MFG.	4FW7840LB	MODEL	658000	CAPACITY OUTPUT (BTUH)
				816000	CAPACITY INPUT (BTUH)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)
					CAPACITY INPUT (BTUH)
2	HW PUMP 1 - HP	TACO	MFG.	BB20087.2BSB2LLO	MODEL
	HW PUMP 2 - HP		MFG.		MODEL
	HW PUMP 3 - HP		MFG.		MODEL
COMMENT:					

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	500	500	500	500	500	500	500	
REQUIRED STOP TIME	2000	2000	2000	2000	2000	2000	2000	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		PSIG		HW SUPPLY					
RESET CONTROL (oF)		HW HIGH		HW LOW		OA LOW		OA HIGH	
BURNER CONTROLS		O2 TRIM (Y/N)		OTHER					

COMMENTS: **HW PUMP WILL START WHEN TEMPERATURE IS BELOW 65 °F**

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1350

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1350CH1

REFRIGERATION EQUIPMENT SURVEY OBSERVATIONS

ACCU-3	CHILLER/COMPRESSOR NO.	ROOF	LOCATION (RM)

UNIT TYPE:

	CENTRIFUGAL WITH WATER SIDE COOLING TOWER						OTHER
	RECIPROCATING WITH WATER SIDE COOLING TOWER					X	AHU'S SERVED AHU-3
	RECIPROCATING WITH AIR COOLED CONDENSING UNIT						
	ABSORBTION WITH WATER SIDE COOLING TOWER						
X	AIR COOLED CONDENSING UNIT						
	CHW	X	DX		OTHER		

NAMEPLATE:

CHILLER	TRANE	MFG.	BTA120C300MB		MODEL	B05196238			SERIAL NO.
230	VOLTS	37	MCA	3	PH	60	HZ	10	CAPACITY (TONS)
CONDENSER FANS		MFG.			MODEL			2	# OF FANS
230	VOLTS	3.8	AMPS	1	PH	60	HZ	0.5	HP
DTW PUMP		MFG.			MODEL				SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP
CNW PUMP		MFG.			MODEL				SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP

COMMENTS:

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1800	1800	1800	1800	1800	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
0	0	0	0	1	1	1	1	1	0	0	0

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		CWS (oF)		CWR (oF)		CNWS (oF)		CNWR (oF)	
PANEL INDICATORS									
- PRESSURE		LITE-HI		LITE-LOW		GAUGES			
- TEMPERATURE		LITE-HI		LITE-LOW		GAUGES			
- OTHER									

COMMENTS:

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1350

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1350CH2

REFRIGERATION EQUIPMENT SURVEY OBSERVATIONS

ACCU-5	CHILLER/COMPRESSOR NO.	ROOF	LOCATION (RM)

UNIT TYPE:

	CENTRIFUGAL WITH WATER SIDE COOLING TOWER						OTHER
	RECIPROCATING WITH WATER SIDE COOLING TOWER					X	AHU'S SERVED AHU-5
	RECIPROCATING WITH AIR COOLED CONDENSING UNIT						
	ABSORBTION WITH WATER SIDE COOLING TOWER						
X	AIR COOLED CONDENSING UNIT						
	CHW	X	DX		OTHER		

NAMEPLATE:

CHILLER	TRANE	MFG.	BTA120C300MB			MODEL				SERIAL NO.
230	VOLTS	56.4	MCA	3	PH	60	HZ	14	CAPACITY (TONS)	
CONDENSER FANS		MFG.				MODEL			3	# OF FANS
230	VOLTS	5	AMPS	1	PH	60	HZ	0.75	HP	
DTW PUMP		MFG.				MODEL				SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP	
CNW PUMP		MFG.				MODEL				SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP	
COMMENTS:										

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1800	1800	1800	1800	1800	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
0	0	0	0	1	1	1	1	1	0	0	0

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		CWS (oF)		CWR (oF)		CNWS (oF)		CNWR (oF)	
PANEL INDICATORS									
- PRESSURE		LITE-HI		LITE-LOW		GAUGES			
- TEMPERATURE		LITE-HI		LITE-LOW		GAUGES			
- OTHER									
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1350

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1350DHW1

DOMESTIC HW SURVEY OBSERVATIONS

DHW-1	BOILER/CONVERTER NO.	MECH RM	LOCATION (RM)
ELEC.	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	NO.2 OIL		NO.6 OIL		N.GAS	X	ELEC		FUELS:
	STM/HW		HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:

COMMENT:

NAMEPLATE:

DURA POWER	MFG.	DVE120	MODEL	30000	CAPACITY OUTPUT (WATTS)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)

DOMESTIC HW CIRCULATION PUMP: NONE

	HW PUMP 1 – HP		MFG.	MODEL
	HW PUMP 2 – HP		MFG.	MODEL
	HW PUMP 3 – HP		MFG.	MODEL

COMMENT:

DIMENSION:	30	DIAMETER (INCHES)	60	HEIGHT OR LENGTH (INCHES)	120 GALLON

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	500	500	500	500	500	500	500	
REQUIRED STOP TIME	2000	2000	2000	2000	2000	2000	2000	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS				HW SUPPLY					

COMMENTS:

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1350

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1350DHW3

DOMESTIC HW SURVEY OBSERVATIONS

DHW-2	BOILER/CONVERTER NO.	MECH RM	LOCATION (RM)
ELEC.	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	NO.2 OIL		NO.6 OIL		N.GAS	X	ELEC		FUELS:
	STM/HW		HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:
COMMENT:									

NAMEPLATE:

DURA POWER	MFG.	DVE120	MODEL	30000	CAPACITY OUTPUT (WATTS)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)

DOMESTIC HW CIRCULATION PUMP: **NONE**

	HW PUMP 1 – HP		MFG.	MODEL
	HW PUMP 2 – HP		MFG.	MODEL
	HW PUMP 3 – HP		MFG.	MODEL

COMMENT:

DIMENSION:	30	DIAMETER (INCHES)	60	HEIGHT OR LENGTH (INCHES)	120 GALLON

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	500	500	500	500	500	500	500	
REQUIRED STOP TIME	2000	2000	2000	2000	2000	2000	2000	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS				HW SUPPLY					
COMMENTS:									

FIELD SURVEY NOTES

BUILDING 1382

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1382

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: BHS
CHECKED BY: CEL
FILE: 1382BLG

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 1382 BLDG NAME: CAR WASH

ZONE NO.	1	FUNCTION: CAR WASH							
OCCUPANCY HOURS:	M-F	0	TO	0	SAT	0	TO	0	
	SUN	0	TO	0					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

REMARKS:

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1382

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: CEL
CHECKED BY: CEL
FILE: 1382BLR1

BOILER & CONVERTER SURVEY OBSERVATIONS

BLR-1	BOILER/CONVERTER NO.	MER	LOCATION (RM)
	SOURCE OF HEATING (PLANT)	CAR WASH	SERVES AREA

UNIT TYPE:

	STEAM		PSIG	X	HW		TEMP.		BOILER TYPE:
	NO.2 OIL		NO.6 OIL		N.GAS		ELEC		FUELS:
	STM/HW		HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:
	SPACE HEAT		DHW		OTHER				USE:
COMMENT:								0%	% HTG AREA SERVED
									BB RADIATION ONLY

NAMEPLATE:

RAYPAK	MFG.		MODEL		CAPACITY OUTPUT (BTUH)
					CAPACITY INPUT (BTUH)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)
					CAPACITY INPUT (BTUH)
5	HW PUMP 1 – HP	BALDOR	MFG.	M3218T	MODEL
5	HW PUMP 2 – HP	BALDOR	MFG.	M3218T	MODEL
	HW PUMP 3 – HP		MFG.		MODEL
COMMENT:					

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	0	0	0	0	0	0	0	
REQUIRED STOP TIME	2400	2400	2400	2400	2400	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	0	0						1	1

CONTROLS:

		PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		PSIG		HW SUPPLY					
RESET CONTROL (oF)		HW HIGH		HW LOW		OA LOW		OA HIGH	
BURNER CONTROLS		O2 TRIM (Y/N)		OTHER					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1382

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: CEL
CHECKED BY: CEL
FILE: 1382BLR2

BOILER & CONVERTER SURVEY OBSERVATIONS

BLR-2	BOILER/CONVERTER NO.	MER	LOCATION (RM)
	SOURCE OF HEATING (PLANT)	CAR WASH	SERVES AREA

UNIT TYPE:

	STEAM		PSIG	X	HW		TEMP.		BOILER TYPE:
	NO.2 OIL		NO.6 OIL		N.GAS		ELEC		FUELS:
	STM/HW		HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:
	SPACE HEAT		DHW		OTHER				USE:
COMMENT:							0%		% HTG AREA SERVED
									BB RADIATION ONLY

NAMEPLATE:

RAYPAK	MFG.		MODEL		CAPACITY OUTPUT (BTUH)
					CAPACITY INPUT (BTUH)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)
					CAPACITY INPUT (BTUH)
5	HW PUMP 1 - HP	BALDOR	MFG.	M3218T	MODEL
5	HW PUMP 2 - HP	BALDOR	MFG.	M3218T	MODEL
	HW PUMP 3 - HP		MFG.		MODEL
COMMENT:					

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	0	0	0	0	0	0	0	
REQUIRED STOP TIME	2400	2400	2400	2400	2400	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	0	0						1	1

CONTROLS:

		PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		PSIG		HW SUPPLY					
RESET CONTROL (oF)		HW HIGH		HW LOW		OA LOW		OA HIGH	
BURNER CONTROLS		O2 TRIM (Y/N)		OTHER					
COMMENTS:									

FIELD SURVEY NOTES

BUILDING 1383

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1383

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1383BLG

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 1383 BLDG NAME: AUTO CRAFT SHOP

ZONE NO.	1	FUNCTION: AUTO CRAFT SHOP							
OCCUPANCY HOURS:	M-F	1100	TO	1900	SAT	1000	TO	1700	
	SUN	1000	TO	1700					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

REMARKS:

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1383

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: DR
CHECKED BY: CEL
FILE: 1383UH1

AIR HANDLING UNIT SURVEY OBSERVATIONS

UH-1	AHU NO.	SHOP REPAIR BAY	LOCATION (RM)
	REF. SYS. SERVING AHU	SHOP REPAIR BAY	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC	X	UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:	GAS-FIRED UNIT HEATER (CEILING MOUNTED) FUEL TYPE: PROPANE							

NAMEPLATE:

					MFG.				MODEL
0.3	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
2160	CFM-HTG	0	CFM-CLG	0%	MIN %OA	0%	MAX %OA	14.3%	% HTG AREA SERVED
COMMENT:									

COILS:

	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		FUEL OIL		HW		ELEC		MOD VLV	HEATING
	NONE		STM		HW		ELEC		MOD VLV	REHEAT
	NONE		STM		HW		EVAP MEDIA		MOD VLV	HUMID.
	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	1000	0	1100	1100	1100	1100	1000	
REQUIRED STOP TIME	1700	0	1900	1900	1900	1900	1700	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (°F):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (°F):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	N	(Y/N)		NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1383

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: DR
CHECKED BY: CEL
FILE: 1383UH2

AIR HANDLING UNIT SURVEY OBSERVATIONS

UH-2	AHU NO.	SHOP REPAIR BAY	LOCATION (RM)
	REF. SYS. SERVING AHU	SHOP REPAIR BAY	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC	X	UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:	GAS-FIRED UNIT HEATER (CEILING MOUNTED) FUEL TYPE: PROPANE							

NAMEPLATE:

					MFG.				MODEL
0.3	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
2160	CFM-HTG	0	CFM-CLG	0%	MIN %OA	0%	MAX %OA	14.3%	% HTG AREA SERVED
COMMENT:									

COILS:

	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		FUEL OIL		HW		ELEC		MOD VLV	HEATING
	NONE		STM		HW		ELEC		MOD VLV	REHEAT
	NONE		STM		HW		EVAP MEDIA		MOD VLV	HUMID.
	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	1000	0	1100	1100	1100	1100	1000	
REQUIRED STOP TIME	1700	0	1900	1900	1900	1900	1700	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (°F):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (°F):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	N	(Y/N)		NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1383

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: DR
CHECKED BY: CEL
FILE: 1383UH3

AIR HANDLING UNIT SURVEY OBSERVATIONS

UH-3	AHU NO.	SHOP REPAIR BAY	LOCATION (RM)
	REF. SYS. SERVING AHU	SHOP REPAIR BAY	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC	X	UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:	GAS-FIRED UNIT HEATER (CEILING MOUNTED) FUEL TYPE: PROPANE							

NAMEPLATE:

				MFG.				MODEL
0.3	SUPPLY FAN HP			MFG.				MODEL
	RET/EXH FAN HP			MFG.				MODEL
2160	CFM-HTG	0	CFM-CLG	0%	MIN %OA	0%	MAX %OA	14.3%	% HTG AREA SERVED
COMMENT:									

COILS:

	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		FUEL OIL		HW		ELEC		MOD VLV	HEATING
	NONE		STM		HW		ELEC		MOD VLV	REHEAT
	NONE		STM		HW		EVAP MEDIA		MOD VLV	HUMID.
	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	1000	0	1100	1100	1100	1100	1000	
REQUIRED STOP TIME	1700	0	1900	1900	1900	1900	1700	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (°F):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (°F):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	N	(Y/N)		NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1383

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: DR
CHECKED BY: CEL
FILE: 1383UH4

AIR HANDLING UNIT SURVEY OBSERVATIONS

UH-4	AHU NO.	SHOP REPAIR BAY	LOCATION (RM)
	REF. SYS. SERVING AHU	SHOP REPAIR BAY	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC	X	UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:	GAS-FIRED UNIT HEATER (CEILING MOUNTED) FUEL TYPE: PROPANE							

NAMEPLATE:

					MFG.				MODEL
0.3	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
2160	CFM-HTG	0	CFM-CLG	0%	MIN %OA	0%	MAX %OA	14.3%	% HTG AREA SERVED
COMMENT:									

COILS:

	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		FUEL OIL		HW		ELEC		MOD VLV	HEATING
	NONE		STM		HW		ELEC		MOD VLV	REHEAT
	NONE		STM		HW		EVAP MEDIA		MOD VLV	HUMID.
	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	1000	0	1100	1100	1100	1100	1000	
REQUIRED STOP TIME	1700	0	1900	1900	1900	1900	1700	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (°F):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (°F):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	N	(Y/N)		NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1383

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: DR
CHECKED BY: CEL
FILE: 1383UH5

AIR HANDLING UNIT SURVEY OBSERVATIONS

UH-5	AHU NO.	SHOP REPAIR BAY	LOCATION (RM)
	REF. SYS. SERVING AHU	SHOP REPAIR BAY	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC	X	UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:	GAS-FIRED UNIT HEATER (CEILING MOUNTED) FUEL TYPE: PROPANE							

NAMEPLATE:

					MFG.				MODEL
0.3	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
2160	CFM-HTG	0	CFM-CLG	0%	MIN %OA	0%	MAX %OA	14.3%	% HTG AREA SERVED
COMMENT:									

COILS:

	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		FUEL OIL		HW		ELEC		MOD VLV	HEATING
	NONE		STM		HW		ELEC		MOD VLV	REHEAT
	NONE		STM		HW		EVAP MEDIA		MOD VLV	HUMID.
	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	1000	0	1100	1100	1100	1100	1000	
REQUIRED STOP TIME	1700	0	1900	1900	1900	1900	1700	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (°F):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (°F):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	N	(Y/N)		NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1383

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: DR
CHECKED BY: CEL
FILE: 1383UH6

AIR HANDLING UNIT SURVEY OBSERVATIONS

UH-6	AHU NO.	SHOP REPAIR BAY	LOCATION (RM)
	REF. SYS. SERVING AHU	SHOP REPAIR BAY	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC	X	UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:	GAS-FIRED UNIT HEATER (CEILING MOUNTED) FUEL TYPE: PROPANE							

NAMEPLATE:

					MFG.				MODEL
0.3	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
2160	CFM-HTG	0	CFM-CLG	0%	MIN %OA	0%	MAX %OA	14.3%	% HTG AREA SERVED
COMMENT:									

COILS:

	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		FUEL OIL		HW		ELEC		MOD VLV	HEATING
	NONE		STM		HW		ELEC		MOD VLV	REHEAT
	NONE		STM		HW		EVAP MEDIA		MOD VLV	HUMID.
	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	1000	0	1100	1100	1100	1100	1000	
REQUIRED STOP TIME	1700	0	1900	1900	1900	1900	1700	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (°F):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (°F):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	N	(Y/N)		NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1383

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: DR
CHECKED BY: CEL
FILE: 1383UH7

AIR HANDLING UNIT SURVEY OBSERVATIONS

UH-7	AHU NO.	SHOP REPAIR BAY	LOCATION (RM)
	REF. SYS. SERVING AHU	SHOP REPAIR BAY	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC	X	UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:	GAS-FIRED UNIT HEATER (CEILING MOUNTED) FUEL TYPE: PROPANE							

NAMEPLATE:

					MFG.				MODEL
0.3	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
2160	CFM-HTG	0	CFM-CLG	0%	MIN %OA	0%	MAX %OA	14.3%	% HTG AREA SERVED
COMMENT:									

COILS:

	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		FUEL OIL		HW		ELEC		MOD VLV	HEATING
	NONE		STM		HW		ELEC		MOD VLV	REHEAT
	NONE		STM		HW		EVAP MEDIA		MOD VLV	HUMID.
	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	1000	0	1100	1100	1100	1100	1000	
REQUIRED STOP TIME	1700	0	1900	1900	1900	1900	1700	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (°F):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (°F):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	N	(Y/N)		NO					
COMMENTS:									

FIELD SURVEY NOTES

BUILDING 1390

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1390

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1390BLG

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 1390 BLDG NAME: RESERVE MOTOR POOL

ZONE NO.	1	FUNCTION: VEHICLE MAINTENANCE							
OCCUPANCY HOURS:	M-F	600	TO	1700	SAT	0	TO	0	
	SUN	0	TO	0					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

REMARKS:

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1390

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: CMD
CHECKED BY: CEL
FILE: 1390HV1

AIR HANDLING UNIT SURVEY OBSERVATIONS

HV-1	AHU NO.	ROOFTOP	LOCATION (RM)
BLR-1	REF. SYS. SERVING AHU	WORK BAY	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR	X	H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	OTHER				OTHER				
	COMMENT:								

NAMEPLATE:

TRANE					MFG.	PCC14-A-551A155A35			MODEL
5.0	SUPPLY FAN HP		MARATHON		MFG.	EC184TTDR7627ABWF1			MODEL
	RET/EXH FAN HP				MFG.				MODEL
8000	CFM-HTG	0	CFM-CLG	100%	MIN %OA	100%	MAX %OA	11%	% HTG AREA SERVED
COMMENT:									

COILS:

	NONE		STM	X	HW		ELEC		MOD VLV	PREHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
X	NONE		STM		HW		ELEC		MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	600	600	600	600	600	0	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):	75	OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	N	RA (Y/N)		EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT	X	OTHER	FACE & BYPASS
DEMAND LIMIT:	N	(Y/N)							
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1390

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: CMD
CHECKED BY: CEL
FILE: 1390HV2

AIR HANDLING UNIT SURVEY OBSERVATIONS

HV-2	AHU NO.	ROOFTOP	LOCATION (RM)
BLR-1	REF. SYS. SERVING AHU	WORK BAY	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR	X	H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	OTHER				OTHER				
	COMMENT:								

NAMEPLATE:

TRANE					MFG.	PCC14-A-551A155A35			MODEL
5.0	SUPPLY FAN HP		MARATHON		MFG.	EC184TTDR7627ABWF1			MODEL
	RET/EXH FAN HP				MFG.				MODEL
8000	CFM-HTG	0	CFM-CLG	100%	MIN %OA	100%	MAX %OA	11%	% HTG AREA SERVED
COMMENT:									

COILS:

	NONE		STM	X	HW		ELEC		MOD VLV	PREHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
X	NONE		STM		HW		ELEC		MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	600	600	600	600	600	0	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):	75	OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	N	RA (Y/N)		EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT	X	OTHER	FACE & BYPASS
DEMAND LIMIT:	N	(Y/N)							
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1390

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: CMD
CHECKED BY: CEL
FILE: 1390HV3

AIR HANDLING UNIT SURVEY OBSERVATIONS

HV-3	AHU NO.	ROOFTOP	LOCATION (RM)
BLR-1	REF. SYS. SERVING AHU	WORK BAY	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR	X	H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	OTHER				OTHER				
	COMMENT:								

NAMEPLATE:

TRANE					MFG.				MODEL
3.0	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
6000	CFM-HTG	0	CFM-CLG	100%	MIN %OA	100%	MAX %OA	11%	% HTG AREA SERVED
COMMENT:									

COILS:

	NONE		STM	X	HW		ELEC		MOD VLV	PREHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
X	NONE		STM		HW		ELEC		MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	600	600	600	600	600	0	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):	75	OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	N	RA (Y/N)		EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT	X	OTHER	FACE & BYPASS
DEMAND LIMIT:	N	(Y/N)							
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1390

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: BHS
CHECKED BY: CEL
FILE: 1390FC1

AIR HANDLING UNIT SURVEY OBSERVATIONS

FC-1	AHU NO.	WORK BAY	LOCATION (RM)
BLR-1	REF. SYS. SERVING AHU	WORK BAY	SERVES AREA

UNIT TYPE:

	SINGLE ZN	X	2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:	PERIMETER HEATING HW FAN COILS							

NAMEPLATE:

					MFG.				MODEL
1.1	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
7200	CFM-HTG		CFM-CLG	0%	MIN %OA	0%	MAX %OA	40.0%	% HTG AREA SERVED
COMMENT:	TOTAL CFM FOR ALL FAN COILS								

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		EVAP MEDIA		MOD VLV	HUMID.
X	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	600	600	600	600	600	0	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC	DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK		
SPACE SETPOINT (°F):		OCC HEAT		UNOCC HEAT		OCC COOL	UNOCC COOL	
OTHER SETPOINTS (°F):		HOT DECK		COLD DECK		MIXED AIR	OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)		RA (Y/N)	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT	OTHER	
DEMAND LIMIT:	N	(Y/N)						
COMMENTS:								

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1390

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1390RAD

PERIMETER RADIATION SURVEY OBSERVATIONS

RAD-1	PER RAD NO.	OFFICES & TOILETS	LOCATION (RM)
BLR-1	SOURCE OF HEATING	ALL	SERVES AREA

UNIT TYPE:

	STEAM	X	HW		ELECTRIC				
	OTHER								
	COMMENT:								

NAMEPLATE:

	HW PUMP 1 - HP		MFG.		MODEL
	HW PUMP 2 - HP		MFG.		MODEL
	HW PUMP 3 - HP		MFG.		MODEL
	HW PUMP 4 - HP		MFG.		MODEL
COMMENT:				26.6%	% AREA HEATING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	600	600	600	600	600	0	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
RADIATION CONTROL	X	NONE		2-WAY VLV		3-WAY VLV		OTHER	
SPACE SETPOINT (°F):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
RESET CONTROL (°F):		HW HIGH		HW LOW		OA LOW		OA HIGH	
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1390

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1390BLR

BOILER & CONVERTER SURVEY OBSERVATIONS

BLR-1	BOILER/CONVERTER NO.	MECH. RM.	LOCATION (RM)
	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	STEAM		PSIG	X	HW		TEMP.		BOILER TYPE:
X	NO.2 OIL		NO.6 OIL		N.GAS		ELEC		FUELS:
	STM/HW		HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:
X	SPACE HEAT		DHW		OTHER				USE:
COMMENT:							26.6%		% HTG AREA SERVED
									BB RADIATION ONLY

NAMEPLATE:

KEWANEE	MFG.	M265-KA	MODEL	2120000	CAPACITY OUTPUT (BTUH)
				2650000	CAPACITY INPUT (BTUH)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)
					CAPACITY INPUT (BTUH)

0.75	HW PUMP 1 - HP	UHs IN WORK BAYS	MFG.		MODEL
0.75	HW PUMP 2 - HP	HVs IN WORK BAYS	MFG.		MODEL
0.1	HW PUMP 3 - HP	RAD IN OFFICE AREA	MFG.		MODEL
COMMENT:					

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	0	600	600	600	600	600	0	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		PSIG		HW SUPPLY					
RESET CONTROL (oF)	N	HW HIGH	N	HW LOW	N	OA LOW	N	OA HIGH	
BURNER CONTROLS		O2 TRIM (Y/N)		OTHER					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1390

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1390AH1

AIR HANDLING UNIT SURVEY OBSERVATIONS

AC-1	AHU NO.	ABOVE OFFICES	LOCATION (RM)
DX-1	REF. SYS. SERVING AHU	ADMINISTRATION OFFICES	SERVES AREA

UNIT TYPE:

X	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:	NO CW PUMP							

NAMEPLATE:

NO NAME PLATE					MFG.				MODEL
0.3	SUPPLY FAN HP		NO NAME PLATE		MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
0	CFM-HTG	750	CFM-CLG	0%	MIN %OA	0%	MAX %OA	0%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE	X	DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	600	600	600	600	600	0	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON: 0

J	F	M	A	M	J	J	A	S	O	N	D
0	0	0	0	1	1	1	1	1	0	0	0

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	N	(Y/N)							
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1390

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1390CH1

REFRIGERATION EQUIPMENT SURVEY OBSERVATIONS

DX-1	CHILLER/COMPRESSOR NO.	AC-1 ABOVE OFFICES	LOCATION (RM)

UNIT TYPE:

	CENTRIFUGAL WITH WATER SIDE COOLING TOWER						OTHER
	RECIPROCATING WITH WATER SIDE COOLING TOWER					X	AHU'S SERVED AC-1
	RECIPROCATING WITH AIR COOLED CONDENSING UNIT						
	ABSORBTION WITH WATER SIDE COOLING TOWER						
	AIR COOLED CONDENSING UNIT						
	CHW	X	DX		OTHER		

NAMEPLATE:

CHILLER		MFG.	NO NAME PLATE			MODEL			SERIAL NO.
	VOLTS		MCA		PH		HZ	2.7	CAPACITY (TONS)
CONDENSER FANS		MFG.				MODEL			# OF FANS
	VOLTS		AMPS		PH		HZ		HP
DTW PUMP		MFG.				MODEL			SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP
CNW PUMP		MFG.				MODEL			SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP
COMMENTS:									

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	0	600	600	600	600	600	0	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
0	0	0	0	1	1	1	1	1	0	0	0

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		CWS (oF)		CWR (oF)		CNWS (oF)		CNWR (oF)	
PANEL INDICATORS									
- PRESSURE		LITE-HI		LITE-LOW		GAUGES			
- TEMPERATURE		LITE-HI		LITE-LOW		GAUGES			
- OTHER									
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1390

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1390DHW1

DOMESTIC HW SURVEY OBSERVATIONS

DHW-1	BOILER/CONVERTER NO.	MECH RM	LOCATION (RM)
ELEC.	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	NO.2 OIL		NO.6 OIL		N.GAS	X	ELEC		FUELS:
	STM/HW		HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:
COMMENT:									

NAMEPLATE:

A.O. SMITH	MFG.	DVE120 730	MODEL	16000	CAPACITY OUTPUT (WATTS)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)

DOMESTIC HW CIRCULATION PUMP: NONE

	HW PUMP 1 – HP		MFG.		MODEL
	HW PUMP 2 – HP		MFG.		MODEL
	HW PUMP 3 – HP		MFG.		MODEL

COMMENT:

DIMENSION:	24	DIAMETER (INCHES)	60	HEIGHT OR LENGTH (INCHES)	80 GALLON

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	600	600	600	600	600	0	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS				HW SUPPLY					
COMMENTS:									

FIELD SURVEY NOTES

BUILDING 1391

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1391

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1391BLG

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 1391 BLDG NAME: RESERVE MAINTENANCE

ZONE NO.	1	FUNCTION: MAINTENANCE							
OCCUPANCY HOURS:	M-F	600	TO	1700	SAT	0	TO	0	
	SUN	0	TO	0					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

REMARKS:

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1391

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1391UH1

AIR HANDLING UNIT SURVEY OBSERVATIONS

UH-1	AHU NO.	MAINT. SHOP	LOCATION (RM)
	REF. SYS. SERVING AHU	MAINT. SHOP	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC	X	UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:	GAS-FIRED UNIT HEATER (CEILING MOUNTED) FUEL TYPE: PROPANE							

NAMEPLATE:

CARRIER					MFG.	58GS			MODEL
0.3	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
1150	CFM-HTG	0	CFM-CLG	0%	MIN %OA	0%	MAX %OA	50.0%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
X	NONE		FUEL OIL		HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		EVAP MEDIA		MOD VLV	HUMID.
X	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	600	600	600	600	600	0	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (°F):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (°F):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	N	(Y/N)		NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1391

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1391UH2

AIR HANDLING UNIT SURVEY OBSERVATIONS

UH-2	AHU NO.	MAINT. SHOP	LOCATION (RM)
	REF. SYS. SERVING AHU	MAINT. SHOP	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC	X	UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:	GAS-FIRED UNIT HEATER (CEILING MOUNTED) FUEL TYPE: PROPANE							

NAMEPLATE:

CARRIER					MFG.	58GS			MODEL
0.3	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
1150	CFM-HTG	0	CFM-CLG	0%	MIN %OA	0%	MAX %OA	50.0%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
X	NONE		FUEL OIL		HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		EVAP MEDIA		MOD VLV	HUMID.
X	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	600	600	600	600	600	0	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (°F):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (°F):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	N	(Y/N)		NO					
COMMENTS:									

FIELD SURVEY NOTES

BUILDING 1601

FIELD SURVEY NOTES

TO: FILE, FT. LEONARD WOOD
FR: CARL LUNDSTROM
DT: 16 NOVEMBER 1992

RE: BLDG 1601, WATER TREATMENT PLANT

Regarding controls:

- From the river they pump water to the treatment plant.
- They have 4 electric and 1 diesel pump.
- Normally they run 2 pumps in the summer, and 1 pump in the winter
- They have two headers from the pump station to the plant
- They have flow meters on both headers
- They could use a totalizer and flow on each header into the plant
- They could use a flow and totalizer on headers out of plant
- They could use a turbidity measurement into plant
- They could use a turbidity and chlorine out of plant
- Chemical metering is OK now
- Elevated tank level is OK now
- DNR does not require pH metering

Regarding pumping:

- They really need a variable speed pumping system which could be monitored and controlled from the plant.
- The combinations of pumps at the river and wells doesn't give them much flexibility.
- When pumps go off from a momentary power trip, the pumps go off, and must be manually restarted.
- Until an extra man comes on first shift, the pumps can not be restarted.

FIELD SURVEY NOTES

BUILDING 1700

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1700

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1700BLG

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 1700 BLDG NAME: STORAGE

ZONE NO.	1	FUNCTION: STORAGE							
OCCUPANCY HOURS:	M-F	700	TO	1600	SAT	0	TO	0	
	SUN	0	TO	0					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

REMARKS:

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1700

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: DR
CHECKED BY: CEL
FILE: 1700UH1

AIR HANDLING UNIT SURVEY OBSERVATIONS

UH-1	AHU NO.	STORAGE AREA	LOCATION (RM)
NONE	REF. SYS. SERVING AHU	STORAGE AREA	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC	X	UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:	ELECTRIC							

NAMEPLATE:

NO NAME PLATE					MFG.				MODEL
0.1	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
700	CFM-HTG	0	CFM-CLG	0%	MIN %OA	0%	MAX %OA	16.7%	% HTG AREA SERVED
COMMENT:									

COILS:

	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		FUEL OIL		HW	X	ELEC		MOD VLV	HEATING
	NONE		STM		HW		ELEC		MOD VLV	REHEAT
	NONE		STM		HW		EVAP MEDIA		MOD VLV	HUMID.
	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	0	0	0	0	0	0	
REQUIRED STOP TIME	2200	2200	2200	2200	2200	2200	2200	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (°F):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (°F):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:		MIN OA (Y/N)		MAX OA (Y/N)		RA (Y/N)		EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:		YES	N	NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1700

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: DR
CHECKED BY: CEL
FILE: 1700UH2

AIR HANDLING UNIT SURVEY OBSERVATIONS

UH-2	AHU NO.	STORAGE AREA	LOCATION (RM)
NONE	REF. SYS. SERVING AHU	STORAGE AREA	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC	X	UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:	ELECTRIC							

NAMEPLATE:

NO NAME PLATE					MFG.				MODEL
0.1	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
700	CFM-HTG	0	CFM-CLG	0%	MIN %OA	0%	MAX %OA	16.7%	% HTG AREA SERVED
COMMENT:									

COILS:

	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		FUEL OIL		HW	X	ELEC		MOD VLV	HEATING
	NONE		STM		HW		ELEC		MOD VLV	REHEAT
	NONE		STM		HW		EVAP MEDIA		MOD VLV	HUMID.
	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	0	0	0	0	0	0	
REQUIRED STOP TIME	2200	2200	2200	2200	2200	2200	2200	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (°F):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (°F):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:		MIN OA (Y/N)		MAX OA (Y/N)		RA (Y/N)		EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:		YES	N	NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1700

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: DR
CHECKED BY: CEL
FILE: 1700UH3

AIR HANDLING UNIT SURVEY OBSERVATIONS

UH-3	AHU NO.	STORAGE AREA	LOCATION (RM)
NONE	REF. SYS. SERVING AHU	STORAGE AREA	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC	X	UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:	ELECTRIC							

NAMEPLATE:

NO NAME PLATE					MFG.				MODEL
0.1	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
700	CFM-HTG	0	CFM-CLG	0%	MIN %OA	0%	MAX %OA	16.7%	% HTG AREA SERVED
COMMENT:									

COILS:

	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		FUEL OIL		HW	X	ELEC		MOD VLV	HEATING
	NONE		STM		HW		ELEC		MOD VLV	REHEAT
	NONE		STM		HW		EVAP MEDIA		MOD VLV	HUMID.
	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	0	0	0	0	0	0	
REQUIRED STOP TIME	2200	2200	2200	2200	2200	2200	2200	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (°F):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (°F):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:		MIN OA (Y/N)		MAX OA (Y/N)		RA (Y/N)		EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:		YES	N	NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1700

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: DR
CHECKED BY: CEL
FILE: 1700UH4

AIR HANDLING UNIT SURVEY OBSERVATIONS

UH-4	AHU NO.	STORAGE AREA	LOCATION (RM)
NONE	REF. SYS. SERVING AHU	STORAGE AREA	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC	X	UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:	ELECTRIC							

NAMEPLATE:

NO NAME PLATE				MFG.				MODEL
0.1	SUPPLY FAN HP			MFG.				MODEL
	RET/EXH FAN HP			MFG.				MODEL
570	CFM-HTG	0	CFM-CLG	0%	MIN %OA	0%	MAX %OA	16.7%	% HTG AREA SERVED
COMMENT:									

COILS:

	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		FUEL OIL		HW	X	ELEC		MOD VLV	HEATING
	NONE		STM		HW		ELEC		MOD VLV	REHEAT
	NONE		STM		HW		EVAP MEDIA		MOD VLV	HUMID.
	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	0	0	0	0	0	0	
REQUIRED STOP TIME	2200	2200	2200	2200	2200	2200	2200	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (°F):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (°F):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:		MIN OA (Y/N)		MAX OA (Y/N)		RA (Y/N)		EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:		YES	N	NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1700

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: DR
CHECKED BY: CEL
FILE: 1700UH5

AIR HANDLING UNIT SURVEY OBSERVATIONS

UH-5	AHU NO.	STORAGE AREA	LOCATION (RM)
NONE	REF. SYS. SERVING AHU	STORAGE AREA	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC	X	UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:	ELECTRIC							

NAMEPLATE:

NO NAME PLATE				MFG.				MODEL
0.1	SUPPLY FAN HP			MFG.				MODEL
	RET/EXH FAN HP			MFG.				MODEL
570	CFM-HTG	0	CFM-CLG	0%	MIN %OA	0%	MAX %OA	16.7%	% HTG AREA SERVED
COMMENT:									

COILS:

	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		FUEL OIL		HW	X	ELEC		MOD VLV	HEATING
	NONE		STM		HW		ELEC		MOD VLV	REHEAT
	NONE		STM		HW		EVAP MEDIA		MOD VLV	HUMID.
	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	0	0	0	0	0	0	
REQUIRED STOP TIME	2200	2200	2200	2200	2200	2200	2200	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (°F):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (°F):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:		MIN OA (Y/N)		MAX OA (Y/N)		RA (Y/N)		EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:		YES	N	NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1700

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: DR
CHECKED BY: CEL
FILE: 1700UH6

AIR HANDLING UNIT SURVEY OBSERVATIONS

UH-6	AHU NO.	STORAGE AREA	LOCATION (RM)
NONE	REF. SYS. SERVING AHU	STORAGE AREA	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC	X	UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:	ELECTRIC							

NAMEPLATE:

NO NAME PLATE					MFG.				MODEL
0.1	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
570	CFM-HTG	0	CFM-CLG	0%	MIN %OA	0%	MAX %OA	16.7%	% HTG AREA SERVED
COMMENT:									

COILS:

	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		FUEL OIL		HW	X	ELEC		MOD VLV	HEATING
	NONE		STM		HW		ELEC		MOD VLV	REHEAT
	NONE		STM		HW		EVAP MEDIA		MOD VLV	HUMID.
	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	0	0	0	0	0	0	
REQUIRED STOP TIME	2200	2200	2200	2200	2200	2200	2200	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (°F):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (°F):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:		MIN OA (Y/N)		MAX OA (Y/N)		RA (Y/N)		EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:		YES	N	NO					
COMMENTS:									

FIELD SURVEY NOTES

BUILDING 1702
AND TYPICAL FOR
1701, 1706, AND 1707

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1702

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: CMD
CHECKED BY: CEL
FILE: 1702FC

AIR HANDLING UNIT SURVEY OBSERVATIONS

FC-1	AHU NO.	FRONT HALF	LOCATION (RM)
C.PLANT	REF. SYS. SERVING AHU	OFFICES	SERVES AREA

UNIT TYPE:

	SINGLE ZN	X	2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:	20 FAN COILS							

NAMEPLATE:

NOT ACCESSIBLE					MFG.				MODEL
2.0	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
13575	CFM-HTG	13575	CFM-CLG	0%	MIN %OA	0%	MAX %OA	100%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE		DX	X	CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	500	500	500	500	500	500	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	1700	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:	68	SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)		RA (Y/N)		EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	YES		NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1702

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: cmd
CHECKED BY: CEL
FILE: 1702HV1

AIR HANDLING UNIT SURVEY OBSERVATIONS

HV-1	AHU NO.	STORAGE	LOCATION (RM)
NA	REF. SYS. SERVING AHU	BAY 1	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR	X	H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

TRANE					MFG.	SER. K5L299560 TYPE L-6			MODEL
1.3	SUPPLY FAN HP		MARATHON		MFG.	DN182TTDR72808AWCCW			MODEL
	RET/EXH FAN HP				MFG.				MODEL
2400	CFM-HTG	0	CFM-CLG	10%	MIN %OA	100%	MAX %OA	20%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
X	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	500	500	500	500	500	500	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	1700	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	0	0	0	0	0	0	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:	X	SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):	68.9	OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):	NA	HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
	NA	MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	YES		NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1702

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: cmd
CHECKED BY: CEL
FILE: 1702HV2

AIR HANDLING UNIT SURVEY OBSERVATIONS

HV-2	AHU NO.	STORAGE	LOCATION (RM)
NA	REF. SYS. SERVING AHU	BAY 2	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR	X	H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

TRANE					MFG.	SER. K5L299560 TYPE L-6			MODEL
1.3	SUPPLY FAN HP		MARATHON		MFG.	DN182TTDR72808AWCCW			MODEL
	RET/EXH FAN HP				MFG.				MODEL
2400	CFM-HTG	0	CFM-CLG	10%	MIN %OA	100%	MAX %OA	20%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
X	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	500	500	500	500	500	500	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	1700	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	0	0	0	0	0	0	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:	X	SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):	68.9	OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):	NA	HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
	NA	MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	YES		NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1702

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: cmd
CHECKED BY: CEL
FILE: 1702HV3

AIR HANDLING UNIT SURVEY OBSERVATIONS

HV-3	AHU NO.	STORAGE	LOCATION (RM)
NA	REF. SYS. SERVING AHU	BAY 3	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR	X	H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

TRANE					MFG.	SER. K5L299560 TYPE L-6			MODEL
1.3	SUPPLY FAN HP		MARATHON		MFG.	DN182TTDR72808AWCCW			MODEL
	RET/EXH FAN HP				MFG.				MODEL
2400	CFM-HTG	0	CFM-CLG	10%	MIN %OA	100%	MAX %OA	20%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
X	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	500	500	500	500	500	500	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	1700	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	0	0	0	0	0	0	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:	X	SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):	68.9	OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):	NA	HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
	NA	MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	YES		NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1702

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: cmd
CHECKED BY: CEL
FILE: 1702HV4

AIR HANDLING UNIT SURVEY OBSERVATIONS

HV-4	AHU NO.	STORAGE	LOCATION (RM)
NA	REF. SYS. SERVING AHU	BAY 4	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR	X	H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

TRANE					MFG.	SER. K5L299560 TYPE L-6			MODEL
1.3	SUPPLY FAN HP		MARATHON		MFG.	DN182TTDR72808AWCCW			MODEL
	RET/EXH FAN HP				MFG.				MODEL
2400	CFM-HTG	0	CFM-CLG	10%	MIN %OA	100%	MAX %OA	20%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
X	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	500	500	500	500	500	500	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	1700	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	0	0	0	0	0	0	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:	X	SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):	68.9	OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):	NA	HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
	NA	MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	YES		NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1702

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: cmd
CHECKED BY: CEL
FILE: 1702HV5

AIR HANDLING UNIT SURVEY OBSERVATIONS

HV-5	AHU NO.	STORAGE	LOCATION (RM)
NA	REF. SYS. SERVING AHU	BAY 5	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR	X	H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

TRANE					MFG.	SER. K5L299560 TYPE L-6			MODEL
1.3	SUPPLY FAN HP		MARATHON		MFG.	DN182TTDR72808AWCCW			MODEL
	RET/EXH FAN HP				MFG.				MODEL
2400	CFM-HTG	0	CFM-CLG	10%	MIN %OA	100%	MAX %OA	20%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
X	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	500	500	500	500	500	500	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	1700	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	0	0	0	0	0	0	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:	X	SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):	68.9	OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):	NA	HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
	NA	MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	YES		NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1702

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: KC
CHECKED BY: CEL
FILE: 1702CV

BOILER & CONVERTER SURVEY OBSERVATIONS

CV-1	BOILER/CONVERTER NO.	MER	LOCATION (RM)
C.PLANT	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	STEAM		PSIG		HW		TEMP.		BOILER TYPE:
	NO.2 OIL		NO.6 OIL		N.GAS		ELEC		FUELS:
	STM/HW	X	HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:
X	SPACE HEAT		DHW		OTHER				USE:
COMMENT:									% HTG AREA SERVED
									BB RADIATION ONLY

NAMEPLATE:

NOT AVAILABLE	MFG.		MODEL	383125	CAPACITY OUTPUT (BTUH)
				383125	CAPACITY INPUT (BTUH)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)
					CAPACITY INPUT (BTUH)
3	HW PUMP 1 - HP	BELL & GOSSETT	MFG.	1531-1/2BB81/4BF	MODEL
1.5	HW PUMP 2 - HP	BELL & GOSSETT	MFG.	#6017T	MODEL
	HW PUMP 3 - HP		MFG.		MODEL
COMMENT:	PUMP #1 SERVES FAN COIL UNIT				
	PUMP #2 SERVES H&V UNITS				

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	500	500	500	500	500	500	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	1700	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1							1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		PSIG	155	HW SUPPLY					
RESET CONTROL (oF)	X	HW HIGH		HW LOW		OA LOW		OA HIGH	
BURNER CONTROLS		O2 TRIM (Y/N)		OTHER					
COMMENTS:	RESET TEMP NOT AVAILABLE								

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1702

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: CMD
CHECKED BY: CEL
FILE: 1702DHW

DOMESTIC HW SURVEY OBSERVATIONS

DHW-1	BOILER/CONVERTER NO.	MER	LOCATION (RM)
	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	NO.2 OIL		NO.6 OIL		N.GAS	X	ELEC		FUELS:
	STM/HW		HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:

COMMENT:

NAMEPLATE:

RUUD	MFG.	RP82-2	MODEL	6	CAPACITY OUTPUT (BTUH,KW)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH,KW)

DOMESTIC HW CIRCULATION PUMP:				
0.1	HW PUMP 1 – HP	TACO	MFG.	MODEL
	HW PUMP 2 – HP		MFG.	MODEL
	HW PUMP 3 – HP		MFG.	MODEL

COMMENT:

DIMENSION:	24	DIAMETER (INCHS)	58	HEIGHT OR LENGTH (INCHES)	82 GALLON

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	500	500	500	500	500	500	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	1700	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS				HW SUPPLY					

COMMENTS:

FIELD SURVEY NOTES

BUILDING 1703 AND 1704

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 1703 BLDG NAME: BATTALION HQ

ZONE NO.	1	FUNCTION: ADMINISTRATION/CLASSROOMS							
OCCUPANCY HOURS:	M-F	800	TO	1700	SAT	800	TO	1700	
	SUN	800	TO	1700					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

REMARKS:

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1703

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1703AH1

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-1	AHU NO.	MECH. ROOM	LOCATION (RM)
C. PLANT	REF. SYS. SERVING AHU	OFFICES & CLASSROOMS	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
X	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
7	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

TRANE					MFG.	LZ-25			MODEL
7.5	SUPPLY FAN HP		LINCOLN		MFG.	627003			MODEL
	RET/EXH FAN HP				MFG.				MODEL
13275	CFM-HTG	13275	CFM-CLG	10%	MIN %OA	100%	MAX %OA	66%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE		DX	X	CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	800	800	800	800	800	800	800	
REQUIRED STOP TIME	1700	1700	1700	1700	1700	1700	1700	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	RESET FROM SPACE
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	Y	EA (Y/N)	THERMOSTATS
	Y	MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	YES		NO					
COMMENTS:	CONTROLS ARE IN GOOD CONDITION								

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1703

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1703FC1

AIR HANDLING UNIT SURVEY OBSERVATIONS

FC-1	AHU NO.	STORAGE AREAS	LOCATION (RM)
C. PLANT	REF. SYS. SERVING AHU	ALL	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC	X	4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

					MFG.				MODEL
2.0	SUPPLY FAN HP				MFG.				MODEL
0.0	RET/EXH FAN HP				MFG.				MODEL
6280	CFM-HTG	6280	CFM-CLG	0%	MIN %OA	0%	MAX %OA	34.0%	% HTG AREA SERVED
COMMENT:		TOTAL CFM FOR 8 FAN COILS							

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		EVAP MEDIA		MOD VLV	HUMID.
	NONE		DX	X	CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	800	800	800	800	800	800	800	
REQUIRED STOP TIME	1700	1700	1700	1700	1700	1700	1700	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (°F):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (°F):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:		MIN OA (Y/N)		MAX OA (Y/N)		RA (Y/N)		EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:		YES	X	NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1703

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1703PMP1

REFRIGERATION EQUIPMENT SURVEY OBSERVATIONS

CHW PUMP	CHILLER/COMPRESSOR NO.	MECH. ROOM	LOCATION (RM)

UNIT TYPE:

	CENTRIFUGAL WITH WATER SIDE COOLING TOWER						OTHER
	RECIPROCATING WITH WATER SIDE COOLING TOWER					X	AHU'S SERVED **AHU-1**
	RECIPROCATING WITH AIR COOLED CONDENSING UNIT						
	ABSORBTION WITH WATER SIDE COOLING TOWER						
	AIR COOLED CONDENSING UNIT						
	CHW		DX	X	OTHER		**CHW PUMP ONLY**

NAMEPLATE:

CHILLER		MFG.				MODEL				SERIAL NO.
	VOLTS		AMPS		PH		HZ		CAPACITY (TONS)	
CONDENSER FANS		MFG.				MODEL				# OF FANS
	VOLTS		AMPS		PH		HZ		HP	
CW PUM **B & G**		MFG.	**1531-2AB6-1/2 BA**			MODEL				SERIAL NO.
230	VOLTS	**5**	AMPS	**3**	PH	**60**	HZ	**2**	HP	
CNW PUMP		MFG.				MODEL				SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP	
COMMENTS:										

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	**0**	**0**	**0**	**0**	**0**	**0**	**0**	TIMECLOCK?
PRESENT STOP TIME	**2400**	**2400**	**2400**	**2400**	**2400**	**2400**	**2400**	**NO TIMECLOCK**
REQUIRED START TIME	**800**	**800**	**800**	**800**	**800**	**800**	**800**	
REQUIRED STOP TIME	**1700**	**1700**	**1700**	**1700**	**1700**	**1700**	**1700**	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		CWS (oF)		CWR (oF)		CNWS (oF)		CNWR (oF)	
PANEL INDICATORS									
- PRESSURE		LITE-HI		LITE-LOW		GAUGES			
- TEMPERATURE		LITE-HI		LITE-LOW		GAUGES			
- OTHER									

COMMENTS:

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1703

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1703PMP2

REFRIGERATION EQUIPMENT SURVEY OBSERVATIONS

CHW PUMP	CHILLER/COMPRESSOR NO.	MECH. ROOM	LOCATION (RM)

UNIT TYPE:

	CENTRIFUGAL WITH WATER SIDE COOLING TOWER						OTHER
	RECIPROCATING WITH WATER SIDE COOLING TOWER					X	AHU'S SERVED **FAN COILS**
	RECIPROCATING WITH AIR COOLED CONDENSING UNIT						
	ABSORBTION WITH WATER SIDE COOLING TOWER						
	AIR COOLED CONDENSING UNIT						
	CHW		DX	X	OTHER		**CHW PUMP ONLY**

NAMEPLATE:

CHILLER		MFG.				MODEL			SERIAL NO.
	VOLTS		AMPS		PH		HZ		CAPACITY (TONS)
CONDENSER FANS		MFG.				MODEL			# OF FANS
	VOLTS		AMPS		PH		HZ		HP
CW PUM **DAYTON**		MFG.	**6K22BB**			MODEL			SERIAL NO.
	VOLTS		AMPS		PH		HZ	**0.33**	HP
CNW PUMP		MFG.				MODEL			SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP

COMMENTS:

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	**0**	**0**	**0**	**0**	**0**	**0**	**0**	TIMECLOCK?
PRESENT STOP TIME	**2400**	**2400**	**2400**	**2400**	**2400**	**2400**	**2400**	**NO TIMECLOCK**
REQUIRED START TIME	**800**	**800**	**800**	**800**	**800**	**800**	**800**	
REQUIRED STOP TIME	**1700**	**1700**	**1700**	**1700**	**1700**	**1700**	**1700**	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		CWS (oF)		CWR (oF)		CNWS (oF)		CNWR (oF)	
PANEL INDICATORS									
- PRESSURE		LITE-HI		LITE-LOW		GAUGES			
- TEMPERATURE		LITE-HI		LITE-LOW		GAUGES			
- OTHER									

COMMENTS:

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1703

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1703CV1

BOILER & CONVERTER SURVEY OBSERVATIONS

CV-1	BOILER/CONVERTER NO.	MECH. RM.	LOCATION (RM)
C. PLANT	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	STEAM		PSIG		HW		TEMP.		BOILER TYPE:
	NO.2 OIL		NO.6 OIL		N.GAS		ELEC		FUELS:
	STM/HW	X	HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:
X	SPACE HEAT		DHW		OTHER				USE:
COMMENT:							0%		% HTG AREA SERVED
									BB RADIATION ONLY

NAMEPLATE:

NO NAME PLATE	MFG.		MODEL	367400	CAPACITY OUTPUT (BTUH)
				367400	CAPACITY INPUT (BTUH)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)
					CAPACITY INPUT (BTUH)
0.75	HW PUMP 1 - HP	CENTURY	MFG.	NO. 8-332974-02	MODEL
	HW PUMP 2 - HP		MFG.		MODEL
	HW PUMP 3 - HP		MFG.		MODEL
COMMENT:					

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	800	800	800	800	800	800	800	
REQUIRED STOP TIME	1700	1700	1700	1700	1700	1700	1700	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		PSIG		HW SUPPLY					
RESET CONTROL (oF)		HW HIGH		HW LOW		OA LOW		OA HIGH	
BURNER CONTROLS		O2 TRIM (Y/N)		OTHER					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1703

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1703DHW1

DOMESTIC HW SURVEY OBSERVATIONS

DHW-1	BOILER/CONVERTER NO.	MECH RM	LOCATION (RM)
ELEC.	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	NO.2 OIL		NO.6 OIL		N.GAS	X	ELEC		FUELS:
	STM/HW		HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:
COMMENT:									

NAMEPLATE:

RUUD	MFG.	RP40-1	MODEL	6000	CAPACITY OUTPUT (WATTS)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)

DOMESTIC HW CIRCULATION PUMP: YES

0.063	HW PUMP 1 - HP	TACO	MFG.		MODEL
	HW PUMP 2 - HP		MFG.		MODEL
	HW PUMP 3 - HP		MFG.		MODEL

COMMENT:

DIMENSION:	24	DIAMETER (INCHES)	58	HEIGHT OR LENGTH (INCHES)	40 GALLON

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	800	800	800	800	800	800	800	
REQUIRED STOP TIME	1700	1700	1700	1700	1700	1700	1700	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS				HW SUPPLY					
COMMENTS:									

FIELD SURVEY NOTES

BUILDING 1705

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1705

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1705BLG

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 1705 BLDG NAME: ADMINISTRATION/COURTROOM

ZONE NO.	1	FUNCTION: ADMINISTRATION/COURTROOM							
OCCUPANCY HOURS:	M-F	700	TO	1700	SAT	700	TO	1700	
	SUN	700	TO	1700					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

REMARKS:

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1705

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1705AH1

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-1	AHU NO.	MECH. ROOM	LOCATION (RM)
CH-1	REF. SYS. SERVING AHU	ALL	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
X	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
6	NUMBER OF ZONES				OTHER				
	COMMENT:	PNEUMATIC ACTUATORS							

NAMEPLATE:

TRANE					MFG.	K5L299541			MODEL
10.0	SUPPLY FAN HP		MARATHON		MFG.	DK215TTDR7359AASF1			MODEL
	RET/EXH FAN HP				MFG.				MODEL
14000	CFM-HTG	14000	CFM-CLG	10%	MIN %OA	30%	MAX %OA	100%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE		DX	X	CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	700	700	700	700	700	700	700	
REQUIRED STOP TIME	1700	1700	1700	1700	1700	1700	1700	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:	X	SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	YES		NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1705

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1705CH1

REFRIGERATION EQUIPMENT SURVEY OBSERVATIONS

CH-1	CHILLER/COMPRESSOR NO.	OUTSIDE BLDG	LOCATION (RM)

UNIT TYPE:

	CENTRIFUGAL WITH WATER SIDE COOLING TOWER		OTHER
	RECIPROCATING WITH WATER SIDE COOLING TOWER	X	AHU'S SERVED AHU-1
X	RECIPROCATING WITH AIR COOLED CONDENSING UNIT		
	ABSORBTION WITH WATER SIDE COOLING TOWER		
	AIR COOLED CONDENSING UNIT		

X	CHW		DX		OTHER		

NAMEPLATE:

CHILLER	TSI	MFG.	GA2CSB			MODEL				SERIAL NO.
208	VOLTS	102	AMPS	3	PH	60	HZ	30	CAPACITY (TONS)	
CONDENSER FANS		MFG.				MODEL			2	# OF FANS
208	VOLTS	4.8	AMPS	3	PH	60	HZ	1	HP	
CW PUM	B & G	MFG.	M98550			MODEL				SERIAL NO.
200	VOLTS	4.95	AMPS	3	PH	60	HZ	1	HP	
CNW PUMP		MFG.				MODEL				SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP	

COMMENTS: TOTAL MCA IS 125, 1 COMPRESSER

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO TIMECLOCK
REQUIRED START TIME	700	700	700	700	700	700	700	
REQUIRED STOP TIME	1700	1700	1700	1700	1700	1700	1700	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
0	0	0	0	1	1	1	1	1	0	0	0

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		CWS (oF)		CWR (oF)		CNWS (oF)		CNWR (oF)	
PANEL INDICATORS									
- PRESSURE		LITE-HI		LITE-LOW		GAUGES			
- TEMPERATURE		LITE-HI		LITE-LOW		GAUGES			
- OTHER									

COMMENTS: HAS A FLOW SWITCH

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1705

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1705CV1

BOILER & CONVERTER SURVEY OBSERVATIONS

CV-1	BOILER/CONVERTER NO.	MECH. RM.	LOCATION (RM)
C. PLANT	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	STEAM		PSIG		HW		TEMP.		BOILER TYPE:
	NO.2 OIL		NO.6 OIL		N.GAS		ELEC		FUELS:
	STM/HW	X	HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:
X	SPACE HEAT		DHW		OTHER				USE:
COMMENT:							0%		% HTG AREA SERVED
									BB RADIATION ONLY

NAMEPLATE:

NO NAME PLATE	MFG.		MODEL	294400	CAPACITY OUTPUT (BTUH)
				294400	CAPACITY INPUT (BTUH)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)
					CAPACITY INPUT (BTUH)
1	HW PUMP 1 - HP	BELL & GOSSETT	MFG.	NO. 60-16T-JR	MODEL
	HW PUMP 2 - HP		MFG.		MODEL
	HW PUMP 3 - HP		MFG.		MODEL
COMMENT:					

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	700	700	700	700	700	700	700	
REQUIRED STOP TIME	1700	1700	1700	1700	1700	1700	1700	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		PSIG	200	HW SUPPLY					HAS O.A. RESET
RESET CONTROL (oF):		HW HIGH		HW LOW		OA LOW		OA HIGH	CONTROL
BURNER CONTROLS		O2 TRIM (Y/N)		OTHER					
COMMENTS:	CONTROLS ARE IN GOOD CONDITION								
	NEW CONTROL AIR COMPRESSER								
	HAS TWO-WAY VALVE ON CW RETURN								

FIELD SURVEY NOTES

BUILDING 1711

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1711

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1711BLG

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 1711 BLDG NAME: PX

ZONE NO.	1	FUNCTION: STORE/SNACK BAR						
OCCUPANCY HOURS:	M-F	1100	TO	1400	SAT	0	TO	0
	SUN	0	TO	0				
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F			
	SUMMER OCC	°F		UNOCC	°F			

ZONE NO.		FUNCTION:						
OCCUPANCY HOURS:	M-F		TO		SAT		TO	
	SUN		TO					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F			
	SUMMER OCC	°F		UNOCC	°F			

ZONE NO.		FUNCTION:						
OCCUPANCY HOURS:	M-F		TO		SAT		TO	
	SUN		TO					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F			
	SUMMER OCC	°F		UNOCC	°F			

REMARKS:

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1711

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1711AH1

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-1	AHU NO.	MECH. RM.	LOCATION (RM)
C.P.	REF. SYS. SERVING AHU	ALL	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
X	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
3	NUMBER OF ZONES				OTHER				
	COMMENT:	PNEUMATIC ACTUATORS							

NAMEPLATE:

TRANE					MFG.	TYPE LZ-21			MODEL
7.5	SUPPLY FAN HP		MARATHON		MFG.	DL213TTOR7359AAWF1			MODEL
	RET/EXH FAN HP				MFG.				MODEL
12010	CFM-HTG	12010	CFM-CLG	30%	MIN %OA	100%	MAX %OA	100%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE		DX	X	CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	0	1100	1100	1100	1100	1100	0	
REQUIRED STOP TIME	0	1400	1400	1400	1400	1400	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	YES		NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1711

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1711CV1

BOILER & CONVERTER SURVEY OBSERVATIONS

CV-1	BOILER/CONVERTER NO.	MECH. RM.	LOCATION (RM)
C.P.	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	STEAM		PSIG		HW		TEMP.		BOILER TYPE:
	NO.2 OIL		NO.6 OIL		N.GAS		ELEC		FUELS:
	STM/HW	X	HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:
	SPACE HEAT		DHW		OTHER				USE:
COMMENT:							100%	% HTG AREA SERVED	
								BB RADIATION ONLY	

NAMEPLATE:

NO NAME PLATE	MFG.		MODEL	385380	CAPACITY OUTPUT (BTUH)
				385380	CAPACITY INPUT (BTUH)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)
					CAPACITY INPUT (BTUH)
0.75	HW PUMP 1 - HP	BELL & GOSSETT	MFG.	NOT AVAILABLE	MODEL
	HW PUMP 2 - HP		MFG.		MODEL
	HW PUMP 3 - HP		MFG.		MODEL
COMMENT:					

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	0	1100	1100	1100	1100	1100	0	
REQUIRED STOP TIME	0	1400	1400	1400	1400	1400	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		PSIG		HW SUPPLY					
RESET CONTROL (oF)		HW HIGH		HW LOW		OA LOW		OA HIGH	
BURNER CONTROLS		O2 TRIM (Y/N)		OTHER					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1711

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1711PMP

REFRIGERATION EQUIPMENT SURVEY OBSERVATIONS

CHW PUMP	CHILLER/COMPRESSOR NO.	MECH. ROOM	LOCATION (RM)

UNIT TYPE:

	CENTRIFUGAL WITH WATER SIDE COOLING TOWER						OTHER
	RECIPROCATING WITH WATER SIDE COOLING TOWER					X	AHU'S SERVED **AHU-1**
	RECIPROCATING WITH AIR COOLED CONDENSING UNIT						
	ABSORBTION WITH WATER SIDE COOLING TOWER						
	AIR COOLED CONDENSING UNIT						
	CHW		DX	X	OTHER		**CHW PUMP ONLY**

NAMEPLATE:

CHILLER		MFG.				MODEL				SERIAL NO.
	VOLTS		AMPS		PH		HZ		CAPACITY (TONS)	
TOWER		MFG.				MODEL				# OF FANS
	VOLTS		AMPS		PH		HZ		HP	
CW PUM *		MFG.	**M98541**			MODEL				SERIAL NO.
208	VOLTS	**5**	AMPS	**3**	PH	**60**	HZ	**1.5**	HP	
CNW PUMP		MFG.				MODEL				SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP	
COMMENTS:		*** BELL & GOSSETT**								

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	**0**	**0**	**0**	**0**	**0**	**0**	**0**	TIMECLOCK?
PRESENT STOP TIME	**2400**	**2400**	**2400**	**2400**	**2400**	**2400**	**2400**	**NO TIMECLOCK**
REQUIRED START TIME	**0**	**1100**	**1100**	**1100**	**1100**	**1100**	**0**	
REQUIRED STOP TIME	**0**	**1400**	**1400**	**1400**	**1400**	**1400**	**0**	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
0	**0**	**0**	**0**	**1**	**1**	**1**	**1**	**1**	**0**	**0**	**0**

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		CWS (oF)		CWR (oF)		CNWS (oF)		CNWR (oF)	
PANEL INDICATORS									
- PRESSURE		LITE-HI		LITE-LOW		GAUGES			
- TEMPERATURE		LITE-HI		LITE-LOW		GAUGES			
- OTHER									

COMMENTS:

FIELD SURVEY NOTES

BUILDING 1712

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 1712 BLDG NAME: CHAPEL

ZONE NO.	1	FUNCTION: CHURCH							
OCCUPANCY HOURS:	M-F	1700	TO	1800	SAT	1700	TO	1800	
	SUN	800	TO	1200					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.	2	FUNCTION: ADMINISTRATION OFFICES							
OCCUPANCY HOURS:	M-F	800	TO	1600	SAT	1700	TO	1800	
	SUN	800	TO	1200					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

REMARKS:

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1712

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1712AH1

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-1	AHU NO.	MECH. ROOM	LOCATION (RM)
C. PLANT	REF. SYS. SERVING AHU	CHAPEL SANCTUARY (ZN1)	SERVES AREA

UNIT TYPE:

X	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

TRANE					MFG.	TYPE L-6			MODEL
3.0	SUPPLY FAN HP		MARATHON		MFG.	EVL182TTDR7627ACWF1			MODEL
	RET/EXH FAN HP				MFG.				MODEL
4600	CFM-HTG	4600	CFM-CLG	10%	MIN %OA	30%	MAX %OA	44%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE		DX	X	CW			X	MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	800	1700	1700	1700	1700	1700	1700	
REQUIRED STOP TIME	1200	1800	1800	1800	1800	1800	1800	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:	X	SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):	68	OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	YES		NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1712

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1712AH2

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-2	AHU NO.	MECH. ROOM	LOCATION (RM)
C. PLANT	REF. SYS. SERVING AHU	CHAPEL SANCTUARY (ZN1)	SERVES AREA

UNIT TYPE:

X	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

TRANE					MFG.	TYPE L-10			MODEL
2.0	SUPPLY FAN HP		NO NAME PLATE		MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
3000	CFM-HTG	3000	CFM-CLG	10%	MIN %OA	50%	MAX %OA	34%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE		DX	X	CW			X	MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	800	1700	1700	1700	1700	1700	1700	
REQUIRED STOP TIME	1200	1800	1800	1800	1800	1800	1800	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:	X	SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):	68	OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	YES		NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1712

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1712AH3

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-3	AHU NO.	MECH. ROOM	LOCATION (RM)
C. PLANT	REF. SYS. SERVING AHU	CHAPEL SANCTUARY (ZN1)	SERVES AREA

UNIT TYPE:

X	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

NO NAME PLATE					MFG.				MODEL
1.5	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
1700	CFM-HTG	1700	CFM-CLG	10%	MIN %OA	100%	MAX %OA	22%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE		DX	X	CW			X	MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	800	1700	1700	1700	1700	1700	1700	
REQUIRED STOP TIME	1200	1800	1800	1800	1800	1800	1800	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:	X	SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):	68	OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	YES		NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1712

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1712PMP

REFRIGERATION EQUIPMENT SURVEY OBSERVATIONS

CHW PUMP	CHILLER/COMPRESSOR NO.	MECH. ROOM	LOCATION (RM)

UNIT TYPE:

	CENTRIFUGAL WITH WATER SIDE COOLING TOWER						OTHER	
	RECIPROCATING WITH WATER SIDE COOLING TOWER					X	AHU'S SERVED	**AHU-1, AHU-2, &**
	RECIPROCATING WITH AIR COOLED CONDENSING UNIT							**AHU-3; ZONE 1**
	ABSORBTION WITH WATER SIDE COOLING TOWER							
	AIR COOLED CONDENSING UNIT							
	CHW		DX	X	OTHER		**CHW PUMP ONLY**	

NAMEPLATE:

CHILLER		MFG.				MODEL				SERIAL NO.
	VOLTS		AMPS		PH		HZ		CAPACITY (TONS)	
CONDENSER FANS		MFG.				MODEL				# OF FANS
	VOLTS		AMPS		PH		HZ		HP	
DTW PUMP		MFG.	**NO NAME PLATE**			MODEL				SERIAL NO.
230	VOLTS	**5**	AMPS	**3**	PH	**60**	HZ	**2**	HP	
CNW PUMP		MFG.				MODEL				SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP	
COMMENTS:										

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	**0**	**0**	**0**	**0**	**0**	**0**	**0**	TIMECLOCK?
PRESENT STOP TIME	**2400**	**2400**	**2400**	**2400**	**2400**	**2400**	**2400**	**NO TIMECLOCK**
REQUIRED START TIME	**800**	**800**	**800**	**800**	**800**	**800**	**1700**	
REQUIRED STOP TIME	**1200**	**1600**	**1600**	**1600**	**1600**	**1600**	**1800**	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		CWS (oF)		CWR (oF)		CNWS (oF)		CNWR (oF)	
PANEL INDICATORS									
- PRESSURE		LITE-HI		LITE-LOW		GAUGES			
- TEMPERATURE		LITE-HI		LITE-LOW		GAUGES			
- OTHER									

COMMENTS:

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1712

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1712CV1

BOILER & CONVERTER SURVEY OBSERVATIONS

CV-1	BOILER/CONVERTER NO.	MECH. RM.	LOCATION (RM)
C. PLANT	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	STEAM		PSIG		HW		TEMP.		BOILER TYPE:
	NO.2 OIL		NO.6 OIL		N.GAS		ELEC		FUELS:
	STM/HW	X	HTHW/HW		HTHW/STM		OTHER	S&T	CONVERTER TYPE:
	SPACE HEAT		DHW		OTHER				USE:
COMMENT:	EXP. TANK IS WATER LOGGED						0%		% HTG AREA SERVED
	DUAL TEMPERATURE SYSTEM								BB RADIATION ONLY

NAMEPLATE:

NO NAME PLATE	MFG.		MODEL	585516	CAPACITY OUTPUT (BTUH)
				585516	CAPACITY INPUT (BTUH)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)
					CAPACITY INPUT (BTUH)
2	DTW PUMP 1 - HP	NO NAME PLATE	MFG.		MODEL
	HW PUMP 2 - HP		MFG.		MODEL
	COND. PUMP - HP		MFG.		MODEL
COMMENT:					

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO TIMECLOCK
REQUIRED START TIME	800	800	800	800	800	800	1700	
REQUIRED STOP TIME	1200	1600	1600	1600	1600	1600	1800	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		PSIG		HW SUPPLY					
RESET CONTROL (oF)		HW HIGH		HW LOW		OA LOW		OA HIGH	
BURNER CONTROLS		O2 TRIM (Y/N)		OTHER					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1712

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: BHS
CHECKED BY: CEL
FILE: 1712FC1

AIR HANDLING UNIT SURVEY OBSERVATIONS

FC-1	AHU NO.	OFFICE AREA (ZN#)	LOCATION (RM)
C. PLANT	REF. SYS. SERVING AHU	ALL	SERVES AREA

UNIT TYPE:

	SINGLE ZN	X	2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:	FAN COIL PER ROOM							

NAMEPLATE:

					MFG.				MODEL
0.4	SUPPLY FAN HP				MFG.				MODEL
0.0	RET/EXH FAN HP				MFG.				MODEL
2800	CFM-HTG	2800	CFM-CLG	10%	MIN %OA	10%	MAX %OA	100.0%	% HTG AREA SERVED
COMMENT:	TOTAL CFM FOR ALL FAN COILS								

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		EVAP MEDIA		MOD VLV	HUMID.
	NONE		DX	X	CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	800	800	800	800	800	800	1700	
REQUIRED STOP TIME	1200	1600	1600	1600	1600	1600	1800	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:	X	SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (°F):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (°F):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:		MIN OA (Y/N)		MAX OA (Y/N)		RA (Y/N)		EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:		YES	X	NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1712

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1712DHW1

DOMESTIC HW SURVEY OBSERVATIONS

DHW-1	BOILER/CONVERTER NO.	MECH RM	LOCATION (RM)
ELEC.	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	NO.2 OIL		NO.6 OIL		N.GAS	X	ELEC		FUELS:
	STM/HW		HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:
COMMENT:									

NAMEPLATE:

RUUD	MFG.	RP-52-2	MODEL	4500	CAPACITY OUTPUT (WATTS)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)

DOMESTIC HW CIRCULATION PUMP: **NONE**

	HW PUMP 1 - HP		MFG.	MODEL
	HW PUMP 2 - HP		MFG.	MODEL
	HW PUMP 3 - HP		MFG.	MODEL

COMMENT:

DIMENSION:	DIAMETER (INCHES)		HEIGHT OR LENGTH (INCHES)	52 GALLON

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	800	800	800	800	800	800	1700	
REQUIRED STOP TIME	1200	1600	1600	1600	1600	1600	1800	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS				HW SUPPLY					
COMMENTS:									

FIELD SURVEY NOTES

BUILDING 1714

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1714

EMC NO.: #3204-000
DATE: Apr-93
PREPARED BY: CMD
CHECKED BY: CEL
FILE: 1714BLG

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 1714 BLDG NAME: GYM

ZONE NO.	1	FUNCTION: GYM						
OCCUPANCY HOURS:	M-F	530	TO	2100	SAT	900	TO	1800
	SUN	1200	TO	2000				
PRESENT TEMP	WINTER OCC	73.0 °F		UNOCC	°F			
	SUMMER OCC	°F		UNOCC	°F			

ZONE NO.		FUNCTION:						
OCCUPANCY HOURS:	M-F		TO		SAT		TO	
	SUN		TO					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F			
	SUMMER OCC	°F		UNOCC	°F			

ZONE NO.		FUNCTION:						
OCCUPANCY HOURS:	M-F		TO		SAT		TO	
	SUN		TO					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F			
	SUMMER OCC	°F		UNOCC	°F			

REMARKS:

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1714

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1714AH1

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-1	AHU NO.	MECH. ROOM	LOCATION (RM)
C. PLANT	REF. SYS. SERVING AHU	HANDBALL COURTS	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
X	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
3	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

TRANE					MFG.	LZ-17			MODEL
5.0	SUPPLY FAN HP		MARATHON		MFG.	MVB-184TTDR7026DNL			MODEL
	RET/EXH FAN HP				MFG.				MODEL
8140	CFM-HTG	8140	CFM-CLG	10%	MIN %OA	45%	MAX %OA	12%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE	X	STM		HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE		DX	X	CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	1200	600	600	600	600	600	900	
REQUIRED STOP TIME	2000	2100	2100	2100	2100	2100	1800	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:	X	SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:		YES	N	NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1714

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1714AH2

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-2	AHU NO.	MECH. ROOM	LOCATION (RM)
CV-1	REF. SYS. SERVING AHU	LOBBY, R. RMs, EXER. RM	SERVES AREA

UNIT TYPE:

X	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT	X	REHEAT		INDUCTION		VAV
4	NUMBER OF ZONES				OTHER				
	COMMENT:	4 ZONES WITH REHEAT COILS							

NAMEPLATE:

TRANE					MFG.	TYPE L-21			MODEL
7.5	SUPPLY FAN HP		MARATHON		MFG.	DL213TTDR7359AAWF1			MODEL
	RET/EXH FAN HP				MFG.				MODEL
14235	CFM-HTG	0	CFM-CLG	10%	MIN %OA	100%	MAX %OA	38%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE	X	STM		HW		ELEC		MOD VLV	HEATING
X	NONE	X	STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE		DX	X	CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	1200	600	600	600	600	600	900	
REQUIRED STOP TIME	2000	2100	2100	2100	2100	2100	1800	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	YES	N	NO					
COMMENTS:	RA AND OA SHARE DAMPER ACTUATOR, HAS FACE & BYPASS DAMPERS								

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1714

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1714HV1

AIR HANDLING UNIT SURVEY OBSERVATIONS

HV-1	AHU NO.	GYMNASIUM	LOCATION (RM)
CV-1	REF. SYS. SERVING AHU	GYMNASIUM	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR	X	H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	OTHER				OTHER				
	COMMENT:								

NAMEPLATE:

TRANE					MFG.				MODEL
5.0	SUPPLY FAN HP		MARATHON		MFG.	DL184TTDR7627ABWF1			MODEL
	RET/EXH FAN HP				MFG.				MODEL
11300	CFM-HTG	0	CFM-CLG	0%	MIN %OA	100%	MAX %OA	12.5%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE	X	STM		HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
X	NONE		STM		HW		ELEC		MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	1200	600	600	600	600	600	900	
REQUIRED STOP TIME	2000	2100	2100	2100	2100	2100	1800	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:		YES		NO					
COMMENTS:	RETURN AIR USES SPACE AS PLENUM, HAS FACE & BYPASS DAMPERS								

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1714

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1714HV2

AIR HANDLING UNIT SURVEY OBSERVATIONS

HV-2	AHU NO.	GYMNASIUM	LOCATION (RM)
CV-1	REF. SYS. SERVING AHU	GYMNASIUM	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR	X	H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	OTHER				OTHER				
	COMMENT:								

NAMEPLATE:

TRANE					MFG.				MODEL
5.0	SUPPLY FAN HP		MARATHON		MFG.	DL184TTDR7627ABWF1			MODEL
	RET/EXH FAN HP				MFG.				MODEL
11300	CFM-HTG	0	CFM-CLG	0%	MIN %OA	100%	MAX %OA	12.5%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE	X	STM		HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
X	NONE		STM		HW		ELEC		MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	1200	600	600	600	600	600	900	
REQUIRED STOP TIME	2000	2100	2100	2100	2100	2100	1800	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:		YES		NO					
COMMENTS:	RETURN AIR USES SPACE AS PLENUM, HAS FACE & BYPASS DAMPERS								

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1714

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1714HV3

AIR HANDLING UNIT SURVEY OBSERVATIONS

HV-3	AHU NO.	GYMNASIUM	LOCATION (RM)
CV-1	REF. SYS. SERVING AHU	GYMNASIUM	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR	X	H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	OTHER				OTHER				
	COMMENT:								

NAMEPLATE:

TRANE					MFG.				MODEL
5.0	SUPPLY FAN HP		MARATHON		MFG.	DL184TTDR7627ABWF1			MODEL
	RET/EXH FAN HP				MFG.				MODEL
11300	CFM-HTG	0	CFM-CLG	0%	MIN %OA	100%	MAX %OA	12.5%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE	X	STM		HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
X	NONE		STM		HW		ELEC		MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	1200	600	600	600	600	600	900	
REQUIRED STOP TIME	2000	2100	2100	2100	2100	2100	1800	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:		YES		NO					
COMMENTS:	RETURN AIR USES SPACE AS PLENUM, HAS FACE & BYPASS DAMPERS								

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1714

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1714HV4

AIR HANDLING UNIT SURVEY OBSERVATIONS

HV-4	AHU NO.	GYMNASIUM	LOCATION (RM)
CV-1	REF. SYS. SERVING AHU	GYMNASIUM	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR	X	H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	OTHER				OTHER				
	COMMENT:								

NAMEPLATE:

TRANE				MFG.				MODEL
5.0	SUPPLY FAN HP	MARATHON		MFG.	DL184TTDR7627ABWF1			MODEL
	RET/EXH FAN HP			MFG.				MODEL
11300	CFM-HTG	0	CFM-CLG	0%	MIN %OA	100%	MAX %OA	12.5%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE	X	STM		HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
X	NONE		STM		HW		ELEC		MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	1200	600	600	600	600	600	900	
REQUIRED STOP TIME	2000	2100	2100	2100	2100	2100	1800	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:		YES		NO					
COMMENTS:	RETURN AIR USES SPACE AS PLENUM, HAS FACE & BYPASS DAMPERS								

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1714

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1714PMP

REFRIGERATION EQUIPMENT SURVEY OBSERVATIONS

CHW PUMP	CHILLER/COMPRESSOR NO.	MECH. ROOM	LOCATION (RM)

UNIT TYPE:

	CENTRIFUGAL WITH WATER SIDE COOLING TOWER						OTHER
	RECIPROCATING WITH WATER SIDE COOLING TOWER					X	AHU'S SERVED AHU-1
	RECIPROCATING WITH AIR COOLED CONDENSING UNIT						
	ABSORBTION WITH WATER SIDE COOLING TOWER						
	AIR COOLED CONDENSING UNIT						
	CHW		DX	X	OTHER		CHW PUMP ONLY

NAMEPLATE:

CHILLER		MFG.				MODEL			SERIAL NO.
	VOLTS		AMPS		PH		HZ		CAPACITY (TONS)
CONDENSER FANS		MFG.				MODEL			# OF FANS
	VOLTS		AMPS		PH		HZ		HP
CW PUM	B & G	MFG.	17B015			MODEL			SERIAL NO.
208	VOLTS	5	AMPS	3	PH	60	HZ	0.75	HP
CNW PUMP		MFG.				MODEL			SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP
COMMENTS:									

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO TIMECLOCK
REQUIRED START TIME	1200	600	600	600	600	600	900	
REQUIRED STOP TIME	2000	2100	2100	2100	2100	2100	1800	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
0	0	0	0	1	1	1	1	1	0	0	0

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		CWS (oF)		CWR (oF)		CNWS (oF)		CNWR (oF)	
PANEL INDICATORS									
- PRESSURE		LITE-HI		LITE-LOW		GAUGES			
- TEMPERATURE		LITE-HI		LITE-LOW		GAUGES			
- OTHER									
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1714

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1714CV1

BOILER & CONVERTER SURVEY OBSERVATIONS

CV-1	BOILER/CONVERTER NO.	MECH. RM.	LOCATION (RM)
C. PLANT	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	STEAM		PSIG		HW		TEMP.		BOILER TYPE:
	NO.2 OIL		NO.6 OIL		N.GAS		ELEC		FUELS:
	STM/HW		HTHW/HW	X	HTHW/STM		OTHER	S&T	GENERATOR TYPE:
X	SPACE HEAT		DHW		OTHER				USE:
COMMENT:	GENERATOR PRODUCES 15# STEAM						0%		% HTG AREA SERVED
									BB RADIATION ONLY

NAMEPLATE:

NO NAME PLATE	MFG.		MODEL	3330000	CAPACITY OUTPUT (BTUH)
				3330000	CAPACITY INPUT (BTUH)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)
					CAPACITY INPUT (BTUH)
	HW PUMP 1 - HP		MFG.		MODEL
	HW PUMP 2 - HP		MFG.		MODEL
1	COND. PUMP - HP	DUNHAM-BUSH	MFG.	420-1	MODEL
COMMENT:	DRAIN VALVE ON CONDENSATE PUMP INLET IS OPEN AND DRAINING ONTO FLOOR				
	FLOAT CONTROLLER MISSING AND LEAKING AT CONNECTION				

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO TIMECLOCK
REQUIRED START TIME	1200	600	600	600	600	600	900	
REQUIRED STOP TIME	2000	2100	2100	2100	2100	2100	1800	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		PSIG		HW SUPPLY					
RESET CONTROL (oF)		HW HIGH		HW LOW		OA LOW		OA HIGH	
BURNER CONTROLS		O2 TRIM (Y/N)		OTHER					
COMMENTS:	NEW AIR COMPRESSERS, DUAL, ON OLD TANK								

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1714

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1714DHW1

DOMESTIC HW SURVEY OBSERVATIONS

DHW-1	BOILER/CONVERTER NO.	MECH RM	LOCATION (RM)
C. PLANT	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	NO.2 OIL		NO.6 OIL		N.GAS		ELEC		FUELS:
	STM/HW	X	HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:
COMMENT:									

NAMEPLATE:

NO NAME PLATE	MFG.		MODEL	520800	CAPACITY OUTPUT (BTUH)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)
DOMESTIC HW CIRCULATION PUMP:		YES			
0.083	HW PUMP 1 – HP	TACO	MFG.		MODEL
	HW PUMP 2 – HP		MFG.		MODEL
	HW PUMP 3 – HP		MFG.		MODEL
COMMENT:					

DIMENSION:	44	DIAMETER (INCHES)	54	HEIGHT OR LENGTH (INCHES)	600	GALLON

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	1200	600	600	600	600	600	900	
REQUIRED STOP TIME	2000	2100	2100	2100	2100	2100	1800	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS			130	HW SUPPLY					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1714

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1714DHW2

DOMESTIC HW SURVEY OBSERVATIONS

DHW-2	BOILER/CONVERTER NO.	MECH RM	LOCATION (RM)
C. PLANT	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	NO.2 OIL		NO.6 OIL		N.GAS		ELEC		FUELS:
	STM/HW	X	HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:

COMMENT:

NAMEPLATE:

NO NAME PLATE	MFG.		MODEL	520800	CAPACITY OUTPUT (BTUH)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)

DOMESTIC HW CIRCULATION PUMP: YES

0.083	HW PUMP 1 – HP	TACO	MFG.		MODEL
	HW PUMP 2 – HP		MFG.		MODEL
	HW PUMP 3 – HP		MFG.		MODEL

COMMENT:

DIMENSION:	44	DIAMETER (INCHES)	54	HEIGHT OR LENGTH (INCHES)	600 GALLON

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	1200	600	600	600	600	600	900	
REQUIRED STOP TIME	2000	2100	2100	2100	2100	2100	1800	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS			130	HW SUPPLY					

COMMENTS:

FIELD SURVEY NOTES

BUILDING 1720
AND TYPICAL FOR
1723, 1728, 1729, 1734,
1735, 1761, 1765, 1767,
1769, 1773, AND 1776

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1720

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1720BLG

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 1720 BLDG NAME: BARRACKS

ZONE NO.	1	FUNCTION: QUARTERS							
OCCUPANCY HOURS:	M-F	0	TO	2400	SAT	0	TO	2400	
	SUN	0	TO	2400					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

REMARKS:

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1720

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: BHS
CHECKED BY: CEL
FILE: 1720FC1

AIR HANDLING UNIT SURVEY OBSERVATIONS

FC-1	AHU NO.	THROUGHOUT BLDG	LOCATION (RM)
C.P.	REF. SYS. SERVING AHU	ALL	SERVES AREA

UNIT TYPE:

	SINGLE ZN	X	2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:	FAN COIL PER ROOM							

NAMEPLATE:

					MFG.				MODEL
17.8	SUPPLY FAN HP				MFG.				MODEL
0.0	RET/EXH FAN HP				MFG.				MODEL
37800	CFM-HTG	37800	CFM-CLG	0%	MIN %OA		MAX %OA	100.0%	% HTG AREA SERVED
COMMENT:	TOTAL CFM FOR ALL FAN COILS								

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		EVAP MEDIA		MOD VLV	HUMID.
	NONE		DX	X	CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	CONTROLLED BY
REQUIRED START TIME	0	0	0	0	0	0	0	OCCUPANT
REQUIRED STOP TIME	2400	2400	2400	2400	2400	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:	X	SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (°F):	73	OCC HEAT	73	UNOCC HEAT		OCC COOL		UNOCC COOL	70° MEASURED
OTHER SETPOINTS (°F):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:		MIN OA (Y/N)		MAX OA (Y/N)		RA (Y/N)		EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:		YES	X	NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1720

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: DR
CHECKED BY: CEL
FILE: 1720CV1

BOILER & CONVERTER SURVEY OBSERVATIONS

CV-1	BOILER/CONVERTER NO.	MECH. RM.	LOCATION (RM)
C.P.	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	STEAM		PSIG		HW		TEMP.		BOILER TYPE:
	NO.2 OIL		NO.6 OIL		N.GAS		ELEC		FUELS:
	STM/HW	X	HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:
X	SPACE HEAT		DHW		OTHER				USE:
COMMENT:							0%		% HTG AREA SERVED
									BB RADIATION ONLY

NAMEPLATE:

N/A	MFG.	N/A	MODEL	560000	CAPACITY OUTPUT (BTUH)
				560000	CAPACITY INPUT (BTUH)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)
					CAPACITY INPUT (BTUH)

7.5	HW PUMP 1 – HP	BELL & GOSSETT	MFG.	2BB8-3/4BF	MODEL
	HW PUMP 2 – HP		MFG.		MODEL
	HW PUMP 3 – HP		MFG.		MODEL

COMMENT: 198 GPM
DEMAND LIMIT PUMP

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK? NO
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	0	0	0	0	0	0	0	
REQUIRED STOP TIME	2400	2400	2400	2400	2400	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		PSIG	180	HW SUPPLY					HAS O.A. RESET
RESET CONTROL (oF)		HW HIGH		HW LOW		OA LOW		OA HIGH	CONTROL
BURNER CONTROLS		O2 TRIM (Y/N)		OTHER					

COMMENTS: MEASURED HW SUPPLY AT 128°F; HAS SUMMER/WINTER CHANGEOVER VALVE;
HAS 2-WAY VALVE ON CHILLED WATER RETURN

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1720

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: DR
CHECKED BY: CEL
FILE: 1720DHW1

DOMESTIC HW SURVEY OBSERVATIONS

DHW-1	BOILER/CONVERTER NO.	MECH RM	LOCATION (RM)
C.P.	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	NO.2 OIL		NO.6 OIL		N.GAS		ELEC		FUELS:
	STM/HW	X	HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:

COMMENT:

NAMEPLATE:

N/A	MFG.	N/A	MODEL	587500	CAPACITY OUTPUT (BTUH)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)

DOMESTIC HW CIRCULATION PUMP:

0.25	HW PUMP 1 – HP	TACO	MFG.	N/A	MODEL
	HW PUMP 2 – HP		MFG.		MODEL
	HW PUMP 3 – HP		MFG.		MODEL

COMMENT: **DHW PUMP IS LEAKING AT PIPE CONNECTION**

DIMENSION:	42	DIAMETER (INCHES)	111	HEIGHT OR LENGTH (INCHES)	583 GALLON

DHW GENERATOR HAS 1 INCH INSULATION

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	0	0	0	0	0	0	0	
REQUIRED STOP TIME	2400	2400	2400	2400	2400	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS				HW SUPPLY			-		

COMMENTS:

FIELD SURVEY NOTES

BUILDING 1721
AND TYPICAL FOR
1727, 1736, 1760, 1770, AND 1772

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1721

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: DR
CHECKED BY: CEL
FILE: 1721BLG

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 1721 BLDG NAME: DAYROOM

ZONE NO.	1	FUNCTION: MAIL/LOUNGE/RECREATION						
OCCUPANCY HOURS:	M-F	600	TO	2100	SAT	600	TO	2100
	SUN	600	TO	2100				
PRESENT TEMP	WINTER OCC	70.0 °F		UNOCC	70.0 °F			
	SUMMER OCC	°F		UNOCC	°F			

ZONE NO.		FUNCTION:						
OCCUPANCY HOURS:	M-F		TO		SAT		TO	
	SUN		TO					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F			
	SUMMER OCC	°F		UNOCC	°F			

ZONE NO.		FUNCTION:						
OCCUPANCY HOURS:	M-F		TO		SAT		TO	
	SUN		TO					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F			
	SUMMER OCC	°F		UNOCC	°F			

REMARKS:
1. HTHW TO HW CONVERTER
2. 2-WAY VALVE ON CHW RETURN
3. EXPANSION TANK WATER LOGGED
4. TIME CLOCK HAS NO PINS
5. CONTROLS OK
6. T'STAT IN RETURN AIR

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1721

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: DR
CHECKED BY: CEL
FILE: 1721AH1

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-1	AHU NO.	MER	LOCATION (RM)
C.PLANT	REF. SYS. SERVING AHU	ALL	SERVES AREA

UNIT TYPE:

X	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

TRANE					MFG.	L-8			MODEL
1.5	SUPPLY FAN HP		BALDOR		MFG.	CM3554T			MODEL
	RET/EXH FAN HP				MFG.				MODEL
3490	CFM-HTG	3490	CFM-CLG	10%	MIN %OA	100%	MAX %OA	100%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE		DX	X	CW			X	MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	YES
REQUIRED START TIME	800	1500	1500	1500	1500	0	0	NO PINS
REQUIRED STOP TIME	2200	2200	2200	2200	2200	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT	X	DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	T'STAT IN
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	POOR
DEMAND LIMIT:	X	YES		NO					CONDITION
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1721

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: DR
CHECKED BY: CEL
FILE: 1721CV

BOILER & CONVERTER SURVEY OBSERVATIONS

CONV-1	BOILER/CONVERTER NO.	**MER**	LOCATION (RM)
C.PLANT	SOURCE OF HEATING (PLANT)	**ALL**	SERVES AREA

UNIT TYPE:

	STEAM		PSIG		HW		TEMP.		BOILER TYPE:
	NO.2 OIL		NO.6 OIL		N.GAS		ELEC		FUELS:
	STM/HW	X	HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:
X	SPACE HEAT		DHW		OTHER				USE:
COMMENT:							**0%**		% HTG AREA SERVED
									BB RADIATION ONLY

NAMEPLATE:

SIMS	MFG.	**8087**	MODEL	**97500**	CAPACITY OUTPUT (BTUH)
				97500	CAPACITY INPUT (BTUH)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)
					CAPACITY INPUT (BTUH)
0.75	HW PUMP 1 – HP	**BELL & GOSSETT**	MFG.	**24C6.5BF**	MODEL
	HW PUMP 2 – HP		MFG.		MODEL
	HW PUMP 3 – HP		MFG.		MODEL
COMMENT:					

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	**0**	**0**	**0**	**0**	**0**	**0**	**0**	TIMECLOCK?
PRESENT STOP TIME	**2400**	**2400**						**YES**
REQUIRED START TIME	**800**	**1500**				**0**	**0**	**NO PINS**
REQUIRED STOP TIME	**2200**	**2200**				**2400**	**2400**	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		PSIG	**136**	HW SUPPLY					**HAS OA RESET**
RESET CONTROL (oF)		HW HIGH		HW LOW		OA LOW		OA HIGH	
BURNER CONTROLS		O2 TRIM (Y/N)		OTHER					
COMMENTS:									

FIELD SURVEY NOTES

BUILDING 1724
AND TYPICAL FOR
1722, 1725, 1726, 1730,
1731, 1732, 1733, 1762,
1763, 1764, 1766, 1768
1771, 1774, AND 1775

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 1724 BLDG NAME: BARRACKS

ZONE NO.	1	FUNCTION: QUARTERS							
OCCUPANCY HOURS:	M-F	0	TO	2400	SAT	0	TO	2400	
	SUN	0	TO	2400					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

REMARKS:
HW SUPPLY TEMPERATURE MEASURED AT 138 °F
PNEUMATIC CONTROLS ARE IN GOOD CONDITION
HAS O.A. RESET CONTROL ON HW
TWO-WAY VALVE ON CHW RETURN PIPE
SUMMER/WINTER CHANGEOVER VALVE

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1724

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1724FC1

AIR HANDLING UNIT SURVEY OBSERVATIONS

FC-1	AHU NO.	THROUGHOUT BLDG	LOCATION (RM)
C.P.	REF. SYS. SERVING AHU	ALL	SERVES AREA

UNIT TYPE:

	SINGLE ZN	X	2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:	MANUAL SUMMER-WINTER CHANGEOVER							

NAMEPLATE:

					MFG.				MODEL
9.0	SUPPLY FAN HP				MFG.				MODEL
0.0	RET/EXH FAN HP				MFG.				MODEL
19200	CFM-HTG	19200	CFM-CLG	0%	MIN %OA		MAX %OA	100.0%	% HTG AREA SERVED
COMMENT:	TOTAL CFM FOR ALL FAN COILS; TWO-PIPE FAN COIL IN EACH ROOM;								
	DAY ROOMS HAVE 2 FAN COILS								

COILS:

X	NONE		STM		HW		ELEC	MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	MOD VLV	HEATING
X	NONE		STM		HW		ELEC	MOD VLV	REHEAT
X	NONE		STM		HW		EVAP MEDIA	MOD VLV	HUMID.
	NONE		DX	X	CW			MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK NO
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	CONTROLLED BY
REQUIRED START TIME	0	0	0	0	0	0	0	OCCUPANT
REQUIRED STOP TIME	2400	2400	2400	2400	2400	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC	DDC	COMMENTS
THERMOSTAT TYPE:	X	SINGLE STPT		DUAL SETPNT		SETBACK		
SPACE SETPOINT (°F):	73	OCC HEAT	73	UNOCC HEAT		OCC COOL	UNOCC COOL	
OTHER SETPOINTS (°F):		HOT DECK		COLD DECK		MIXED AIR	OTHER	
DAMPER CONTROL:	NONE	MIN OA (Y/N)		MAX OA (Y/N)		RA (Y/N)	EA (Y/N)	
	NONE	MA CONTROL		ECONO-DB		ECONO-ENT	OTHER	
DEMAND LIMIT:		YES	X	NO				
COMMENTS:	THERMOSTAT AND 3-SPEED FAN SWITCH							

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1724

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1724CV1

BOILER & CONVERTER SURVEY OBSERVATIONS

CV-1	BOILER/CONVERTER NO.	MECH. RM.	LOCATION (RM)
C.P.	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	STEAM		PSIG		HW		TEMP.		BOILER TYPE:
	NO.2 OIL		NO.6 OIL		N.GAS		ELEC		FUELS:
	STM/HW	X	HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:
X	SPACE HEAT		DHW		OTHER				USE:
COMMENT:							0%		% HTG AREA SERVED
									BB RADIATION ONLY

NAMEPLATE:

NO NAME PLATE	MFG.		MODEL	290000	CAPACITY OUTPUT (BTUH)
				290000	CAPACITY INPUT (BTUH)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)
					CAPACITY INPUT (BTUH)
3	HW PUMP 1 - HP	BELL & GOSSETT	MFG.	NO. 1531; 1-1/2 BB7-1/2 BF	MODEL
	HW PUMP 2 - HP		MFG.		MODEL
	HW PUMP 3 - HP		MFG.		MODEL
COMMENT:					

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK' NO
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	0	0	0	0	0	0	0	
REQUIRED STOP TIME	2400	2400	2400	2400	2400	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		PSIG	110	HW SUPPLY					HAS O.A. RESET
RESET CONTROL (oF)		HW HIGH		HW LOW		OA LOW		OA HIGH	CONTROL
BURNER CONTROLS		O2 TRIM (Y/N)		OTHER					
COMMENTS:	CONTROLS ARE IN FAIR CONDITION								

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1724

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1724DHW1

DOMESTIC HW SURVEY OBSERVATIONS

DHW-1	BOILER/CONVERTER NO.	MECH RM	LOCATION (RM)
C.P.	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	NO.2 OIL		NO.6 OIL		N.GAS		ELEC		FUELS:
	STM/HW	X	HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:

COMMENT:

NAMEPLATE:

NO NAME PLATE	MFG.		MODEL	306250	CAPACITY OUTPUT (BTUH)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)

DOMESTIC HW CIRCULATION PUMP:

0.04	HW PUMP 1 – HP	TACO	MFG.	N/A	MODEL
	HW PUMP 2 – HP		MFG.		MODEL
	HW PUMP 3 – HP		MFG.		MODEL

COMMENT:

DIMENSION:	33	DIAMETER (INCHES)	111	HEIGHT OR LENGTH (INCHES)	330 GALLON

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK' NO
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	0	0	0	0	0	0	0	
REQUIRED STOP TIME	2400	2400	2400	2400	2400	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS			138 °F	HW SUPPLY					

COMMENTS:

FIELD SURVEY NOTES

BUILDING 1740

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 1740 BLDG NAME: MESS HALL

ZONE NO.	1	FUNCTION: MESS HALL							
OCCUPANCY HOURS:	M-F	400	TO	2400	SAT	400	TO	2400	
	SUN	400	TO	2400					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

REMARKS:

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1740

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1740HV1

AIR HANDLING UNIT SURVEY OBSERVATIONS

HV-1	AHU NO.	MEZZ. MECH. RM	LOCATION (RM)
CV-1	REF. SYS. SERVING AHU	KITCHEN	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR	X	H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	OTHER				OTHER				
	COMMENT:								

NAMEPLATE:

ALTON					MFG.	2870-A-MUC			MODEL
20.0	SUPPLY FAN HP		CENTURY		MFG.	6-323411-2			MODEL
	RET/EXH FAN HP				MFG.				MODEL
26000	CFM-HTG	0	CFM-CLG	100%	MIN %OA	100%	MAX %OA	50.0%	% HTG AREA SERVED
COMMENT:	HAS FACE & BYPASS DAMPER CONTROL								

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE	X	STM		HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
X	NONE		STM		HW		ELEC		MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	400	400	400	400	400	400	400	
REQUIRED STOP TIME	2400	2400	2400	2400	2400	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	N	YES	N	NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1740

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1740HV2

AIR HANDLING UNIT SURVEY OBSERVATIONS

HV-2	AHU NO.	MEZZ. MECH. RM	LOCATION (RM)
CV-1	REF. SYS. SERVING AHU	KITCHEN	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR	X	H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	OTHER				OTHER				
	COMMENT:								

NAMEPLATE:

ALTON					MFG.	1250-A-5-MIC			MODEL
10.0	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
10725	CFM-HTG	0	CFM-CLG	100%	MIN %OA	100%	MAX %OA	50.0%	% HTG AREA SERVED
COMMENT:	HAS FACE & BYPASS DAMPER CONTROL								

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE	X	STM		HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
X	NONE		STM		HW		ELEC		MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	400	400	400	400	400	400	400	
REQUIRED STOP TIME	2400	2400	2400	2400	2400	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):	60	HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	N	YES	N	NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1740

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1740CV1

BOILER & CONVERTER SURVEY OBSERVATIONS

CV-1	BOILER/CONVERTER NO.	MECH. RM.	LOCATION (RM)
C. PLANT	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	STEAM		PSIG		HW		TEMP.		BOILER TYPE:
	NO.2 OIL		NO.6 OIL		N.GAS		ELEC		FUELS:
	STM/HW		HTHW/HW	X	HTHW/STM		OTHER	S&T	GENERATOR TYPE:
X	SPACE HEAT		DHW		OTHER				USE:
COMMENT:		GENERATOR PRODUCES 15# STEAM					0%		% HTG AREA SERVED
									BB RADIATION ONLY

NAMEPLATE:

NO NAME PLATE	MFG.		MODEL	7515000	CAPACITY OUTPUT (BTUH)
				7515000	CAPACITY INPUT (BTUH)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)
					CAPACITY INPUT (BTUH)
	HW PUMP 1 - HP		MFG.		MODEL
	HW PUMP 2 - HP		MFG.		MODEL
1	COND. PUMP - HP		MFG.		MODEL
COMMENT:					

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO TIMECLOCK
REQUIRED START TIME	400	400	400	400	400	400	400	
REQUIRED STOP TIME	2400	2400	2400	2400	2400	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS	15	PSIG		HW SUPPLY					
RESET CONTROL (oF)		HW HIGH		HW LOW		OA LOW		OA HIGH	
BURNER CONTROLS		O2 TRIM (Y/N)		OTHER					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1740

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1740AH1

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-1	AHU NO.	MEZZ. MECH. RM	LOCATION (RM)
	REF. SYS. SERVING AHU	NORTH DINING	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
X	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
6	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

TRANE					MFG.	LZ-31			MODEL
7.5	SUPPLY FAN HP		MARATHON		MFG.	DL213TTDR7359AAWF1			MODEL
	RET/EXH FAN HP				MFG.				MODEL
14000	CFM-HTG	14000	CFM-CLG	50%	MIN %OA	100%	MAX %OA	50%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE	X	STM		HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE		DX	X	CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	600	600	600	600	600	600	600	
REQUIRED STOP TIME	1800	1800	1800	1800	1800	1800	1800	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC		ELECTRIC	X	ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
	Y	MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	YES		NO					
COMMENTS:	O.A. RESET ON HOT DECK								

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1740

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1740AH2

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-2	AHU NO.	MEZZ. MECH. RM	LOCATION (RM)
	REF. SYS. SERVING AHU	SOUTH DINING	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
X	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
6	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

TRANE					MFG.	LZ-31			MODEL
7.5	SUPPLY FAN HP		MARATHON		MFG.	DL213TTDR7359AAWF1			MODEL
	RET/EXH FAN HP				MFG.				MODEL
14000	CFM-HTG	14000	CFM-CLG	50%	MIN %OA	100%	MAX %OA	50%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE	X	STM		HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE		DX	X	CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	600	600	600	600	600	600	600	
REQUIRED STOP TIME	1800	1800	1800	1800	1800	1800	1800	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC		ELECTRIC	X	ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
	Y	MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	YES		NO					
COMMENTS:	O.A. RESET ON HOT DECK								

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1740

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1740PMP

REFRIGERATION EQUIPMENT SURVEY OBSERVATIONS

CHW PUMP	CHILLER/COMPRESSOR NO.	MECH. ROOM	LOCATION (RM)

UNIT TYPE:

	CENTRIFUGAL WITH WATER SIDE COOLING TOWER						OTHER
	RECIPROCATING WITH WATER SIDE COOLING TOWER					X	AHU'S SERVED **AHU-1 & AHU-2**
	RECIPROCATING WITH AIR COOLED CONDENSING UNIT						
	ABSORBTION WITH WATER SIDE COOLING TOWER						
	AIR COOLED CONDENSING UNIT						
	CHW		DX	X	OTHER		**CHW PUMP ONLY**

NAMEPLATE:

CHILLER		MFG.				MODEL				SERIAL NO.
	VOLTS		AMPS		PH		HZ		CAPACITY (TONS)	
CONDENSER FANS		MFG.				MODEL				# OF FANS
	VOLTS		AMPS		PH		HZ		HP	
CW PUM	**B & G**	MFG.	**1531**			MODEL				SERIAL NO.
	VOLTS		AMPS		PH		HZ	**5**	HP	
CNW PUMP		MFG.				MODEL				SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP	
COMMENTS:										

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	**0**	**0**	**0**	**0**	**0**	**0**	**0**	TIMECLOCK?
PRESENT STOP TIME	**2400**	**2400**	**2400**	**2400**	**2400**	**2400**	**2400**	**NO TIMECLOCK**
REQUIRED START TIME	**600**	**600**	**600**	**600**	**600**	**600**	**600**	
REQUIRED STOP TIME	**1800**	**1800**	**1800**	**1800**	**1800**	**1800**	**1800**	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
0	**0**	**0**	**0**	**1**	**1**	**1**	**1**	**1**	**0**	**0**	**0**

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		CWS (oF)		CWR (oF)		CNWS (oF)		CNWR (oF)	
PANEL INDICATORS									
- PRESSURE		LITE-HI		LITE-LOW		GAUGES			
- TEMPERATURE		LITE-HI		LITE-LOW		GAUGES			
- OTHER									
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1740

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1740DHW1

DOMESTIC HW SURVEY OBSERVATIONS

DHW-1	BOILER/CONVERTER NO.	MECH RM	LOCATION (RM)
C. PLANT	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	NO.2 OIL		NO.6 OIL		N.GAS		ELEC		FUELS:
	STM/HW	X	HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:

COMMENT:

NAMEPLATE:

NO NAME PLATE	MFG.		MODEL	1093750	CAPACITY OUTPUT (BTUH)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)

DOMESTIC HW CIRCULATION PUMP: YES

0.05	HW PUMP 1 – HP	BELL & GOSSETT	MFG.	SLC25	MODEL
	HW PUMP 2 – HP		MFG.		MODEL
	HW PUMP 3 – HP		MFG.		MODEL

COMMENT:

DIMENSION:	66	DIAMETER (INCHES)	96	HEIGHT OR LENGTH (INCHES)	1300 GALLON

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	400	400	400	400	400	400	400	
REQUIRED STOP TIME	2400	2400	2400	2400	2400	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS				HW SUPPLY					

COMMENTS:

FIELD SURVEY NOTES

BUILDING 1750

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1750

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1750BLG

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 1750 BLDG NAME: ADMINISTRATION

ZONE NO.	1	FUNCTION: OFFICES (FORMERLY A MESS HALL							
OCCUPANCY HOURS:	M-F	700	TO	1600	SAT	0	TO	0	
	SUN	0	TO	0					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

REMARKS:
SAME BUILDING CONSTRUCTION AND AIR SYSTEMS AS 1740 (MESS HALL)
CONTROLS ARE IN GOOD CONDITION
HV-2 IS RUNNING, BUT DOES NOT SERVE ANY OFFICE SPACE. HV-2 SHOULD BE SHUT OFF.
GROUND FLOOR MECHANICAL ROOM IS IN POOR CONDITION:
- HW LEAKING OUT ONTO FLOOR
- NO INSULATION ON HTHW/STM GENERATOR
- INSULATION FALLING OFF PIPING
- LARGE DHW TANK IS OPERATING, OVERSIZED FOR CURRENT USE

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1750

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1750AH1

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-1	AHU NO.	MEZZ. MECH. RM	LOCATION (RM)
	REF. SYS. SERVING AHU	OFFICE AREA	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
X	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
6	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

TRANE					MFG.	LZ-31			MODEL
7.5	SUPPLY FAN HP		MARATHON		MFG.	DL213TTDR7359AAWF1			MODEL
	RET/EXH FAN HP				MFG.				MODEL
14000	CFM-HTG	14000	CFM-CLG	50%	MIN %OA	100%	MAX %OA	50%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE	X	STM		HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE		DX	X	CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1600	1600	1600	1600	1600	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC		ELECTRIC	X	ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
	Y	MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	YES		NO					
COMMENTS:	O.A. RESET ON HOT DECK								

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1750

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1750AH2

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-2	AHU NO.	MEZZ. MECH. RM	LOCATION (RM)
	REF. SYS. SERVING AHU	OFFICES	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
X	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
6	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

TRANE					MFG.	LZ-31			MODEL
7.5	SUPPLY FAN HP		MARATHON		MFG.	DL21STTDR7359AAWF1			MODEL
	RET/EXH FAN HP				MFG.				MODEL
14000	CFM-HTG	14000	CFM-CLG	50%	MIN %OA	100%	MAX %OA	50%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE	X	STM		HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE		DX	X	CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1600	1600	1600	1600	1600	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC		ELECTRIC	X	ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
	Y	MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	YES		NO					
COMMENTS:	O.A. RESET ON HOT DECK								

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1750

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1750HV1

AIR HANDLING UNIT SURVEY OBSERVATIONS

HV-1	AHU NO.	MEZZ. MECH. RM	LOCATION (RM)
CV-1	REF. SYS. SERVING AHU	OFFICES	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR	X	H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	OTHER				OTHER				
	COMMENT:								

NAMEPLATE:

ALTON					MFG.	2870-A-MUC			MODEL
20.0	SUPPLY FAN HP		CENTURY		MFG.	6-323411-2			MODEL
	RET/EXH FAN HP				MFG.				MODEL
26000	CFM-HTG	0	CFM-CLG	100%	MIN %OA	100%	MAX %OA	50.0%	% HTG AREA SERVED
COMMENT:	HAS FACE & BYPASS DAMPER CONTROL								

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE	X	STM		HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
X	NONE		STM		HW		ELEC		MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1600	1600	1600	1600	1600	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	N	YES	N	NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1750

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1750HV2

AIR HANDLING UNIT SURVEY OBSERVATIONS

HV-2	AHU NO.	MEZZ. MECH. RM	LOCATION (RM)
CV-1	REF. SYS. SERVING AHU	NOTHING	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR	X	H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	OTHER				OTHER				
	COMMENT:								

NAMEPLATE:

ALTON					MFG.	1250--A-5-MIC			MODEL
10.0	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
10725	CFM-HTG	0	CFM-CLG	100%	MIN %OA	100%	MAX %OA	50.0%	% HTG AREA SERVED
COMMENT:	HAS FACE & BYPASS DAMPER CONTROL								

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE	X	STM		HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
X	NONE		STM		HW		ELEC		MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	0	0	0	0	0	0	
REQUIRED STOP TIME	0	0	0	0	0	0	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):	60	HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	N	YES	N	NO					
COMMENTS:	HV-2 DOES NOT SERVE AN AREA IN THE BUILDING (PREVIOUSLY FOR A KITCHEN HOOD)								

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1750

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1750CV1

BOILER & CONVERTER SURVEY OBSERVATIONS

CV-1	BOILER/CONVERTER NO.	MECH. RM.	LOCATION (RM)
C. PLANT	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	STEAM		PSIG		HW		TEMP.		BOILER TYPE:
	NO.2 OIL		NO.6 OIL		N.GAS		ELEC		FUELS:
	STM/HW		HTHW/HW	X	HTHW/STM		OTHER	S&T	GENERATOR TYPE:
X	SPACE HEAT		DHW		OTHER				USE:
COMMENT:		GENERATOR PRODUCES 15# STEAM					0%		% HTG AREA SERVED
									BB RADIATION ONLY

NAMEPLATE:

NO NAME PLATE	MFG.		MODEL	7515000	CAPACITY OUTPUT (BTUH)
				7515000	CAPACITY INPUT (BTUH)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)
					CAPACITY INPUT (BTUH)
	HW PUMP 1 - HP		MFG.		MODEL
	HW PUMP 2 - HP		MFG.		MODEL
1	COND. PUMP - HP		MFG.		MODEL
COMMENT:					

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO TIMECLOCK
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1600	1600	1600	1600	1600	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS	15	PSIG		HW SUPPLY					
RESET CONTROL (oF)		HW HIGH		HW LOW		OA LOW		OA HIGH	
BURNER CONTROLS		O2 TRIM (Y/N)		OTHER					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 1750

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 1750DHW1

DOMESTIC HW SURVEY OBSERVATIONS

DHW-1	BOILER/CONVERTER NO.	MECH RM	LOCATION (RM)
C. PLANT	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	NO.2 OIL		NO.6 OIL		N.GAS		ELEC		FUELS:
	STM/HW	X	HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:

COMMENT:

NAMEPLATE:

NO NAME PLATE	MFG.		MODEL	1093750	CAPACITY OUTPUT (BTUH)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)

DOMESTIC HW CIRCULATION PUMP: YES

0.05	HW PUMP 1 – HP	BELL & GOSSETT	MFG.	SLC25	MODEL
	HW PUMP 2 – HP		MFG.		MODEL
	HW PUMP 3 – HP		MFG.		MODEL

COMMENT:

DIMENSION:	66	DIAMETER (INCHES)	96	HEIGHT OR LENGTH (INCHES)	1300 GALLON

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1600	1600	1600	1600	1600	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS				HW SUPPLY					

COMMENTS:

FIELD SURVEY NOTES

BUILDING 2100

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 2100

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 2100BLG

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 2100 BLDG NAME: RECEPTION CENTER

ZONE NO.	1	FUNCTION: OFFICES / MEDICAL / CLOTHING ISSUE / PX / AUDITORIUM						
OCCUPANCY HOURS:	M-F	700	TO	1700	SAT	0	TO	0
	SUN	0	TO	0				
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F			
	SUMMER OCC	°F		UNOCC	°F			

ZONE NO.		FUNCTION:						
OCCUPANCY HOURS:	M-F		TO		SAT		TO	
	SUN		TO					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F			
	SUMMER OCC	°F		UNOCC	°F			

ZONE NO.		FUNCTION:						
OCCUPANCY HOURS:	M-F		TO		SAT		TO	
	SUN		TO					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F			
	SUMMER OCC	°F		UNOCC	°F			

REMARKS:

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 2100

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 2100AH1

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-1	AHU NO.	WEST MECH. RM	LOCATION (RM)
CH-1, CH-2	REF. SYS. SERVING AHU	ADMIN. OFFICES	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION	X	VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:	VARIABLE INLET VANES ON FAN; 7 VAV BOXES							

NAMEPLATE:

					MFG.				MODEL
7.5	SUPPLY FAN HP		CENTURY		MFG.		6-357721-1		MODEL
	RET/EXH FAN HP				MFG.				MODEL
6430	CFM-HTG	6430	CFM-CLG	10%	MIN %OA	100%	MAX %OA	12.5%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE		DX	X	CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	YES,
REQUIRED START TIME	0	700	700	700	700	700	0	NO PINS
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
	Y	MA CONTROL	Y	ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	(Y / N)							
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 2100

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 2100AH2

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-2	AHU NO.	WAREHOUSE MECH. RM	LOCATION (RM)
CH-1, CH-2	REF. SYS. SERVING AHU	ADMIN. OFFICES	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION	X	VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:	VARIABLE INLET VANES ON FAN; 7 VAV BOXES							

NAMEPLATE:

McQUAY					MFG.				MODEL
5.0	SUPPLY FAN HP		CENTURY		MFG.		6-357714-01		MODEL
	RET/EXH FAN HP				MFG.				MODEL
6100	CFM-HTG	6100	CFM-CLG	10%	MIN %OA	100%	MAX %OA	12.5%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE		DX	X	CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	YES,
REQUIRED START TIME	0	700	700	700	700	700	0	NO PINS
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:	X	SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	Y	EA (Y/N)	
	Y	MA CONTROL	Y	ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	(Y / N)							
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 2100

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 2100AH3

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-3	AHU NO.	WAREHOUSE MECH. RM	LOCATION (RM)
CH-1, CH-2	REF. SYS. SERVING AHU	ASSEMBLY AREA	SERVES AREA

UNIT TYPE:

X	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

McQUAY					MFG.	LSC114DV			MODEL
5.0	SUPPLY FAN HP		CENTURY		MFG.	6-357719-01			MODEL
	RET/EXH FAN HP				MFG.				MODEL
7670	CFM-HTG	7670	CFM-CLG	10%	MIN %OA	100%	MAX %OA	10.3%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE		DX	X	CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC	DDC	COMMENTS
THERMOSTAT TYPE:	X	SINGLE STPT		DUAL SETPNT		SETBACK		
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL	UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR	OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)
	Y	MA CONTROL	Y	ECONO-DB		ECONO-ENT	OTHER	
DEMAND LIMIT:	Y	(Y / N)						
COMMENTS:								

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 2100

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 2100AH4

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-4	AHU NO.	WAREHOUSE MECH. RM	LOCATION (RM)
CH-1, CH-2	REF. SYS. SERVING AHU	ASSEMBLY AREA	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION	X	VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:	VARIABLE INLET VANES ON FAN; 7 VAV BOXES							

NAMEPLATE:

McQUAY					MFG.	MSL12DV			MODEL
7.5	SUPPLY FAN HP		MARATHON		MFG.	6-357721-01			MODEL
	RET/EXH FAN HP				MFG.				MODEL
12690	CFM-HTG	12690	CFM-CLG	10%	MIN %OA	100%	MAX %OA	18.9%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE		DX	X	CW			X	MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	YES,
REQUIRED START TIME	0	700	700	700	700	700	0	NO PINS
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:	X	SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	Y	EA (Y/N)	
	Y	MA CONTROL	Y	ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	(Y / N)							
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 2100

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 2100AH5

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-5	AHU NO.	WAREHOUSE MECH. RM	LOCATION (RM)
CH-1, CH-2	REF. SYS. SERVING AHU	CLOTHING ISSUE	SERVES AREA

UNIT TYPE:

X	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

McQUAY					MFG.	LHD1140V			MODEL
5.0	SUPPLY FAN HP		CENTURY		MFG.	6-357719-01			MODEL
	RET/EXH FAN HP				MFG.				MODEL
7710	CFM-HTG	0	CFM-CLG	10%	MIN %OA	100%	MAX %OA	17.0%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
X	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	YES,
REQUIRED START TIME	0	700	700	700	700	700	0	NO PINS
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:	X	SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
	Y	MA CONTROL	N	ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	(Y / N)							
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 2100

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 2100AH6

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-6	AHU NO.	WAREHOUSE MECH. RM	LOCATION (RM)
CH-1, CH-2	REF. SYS. SERVING AHU	CLOTHING ISSUE OFFICES	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION	X	VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:	VARIABLE INLET VANES ON FAN; 4 VAV BOXES							

NAMEPLATE:

McQUAY					MFG.				MODEL
7.5	SUPPLY FAN HP		CENTURY		MFG.		6-357721-01		MODEL
	RET/EXH FAN HP				MFG.				MODEL
4510	CFM-HTG	4510	CFM-CLG	10%	MIN %OA	100%	MAX %OA	10.6%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE		DX	X	CW			X	MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	YES,
REQUIRED START TIME	0	700	700	700	700	700	0	NO PINS
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:	X	SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	Y	EA (Y/N)	
	Y	MA CONTROL	Y	ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	(Y / N)							
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 2100

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 2100AH7

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-7	AHU NO.	RM 413	LOCATION (RM)
CH-1, CH-2	REF. SYS. SERVING AHU	STORE	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION	X	VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:	VARIABLE INLET VANES ON FAN							

NAMEPLATE:

McQUAY					MFG.				MODEL
5.0	SUPPLY FAN HP		CENTURY		MFG.		6-357719-01		MODEL
	RET/EXH FAN HP				MFG.				MODEL
2500	CFM-HTG	2500	CFM-CLG	10%	MIN %OA	100%	MAX %OA	7.1%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE		DX	X	CW			X	MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	YES,
REQUIRED START TIME	0	1400	1400	1400	1400	1400	0	NO PINS
REQUIRED STOP TIME	0	1800	1800	1800	1800	1800	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:	X	SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
	Y	MA CONTROL	Y	ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	(Y / N)							
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 2100

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 2100AH8

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-8	AHU NO.	AUDITORIUM MECH. RM	LOCATION (RM)
CH-1, CH-2	REF. SYS. SERVING AHU	AUDITORIUM	SERVES AREA

UNIT TYPE:

X	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

McQUAY					MFG.	LSL111CV			MODEL
5.0	SUPPLY FAN HP		CENTURY		MFG.	6-357719-01			MODEL
	RET/EXH FAN HP				MFG.				MODEL
6000	CFM-HTG	6000	CFM-CLG	20%	MIN %OA	100%	MAX %OA	5.0%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE		DX	X	CW			X	MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	YES,
REQUIRED START TIME	0	700	700	700	700	700	0	NO PINS
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:	X	SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
	Y	MA CONTROL	N	ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	(Y / N)							
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 2100

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 2100AH9

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-9	AHU NO.	AUDITORIUM MECH. RM	LOCATION (RM)
CH-1, CH-2	REF. SYS. SERVING AHU	AUDITORIUM	SERVES AREA

UNIT TYPE:

X	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

McQUAY					MFG.	LSL111CV			MODEL
5.0	SUPPLY FAN HP		CENTURY		MFG.	6-357719-01			MODEL
	RET/EXH FAN HP				MFG.				MODEL
6000	CFM-HTG	6000	CFM-CLG	20%	MIN %OA	100%	MAX %OA	5.0%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE		DX	X	CW			X	MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	YES,
REQUIRED START TIME	0	700	700	700	700	700	0	NO PINS
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:	X	SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
	Y	MA CONTROL	N	ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	(Y / N)							
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 2100

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 2100BLR

BOILER & CONVERTER SURVEY OBSERVATIONS

BLR-1	BOILER/CONVERTER NO.	MECH. RM.	LOCATION (RM)
	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	STEAM		PSIG	X	HW	180	TEMP.		BOILER TYPE:
	NO.2 OIL		NO.6 OIL	X	LP GAS		ELEC		FUELS:
	STM/HW		HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:
X	SPACE HEAT		DHW		OTHER				USE:
COMMENT:							0.0%		% HTG AREA SERVED
									BB RADIATION ONLY

NAMEPLATE:

CLEAVER BROOKS	MFG.	MAW-3000	MODEL	2400000	CAPACITY OUTPUT (BTUH)
				3000000	CAPACITY INPUT (BTUH)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)
					CAPACITY INPUT (BTUH)
5	HW PUMP 1 - HP		MFG.		MODEL
	HW PUMP 2 - HP		MFG.		MODEL
	HW PUMP 3 - HP		MFG.		MODEL
COMMENT:					

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		PSIG		HW SUPPLY					
RESET CONTROL (oF):		HW HIGH		HW LOW		OA LOW		OA HIGH	
BURNER CONTROLS	N	O2 TRIM (Y/N)		OTHER					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 2100

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 2100BLR2

BOILER & CONVERTER SURVEY OBSERVATIONS

BLR-2	BOILER/CONVERTER NO.	MECH. RM.	LOCATION (RM)
	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	STEAM		PSIG	X	HW	180	TEMP.		BOILER TYPE:
	NO.2 OIL		NO.6 OIL	X	LP GAS		ELEC		FUELS:
	STM/HW		HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:
X	SPACE HEAT		DHW		OTHER				USE:
COMMENT:							0.0%		% HTG AREA SERVED
									BB RADIATION ONLY

NAMEPLATE:

CLEAVER BROOKS	MFG.	MAW-3000	MODEL	2400000	CAPACITY OUTPUT (BTUH)
				3000000	CAPACITY INPUT (BTUH)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)
					CAPACITY INPUT (BTUH)
5	HW PUMP 1 - HP		MFG.		MODEL
	HW PUMP 2 - HP		MFG.		MODEL
	HW PUMP 3 - HP		MFG.		MODEL
COMMENT:					

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC	DDC	COMMENTS
SETPOINTS		PSIG		HW SUPPLY				
RESET CONTROL (oF)		HW HIGH		HW LOW		OA LOW	OA HIGH	
BURNER CONTROLS	N	O2 TRIM (Y/N)		OTHER				
COMMENTS:								

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 2100

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 2100CH1

REFRIGERATION EQUIPMENT SURVEY OBSERVATIONS

CH-1	CHILLER/COMPRESSOR NO.	OUTSIDE BLDG	LOCATION (RM)

UNIT TYPE:

	CENTRIFUGAL WITH WATER SIDE COOLING TOWER						OTHER
	RECIPROCATING WITH WATER SIDE COOLING TOWER					X	AHU'S SERVED **AHUs 1 THRU 9**
X	RECIPROCATING WITH AIR COOLED CONDENSING UNIT						
	ABSORBTION WITH WATER SIDE COOLING TOWER						
	AIR COOLED CONDENSING UNIT						
X	CHW		DX		OTHER		

NAMEPLATE:

CHILLER **McQUAY**		MFG.	**ALRO95C**			MODEL	**55F0712100**		SERIAL NO.
460	VOLTS	**100**	AMPS	**3**	PH	**60**	HZ	**95**	CAPACITY (TONS)
CONDENSER FANS		MFG.				MODEL		**10**	# OF FANS
460	VOLTS	**2**	AMPS	**3**	PH	**60**	HZ	**1**	HP
DTW PUMP		MFG.				MODEL			SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP
CNW PUMP		MFG.				MODEL			SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP
COMMENTS:									

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	**0**	**0**	**0**	**0**	**0**	**0**	**0**	TIMECLOCK?
PRESENT STOP TIME	**2400**	**2400**	**2400**	**2400**	**2400**	**2400**	**2400**	**NO**
REQUIRED START TIME	**0**	**700**	**700**	**700**	**700**	**700**	**0**	
REQUIRED STOP TIME	**0**	**1700**	**1700**	**1700**	**1700**	**1700**	**0**	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
0	**0**	**0**	**0**	**1**	**1**	**1**	**1**	**1**	**0**	**0**	**0**

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		CWS (oF)		CWR (oF)		CNWS (oF)		CNWR (oF)	
PANEL INDICATORS									
- PRESSURE		LITE-HI		LITE-LOW		GAUGES			
- TEMPERATURE		LITE-HI		LITE-LOW		GAUGES			
- OTHER									
COMMENTS:	**FM RADIO CONTROL**								

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 2100

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 2100CH2

REFRIGERATION EQUIPMENT SURVEY OBSERVATIONS

CH-2	CHILLER/COMPRESSOR NO.	OUTSIDE BLDG	LOCATION (RM)

UNIT TYPE:

	CENTRIFUGAL WITH WATER SIDE COOLING TOWER						OTHER
	RECIPROCATING WITH WATER SIDE COOLING TOWER					X	AHU'S SERVED **AHUs 1 THRU 9**
X	RECIPROCATING WITH AIR COOLED CONDENSING UNIT						
	ABSORBTION WITH WATER SIDE COOLING TOWER						
	AIR COOLED CONDENSING UNIT						
X	CHW		DX		OTHER		

NAMEPLATE:

CHILLER **McQUAY**	MFG.	**ALRO95C**			MODEL	**55F0712100**			SERIAL NO.
460 VOLTS	**100**	AMPS	**3**	PH	**60**	HZ	**95**	CAPACITY (TONS)	
CONDENSER FANS	MFG.				MODEL			**10**	# OF FANS
460 VOLTS	**2**	AMPS	**3**	PH	**60**	HZ	**1**	HP	
DTW PUMP	MFG.				MODEL				SERIAL NO.
VOLTS		AMPS		PH		HZ		HP	
CNW PUMP	MFG.				MODEL				SERIAL NO.
VOLTS		AMPS		PH		HZ		HP	
COMMENTS:									

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	**0**	**0**	**0**	**0**	**0**	**0**	**0**	TIMECLOCK?
PRESENT STOP TIME	**2400**	**2400**	**2400**	**2400**	**2400**	**2400**	**2400**	**NO**
REQUIRED START TIME	**0**	**700**	**700**	**700**	**700**	**700**	**0**	
REQUIRED STOP TIME	**0**	**1700**	**1700**	**1700**	**1700**	**1700**	**0**	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
0	**0**	**0**	**0**	**1**	**1**	**1**	**1**	**1**	**0**	**0**	**0**

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		CWS (oF)		CWR (oF)		CNWS (oF)		CNWR (oF)	
PANEL INDICATORS									
- PRESSURE		LITE-HI		LITE-LOW		GAUGES			
- TEMPERATURE		LITE-HI		LITE-LOW		GAUGES			
- OTHER									

COMMENTS: **FM RADIO CONTROL**

FIELD SURVEY NOTES

BUILDING 2105

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 2105

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 2105BLG

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 2105 BLDG NAME: MESS HALL

ZONE NO.	1	FUNCTION: KITCHEN AND DINING							
OCCUPANCY HOURS:	M-F	400	TO	2000	SAT	400	TO	2000	
	SUN	400	TO	2000					
PRESENT TEMP	WINTER OCC	75.0 °F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

REMARKS: SAME AS BUILDING 630

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 2105

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 2105AH3

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-3	AHU NO.	MECH. ROOM	LOCATION (RM)
BLR-1	REF. SYS. SERVING AHU	KITCHEN	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR	X	H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

TRANE					MFG.				MODEL
7.5	SUPPLY FAN HP		CENTURY		MFG.		6-357416-1		MODEL
	RET/EXH FAN HP				MFG.				MODEL
6000	CFM-HTG	6000	CFM-CLG	100%	MIN %OA	100%	MAX %OA	100%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE	X	STM		HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
X	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	500	500	500	500	500	500	500	
REQUIRED STOP TIME	1900	1900	1900	1900	1900	1900	1900	

MONTHS ON: 0

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:	X	SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	(Y/N)							
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 2105

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 2105BLR1

BOILER & CONVERTER SURVEY OBSERVATIONS

BLR-1	BOILER/CONVERTER NO.	MECH. RM.	LOCATION (RM)
	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

X	STEAM		PSIG		HW		TEMP.	BOILER TYPE:
	NO.2 OIL		NO.6 OIL	X	PROPANE		ELEC	FUELS:
	STM/HW		HTHW/HW		HTHW/STM		OTHER	CONVERTER TYPE:
X	SPACE HEAT		DHW	X	OTHER			USE:
COMMENT:	ALSO SERVES KITCHEN STEAM COOKERS & KETTLES						0.0%	% HTG AREA SERVED
								BB RADIATION ONLY

NAMEPLATE:

NO NAME PLATE	MFG.		MODEL	1674000	CAPACITY OUTPUT (BTUH)
				2096000	CAPACITY INPUT (BTUH)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)
					CAPACITY INPUT (BTUH)
	HW PUMP 1 – HP		MFG.		MODEL
	HW PUMP 2 – HP		MFG.		MODEL
1	COND PUMP – HP		MFG.		MODEL
COMMENT:					

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	400	400	400	400	400	400	400	
REQUIRED STOP TIME	2000	2000	2000	2000	2000	2000	2000	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		PSIG		HW SUPPLY					
RESET CONTROL (oF)	N	HW HIGH	N	HW LOW	N	OA LOW	N	OA HIGH	
BURNER CONTROLS		O2 TRIM (Y/N)		OTHER					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 2105

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 2105AH1

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-1	AHU NO.	MECH. ROOM	LOCATION (RM)
ACCU-1	REF. SYS. SERVING AHU	DINING HALL	SERVES AREA

UNIT TYPE:

X	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

TRANE					MFG.				MODEL
15.0	SUPPLY FAN HP		MARATHON		MFG.		VVB254TTDR5026AAL		MODEL
	RET/EXH FAN HP				MFG.				MODEL
11000	CFM-HTG	11000	CFM-CLG	20%	MIN %OA	100%	MAX %OA	50%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE	X	STM		HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE	X	DX		CW			X	MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	500	500	500	500	500	500	500	
REQUIRED STOP TIME	1900	1900	1900	1900	1900	1900	1900	

MONTHS ON: 0

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:	X	SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	Y	EA (Y/N)	
	Y	MA CONTROL	Y	ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	(Y/N)							
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 2105

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 2105AH2

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-2	AHU NO.	MECH. ROOM	LOCATION (RM)
ACCU-2	REF. SYS. SERVING AHU	DINING HALL	SERVES AREA

UNIT TYPE:

X	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

TRANE					MFG.				MODEL
15.0	SUPPLY FAN HP		MARATHON		MFG.		VVB254TTDR5026AAL		MODEL
	RET/EXH FAN HP				MFG.				MODEL
11000	CFM-HTG	11000	CFM-CLG	20%	MIN %OA	100%	MAX %OA	50%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE	X	STM		HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE	X	DX		CW			X	MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	500	500	500	500	500	500	500	
REQUIRED STOP TIME	1900	1900	1900	1900	1900	1900	1900	

MONTHS ON: 0

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:	X	SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	Y	EA (Y/N)	
	Y	MA CONTROL	Y	ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	(Y/N)							
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 2105

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 2105CH1

REFRIGERATION EQUIPMENT SURVEY OBSERVATIONS

ACCU-1	CHILLER/COMPRESSOR NO.	OUTSIDE BLDG	LOCATION (RM)

UNIT TYPE:

	CENTRIFUGAL WITH WATER SIDE COOLING TOWER						OTHER
	RECIPROCATING WITH WATER SIDE COOLING TOWER					X	AHU'S SERVED AHU-1
	RECIPROCATING WITH AIR COOLED CONDENSING UNIT						
	ABSORBTION WITH WATER SIDE COOLING TOWER						
X	AIR COOLED CONDENSING UNIT						
	CHW	X	DX		OTHER		

NAMEPLATE:

CHILLER	TRANE	MFG.	RAUBC404BE10		MODEL	J89D80590			SERIAL NO.
460	VOLTS	32.8	AMPS	3	PH	60	HZ	38.5	CAPACITY (TONS)
CONDENSER FANS		MFG.			MODEL			4	# OF FANS
460	VOLTS	1.8	AMPS	3	PH	60	HZ	1	HP
CW PUMP		MFG.			MODEL				SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP
CNW PUMP		MFG.			MODEL				SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP

COMMENTS:

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	500	500	500	500	500	500	500	
REQUIRED STOP TIME	1900	1900	1900	1900	1900	1900	1900	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
0	0	0	0	1	1	1	1	1	0	0	0

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		CWS (oF)		CWR (oF)		CNWS (oF)		CNWR (oF)	
PANEL INDICATORS									
- PRESSURE		LITE-HI		LITE-LOW		GAUGES			
- TEMPERATURE		LITE-HI		LITE-LOW		GAUGES			
- OTHER									

COMMENTS: FM RADIO CONTROL

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 2105

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 2105CH2

REFRIGERATION EQUIPMENT SURVEY OBSERVATIONS

ACCU-2	CHILLER/COMPRESSOR NO.	OUTSIDE BLDG	LOCATION (RM)

UNIT TYPE:

	CENTRIFUGAL WITH WATER SIDE COOLING TOWER						OTHER
	RECIPROCATING WITH WATER SIDE COOLING TOWER					X	AHU'S SERVED AHU-2
	RECIPROCATING WITH AIR COOLED CONDENSING UNIT						
	ABSORBTION WITH WATER SIDE COOLING TOWER						
X	AIR COOLED CONDENSING UNIT						
	CHW	X	DX		OTHER		

NAMEPLATE:

CHILLER	TRANE	MFG.	RAUBC404BE10		MODEL	J89D80590			SERIAL NO.
460	VOLTS	32.8	AMPS	3 PH	60	HZ	38.5	CAPACITY (TONS)	
CONDENSER FANS		MFG.			MODEL			4	# OF FANS
460	VOLTS	1.8	AMPS	3 PH	60	HZ	1	HP	
CW PUMP		MFG.			MODEL				SERIAL NO.
	VOLTS		AMPS	PH		HZ		HP	
CNW PUMP		MFG.			MODEL				SERIAL NO.
	VOLTS		AMPS	PH		HZ		HP	
COMMENTS:									

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	500	500	500	500	500	500	500	
REQUIRED STOP TIME	1900	1900	1900	1900	1900	1900	1900	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
0	0	0	0	1	1	1	1	1	0	0	0

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC	DDC	COMMENTS
SETPOINTS		CWS (oF)		CWR (oF)		CNWS (oF)	CNWR (oF)	
PANEL INDICATORS								
- PRESSURE		LITE-HI		LITE-LOW		GAUGES		
- TEMPERATURE		LITE-HI		LITE-LOW		GAUGES		
- OTHER								
COMMENTS:	FM RADIO CONTROL							

FIELD SURVEY NOTES

BUILDING 2240

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 2240 BLDG NAME: MP KENNEL

ZONE NO.	1	FUNCTION: OFFICE / DOG KENNEL							
OCCUPANCY HOURS:	M-F	800	TO	1700	SAT	0	TO	0	
	SUN	0	TO	0					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

REMARKS:

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 2240

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 2240AH1

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-1	AHU NO.	MECH. CLOSET	LOCATION (RM)
DX-1	REF. SYS. SERVING AHU	OFFICES	SERVES AREA

UNIT TYPE:

X	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:	FUEL OIL - FIRED HEATER							

NAMEPLATE:

WHIRLPOOL					MFG.				MODEL
0.3	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
780	CFM-HTG	780	CFM-CLG	0%	MIN %OA	0%	MAX %OA	54%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE	X	DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	800	800	800	800	800	0	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON: 0

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	(Y/N)							
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 2240

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 2240CH1

REFRIGERATION EQUIPMENT SURVEY OBSERVATIONS

DX-1	CHILLER/COMPRESSOR NO.	OUTSIDE BLDG	LOCATION (RM)

UNIT TYPE:

	CENTRIFUGAL WITH WATER SIDE COOLING TOWER						OTHER
	RECIPROCATING WITH WATER SIDE COOLING TOWER					X	AHU'S SERVED AHU-1
	RECIPROCATING WITH AIR COOLED CONDENSING UNIT						
	ABSORBTION WITH WATER SIDE COOLING TOWER						
	AIR COOLED CONDENSING UNIT						
	CHW	X	DX		OTHER		

NAMEPLATE:

CHILLER		MFG.	NO NAME PLATE			MODEL			SERIAL NO.
	VOLTS		MCA		PH		HZ	2	CAPACITY (TONS)
CONDENSER FANS		MFG.				MODEL			# OF FANS
	VOLTS		AMPS		PH		HZ		HP
DTW PUMP		MFG.				MODEL			SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP
CNW PUMP		MFG.				MODEL			SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP
COMMENTS:									

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	0	800	800	800	800	800	0	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
0	0	0	0	1	1	1	1	1	0	0	0

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		CWS (oF)		CWR (oF)		CNWS (oF)		CNWR (oF)	
PANEL INDICATORS									
- PRESSURE		LITE-HI		LITE-LOW		GAUGES			
- TEMPERATURE		LITE-HI		LITE-LOW		GAUGES			
- OTHER									
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 2240

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: DR
CHECKED BY: CEL
FILE: 2240UH1

AIR HANDLING UNIT SURVEY OBSERVATIONS

UH-1	AHU NO.	DOG KENNEL	LOCATION (RM)
	REF. SYS. SERVING AHU	DOG KENNEL	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC	X	UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:	GAS-FIRED UNIT HEATER (CEILING MOUNTED) FUEL TYPE: PROPANE							

NAMEPLATE:

HYDROTHERM					MFG.	M-100B			MODEL
0.3	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
400	CFM-HTG	0	CFM-CLG	0%	MIN %OA	0%	MAX %OA	11.6%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
X	NONE		FUEL OIL		HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		EVAP MEDIA		MOD VLV	HUMID.
X	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	0	0	0	0	0	0	
REQUIRED STOP TIME	2400	2400	2400	2400	2400	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (°F):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (°F):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	N	(Y/N)		NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 2240

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: DR
CHECKED BY: CEL
FILE: 2240UH2

AIR HANDLING UNIT SURVEY OBSERVATIONS

UH-2	AHU NO.	DOG KENNEL	LOCATION (RM)
	REF. SYS. SERVING AHU	DOG KENNEL	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC	X	UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:	GAS-FIRED UNIT HEATER (CEILING MOUNTED) FUEL TYPE: PROPANE							

NAMEPLATE:

HYDROTHERM					MFG.	M-100B			MODEL
0.3	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
400	CFM-HTG	0	CFM-CLG	0%	MIN %OA	0%	MAX %OA	11.6%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
X	NONE		FUEL OIL		HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		EVAP MEDIA		MOD VLV	HUMID.
X	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	0	0	0	0	0	0	
REQUIRED STOP TIME	2400	2400	2400	2400	2400	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (°F):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (°F):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	N	(Y/N)		NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 2240

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: DR
CHECKED BY: CEL
FILE: 2240UH3

AIR HANDLING UNIT SURVEY OBSERVATIONS

UH-3	AHU NO.	DOG KENNEL	LOCATION (RM)
	REF. SYS. SERVING AHU	DOG KENNEL	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC	X	UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:	GAS-FIRED UNIT HEATER (CEILING MOUNTED) FUEL TYPE: PROPANE							

NAMEPLATE:

HYDROTHERM					MFG.	M-100B			MODEL
0.3	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
400	CFM-HTG	0	CFM-CLG	0%	MIN %OA	0%	MAX %OA	11.6%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
X	NONE		FUEL OIL		HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		EVAP MEDIA		MOD VLV	HUMID.
X	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	0	0	0	0	0	0	
REQUIRED STOP TIME	2400	2400	2400	2400	2400	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (°F):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (°F):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	N	(Y/N)		NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 2240

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: DR
CHECKED BY: CEL
FILE: 2240UH4

AIR HANDLING UNIT SURVEY OBSERVATIONS

UH-4	AHU NO.	DOG KENNEL	LOCATION (RM)
	REF. SYS. SERVING AHU	DOG KENNEL	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC	X	UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:	GAS-FIRED UNIT HEATER (CEILING MOUNTED) FUEL TYPE: PROPANE							

NAMEPLATE:

HYDROTHERM					MFG.	M-100B			MODEL
0.3	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
400	CFM-HTG	0	CFM-CLG	0%	MIN %OA	0%	MAX %OA	11.6%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
X	NONE		FUEL OIL		HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		EVAP MEDIA		MOD VLV	HUMID.
X	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	0	0	0	0	0	0	
REQUIRED STOP TIME	2400	2400	2400	2400	2400	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (°F):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (°F):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	N	(Y/N)		NO					
COMMENTS:									

FIELD SURVEY NOTES

BUILDING 2250

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 2250 BLDG NAME: MOTOR POOL

ZONE NO.	1	FUNCTION: VEHICLE MAINTENANCE							
OCCUPANCY HOURS:	M-F	700	TO	1600	SAT	0	TO	0	
	SUN	0	TO	0					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

REMARKS:

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 2250

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 2250AH1

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-1	AHU NO.	MECH. ROOM	LOCATION (RM)
BLR-1	REF. SYS. SERVING AHU	WORK BAY	SERVES AREA

UNIT TYPE:

X	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

NO NAME PLATE					MFG.				MODEL
1.0	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
1680	CFM-HTG	0	CFM-CLG	64%	MIN %OA	100%	MAX %OA	53%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
X	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1600	1600	1600	1600	1600	0	

MONTHS ON: 0

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	N	(Y/N)							
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 2250

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 2250FC1

AIR HANDLING UNIT SURVEY OBSERVATIONS

FC-1	AHU NO.	WORK BAY	LOCATION (RM)
BLR-1	REF. SYS. SERVING AHU	WORK BAY	SERVES AREA

UNIT TYPE:

	SINGLE ZN	X	2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:	ONE HW FAN COIL							

NAMEPLATE:

					MFG.				MODEL
0.8	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
1750	CFM-HTG	0	CFM-CLG	0%	MIN %OA	0%	MAX %OA	25.0%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		EVAP MEDIA		MOD VLV	HUMID.
X	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1600	1600	1600	1600	1600	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (°F):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (°F):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)		RA (Y/N)		EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	N	(Y/N)							
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 2250

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 2250RAD

PERIMETER RADIATION SURVEY OBSERVATIONS

RAD-1	PER RAD NO.	OFFICES & TOILETS	LOCATION (RM)
BLR-1	SOURCE OF HEATING	ALL	SERVES AREA

UNIT TYPE:

	STEAM	X	HW		ELECTRIC				
	OTHER								
	COMMENT:								

NAMEPLATE:

	HW PUMP 1 - HP		MFG.		MODEL
	HW PUMP 2 - HP		MFG.		MODEL
	HW PUMP 3 - HP		MFG.		MODEL
	HW PUMP 4 - HP		MFG.		MODEL
COMMENT:				22.0%	% AREA HEATING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1600	1600	1600	1600	1600	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
RADIATION CONTROL	X	NONE		2-WAY VLV		3-WAY VLV		OTHER	
SPACE SETPOINT (°F):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
RESET CONTROL (°F):		HW HIGH		HW LOW		OA LOW		OA HIGH	
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 2250

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 2250BLR

BOILER & CONVERTER SURVEY OBSERVATIONS

BLR-1	BOILER/CONVERTER NO.	MECH. RM.	LOCATION (RM)
	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	STEAM		PSIG	X	HW		TEMP.		BOILER TYPE:
X	NO.2 OIL		NO.6 OIL		N.GAS		ELEC		FUELS:
	STM/HW		HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:
X	SPACE HEAT		DHW		OTHER				USE:
COMMENT:							22.0%	% HTG AREA SERVED	
								BB RADIATION ONLY	

NAMEPLATE:

NO NAME PLATE	MFG.		MODEL	283100	CAPACITY OUTPUT (BTUH)
				353875	CAPACITY INPUT (BTUH)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)
					CAPACITY INPUT (BTUH)
0.75	HW PUMP 1 - HP		MFG.		MODEL
	HW PUMP 2 - HP		MFG.		MODEL
	HW PUMP 3 - HP		MFG.		MODEL
COMMENT:	HW PUMP SERVES AHU-1, UH-1, AND BASEBOARD RADIATION				

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1600	1600	1600	1600	1600	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		PSIG		HW SUPPLY					
RESET CONTROL (oF)	N	HW HIGH	N	HW LOW	N	OA LOW	N	OA HIGH	
BURNER CONTROLS		O2 TRIM (Y/N)		OTHER					
COMMENTS:									

FIELD SURVEY NOTES

BUILDING 2273

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 2273

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 2273BLG

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 2273 BLDG NAME: ENTOMOLOGY

ZONE NO.	1	FUNCTION: INSECT CONTROL							
OCCUPANCY HOURS:	M-F	700	TO	1600	SAT	0	TO	0	
	SUN	0	TO	0					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

REMARKS:

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 2273

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 2273AH1

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-1	AHU NO.	MECH. ROOM	LOCATION (RM)
DX-1	REF. SYS. SERVING AHU	ADMINISTRATION OFFICES	SERVES AREA

UNIT TYPE:

X	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

NO NAME PLATE					MFG.				MODEL
0.8	SUPPLY FAN HP		NO NAME PLATE		MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
1800	CFM-HTG	1800	CFM-CLG	10%	MIN %OA	100%	MAX %OA	40%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE	X	STM		HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE	X	DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1600	1600	1600	1600	1600	0	

MONTHS ON: 0

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	(Y/N)							
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 2273

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 2273CH1

REFRIGERATION EQUIPMENT SURVEY OBSERVATIONS

DX-1	CHILLER/COMPRESSOR NO.	OUTSIDE BLDG	LOCATION (RM)

UNIT TYPE:

	CENTRIFUGAL WITH WATER SIDE COOLING TOWER						OTHER	
	RECIPROCATING WITH WATER SIDE COOLING TOWER					X	AHU'S SERVED	AHU-1
	RECIPROCATING WITH AIR COOLED CONDENSING UNIT							
	ABSORBTION WITH WATER SIDE COOLING TOWER							
X	AIR COOLED CONDENSING UNIT							
	CHW	X	DX		OTHER			

NAMEPLATE:

CHILLER		MFG.	NO NAME PLATE			MODEL			SERIAL NO.
	VOLTS		MCA		PH		HZ	4.5	CAPACITY (TONS)
CONDENSER FANS		MFG.				MODEL			# OF FANS
	VOLTS		AMPS		PH		HZ		HP
DTW PUMP		MFG.				MODEL			SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP
CNW PUMP		MFG.				MODEL			SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP
COMMENTS:									

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1600	1600	1600	1600	1600	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
0	0	0	0	1	1	1	1	1	0	0	0

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		CWS (oF)		CWR (oF)		CNWS (oF)		CNWR (oF)	
PANEL INDICATORS									
- PRESSURE		LITE-HI		LITE-LOW		GAUGES			
- TEMPERATURE		LITE-HI		LITE-LOW		GAUGES			
- OTHER									
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 2273

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 2273HV1

AIR HANDLING UNIT SURVEY OBSERVATIONS

HV-1	AHU NO.	MIXING ROOM	LOCATION (RM)
BLR-1	REF. SYS. SERVING AHU	MIXING ROOM & STORAGE	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR	X	H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	OTHER				OTHER				
	COMMENT:								

NAMEPLATE:

NO NAME PLATE					MFG.				MODEL
0.5	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
1200	CFM-HTG	0	CFM-CLG	100%	MIN %OA	100%	MAX %OA	60%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
X	NONE		STM		HW		ELEC		MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1600	1600	1600	1600	1600	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	N	(Y/N)							
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 2273

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 2273BLR

BOILER & CONVERTER SURVEY OBSERVATIONS

BLR-1	BOILER/CONVERTER NO.	MECH. RM.	LOCATION (RM)
	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

X	STEAM		PSIG		HW		TEMP.		BOILER TYPE:
X	NO.2 OIL		NO.6 OIL		N.GAS		ELEC		FUELS:
	STM/HW		HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:
X	SPACE HEAT		DHW		OTHER				USE:
COMMENT:							0.0%	% HTG AREA SERVED	
								BB RADIATION ONLY	

NAMEPLATE:

NO NAME PLATE	MFG.		MODEL	300000	CAPACITY OUTPUT (BTUH)
				300000	CAPACITY INPUT (BTUH)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)
					CAPACITY INPUT (BTUH)
	HW PUMP 1 – HP		MFG.		MODEL
	HW PUMP 2 – HP		MFG.		MODEL
0.33	COND PUMP 1 – HP		MFG.		MODEL
COMMENT:					

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1600	1600	1600	1600	1600	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		PSIG		HW SUPPLY					
RESET CONTROL (oF)	N	HW HIGH	N	HW LOW	N	OA LOW	N	OA HIGH	
BURNER CONTROLS		O2 TRIM (Y/N)		OTHER					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 2273

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 2273DHW1

DOMESTIC HW SURVEY OBSERVATIONS

DHW-1	BOILER/CONVERTER NO.	MECH RM	LOCATION (RM)
ELEC.	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	NO.2 OIL		NO.6 OIL		N.GAS	X	ELEC		FUELS:
	STM/HW		HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:
COMMENT:									

NAMEPLATE:

IMPERIAL	MFG.	81G-52D	MODEL	4500	CAPACITY OUTPUT (WATTS)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)

DOMESTIC HW CIRCULATION PUMP: NONE

	HW PUMP 1 - HP		MFG.	MODEL
	HW PUMP 2 - HP		MFG.	MODEL
	HW PUMP 3 - HP		MFG.	MODEL

COMMENT:

DIMENSION:	36	DIAMETER (INCHES)	60	HEIGHT OR LENGTH (INCHES)	40 GALLON

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1600	1600	1600	1600	1600	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS				HW SUPPLY					
COMMENTS:									

FIELD SURVEY NOTES

BUILDING 2399

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 2399

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 2399BLG

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 2399 BLDG NAME: VET CLINIC

ZONE NO.	1	FUNCTION: ANIMAL CARE						
OCCUPANCY HOURS:	M-F	800	TO	1600	SAT	0	TO	0
	SUN	0	TO	0				
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F			
	SUMMER OCC	°F		UNOCC	°F			

ZONE NO.		FUNCTION:						
OCCUPANCY HOURS:	M-F		TO		SAT		TO	
	SUN		TO					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F			
	SUMMER OCC	°F		UNOCC	°F			

ZONE NO.		FUNCTION:						
OCCUPANCY HOURS:	M-F		TO		SAT		TO	
	SUN		TO					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F			
	SUMMER OCC	°F		UNOCC	°F			

REMARKS:

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 2399

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 2399AH1

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-1	AHU NO.	MECH. ROOM	LOCATION (RM)
ACCU-1	REF. SYS. SERVING AHU	ALL	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
X	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
4	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

BOHN				MFG.	VAH603			MODEL
5.0	SUPPLY FAN HP		DOERR	MFG.	3N24BC			MODEL
	RET/EXH FAN HP			MFG.				MODEL
3440	CFM-HTG	3440	CFM-CLG	0%	MIN %OA	20%	MAX %OA	100%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE	X	STM		HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE	X	DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	YES,
REQUIRED START TIME	0	800	800	800	800	800	0	NO PINS
REQUIRED STOP TIME	0	1600	1600	1600	1600	1600	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			PNEUMATIC
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	ACTUATORS
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	YES		NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 2399

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 2399CH1

REFRIGERATION EQUIPMENT SURVEY OBSERVATIONS

ACCU-1	CHILLER/COMPRESSOR NO.	OUTSIDE BLDG	LOCATION (RM)

UNIT TYPE:

	CENTRIFUGAL WITH WATER SIDE COOLING TOWER						OTHER
	RECIPROCATING WITH WATER SIDE COOLING TOWER					X	AHU'S SERVED AHU-1
	RECIPROCATING WITH AIR COOLED CONDENSING UNIT						
	ABSORBTION WITH WATER SIDE COOLING TOWER						
X	AIR COOLED CONDENSING UNIT						
	CHW	X	DX		OTHER		

NAMEPLATE:

CHILLER		MFG.	NO NAME PLATE			MODEL			SERIAL NO.
	VOLTS		MCA		PH		HZ	17.5	CAPACITY (TONS)
CONDENSER FANS		MFG.				MODEL		1	# OF FANS
	VOLTS		AMPS		PH		HZ	3	HP
DTW PUMP		MFG.				MODEL			SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP
CNW PUMP		MFG.				MODEL			SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP
COMMENTS:									

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	0	800	800	800	800	800	0	
REQUIRED STOP TIME	0	1600	1600	1600	1600	1600	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
0	0	0	0	1	1	1	1	1	0	0	0

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		CWS (oF)		CWR (oF)		CNWS (oF)		CNWR (oF)	
PANEL INDICATORS									
- PRESSURE		LITE-HI		LITE-LOW		GAUGES			
- TEMPERATURE		LITE-HI		LITE-LOW		GAUGES			
- OTHER									
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 2399

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 2399BLR

BOILER & CONVERTER SURVEY OBSERVATIONS

BLR-1	BOILER/CONVERTER NO.	MECH. RM.	LOCATION (RM)
	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

X	STEAM	15	PSIG		HW		TEMP.	HFB	BOILER TYPE:
	NO.2 OIL		NO.6 OIL		N.GAS		ELEC		FUELS:
	STM/HW		HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:
X	SPACE HEAT		DHW		OTHER				USE:
COMMENT:									% HTG AREA SERVED
									BB RADIATION ONLY

NAMEPLATE:

KEWANEE	MFG.	3R5K0	MODEL	648000	CAPACITY OUTPUT (BTUH)
				810000	CAPACITY INPUT (BTUH)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)
					CAPACITY INPUT (BTUH)

	HW PUMP 1 - HP		MFG.		MODEL
	HW PUMP 2 - HP		MFG.		MODEL
0.75	COND PUMP 1 - HP		MFG.		MODEL

COMMENT:

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	0	800	800	800	800	800	0	
REQUIRED STOP TIME	0	1600	1600	1600	1600	1600	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		PSIG		HW SUPPLY					
RESET CONTROL (oF)	N	HW HIGH	N	HW LOW	N	OA LOW	N	OA HIGH	
BURNER CONTROLS	N	O2 TRIM (Y/N)		OTHER					

COMMENTS: OIL FIRED

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 2399

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 2399DHW1

DOMESTIC HW SURVEY OBSERVATIONS

DHW-1	BOILER/CONVERTER NO.	MECH RM	LOCATION (RM)
ELEC.	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	NO.2 OIL		NO.6 OIL	X	N.GAS	X	ELEC		FUELS:
	STM/HW		HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:
COMMENT:									

NAMEPLATE:

RUUD	MFG.	RPL75	MODEL	20210	CAPACITY OUTPUT (WATTS)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)

DOMESTIC HW CIRCULATION PUMP: YES

0.1	HW PUMP 1 - HP	ARMSTRONG	MFG.		MODEL
	HW PUMP 2 - HP		MFG.		MODEL
	HW PUMP 3 - HP		MFG.		MODEL

COMMENT:

DIMENSION:	24	DIAMETER (INCHES)	60	HEIGHT OR LENGTH (INCHES)	100 GALLON

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	800	800	800	800	800	0	
REQUIRED STOP TIME	0	1600	1600	1600	1600	1600	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS				HW SUPPLY					
COMMENTS:									

FIELD SURVEY NOTES

BUILDING 2574

FIELD SURVEY NOTES

TO: FILE, FT. LEONARD WOOD
FR: CARL LUNDSTROM
DT: 16 NOVEMBER 1992

RE: BLDG 2574, PROPANE GAS PLANT

- Harbert, the fort maintenance contractor operators the propane gas plant.
- The plant is operated one shift, 5 days a week.
- The operators thought it would be very good to have it remotely monitored.
- The monitoring could include such items as:

  - Fire alarm
  - Fire suppression status
  - Propane temperature out of the 9 vaporizers
  - Monitor controlling regulator for inlet pressure and outlet pressure

- The fort is currently adding natural gas. They don't know how the plant will be used after the gas is added.

FIELD SURVEY NOTES

BUILDING 3210

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 3210 BLDG NAME: DAYROOM

ZONE NO.	1	FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

REMARKS: A. SEE SYSTEM SCHEDULES FOR OCCUPANCY

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 3210

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: kc
CHECKED BY: CEL
FILE: 3210FC1

AIR HANDLING UNIT SURVEY OBSERVATIONS

FC-1	AHU NO.	CEILING	LOCATION (RM)
C.PLANT	REF. SYS. SERVING AHU	NORTH	SERVES AREA

UNIT TYPE:

	SINGLE ZN	X	2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

NA					MFG.	NA			MODEL
2.0	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
1200	CFM-HTG	1200	CFM-CLG	50%	MIN %OA	100%	MAX %OA	50%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE		DX	X	CW			X	MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	N
REQUIRED START TIME	0	1700	1700	1700	1700	1700	1700	
REQUIRED STOP TIME	0	2200	2200	2200	2200	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)		RA (Y/N)		EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	YES		NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 3210

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: kc
CHECKED BY: CEL
FILE: 3210FC2

AIR HANDLING UNIT SURVEY OBSERVATIONS

FC-2	AHU NO.	CEILING	LOCATION (RM)
C.PLANT	REF. SYS. SERVING AHU	SOUTH	SERVES AREA

UNIT TYPE:

	SINGLE ZN	X	2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

NA					MFG.	NA			MODEL
2.0	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
1200	CFM-HTG	1200	CFM-CLG	50%	MIN %OA	100%	MAX %OA	50%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE		DX	X	CW			X	MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	N
REQUIRED START TIME	0	1700	1700	1700	1700	1700	1700	
REQUIRED STOP TIME	0	2200	2200	2200	2200	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)		RA (Y/N)		EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	YES		NO					
COMMENTS:									

FIELD SURVEY NOTES

3211 3212, 3213, 3214
BUILDING 3215

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 3211

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: KC
CHECKED BY: CEL
FILE: 3211BLG

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 3211 BLDG NAME: VISITOR OFFICER QUARTERS

ZONE NO.	1	FUNCTION: QUARTERS							
OCCUPANCY HOURS:	M-F	0	TO	2400	SAT	0	TO	2400	
	SUN	0	TO	2400					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

REMARKS:

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 3211

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: KC
CHECKED BY: CEL
FILE: 3211FC1

AIR HANDLING UNIT SURVEY OBSERVATIONS

FC-1	AHU NO.	1ST FLOOR	LOCATION (RM)
3215	REF. SYS. SERVING AHU	ALL	SERVES AREA

UNIT TYPE:

	SINGLE ZN	X	2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES		35		OTHER				
	COMMENT:	TOTAL OF 35 UNITS							

NAMEPLATE:

					MFG.				MODEL
4.0	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
11200	CFM-HTG	11200	CFM-CLG	16%	MIN %OA	16%	MAX %OA	30%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE		DX	X	CW			X	MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	0	0	0	0	0	0	0	
REQUIRED STOP TIME	2400	2400	2400	2400	2400	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	YES		NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 3211

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: KC
CHECKED BY: CEL
FILE: 3211FC2

AIR HANDLING UNIT SURVEY OBSERVATIONS

FC-2	AHU NO.	2ND FLOOR	LOCATION (RM)
3215	REF. SYS. SERVING AHU	ALL	SERVES AREA

UNIT TYPE:

	SINGLE ZN	X	2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES		32		OTHER				
	COMMENT:	TOTAL OF 32 UNITS							

NAMEPLATE:

					MFG.				MODEL
4.0	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
10240	CFM-HTG	10240	CFM-CLG	16%	MIN %OA	16%	MAX %OA	30%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE		DX	X	CW			X	MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	0	0	0	0	0	0	0	
REQUIRED STOP TIME	2400	2400	2400	2400	2400	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	YES		NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 3211

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: KC
CHECKED BY: CEL
FILE: 3211FC3

AIR HANDLING UNIT SURVEY OBSERVATIONS

FC-3	AHU NO.	3RD FLOOR	LOCATION (RM)
3215	REF. SYS. SERVING AHU	ALL	SERVES AREA

UNIT TYPE:

	SINGLE ZN	X	2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES		35		OTHER				
	COMMENT:	TOTAL OF 35 UNITS							

NAMEPLATE:

					MFG.				MODEL
4.0	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
11200	CFM-HTG	11200	CFM-CLG	16%	MIN %OA	16%	MAX %OA	30%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE		DX	X	CW			X	MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	0	0	0	0	0	0	0	
REQUIRED STOP TIME	2400	2400	2400	2400	2400	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	YES		NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 3211

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: CEL
CHECKED BY: CEL
FILE: 3211DHW1

DOMESTIC HW SURVEY OBSERVATIONS

DHW-1	BOILER/CONVERTER NO.	MER	LOCATION (RM)
	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	NO.2 OIL		NO.6 OIL	X	N.GAS		ELEC		FUELS:
	STM/HW		HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:

COMMENT:

NAMEPLATE:

POLYSHIELD	MFG.	500PV250TP	MODEL	400000	CAPACITY OUTPUT (BTUH,KW)
POLYSHIELD	MFG.	500PV250TP	MODEL	400000	CAPACITY OUTPUT (BTUH,KW)

DOMESTIC HW CIRCULATION PUMP:

0.3	HW PUMP 1 – HP		MFG.	MODEL
	HW PUMP 2 – HP		MFG.	MODEL
	HW PUMP 3 – HP		MFG.	MODEL

COMMENT:

DIMENSION:	36	DIAMETER (INCHS)	84	HEIGHT OR LENGTH (INCHES)	250 GALLON

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	0	0	0	0	0	0	0	
REQUIRED STOP TIME	2400	2400	2400	2400	2400	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS				HW SUPPLY					

COMMENTS:

FIELD SURVEY NOTES

BUILDING 4052

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 4052

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 4052BLG

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 4052 BLDG NAME: ADMINISTRATION

ZONE NO.	1	FUNCTION: ADMINISTRATION						
OCCUPANCY HOURS:	M-F	800	TO	1600	SAT	0	TO	0
	SUN	0	TO	0				
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F			
	SUMMER OCC	°F		UNOCC	°F			

ZONE NO.		FUNCTION:						
OCCUPANCY HOURS:	M-F		TO		SAT		TO	
	SUN		TO					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F			
	SUMMER OCC	°F		UNOCC	°F			

ZONE NO.		FUNCTION:						
OCCUPANCY HOURS:	M-F		TO		SAT		TO	
	SUN		TO					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F			
	SUMMER OCC	°F		UNOCC	°F			

REMARKS:

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 4052

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 4052AH1

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-1	AHU NO.	MECH. ROOM	LOCATION (RM)
ACCU-1	REF. SYS. SERVING AHU	ALL	SERVES AREA

UNIT TYPE:

X	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

NO NAME PLATE					MFG.				MODEL
0.3	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
1000	CFM-HTG	1000	CFM-CLG	0%	MIN %OA	0%	MAX %OA	100%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM		HW	X	ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE	X	DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	800	800	800	800	800	0	
REQUIRED STOP TIME	0	1600	1600	1600	1600	1600	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)		RA (Y/N)		EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	YES		NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 4052

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 4052CH1

REFRIGERATION EQUIPMENT SURVEY OBSERVATIONS

ACCU-1	CHILLER/COMPRESSOR NO.	OUTSIDE BLDG	LOCATION (RM)

UNIT TYPE:

	CENTRIFUGAL WITH WATER SIDE COOLING TOWER						OTHER
	RECIPROCATING WITH WATER SIDE COOLING TOWER					X	AHU'S SERVED AHU-1
	RECIPROCATING WITH AIR COOLED CONDENSING UNIT						
	ABSORBTION WITH WATER SIDE COOLING TOWER						
X	AIR COOLED CONDENSING UNIT						
	CHW	X	DX		OTHER		

NAMEPLATE:

CHILLER AIRTEMP		MFG.	12930HQ10			MODEL			SERIAL NO.
230	VOLTS		MCA	1	PH	60	HZ	25.9	CAPACITY (TONS)
CONDENSER FANS		MFG.				MODEL		1	# OF FANS
	VOLTS		AMPS		PH		HZ	1.5	HP
DTW PUMP		MFG.				MODEL			SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP
CNW PUMP		MFG.				MODEL			SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP

COMMENTS:

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	0	800	800	800	800	800	0	
REQUIRED STOP TIME	0	1600	1600	1600	1600	1600	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
0	0	0	0	1	1	1	1	1	0	0	0

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		CWS (oF)		CWR (oF)		CNWS (oF)		CNWR (oF)	
PANEL INDICATORS									
- PRESSURE		LITE-HI		LITE-LOW		GAUGES			
- TEMPERATURE		LITE-HI		LITE-LOW		GAUGES			
- OTHER									

COMMENTS:

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 4052

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 4052DHW1

DOMESTIC HW SURVEY OBSERVATIONS

DHW-1	BOILER/CONVERTER NO.	MECH RM	LOCATION (RM)
ELEC.	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	NO.2 OIL		NO.6 OIL		N.GAS	X	ELEC		FUELS:
	STM/HW		HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:

COMMENT:

NAMEPLATE:

PACEMAKER	MFG.	RP20P40-1	MODEL	1500	CAPACITY OUTPUT (WATTS)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)

DOMESTIC HW CIRCULATION PUMP: NONE

	HW PUMP 1 – HP		MFG.	MODEL
	HW PUMP 2 – HP		MFG.	MODEL
	HW PUMP 3 – HP		MFG.	MODEL

COMMENT:

DIMENSION:	20	DIAMETER (INCHES)	24	HEIGHT OR LENGTH (INCHES)	20 GALLON

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	800	800	800	800	800	0	
REQUIRED STOP TIME	0	1600	1600	1600	1600	1600	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS				HW SUPPLY					

COMMENTS:

FIELD SURVEY NOTES

BUILDING 4100 & 4101

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 4100 BLDG NAME: BEQ

ZONE NO.	1	FUNCTION: QUARTERS							
OCCUPANCY HOURS:	M-F	0	TO	2400	SAT	0	TO	2400	
	SUN	0	TO	2400					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

REMARKS:

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 4100

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: KC
CHECKED BY: CEL
FILE: 4100RAD1

PERIMETER RADIATION SURVEY OBSERVATIONS

HWR-1	PER RAD NO.	EAST HALF	LOCATION (RM)
BLR-1	SOURCE OF HEATING	EAST HALF	SERVES AREA

UNIT TYPE:

	STEAM	X	HW		ELECTRIC				
	OTHER								
	COMMENT:								

NAMEPLATE:

0.75	HW PUMP 1 - HP	MANETECH	MFG.	8-165775-1	MODEL
	HW PUMP 2 - HP		MFG.		MODEL
	HW PUMP 3 - HP		MFG.		MODEL
	HW PUMP 4 - HP		MFG.		MODEL
COMMENT:				50.0%	% AREA HEATING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	0	0	0	0	0	0	0	
REQUIRED STOP TIME	2400	2400	2400	2400	2400	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1						1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC	DDC	COMMENTS
RADIATION CONTROL:		NONE		2-WAY VLV		3-WAY VLV	OTHER	
SPACE SETPOINT (°F):		OCC HEAT		UNOCC HEAT		OCC COOL	UNOCC COOL	
RESET CONTROL (°F):		HW HIGH		HW LOW		OA LOW	OA HIGH	
COMMENTS:								

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 4100

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: KC
CHECKED BY: CEL
FILE: 4100RAD2

PERIMETER RADIATION SURVEY OBSERVATIONS

HWR-2	PER RAD NO.	WEST HALF	LOCATION (RM)
BLR-1	SOURCE OF HEATING	WEST HALF	SERVES AREA

UNIT TYPE:

	STEAM	X	HW		ELECTRIC				
	OTHER								
	COMMENT:								

NAMEPLATE:

1	HW PUMP 1 - HP	MANETECH	MFG.	8-135852-01	MODEL
	HW PUMP 2 - HP		MFG.		MODEL
	HW PUMP 3 - HP		MFG.		MODEL
	HW PUMP 4 - HP		MFG.		MODEL
COMMENT:				50.0%	% AREA HEATING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	0	0	0	0	0	0	0	
REQUIRED STOP TIME	2400	2400	2400	2400	2400	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1						1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
RADIATION CONTROL:		NONE		2-WAY VLV		3-WAY VLV		OTHER	
SPACE SETPOINT (°F):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
RESET CONTROL (°F):		HW HIGH		HW LOW		OA LOW		OA HIGH	
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 4100

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: kc
CHECKED BY: CEL
FILE: 4100BLR

BOILER & CONVERTER SURVEY OBSERVATIONS

BLR-1	BOILER/CONVERTER NO.	MER	LOCATION (RM)
	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	STEAM		PSIG	X	HW		TEMP.		BOILER TYPE:
	NO.2 OIL		NO.6 OIL	X	N.GAS		ELEC		FUELS:
	STM/HW		HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:
	SPACE HEAT		DHW		OTHER				USE:
COMMENT:	LP GAS								% HTG AREA SERVED
									BB RADIATION ONLY

NAMEPLATE:

PARKER	MFG.	GO-1008	MODEL	100800	CAPACITY OUTPUT (BTUH)
				126000	CAPACITY INPUT (BTUH)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)
					CAPACITY INPUT (BTUH)
	HW PUMP 1 - HP		MFG.		MODEL
	HW PUMP 2 - HP		MFG.		MODEL
	HW PUMP 3 - HP		MFG.		MODEL
COMMENT:	PUMPS, SEE HW RAD SYSTEMS				

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	0	0	0	0	0	0	0	
REQUIRED STOP TIME	2400	2400	2400	2400	2400	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1						1	1	1

CONTROLS:

		PNEUMATIC		ELECTRIC	X	ELEC'NIC		DDC	COMMENTS
SETPOINTS		PSIG	180	HW SUPPLY					
RESET CONTROL (oF)		HW HIGH		HW LOW		OA LOW		OA HIGH	
BURNER CONTROLS		O2 TRIM (Y/N)		OTHER					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 4100

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: KC
CHECKED BY: CEL
FILE: 4100DWH

DOMESTIC HW SURVEY OBSERVATIONS

DHW-1	BOILER/CONVERTER NO.	MER	LOCATION (RM)
	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	NO.2 OIL		NO.6 OIL	X	N.GAS		ELEC		FUELS:
	STM/HW		HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:
COMMENT:	LP GAS								

NAMEPLATE:

STATE	MFG.	SB75360EDF	MODEL		CAPACITY OUTPUT (BTUH,KW)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH,KW)
DOMESTIC HW CIRCULATION PUMP:					
0.25	HW PUMP 1 – HP	BELL & GOSSET	MFG.	NA-115V	MODEL
	HW PUMP 2 – HP		MFG.		MODEL
	HW PUMP 3 – HP		MFG.		MODEL
COMMENT:	360,000 BTUH				

DIMENSION:	24	DIAMETER (INCHS)	60	HEIGHT OR LENGTH (INCHES) GALLON

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	0	0	0	0	0	0	0	
REQUIRED STOP TIME	2400	2400	2400	2400	2400	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS				HW SUPPLY					
COMMENTS:									

FIELD SURVEY NOTES

BUILDING 4102 & 4104
SAME AS 4100

FIELD SURVEY NOTES

BUILDING 4103
SAME AS 4100

FIELD SURVEY NOTES

BUILDING 4109

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 4109

EMC NO.: #3204-000
DATE: Apr-93
PREPARED BY: KC
CHECKED BY: CEL
FILE: 4109BLG

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 4109 BLDG NAME: OFFICERS OPEN MESS

ZONE NO.	1	FUNCTION: DINING							
OCCUPANCY HOURS:	M-F	VARIES	TO	0	SAT	0	TO	0	
	SUN	0	TO	0					
PRESENT TEMP	WINTER OCC	70.0 °F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.	2	FUNCTION: OFFICES							
OCCUPANCY HOURS:	M-F	700	TO	2200	SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	70.0 °F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

REMARKS:

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 4109

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 4109AC1

AIR HANDLING UNIT SURVEY OBSERVATIONS

ACU-1	AHU NO.	RM 115	LOCATION (RM)
CH-1	REF. SYS. SERVING AHU	OFFICES	SERVES AREA

UNIT TYPE:

X	SINGLE ZN		2-PIPE FC	X	4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

					MFG.				MODEL
0.75	SUPPLY FAN HP		CENTURY		MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
2060	CFM-HTG	2060	CFM-CLG	20%	MIN %OA	100%	MAX %OA	8.0%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE		DX	X	CW			X	MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	YES,
REQUIRED START TIME	0	700	700	700	700	700	0	NO PINS
REQUIRED STOP TIME	0	2200	2200	2200	2200	2200	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
	N	MA CONTROL	N	ECONO-DB	N	ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	(Y / N)							
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 4109

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 4109AC2

AIR HANDLING UNIT SURVEY OBSERVATIONS

ACU-2	AHU NO.	RM 115	LOCATION (RM)
CH-1	REF. SYS. SERVING AHU	OFFICES	SERVES AREA

UNIT TYPE:

X	SINGLE ZN		2-PIPE FC	X	4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

					MFG.				MODEL
0.75	SUPPLY FAN HP		CENTURY		MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
1435	CFM-HTG	1435	CFM-CLG	20%	MIN %OA	100%	MAX %OA	8.0%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE		DX	X	CW			X	MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	YES,
REQUIRED START TIME	0	700	700	700	700	700	0	NO PINS
REQUIRED STOP TIME	0	2200	2200	2200	2200	2200	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
	N	MA CONTROL	N	ECONO-DB	N	ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	(Y / N)							
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 4109

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 4109AC3

AIR HANDLING UNIT SURVEY OBSERVATIONS

ACU-3	AHU NO.	RM 118	LOCATION (RM)
CH-1	REF. SYS. SERVING AHU	STORE/BARBER SHOP	SERVES AREA

UNIT TYPE:

X	SINGLE ZN		2-PIPE FC	X	4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

					MFG.				MODEL
0.75	SUPPLY FAN HP		CENTURY		MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
1785	CFM-HTG	1785	CFM-CLG	20%	MIN %OA	100%	MAX %OA	10.3%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE		DX	X	CW			X	MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	YES,
REQUIRED START TIME	0	700	700	700	700	700	0	NO PINS
REQUIRED STOP TIME	0	2200	2200	2200	2200	2200	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
	N	MA CONTROL	N	ECONO-DB	N	ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	(Y / N)							
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 4109

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 4109AC4

AIR HANDLING UNIT SURVEY OBSERVATIONS

ACU-4	AHU NO.	RM 102	LOCATION (RM)
CH-1	REF. SYS. SERVING AHU	BAR / LOUNGE	SERVES AREA

UNIT TYPE:

X	SINGLE ZN		2-PIPE FC	X	4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

					MFG.				MODEL
0.75	SUPPLY FAN HP		CENTURY		MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
2760	CFM-HTG	2760	CFM-CLG	35%	MIN %OA	100%	MAX %OA	5.6%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE		DX	X	CW			X	MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	YES,
REQUIRED START TIME	1200	1200	1200	1200	1200	1200	1200	NO PINS
REQUIRED STOP TIME	2200	2200	2200	2200	2200	2200	2200	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
	N	MA CONTROL	N	ECONO-DB	N	ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	(Y / N)							
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 4109

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 4109AH5

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-5	AHU NO.	MECH. ROOM	LOCATION (RM)
CH-2	REF. SYS. SERVING AHU	BALL RM, KITCHEN, DINING	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
X	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
7	NUMBER OF ZONES				OTHER				
	COMMENT:	HONEYWELL ELECTRIC ACTUATORS							

NAMEPLATE:

CARRIER					MFG.				MODEL
10.00	SUPPLY FAN HP		CENTURY		MFG.		6-330772-1		MODEL
	RET/EXH FAN HP				MFG.				MODEL
20780	CFM-HTG	20780	CFM-CLG	45%	MIN %OA	100%	MAX %OA	68.0%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE		DX	X	CW			X	MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	YES,
REQUIRED START TIME	600	600	600	600	600	600	600	NO PINS
REQUIRED STOP TIME	2200	2200	2200	2200	2200	2200	2200	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
	N	MA CONTROL	N	ECONO-DB	N	ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	(Y / N)							
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 4109

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 4109BLR

BOILER & CONVERTER SURVEY OBSERVATIONS

BLR-1	BOILER/CONVERTER NO.	MECH. RM.	LOCATION (RM)
	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	STEAM		PSIG	X	HW		TEMP.		BOILER TYPE:
	NO.2 OIL		NO.6 OIL		N.GAS		ELEC		FUELS:
	STM/HW		HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:
X	SPACE HEAT		DHW		OTHER				USE:
COMMENT:							0.0%		% HTG AREA SERVED
									BB RADIATION ONLY

NAMEPLATE:

PARKER	MFG.	0-1536	MODEL	1228800	CAPACITY OUTPUT (BTUH)
				1536000	CAPACITY INPUT (BTUH)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)
					CAPACITY INPUT (BTUH)

0.75	HW PUMP 1 - HP	TACO	MFG.	2506-5.5 A5B2A2TL2	MODEL
0.5	HW PUMP 2 - HP	TACO	MFG.		MODEL
0.5	HW PUMP 3 - HP	TACO	MFG.		MODEL

COMMENT: HW PUMP 1 IS PRIMARY; HW PUMP 2 IS SECONDARY SERVING ACUs 1-4;
HW PUMP 3 IS SECONDARY SERVING AHU-5

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	600	600	600	600	600	600	600	
REQUIRED STOP TIME	2200	2200	2200	2200	2200	2200	2200	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		PSIG	150	HW SUPPLY	165	HIGH LIMIT			
RESET CONTROL (oF)		HW HIGH		HW LOW		OA LOW		OA HIGH	
BURNER CONTROLS		O2 TRIM (Y/N)		OTHER					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 4109

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 4109CH1

REFRIGERATION EQUIPMENT SURVEY OBSERVATIONS

CH-1	CHILLER/COMPRESSOR NO.	MECH. ROOM	LOCATION (RM)

UNIT TYPE:

	CENTRIFUGAL WITH WATER SIDE COOLING TOWER						OTHER
	RECIPROCATING WITH WATER SIDE COOLING TOWER					X	AHU'S SERVED ACU-1, ACU-2,
X	RECIPROCATING WITH AIR COOLED CONDENSING UNIT						ACU-3, ACU-4,
	ABSORBTION WITH WATER SIDE COOLING TOWER						
	AIR COOLED CONDENSING UNIT						
X	CHW		DX		OTHER		

NAMEPLATE:

CHILLER	CARRIER	MFG.	30H60-B160		MODEL	J322509			SERIAL NO.
460	VOLTS	52	AMPS	3 PH	60	HZ	52	CAPACITY (TONS)	
CN FANS	CARRIER	MFG.	09AD044600		MODEL			3	# OF FANS
460	VOLTS	3	AMPS	3 PH	60	HZ	1.5	HP	
CW PUM	CENTURY	MFG.	6-32246A-01		MODEL				SERIAL NO.
230	VOLTS	10	AMPS	3 PH	60	HZ	3	HP	
CW PUM	GE	MFG.			MODEL				SERIAL NO.
230	VOLTS	2.8	AMPS	3 PH	60	HZ	0.75	HP	
COMMENTS:	1.5 HP CW PUMP IS THE PRIMARY; 0.75 HP PUMP IS SECONDARY SERVING ACUs 1-4								

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	2200	2200	2200	2200	2200	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
0	0	0	0	1	1	1	1	1	0	0	0

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		CWS (oF)		CWR (oF)		CNWS (oF)		CNWR (oF)	
PANEL INDICATORS									
- PRESSURE		LITE-HI		LITE-LOW		GAUGES			
- TEMPERATURE		LITE-HI		LITE-LOW		GAUGES			
- OTHER									
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 4109

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 4109CH2

REFRIGERATION EQUIPMENT SURVEY OBSERVATIONS

CH-2	CHILLER/COMPRESSOR NO.	MECH. ROOM	LOCATION (RM)

UNIT TYPE:

	CENTRIFUGAL WITH WATER SIDE COOLING TOWER		OTHER
	RECIPROCATING WITH WATER SIDE COOLING TOWER	X	AHU'S SERVED AHU-5
X	RECIPROCATING WITH AIR COOLED CONDENSING UNIT		
	ABSORBTION WITH WATER SIDE COOLING TOWER		
	AIR COOLED CONDENSING UNIT		

X	CHW		DX		OTHER		

NAMEPLATE:

CHILLER	CARRIER	MFG.	30H60-B160			MODEL	J322509			SERIAL NO.
460	VOLTS	52	AMPS	3	PH	60	HZ	52	CAPACITY (TONS)	
CN FANS	CARRIER	MFG.	09AD044600			MODEL			3	# OF FANS
460	VOLTS	3	AMPS	3	PH	60	HZ	1.5	HP	
CW PUMP		MFG.				MODEL				SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP	
CW PUM	GE	MFG.				MODEL				SERIAL NO.
230	VOLTS	2.8	AMPS	3	PH	60	HZ	0.75	HP	
COMMENTS:		0.75 CW PUMP IS SECONDARY SERVING AHU-5								

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	600	600	600	600	600	600	600	
REQUIRED STOP TIME	2200	2200	2200	2200	2200	2200	2200	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
0	0	0	0	1	1	1	1	1	0	0	0

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		CWS (oF)		CWR (oF)		CNWS (oF)		CNWR (oF)	
PANEL INDICATORS									
- PRESSURE		LITE-HI		LITE-LOW		GAUGES			
- TEMPERATURE		LITE-HI		LITE-LOW		GAUGES			
- OTHER									

COMMENTS:

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 4109

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 4109DHW1

DOMESTIC HW SURVEY OBSERVATIONS

DHW-1	BOILER/CONVERTER NO.	MECH RM	LOCATION (RM)
	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

X	NO.2 OIL		NO.6 OIL		N.GAS		ELEC	FUELS:
	STM/HW		HTHW/HW		HTHW/STM		OTHER	CONVERTER TYPE:

COMMENT:

NAMEPLATE:

ALDRICH	MFG.	WHO-641D	MODEL	68260	CAPACITY OUTPUT (BTUH)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)

DOMESTIC HW CIRCULATION PUMP: YES

0.1	HW PUMP 1 – HP	TACO	MFG.		MODEL
	HW PUMP 2 – HP		MFG.		MODEL
	HW PUMP 3 – HP		MFG.		MODEL

COMMENT:

DIMENSION:	24	DIAMETER (INCHES)	60	HEIGHT OR LENGTH (INCHES)	80 GALLON

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	600	600	600	600	600	600	600	
REQUIRED STOP TIME	2200	2200	2200	2200	2200	2200	2200	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC	DDC	COMMENTS
SETPOINTS				HW SUPPLY				

COMMENTS:

FIELD SURVEY NOTES

BUILDING 4110
AND TYPICAL FOR
4111, 4112, 4113, 4114, AND 4115
SAME AS 4100

FIELD SURVEY NOTES

BUILDING 5001

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5001

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5001BLG

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 5001 BLDG NAME: AIRFIELD FIRE HOUSE

ZONE NO.	1	FUNCTION: QUARTERS / FIRE FIGHTING EQUIPMENT							
OCCUPANCY HOURS:	M-F	0	TO	2400	SAT	0	TO	2400	
	SUN	0	TO	2400					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

REMARKS:

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5001

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5001FC1

AIR HANDLING UNIT SURVEY OBSERVATIONS

FC-1	AHU NO.	EQUIP. RM	LOCATION (RM)
BLR-1	REF. SYS. SERVING AHU	EQUIP. RM	SERVES AREA

UNIT TYPE:

	SINGLE ZN	X	2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:	3 HW UNIT HEATER FAN COILS							

NAMEPLATE:

NO NAME PLATE					MFG.				MODEL
0.6	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
1800	CFM-HTG	0	CFM-CLG	0%	MIN %OA	0%	MAX %OA	43.0%	% HTG AREA SERVED
COMMENT:	TOTAL CFM FOR 4 FAN COILS								

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		EVAP MEDIA		MOD VLV	HUMID.
X	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	0	0	0	0	0	0	
REQUIRED STOP TIME	2400	2400	2400	2400	2400	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (°F):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (°F):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	N	(Y/N)							
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5001

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5001RAD1

PERIMETER RADIATION SURVEY OBSERVATIONS

RAD-1	PER RAD NO.	OFFICES AND QUARTERS	LOCATION (RM)
BLR-1	SOURCE OF HEATING	OFFICES AND QUARTERS	SERVES AREA

UNIT TYPE:

	STEAM	X	HW		ELECTRIC				
	OTHER								
	COMMENT:								

NAMEPLATE:

	HW PUMP 1 – HP		MFG.		MODEL
	HW PUMP 2 – HP		MFG.		MODEL
	HW PUMP 3 – HP		MFG.		MODEL
	HW PUMP 4 – HP		MFG.		MODEL
COMMENT:				57.0%	% AREA HEATING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	0	0	0	0	0	0	0	
REQUIRED STOP TIME	2400	2400	2400	2400	2400	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
RADIATION CONTROL	X	NONE		2-WAY VLV		3-WAY VLV		OTHER	
SPACE SETPOINT (°F):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
RESET CONTROL (°F):		HW HIGH		HW LOW		OA LOW		OA HIGH	
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5001

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5001BLR

BOILER & CONVERTER SURVEY OBSERVATIONS

BLR-1	BOILER/CONVERTER NO.	MECH. RM.	LOCATION (RM)
	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	STEAM		PSIG	X	HW		TEMP.		BOILER TYPE:
	NO.2 OIL		NO.6 OIL		N.GAS		ELEC		FUELS:
	STM/HW		HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:
X	SPACE HEAT		DHW		OTHER				USE:
COMMENT:							57.0%		% HTG AREA SERVED
									BB RADIATION ONLY

NAMEPLATE:

KEWANEE	MFG.	K125626	MODEL	540000	CAPACITY OUTPUT (BTUH)
				675000	CAPACITY INPUT (BTUH)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)
					CAPACITY INPUT (BTUH)
0.75	HW PUMP 1 – HP	HYDRO FLOW	MFG.	11/2D 5 BF	MODEL
	HW PUMP 2 – HP		MFG.		MODEL
	COND PUMP 1 – HP		MFG.		MODEL
COMMENT:					

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	0	0	0	0	0	0	0	
REQUIRED STOP TIME	2400	2400	2400	2400	2400	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		PSIG	X	HW SUPPLY					
RESET CONTROL (oF)		HW HIGH		HW LOW		OA LOW		OA HIGH	
BURNER CONTROLS	N	O2 TRIM (Y/N)		OTHER					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5001

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5001DHW1

DOMESTIC HW SURVEY OBSERVATIONS

DHW-1	BOILER/CONVERTER NO.	MECH RM	LOCATION (RM)
LPG	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	NO.2 OIL		NO.6 OIL		N.GAS		ELEC		FUELS:
	STM/HW		HTHW/HW		HTHW/STM	X	OTHER		CONVERTER TYPE:

COMMENT: PROPANE

NAMEPLATE:

DAY & NIGHT	MFG.	100-210-JSB-2	MODEL	240000	CAPACITY OUTPUT (BTUH)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)

DOMESTIC HW CIRCULATION PUMP: YES

0.1	HW PUMP 1 - HP	ITT	MFG.	118844	MODEL
	HW PUMP 2 - HP		MFG.		MODEL
	HW PUMP 3 - HP		MFG.		MODEL

COMMENT:

DIMENSION:	30	DIAMETER (INCHES)	60	HEIGHT OR LENGTH (INCHES)	100 GALLON

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	0	0	0	0	0	0	
REQUIRED STOP TIME	2400	2400	2400	2400	2400	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS				HW SUPPLY					

COMMENTS:

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5001

EMC NO.: #3204-000
DATE: 15-Mar-93
PREPARED BY: BHS
CHECKED BY: CEL
FILE:

Building UA: 3,035

System Type	20
System Name:	FAN COIL
System Number:	FC-1

Typical Building Information

Category	Construction	Use	Occ.	Day
2	BRICK AND BLOCK	BARRACKS	0000-2400	S-S

Enter Weeks of Summer:	18
Enter Weeks of Winter:	26

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	PREVIOUS	INPUT
Motor HP	7.5	0.583
Load Factor	0.8	0.8
CFM - HTG	14235	1800
CFM - CLG	0	0
% OA	10.00%	0.00%
% Area	38.00%	43.00%
TON CAPC.	0	0
MBTU CAPC.	0	0
kW/Ton	0.915	0.915
MOSON	1	7
EFF	1	1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,024	3,024
Heating HRSON	4,368	4,368
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	0.17	0.17
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
NSC	21,000	21,000
DDCH	279,000	279,000
OPT	0	0
CHWF	13.90	13.90
CNWF	0.00	0.00
OAF	6.75	6.75

FIELD SURVEY NOTES

BUILDING 5002

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5002

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5002BLG

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 5002 BLDG NAME: AIRLINE TERMINAL

ZONE NO.	1	FUNCTION: AIRLINE TERMINAL							
OCCUPANCY HOURS:	M-F	900	TO	1800	SAT	900	TO	1100	
	SUN	1500	TO	1800					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

REMARKS:

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5002

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5002AH1

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-1	AHU NO.	MECH. ROOM	LOCATION (RM)
ACCU-1	REF. SYS. SERVING AHU	50% OF AIR TERMINAL	SERVES AREA

UNIT TYPE:

X	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

HQCO LAVERGNE					MFG.	867.779442			MODEL
0.8	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
1100	CFM-HTG	1100	CFM-CLG	10%	MIN %OA	10%	MAX %OA	50%	% HTG AREA SERVED
COMMENT:	HEATING CAPACITY IS 100,000 BTUH; SA DUCT SIZE IS 18 X 24								

COILS:

X	NONE		STM		HW		ELEC	MOD VLV	PREHEAT
X	NONE		STM		HW	X	PROPANE	MOD VLV	HEATING
X	NONE		STM		HW		ELEC	MOD VLV	REHEAT
X	NONE		STM		HW		ELEC	MOD VLV	HUMID.
	NONE	X	DX		CW			MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	1500	900	900	900	900	900	900	
REQUIRED STOP TIME	1800	1800	1800	1800	1800	1800	1100	

MONTHS ON: 0

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
	N	MA CONTROL	N	ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	N	(Y/N)							
COMMENTS:	BLDG IS LEASED TO TWA, NO INSULATION								

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5002

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5002AH2

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-2	AHU NO.	MECH. ROOM	LOCATION (RM)
ACCU-2	REF. SYS. SERVING AHU	50% OF AIR TERMINAL	SERVES AREA

UNIT TYPE:

X	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

HQCO LAVERGNE					MFG.	867.779442			MODEL
0.8	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
1100	CFM-HTG	1100	CFM-CLG	10%	MIN %OA	10%	MAX %OA	50%	% HTG AREA SERVED
COMMENT:	HEATING CAPACITY IS 100,000 BTUH; SA DUCT SIZE IS 18 X 24								

COILS:

X	NONE		STM		HW		ELEC	MOD VLV	PREHEAT
X	NONE		STM		HW	X	PROPANE	MOD VLV	HEATING
X	NONE		STM		HW		ELEC	MOD VLV	REHEAT
X	NONE		STM		HW		ELEC	MOD VLV	HUMID.
	NONE	X	DX		CW			MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	1500	900	900	900	900	900	900	
REQUIRED STOP TIME	1800	1800	1800	1800	1800	1800	1100	

MONTHS ON: 0

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
	N	MA CONTROL	N	ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	N	(Y/N)							
COMMENTS:	BLDG IS LEASED TO TWA, NO INSULATION								

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5002

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5002CH1

REFRIGERATION EQUIPMENT SURVEY OBSERVATIONS

ACCU-1	CHILLER/COMPRESSOR NO.	OUTSIDE BLDG	LOCATION (RM)

UNIT TYPE:

	CENTRIFUGAL WITH WATER SIDE COOLING TOWER						OTHER
	RECIPROCATING WITH WATER SIDE COOLING TOWER					X	AHU'S SERVED AHU-1
	RECIPROCATING WITH AIR COOLED CONDENSING UNIT						
	ABSORBTION WITH WATER SIDE COOLING TOWER						
X	AIR COOLED CONDENSING UNIT						
	CHW	X	DX		OTHER		

NAMEPLATE:

CHILLER	HEIL	MFG.	CA1060VKA2		MODEL	L890161953			SERIAL NO.
208	VOLTS	32.2	AMPS	1 PH	60	HZ	5	CAPACITY (TONS)	
CONDENSER FANS		MFG.			MODEL			1	# OF FANS
240	VOLTS	3.6	AMPS	1 PH	60	HZ	0.33	HP	
DTW PUMP		MFG.			MODEL				SERIAL NO.
	VOLTS		AMPS	PH		HZ		HP	
CNW PUMP		MFG.			MODEL				SERIAL NO.
	VOLTS		AMPS	PH		HZ		HP	
COMMENTS:									

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	1500	900	900	900	900	900	900	
REQUIRED STOP TIME	1800	1800	1800	1800	1800	1800	1100	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
0	0	0	0	1	1	1	1	1	0	0	0

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		CWS (oF)		CWR (oF)		CNWS (oF)		CNWR (oF)	
PANEL INDICATORS									
- PRESSURE		LITE-HI		LITE-LOW		GAUGES			
- TEMPERATURE		LITE-HI		LITE-LOW		GAUGES			
- OTHER									
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5002

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5002CH2

REFRIGERATION EQUIPMENT SURVEY OBSERVATIONS

ACCU-2	CHILLER/COMPRESSOR NO.	OUTSIDE BLDG	LOCATION (RM)

UNIT TYPE:

	CENTRIFUGAL WITH WATER SIDE COOLING TOWER						OTHER
	RECIPROCATING WITH WATER SIDE COOLING TOWER					X	AHU'S SERVED AHU-1
	RECIPROCATING WITH AIR COOLED CONDENSING UNIT						
	ABSORBTION WITH WATER SIDE COOLING TOWER						
X	AIR COOLED CONDENSING UNIT						
	CHW	X	DX		OTHER		

NAMEPLATE:

CHILLER	HEIL	MFG.	CA1060VKA2		MODEL	L890161953			SERIAL NO.
208	VOLTS	32.2	AMPS	1 PH	60	HZ	5	CAPACITY (TONS)	
CONDENSER FANS		MFG.			MODEL			1	# OF FANS
240	VOLTS	3.6	AMPS	1 PH	60	HZ	0.33	HP	
DTW PUMP		MFG.			MODEL				SERIAL NO.
	VOLTS		AMPS	PH		HZ		HP	
CNW PUMP		MFG.			MODEL				SERIAL NO.
	VOLTS		AMPS	PH		HZ		HP	

COMMENTS:

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	1500	900	900	900	900	900	900	
REQUIRED STOP TIME	1800	1800	1800	1800	1800	1800	1100	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
0	0	0	0	1	1	1	1	1	0	0	0

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		CWS (oF)		CWR (oF)		CNWS (oF)		CNWR (oF)	
PANEL INDICATORS									
- PRESSURE		LITE-HI		LITE-LOW		GAUGES			
- TEMPERATURE		LITE-HI		LITE-LOW		GAUGES			
- OTHER									

COMMENTS:

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5002

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5002DHW1

DOMESTIC HW SURVEY OBSERVATIONS

DHW-1	BOILER/CONVERTER NO.	MECH RM	LOCATION (RM)
ELEC.	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	NO.2 OIL		NO.6 OIL		N.GAS	X	ELEC		FUELS:
	STM/HW		HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:
COMMENT:									

NAMEPLATE:

NO NAME PLATE	MFG.		MODEL	1500	CAPACITY OUTPUT (WATTS)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)
DOMESTIC HW CIRCULATION PUMP:		NONE			
	HW PUMP 1 - HP		MFG.		MODEL
	HW PUMP 2 - HP		MFG.		MODEL
	HW PUMP 3 - HP		MFG.		MODEL
COMMENT:					

DIMENSION:	12	DIAMETER (INCHES)	18	HEIGHT OR LENGTH (INCHES)	6 GALLON

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	1500	900	900	900	900	900	900	
REQUIRED STOP TIME	1800	1800	1800	1800	1800	1800	1100	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS				HW SUPPLY					
COMMENTS:									

FIELD SURVEY NOTES

BUILDING 5004

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5004

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5004BLG

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 5004 BLDG NAME: AIR FORCE OPS

ZONE NO.	1	FUNCTION: ADMINISTRATION							
OCCUPANCY HOURS:	M-F	600	TO	2100	SAT	1200	TO	2100	
	SUN	700	TO	1500					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

REMARKS:

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5004

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5004AH1

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-1	AHU NO.	MECH. ROOM	LOCATION (RM)
ACCU-1	REF. SYS. SERVING AHU	ALL	SERVES AREA

UNIT TYPE:

X	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

COMFORT MAKER					MFG.				MODEL
0.8	SUPPLY FAN HP		CENTURY		MFG.		8-118812-20		MODEL
	RET/EXH FAN HP				MFG.				MODEL
3600	CFM-HTG	3600	CFM-CLG	10%	MIN %OA	10%	MAX %OA	100%	% HTG AREA SERVED
COMMENT:		HOME STYLE FURNACE WITH DX COIL							
		SUPPLY DUCT IS 14 X 42							

COILS:

X	NONE		STM		HW		ELEC	MOD VLV	PREHEAT
X	NONE		STM		HW	X	PROPANE	MOD VLV	HEATING
X	NONE		STM		HW		ELEC	MOD VLV	REHEAT
X	NONE		STM		HW		ELEC	MOD VLV	HUMID.
	NONE	X	DX		CW			MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	700	600	600	600	600	600	1200	
REQUIRED STOP TIME	1500	2100	2100	2100	2100	2100	2100	

MONTHS ON: 0

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:	X	SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
	N	MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	N	(Y/N)							
COMMENTS:	T-STAT CONTROL; O.A. WITH MANUAL DAMPER								

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5004

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5004CH1

REFRIGERATION EQUIPMENT SURVEY OBSERVATIONS

ACCU-1	CHILLER/COMPRESSOR NO.	OUTSIDE BLDG	LOCATION (RM)

UNIT TYPE:

	CENTRIFUGAL WITH WATER SIDE COOLING TOWER						OTHER
	RECIPROCATING WITH WATER SIDE COOLING TOWER					X	AHU'S SERVED AHU-1
	RECIPROCATING WITH AIR COOLED CONDENSING UNIT						
	ABSORBTION WITH WATER SIDE COOLING TOWER						
X	AIR COOLED CONDENSING UNIT						
	CHW	X	DX		OTHER		

NAMEPLATE:

CHILLER	GE	MFG.	BGTA120C3E		MODEL	219979543			SERIAL NO.
208	VOLTS	40	AMPS	3	PH	60	HZ	10	CAPACITY (TONS)
CONDENSER FANS		MFG.			MODEL			2	# OF FANS
230	VOLTS	3.1	AMPS	1	PH	60	HZ	0.5	HP
DTW PUMP		MFG.			MODEL				SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP
CNW PUMP		MFG.			MODEL				SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP
COMMENTS:									

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	700	600	600	600	600	600	1200	
REQUIRED STOP TIME	1500	2100	2100	2100	2100	2100	2100	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
0	0	0	0	1	1	1	1	1	0	0	0

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		CWS (oF)		CWR (oF)		CNWS (oF)		CNWR (oF)	
PANEL INDICATORS									
- PRESSURE		LITE-HI		LITE-LOW		GAUGES			
- TEMPERATURE		LITE-HI		LITE-LOW		GAUGES			
- OTHER									

COMMENTS: FM RADIO CONTROL

FIELD SURVEY NOTES

BUILDING 5007

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5007

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5007BLG

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 5007 BLDG NAME: HANGER

ZONE NO.	1	FUNCTION: AIRPORT HANGER							
OCCUPANCY HOURS:	M-F	700	TO	1700	SAT	0	TO	0	
	SUN	0	TO	0					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

REMARKS:

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5007

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5007AH1

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-1	AHU NO.	MECH. ROOM	LOCATION (RM)
DX-1	REF. SYS. SERVING AHU	ADMIN. AND TRAINING	SERVES AREA

UNIT TYPE:

X	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:	GAS-FIRED FURNANCE							

NAMEPLATE:

DAY & NIGHT					MFG.	250/60 EF603			MODEL
0.8	SUPPLY FAN HP		NO NAME PLATE		MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
2000	CFM-HTG	0	CFM-CLG	0%	MIN %OA	0%	MAX %OA	22%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM		HW	X	ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE	X	DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON: 0

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:	X	SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	YES		NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5007

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5007CH1

REFRIGERATION EQUIPMENT SURVEY OBSERVATIONS

DX-1	CHILLER/COMPRESSOR NO.	OUTSIDE BLDG	LOCATION (RM)

UNIT TYPE:

	CENTRIFUGAL WITH WATER SIDE COOLING TOWER						OTHER
	RECIPROCATING WITH WATER SIDE COOLING TOWER					X	AHU'S SERVED AHU-1
	RECIPROCATING WITH AIR COOLED CONDENSING UNIT						
	ABSORBTION WITH WATER SIDE COOLING TOWER						
X	AIR COOLED CONDENSING UNIT						
	CHW	X	DX		OTHER		

NAMEPLATE:

CHILLER DAY & NIGH		MFG.	NO NAME PLATE			MODEL			SERIAL NO.
240	VOLTS		MCA	1	PH	60	HZ	3	CAPACITY (TONS)
CONDENSER FANS		MFG.				MODEL		1	# OF FANS
	VOLTS		AMPS		PH		HZ	0.1	HP
DTW PUMP		MFG.				MODEL			SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP
CNW PUMP		MFG.				MODEL			SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP

COMMENTS:

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	YES,
REQUIRED START TIME	0	700	700	700	700	700	0	NO PINS
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
0	0	0	0	1	1	1	1	1	0	0	0

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		CWS (oF)		CWR (oF)		CNWS (oF)		CNWR (oF)	
PANEL INDICATORS									
- PRESSURE		LITE-HI		LITE-LOW		GAUGES			
- TEMPERATURE		LITE-HI		LITE-LOW		GAUGES			
- OTHER									

COMMENTS: FM RADIO CONTROL

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5007

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5007UH1

AIR HANDLING UNIT SURVEY OBSERVATIONS

UH-1	AHU NO.	AIRCRAFT BAY	LOCATION (RM)
	REF. SYS. SERVING AHU	AIRCRAFT BAY	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC	X	UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:	13 GAS-FIRED RADIANT HEATERS (CEILING MOUNTED) FUEL TYPE: PROPANE							

NAMEPLATE:

					MFG.				MODEL
0.1	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
300	CFM-HTG	0	CFM-CLG	0%	MIN %OA	0%	MAX %OA	6.0%	% HTG AREA SERVED
COMMENT:	CFM IS USED TO CALCULATE HTG ENERGY								

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
X	NONE		FUEL OIL		HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		EVAP MEDIA		MOD VLV	HUMID.
X	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (°F):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (°F):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	N	(Y/N)		NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5007

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5007UH2

AIR HANDLING UNIT SURVEY OBSERVATIONS

UH-2	AHU NO.	AIRCRAFT BAY	LOCATION (RM)
	REF. SYS. SERVING AHU	AIRCRAFT BAY	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC	X	UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:	13 GAS-FIRED RADIANT HEATERS (CEILING MOUNTED) FUEL TYPE: PROPANE							

NAMEPLATE:

					MFG.				MODEL
0.1	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
300	CFM-HTG	0	CFM-CLG	0%	MIN %OA	0%	MAX %OA	6.0%	% HTG AREA SERVED
COMMENT:	CFM IS USED TO CALCULATE HTG ENERGY								

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
X	NONE		FUEL OIL		HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		EVAP MEDIA		MOD VLV	HUMID.
X	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (°F):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (°F):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	N	(Y/N)		NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5007

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5007UH3

AIR HANDLING UNIT SURVEY OBSERVATIONS

UH-3	AHU NO.	AIRCRAFT BAY	LOCATION (RM)
	REF. SYS. SERVING AHU	AIRCRAFT BAY	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC	X	UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:	13 GAS-FIRED RADIANT HEATERS (CEILING MOUNTED) FUEL TYPE: PROPANE							

NAMEPLATE:

					MFG.				MODEL
0.1	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
300	CFM-HTG	0	CFM-CLG	0%	MIN %OA	0%	MAX %OA	6.0%	% HTG AREA SERVED
COMMENT:	CFM IS USED TO CALCULATE HTG ENERGY								

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
X	NONE		FUEL OIL		HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		EVAP MEDIA		MOD VLV	HUMID.
X	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (°F):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (°F):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	N	(Y/N)		NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5007

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5007UH4

AIR HANDLING UNIT SURVEY OBSERVATIONS

UH-4	AHU NO.	AIRCRAFT BAY	LOCATION (RM)
	REF. SYS. SERVING AHU	AIRCRAFT BAY	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC	X	UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:	13 GAS-FIRED RADIANT HEATERS (CEILING MOUNTED) FUEL TYPE: PROPANE							

NAMEPLATE:

					MFG.				MODEL
0.1	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
300	CFM-HTG	0	CFM-CLG	0%	MIN %OA	0%	MAX %OA	6.0%	% HTG AREA SERVED
COMMENT:	CFM IS USED TO CALCULATE HTG ENERGY								

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
X	NONE		FUEL OIL		HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		EVAP MEDIA		MOD VLV	HUMID.
X	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (°F):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (°F):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	N	(Y/N)		NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5007

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5007UH5

AIR HANDLING UNIT SURVEY OBSERVATIONS

UH-5	AHU NO.	AIRCRAFT BAY	LOCATION (RM)
	REF. SYS. SERVING AHU	AIRCRAFT BAY	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC	X	UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:	13 GAS-FIRED RADIANT HEATERS (CEILING MOUNTED) FUEL TYPE: PROPANE							

NAMEPLATE:

					MFG.				MODEL
0.1	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
300	CFM-HTG	0	CFM-CLG	0%	MIN %OA	0%	MAX %OA	6.0%	% HTG AREA SERVED
COMMENT:	CFM IS USED TO CALCULATE HTG ENERGY								

COILS:

X	NONE		STM		HW		ELEC	MOD VLV	PREHEAT
X	NONE		FUEL OIL		HW		ELEC	MOD VLV	HEATING
X	NONE		STM		HW		ELEC	MOD VLV	REHEAT
X	NONE		STM		HW		EVAP MEDIA	MOD VLV	HUMID.
X	NONE		DX		CW			MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC	DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK		
SPACE SETPOINT (°F):		OCC HEAT		UNOCC HEAT		OCC COOL	UNOCC COOL	
OTHER SETPOINTS (°F):		HOT DECK		COLD DECK		MIXED AIR	OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)
		MA CONTROL		ECONO-DB		ECONO-ENT	OTHER	
DEMAND LIMIT:	N	(Y/N)		NO				
COMMENTS:								

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5007

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5007UH6

AIR HANDLING UNIT SURVEY OBSERVATIONS

UH-6	AHU NO.	AIRCRAFT BAY	LOCATION (RM)
	REF. SYS. SERVING AHU	AIRCRAFT BAY	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC	X	UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:	13 GAS-FIRED RADIANT HEATERS (CEILING MOUNTED) FUEL TYPE: PROPANE							

NAMEPLATE:

					MFG.				MODEL
0.1	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
300	CFM-HTG	0	CFM-CLG	0%	MIN %OA	0%	MAX %OA	6.0%	% HTG AREA SERVED
COMMENT:	CFM IS USED TO CALCULATE HTG ENERGY								

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
X	NONE		FUEL OIL		HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		EVAP MEDIA		MOD VLV	HUMID.
X	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (°F):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (°F):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	N	(Y/N)		NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5007

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5007UH7

AIR HANDLING UNIT SURVEY OBSERVATIONS

UH-7	AHU NO.	AIRCRAFT BAY	LOCATION (RM)
	REF. SYS. SERVING AHU	AIRCRAFT BAY	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC	X	UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:	13 GAS-FIRED RADIANT HEATERS (CEILING MOUNTED) FUEL TYPE: PROPANE							

NAMEPLATE:

					MFG.				MODEL
0.1	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
300	CFM-HTG	0	CFM-CLG	0%	MIN %OA	0%	MAX %OA	6.0%	% HTG AREA SERVED
COMMENT:	CFM IS USED TO CALCULATE HTG ENERGY								

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
X	NONE		FUEL OIL		HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		EVAP MEDIA		MOD VLV	HUMID.
X	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (°F):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (°F):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	N	(Y/N)		NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5007

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5007UH8

AIR HANDLING UNIT SURVEY OBSERVATIONS

UH-8	AHU NO.	AIRCRAFT BAY	LOCATION (RM)
	REF. SYS. SERVING AHU	AIRCRAFT BAY	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC	X	UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:	13 GAS-FIRED RADIANT HEATERS (CEILING MOUNTED) FUEL TYPE: PROPANE							

NAMEPLATE:

					MFG.				MODEL
0.1	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
300	CFM-HTG	0	CFM-CLG	0%	MIN %OA	0%	MAX %OA	6.0%	% HTG AREA SERVED
COMMENT:	CFM IS USED TO CALCULATE HTG ENERGY								

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
X	NONE		FUEL OIL		HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		EVAP MEDIA		MOD VLV	HUMID.
X	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (°F):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (°F):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	N	(Y/N)		NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5007

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5007UH9

AIR HANDLING UNIT SURVEY OBSERVATIONS

UH-9	AHU NO.	AIRCRAFT BAY	LOCATION (RM)
	REF. SYS. SERVING AHU	AIRCRAFT BAY	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC	X	UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:	13 GAS-FIRED RADIANT HEATERS (CEILING MOUNTED) FUEL TYPE: PROPANE							

NAMEPLATE:

					MFG.				MODEL
0.1	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
300	CFM-HTG	0	CFM-CLG	0%	MIN %OA	0%	MAX %OA	6.0%	% HTG AREA SERVED
COMMENT:	CFM IS USED TO CALCULATE HTG ENERGY								

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
X	NONE		FUEL OIL		HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		EVAP MEDIA		MOD VLV	HUMID.
X	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (°F):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (°F):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	N	(Y/N)		NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5007

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5007UH10

AIR HANDLING UNIT SURVEY OBSERVATIONS

UH-10	AHU NO.	AIRCRAFT BAY	LOCATION (RM)
	REF. SYS. SERVING AHU	AIRCRAFT BAY	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC	X	UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:	13 GAS-FIRED RADIANT HEATERS (CEILING MOUNTED) FUEL TYPE: PROPANE							

NAMEPLATE:

					MFG.				MODEL
0.1	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
300	CFM-HTG	0	CFM-CLG	0%	MIN %OA	0%	MAX %OA	6.0%	% HTG AREA SERVED
COMMENT:	CFM IS USED TO CALCULATE HTG ENERGY								

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
X	NONE		FUEL OIL		HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		EVAP MEDIA		MOD VLV	HUMID.
X	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (°F):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (°F):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	N	(Y/N)		NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5007

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5007UH11

AIR HANDLING UNIT SURVEY OBSERVATIONS

UH-11	AHU NO.	AIRCRAFT BAY	LOCATION (RM)
	REF. SYS. SERVING AHU	AIRCRAFT BAY	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC	X	UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:	13 GAS-FIRED RADIANT HEATERS (CEILING MOUNTED) FUEL TYPE: PROPANE							

NAMEPLATE:

					MFG.				MODEL
0.1	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
300	CFM-HTG	0	CFM-CLG	0%	MIN %OA	0%	MAX %OA	6.0%	% HTG AREA SERVED
COMMENT:	CFM IS USED TO CALCULATE HTG ENERGY								

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
X	NONE		FUEL OIL		HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		EVAP MEDIA		MOD VLV	HUMID.
X	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (°F):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (°F):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	N	(Y/N)		NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5007

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5007UH12

AIR HANDLING UNIT SURVEY OBSERVATIONS

UH-12	AHU NO.	AIRCRAFT BAY	LOCATION (RM)
	REF. SYS. SERVING AHU	AIRCRAFT BAY	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC	X	UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:	13 GAS-FIRED RADIANT HEATERS (CEILING MOUNTED) FUEL TYPE: PROPANE							

NAMEPLATE:

					MFG.				MODEL
0.1	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
300	CFM-HTG	0	CFM-CLG	0%	MIN %OA	0%	MAX %OA	6.0%	% HTG AREA SERVED
COMMENT:	CFM IS USED TO CALCULATE HTG ENERGY								

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
X	NONE		FUEL OIL		HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		EVAP MEDIA		MOD VLV	HUMID.
X	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (°F):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (°F):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	N	(Y/N)		NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5007

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5007UH13

AIR HANDLING UNIT SURVEY OBSERVATIONS

UH-13	AHU NO.	AIRCRAFT BAY	LOCATION (RM)
	REF. SYS. SERVING AHU	AIRCRAFT BAY	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC	X	UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:	13 GAS-FIRED RADIANT HEATERS (CEILING MOUNTED) FUEL TYPE: PROPANE							

NAMEPLATE:

					MFG.				MODEL
0.1	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
300	CFM-HTG	0	CFM-CLG	0%	MIN %OA	0%	MAX %OA	6.0%	% HTG AREA SERVED
COMMENT:	CFM IS USED TO CALCULATE HTG ENERGY								

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
X	NONE		FUEL OIL		HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		EVAP MEDIA		MOD VLV	HUMID.
X	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (°F):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (°F):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	N	(Y/N)		NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5007

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5007DHW1

DOMESTIC HW SURVEY OBSERVATIONS

DHW-1	BOILER/CONVERTER NO.	MECH RM	LOCATION (RM)
ELEC.	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	NO.2 OIL		NO.6 OIL		N.GAS	X	ELEC		FUELS:
	STM/HW		HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:

COMMENT:

NAMEPLATE:

RUUD	MFG.	RP-40-2	MODEL	4500	CAPACITY OUTPUT (WATTS)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)

DOMESTIC HW CIRCULATION PUMP: NONE

	HW PUMP 1 – HP		MFG.	MODEL
	HW PUMP 2 – HP		MFG.	MODEL
	HW PUMP 3 – HP		MFG.	MODEL

COMMENT:

DIMENSION:	15	DIAMETER (INCHES)	60	HEIGHT OR LENGTH (INCHES)	40 GALLON

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1700	1700	1700	1700	1700	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS				HW SUPPLY					

COMMENTS:

FIELD SURVEY NOTES

BUILDING 5265

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5265

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5265BLG

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 5265 BLDG NAME: DOL

ZONE NO.	1	FUNCTION: MAINTENANCE FACILITY							
OCCUPANCY HOURS:	M-F	700	TO	1600	SAT	0	TO	0	
	SUN	0	TO	0					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

REMARKS:

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5265

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5265ACB1

AIR HANDLING UNIT SURVEY OBSERVATIONS

AC-B-1	AHU NO.	MECH. RM NO. 6	LOCATION (RM)
C. PLANT	REF. SYS. SERVING AHU	OFFICES	SERVES AREA

UNIT TYPE:

X	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR	H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION	VAV
	NUMBER OF ZONES				OTHER			
	COMMENT:							

NAMEPLATE:

DUNHAM-BUSH				MFG.				MODEL
0.5	SUPPLY FAN HP	CENTURY		MFG.	8-151195-1			MODEL
	RET/EXH FAN HP			MFG.				MODEL
610	CFM-HTG	610	CFM-CLG	10%	MIN %OA	100%	MAX %OA	0.1%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC	MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC	MOD VLV	REHEAT
X	NONE		STM		HW		ELEC	MOD VLV	HUMID.
	NONE		DX	X	CW			X	MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	YES,
REQUIRED START TIME	0	700	700	700	700	700	0	NO PINS
REQUIRED STOP TIME	0	1600	1600	1600	1600	1600	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:	X	SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):	70	OCC HEAT		UNOCC HEAT	78	OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	Y	MIN OA (Y/N)	N	MAX OA (Y/N)	Y	RA (Y/N)	Y	EA (Y/N)	
	N	MA CONTROL	Y	ECONO-DB	N	ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	(Y / N)							
COMMENTS:	O.A. AND R.A. DAMPERS SHARE SAME ACTUATOR								

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5265

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5265ACB2

AIR HANDLING UNIT SURVEY OBSERVATIONS

AC-B-2	AHU NO.	MECH. RM NO. 6	LOCATION (RM)
C. PLANT	REF. SYS. SERVING AHU	OFFICES	SERVES AREA

UNIT TYPE:

X	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

DUNHAM-BUSH					MFG.				MODEL
0.8	SUPPLY FAN HP		CENTURY		MFG.		8-151350-01		MODEL
	RET/EXH FAN HP				MFG.				MODEL
1160	CFM-HTG	1160	CFM-CLG	10%	MIN %OA	100%	MAX %OA	0.3%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE		DX	X	CW			X	MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	YES,
REQUIRED START TIME	0	700	700	700	700	700	0	NO PINS
REQUIRED STOP TIME	0	1600	1600	1600	1600	1600	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:	X	SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):	70	OCC HEAT		UNOCC HEAT	78	OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	Y	MIN OA (Y/N)	N	MAX OA (Y/N)	Y	RA (Y/N)	Y	EA (Y/N)	
	N	MA CONTROL	N	ECONO-DB	N	ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	(Y / N)							
COMMENTS:	MANUAL DAMPERS								

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5265

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5265ACD1

AIR HANDLING UNIT SURVEY OBSERVATIONS

AC-D-1	AHU NO.	MECH. RM NO. 7	LOCATION (RM)
C. PLANT	REF. SYS. SERVING AHU	FUEL INJECTION RM	SERVES AREA

UNIT TYPE:

X	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

DUNHAM-BUSH					MFG.				MODEL
1.0	SUPPLY FAN HP		CENTURY		MFG.		8-349232-01		MODEL
	RET/EXH FAN HP				MFG.				MODEL
1850	CFM-HTG	1850	CFM-CLG	10%	MIN %OA	100%	MAX %OA	0.1%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE		DX	X	CW			X	MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	YES,
REQUIRED START TIME	0	700	700	700	700	700	0	NO PINS
REQUIRED STOP TIME	0	1600	1600	1600	1600	1600	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:	X	SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):	70	OCC HEAT		UNOCC HEAT	78	OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
	N	MA CONTROL	N	ECONO-DB	N	ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	(Y / N)							
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5265

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5265ACD2

AIR HANDLING UNIT SURVEY OBSERVATIONS

AC-D-2	AHU NO.	MECH. RM NO. 7	LOCATION (RM)
C. PLANT	REF. SYS. SERVING AHU	OFFICES	SERVES AREA

UNIT TYPE:

X	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

DUNHAM-BUSH					MFG.				MODEL
1.5	SUPPLY FAN HP		CENTURY		MFG.	8-E49237-01			MODEL
	RET/EXH FAN HP				MFG.				MODEL
2480	CFM-HTG	2480	CFM-CLG	10%	MIN %OA	100%	MAX %OA	0.8%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE		DX	X	CW			X	MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	YES,
REQUIRED START TIME	0	700	700	700	700	700	0	NO PINS
REQUIRED STOP TIME	0	1600	1600	1600	1600	1600	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:	X	SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):	70	OCC HEAT		UNOCC HEAT	72	OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
	N	MA CONTROL	N	ECONO-DB	N	ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	(Y / N)							
COMMENTS:	OA LOW LIMIT 100 °F/ OA HIGH LIMIT 100 °F								

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5265

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5265ACE1

AIR HANDLING UNIT SURVEY OBSERVATIONS

AC-E-1	AHU NO.	MECH. RM NO. 2	LOCATION (RM)
C. PLANT	REF. SYS. SERVING AHU	OFFICES	SERVES AREA

UNIT TYPE:

X	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

DUNHAM-BUSH					MFG.				MODEL
1.0	SUPPLY FAN HP		CENTURY		MFG.	3-151313-01			MODEL
	RET/EXH FAN HP				MFG.				MODEL
1980	CFM-HTG	1980	CFM-CLG	10%	MIN %OA	100%	MAX %OA	0.6%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE		DX	X	CW			X	MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	YES,
REQUIRED START TIME	0	700	700	700	700	700	0	NO PINS
REQUIRED STOP TIME	0	1600	1600	1600	1600	1600	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:	X	SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):	70	OCC HEAT		UNOCC HEAT	78	OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK	65	MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
	N	MA CONTROL	N	ECONO-DB	N	ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	(Y / N)							
COMMENTS:	CONTROLS ARE IN GOOD CONDITION; 0.5 HP HW PUMP SERVES AHUs								

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5265

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5265ACG1

AIR HANDLING UNIT SURVEY OBSERVATIONS

AC-G-1	AHU NO.	MECH. RM NO. 4	LOCATION (RM)
C. PLANT	REF. SYS. SERVING AHU	MAINT. AREA / OFFICES	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION	X	VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:	FAN TERMINAL UNITS PROVIDE HEATING							

NAMEPLATE:

					MFG.				MODEL
5.0	SUPPLY FAN HP		CENTURY		MFG.	6-322465-10			MODEL
	RET/EXH FAN HP				MFG.				MODEL
4220	CFM-HTG	4220	CFM-CLG	10%	MIN %OA	100%	MAX %OA	3.2%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE		DX	X	CW			X	MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	YES,
REQUIRED START TIME	0	700	700	700	700	700	0	NO PINS
REQUIRED STOP TIME	0	1600	1600	1600	1600	1600	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:	X	SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):	70	OCC HEAT		UNOCC HEAT	78	OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK	60	MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
	Y	MA CONTROL	Y	ECONO-DB	N	ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	(Y / N)							
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5265

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5265ACG2

AIR HANDLING UNIT SURVEY OBSERVATIONS

AC-G-2	AHU NO.	MECH. RM NO. 4	LOCATION (RM)
C. PLANT	REF. SYS. SERVING AHU	OFFICES	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION	X	VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:	FAN TERMINAL UNITS PROVIDE HEATING							

NAMEPLATE:

					MFG.				MODEL
7.5	SUPPLY FAN HP		CENTURY		MFG.	6-339040-03			MODEL
	RET/EXH FAN HP				MFG.				MODEL
6610	CFM-HTG	6610	CFM-CLG	10%	MIN %OA	100%	MAX %OA	3.9%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE		DX	X	CW			X	MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	YES,
REQUIRED START TIME	0	700	700	700	700	700	0	NO PINS
REQUIRED STOP TIME	0	1600	1600	1600	1600	1600	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:	X	SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):	70	OCC HEAT		UNOCC HEAT	78	OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK	60	MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
	Y	MA CONTROL	Y	ECONO-DB	N	ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	(Y / N)							
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5265

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5265ACG3

AIR HANDLING UNIT SURVEY OBSERVATIONS

AC-G-3	AHU NO.	MECH. RM NO. 4	LOCATION (RM)
C. PLANT	REF. SYS. SERVING AHU	CLOTHING REPAIR	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION	X	VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:	FAN TERMINAL UNITS PROVIDE HEATING							

NAMEPLATE:

					MFG.				MODEL
7.5	SUPPLY FAN HP		CENTURY		MFG.		6-339070-03		MODEL
	RET/EXH FAN HP				MFG.				MODEL
8100	CFM-HTG	8100	CFM-CLG	10%	MIN %OA	100%	MAX %OA	5.3%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE		DX	X	CW			X	MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	YES,
REQUIRED START TIME	0	700	700	700	700	700	0	NO PINS
REQUIRED STOP TIME	0	1600	1600	1600	1600	1600	0	

MONTHS ON:												
J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:	X	SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
	Y	MA CONTROL	Y	ECONO-DB	N	ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	(Y / N)							
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5265

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5265ACK1

AIR HANDLING UNIT SURVEY OBSERVATIONS

AC-K-1	AHU NO.	MECH. RM NO. 3	LOCATION (RM)
C. PLANT	REF. SYS. SERVING AHU	OFFICES	SERVES AREA

UNIT TYPE:

X	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

					MFG.				MODEL
1.5	SUPPLY FAN HP		CENTURY		MFG.		8-332578-1		MODEL
	RET/EXH FAN HP				MFG.				MODEL
820	CFM-HTG	820	CFM-CLG	10%	MIN %OA	100%	MAX %OA	0.3%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE		DX	X	CW			X	MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	YES,
REQUIRED START TIME	0	700	700	700	700	700	0	NO PINS
REQUIRED STOP TIME	0	1600	1600	1600	1600	1600	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:	X	SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):	70	OCC HEAT		UNOCC HEAT	78	OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK	65	MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
	Y	MA CONTROL	Y	ECONO-DB	N	ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	(Y / N)							
COMMENTS:	ONE O.A. DAMPER ACTUATOR; ONE R.A. DAMPER ACTUATOR								

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5265

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5265ACK2

AIR HANDLING UNIT SURVEY OBSERVATIONS

AC-K-2	AHU NO.	MECH. RM NO. 3	LOCATION (RM)
C. PLANT	REF. SYS. SERVING AHU	OFFICES	SERVES AREA

UNIT TYPE:

X	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

					MFG.				MODEL
1.5	SUPPLY FAN HP		CENTURY		MFG.	8-151958-01			MODEL
	RET/EXH FAN HP				MFG.				MODEL
2660	CFM-HTG	2660	CFM-CLG	10%	MIN %OA	100%	MAX %OA	0.7%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE		DX	X	CW			X	MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	YES,
REQUIRED START TIME	0	700	700	700	700	700	0	NO PINS
REQUIRED STOP TIME	0	1600	1600	1600	1600	1600	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:	X	SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):	70	OCC HEAT		UNOCC HEAT	78	OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK	65	MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
	Y	MA CONTROL	Y	ECONO-DB	N	ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	(Y / N)							
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5265

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5265HVA1

AIR HANDLING UNIT SURVEY OBSERVATIONS

HV-A-1	AHU NO.	MECH. RM NO. 5	LOCATION (RM)
	REF. SYS. SERVING AHU	MAINTENANCE	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR	X	H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

					MFG.				MODEL
0.8	SUPPLY FAN HP		CENTURY		MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
1360	CFM-HTG	0	CFM-CLG	0%	MIN %OA	0%	MAX %OA	0.7%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
X	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	YES,
REQUIRED START TIME	0	700	700	700	700	700	0	NO PINS
REQUIRED STOP TIME	0	1600	1600	1600	1600	1600	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):	72	OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)	N	RA (Y/N)	Y	EA (Y/N)	
	N	MA CONTROL	N	ECONO-DB	N	ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	(Y / N)							
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5265

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5265HVB1

AIR HANDLING UNIT SURVEY OBSERVATIONS

HV-B-1	AHU NO.	MECH. RM NO. 6	LOCATION (RM)
	REF. SYS. SERVING AHU	MAINTENANCE	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR	X	H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

DUNHAM-BUSH					MFG.	HAH240			MODEL
15.0	SUPPLY FAN HP		CENTURY		MFG.	6-323409-5			MODEL
10.0	RET/EXH FAN HP		CENTURY		MFG.	6-323409-5			MODEL
28000	CFM-HTG	0	CFM-CLG	100%	MIN %OA	100%	MAX %OA	11.8%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
X	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	YES,
REQUIRED START TIME	0	700	700	700	700	700	0	NO PINS
REQUIRED STOP TIME	0	1600	1600	1600	1600	1600	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):	72	OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
	N	MA CONTROL	N	ECONO-DB	N	ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	(Y / N)							
COMMENTS:	ONE ACTUATOR FOR O.A. AND R.A. DAMPERS								

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5265

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5265HVC1

AIR HANDLING UNIT SURVEY OBSERVATIONS

HV-C-1	AHU NO.	MECH. RM NO. 1	LOCATION (RM)
	REF. SYS. SERVING AHU	MAINTENANCE	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR	X	H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

					MFG.				MODEL
0.8	SUPPLY FAN HP		CENTURY		MFG.		8-151350-1		MODEL
	RET/EXH FAN HP				MFG.				MODEL
1320	CFM-HTG	0	CFM-CLG	0%	MIN %OA	0%	MAX %OA	0.1%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
X	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	YES,
REQUIRED START TIME	0	700	700	700	700	700	0	NO PINS
REQUIRED STOP TIME	0	1600	1600	1600	1600	1600	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)	Y	RA (Y/N)	Y	EA (Y/N)	
	N	MA CONTROL	N	ECONO-DB	N	ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	(Y / N)							
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5265

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5265HVD1

AIR HANDLING UNIT SURVEY OBSERVATIONS

HV-D-1	AHU NO.	MECH. RM NO. 7	LOCATION (RM)
	REF. SYS. SERVING AHU	MAINTENANCE	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR	X	H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

DUNHAM-BUSH					MFG.	HAH120			MODEL
7.5	SUPPLY FAN HP		CENTURY		MFG.	6-350192-02			MODEL
10.0	RET/EXH FAN HP				MFG.				MODEL
14700	CFM-HTG	0	CFM-CLG	10%	MIN %OA	100%	MAX %OA	4.7%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
X	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	YES,
REQUIRED START TIME	0	700	700	700	700	700	0	NO PINS
REQUIRED STOP TIME	0	1600	1600	1600	1600	1600	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):	72	OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
	N	MA CONTROL	N	ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	(Y / N)							
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5265

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5265HVD2

AIR HANDLING UNIT SURVEY OBSERVATIONS

HV-D-2	AHU NO.	MECH. RM NO. 7	LOCATION (RM)
	REF. SYS. SERVING AHU	MAINTENANCE	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR	X	H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

					MFG.				MODEL
7.5	SUPPLY FAN HP		CENTURY		MFG.		6-350192-02		MODEL
	RET/EXH FAN HP				MFG.				MODEL
11800	CFM-HTG	0	CFM-CLG	10%	MIN %OA	100%	MAX %OA	2.5%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
X	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	YES,
REQUIRED START TIME	0	700	700	700	700	700	0	NO PINS
REQUIRED STOP TIME	0	1600	1600	1600	1600	1600	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):	72	OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
	N	MA CONTROL	N	ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	(Y / N)							
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5265

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5265HVD3

AIR HANDLING UNIT SURVEY OBSERVATIONS

HV-D-3	AHU NO.	MECH. RM NO. 7	LOCATION (RM)
	REF. SYS. SERVING AHU	MAINTENANCE	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR	X	H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

					MFG.				MODEL
5.0	SUPPLY FAN HP		CENTURY		MFG.		6-350221-43		MODEL
	RET/EXH FAN HP				MFG.				MODEL
10100	CFM-HTG	0	CFM-CLG	10%	MIN %OA	100%	MAX %OA	2.5%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
X	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	YES,
REQUIRED START TIME	0	700	700	700	700	700	0	NO PINS
REQUIRED STOP TIME	0	1600	1600	1600	1600	1600	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:	X	SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
	N	MA CONTROL	N	ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	(Y / N)							
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5265

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5265HVD4

AIR HANDLING UNIT SURVEY OBSERVATIONS

HV-D-4	AHU NO.	MECH. RM NO. 7	LOCATION (RM)
	REF. SYS. SERVING AHU	MAINTENANCE	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR	X	H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

DUNHAM-BUSH					MFG.	HAH040			MODEL
3.0	SUPPLY FAN HP		CENTURY		MFG.	6-350220-10			MODEL
	RET/EXH FAN HP				MFG.				MODEL
4920	CFM-HTG	0	CFM-CLG	17%	MIN %OA	100%	MAX %OA	2.5%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
X	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	YES,
REQUIRED START TIME	0	700	700	700	700	700	0	NO PINS
REQUIRED STOP TIME	0	1600	1600	1600	1600	1600	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:	X	SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
	N	MA CONTROL	N	ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	(Y / N)							

COMMENTS: ONE ACTUATOR FOR O.A. AND R.A. DAMPERS

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5265

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5265HVE1

AIR HANDLING UNIT SURVEY OBSERVATIONS

HV-E-1	AHU NO.	MECH. RM NO. 2	LOCATION (RM)
	REF. SYS. SERVING AHU	MAINTENANCE	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR	X	H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

DUNHAM-BUSH					MFG.	HAH100			MODEL
7.5	SUPPLY FAN HP		CENTURY		MFG.	6-350192-02			MODEL
	RET/EXH FAN HP				MFG.				MODEL
11700	CFM-HTG	0	CFM-CLG	22%	MIN %OA	100%	MAX %OA	8.2%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
X	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	YES,
REQUIRED START TIME	0	700	700	700	700	700	0	NO PINS
REQUIRED STOP TIME	0	1600	1600	1600	1600	1600	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
	N	MA CONTROL	N	ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	(Y / N)							
COMMENTS:	ONE ACTUATOR FOR O.A. AND R.A. DAMPERS								

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5265

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5265HVG1

AIR HANDLING UNIT SURVEY OBSERVATIONS

HV-G-1	AHU NO.	MECH. RM NO. 4	LOCATION (RM)
	REF. SYS. SERVING AHU	WOOD SHOP	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR	X	H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

TRANE					MFG.				MODEL
5.0	SUPPLY FAN HP		CENTURY		MFG.		6-322465-10		MODEL
	RET/EXH FAN HP				MFG.				MODEL
8770	CFM-HTG	0	CFM-CLG	50%	MIN %OA	100%	MAX %OA	5.0%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
X	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	YES,
REQUIRED START TIME	0	700	700	700	700	700	0	NO PINS
REQUIRED STOP TIME	0	1600	1600	1600	1600	1600	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
	N	MA CONTROL	N	ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	(Y / N)							
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5265

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5265HVG3

AIR HANDLING UNIT SURVEY OBSERVATIONS

HV-G-3	AHU NO.	MECH. RM NO. 4	LOCATION (RM)
	REF. SYS. SERVING AHU	CANVAS REPAIR	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR	X	H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

					MFG.				MODEL
3.0	SUPPLY FAN HP		WESTINGHOUSE		MFG.	T12-3H43BDP-MKB			MODEL
	RET/EXH FAN HP				MFG.				MODEL
4710	CFM-HTG	0	CFM-CLG	50%	MIN %OA	100%	MAX %OA	4.7%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
X	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	YES,
REQUIRED START TIME	0	700	700	700	700	700	0	NO PINS
REQUIRED STOP TIME	0	1600	1600	1600	1600	1600	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
	N	MA CONTROL	N	ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	(Y / N)							
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5265

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5265HVG5

AIR HANDLING UNIT SURVEY OBSERVATIONS

HV-G-5	AHU NO.	MECH. RM NO. 4	LOCATION (RM)
	REF. SYS. SERVING AHU	WINDOW REPAIR	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR	X	H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

					MFG.				MODEL
5.0	SUPPLY FAN HP		CENTURY		MFG.	6-322465-01			MODEL
	RET/EXH FAN HP				MFG.				MODEL
8920	CFM-HTG	0	CFM-CLG	10%	MIN %OA	100%	MAX %OA	5.0%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
X	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	YES,
REQUIRED START TIME	0	700	700	700	700	700	0	NO PINS
REQUIRED STOP TIME	0	1600	1600	1600	1600	1600	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
	N	MA CONTROL	N	ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	(Y / N)							
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5265

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5265HVK1

AIR HANDLING UNIT SURVEY OBSERVATIONS

HV-K-1	AHU NO.	MECH. RM NO. 3	LOCATION (RM)
	REF. SYS. SERVING AHU	MAINTENANCE	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR	X	H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

TRANE					MFG.				MODEL
25.0	SUPPLY FAN HP		CENTURY		MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
39600	CFM-HTG	0	CFM-CLG	100%	MIN %OA	100%	MAX %OA	22.9%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
X	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	YES,
REQUIRED START TIME	0	700	700	700	700	700	0	NO PINS
REQUIRED STOP TIME	0	1600	1600	1600	1600	1600	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
	N	MA CONTROL	N	ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	(Y / N)							
COMMENTS:	O.A. DAMPER HAS ACTUATOR; R.A. DAMPER HAS ACTUATOR								

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5265

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5265FC1

AIR HANDLING UNIT SURVEY OBSERVATIONS

FC-1	AHU NO.	BLDG PERIMETER	LOCATION (RM)
CV-1	REF. SYS. SERVING AHU	MAINTENANCE	SERVES AREA

UNIT TYPE:

	SINGLE ZN	X	2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:	31 HW UNIT HEATER FAN COILS							

NAMEPLATE:

NO NAME PLATE					MFG.				MODEL
3.4	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
79100	CFM-HTG	0	CFM-CLG	0%	MIN %OA	0%	MAX %OA	9.7%	% HTG AREA SERVED
COMMENT:	TOTAL CFM FOR ALL FAN COILS								

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		EVAP MEDIA		MOD VLV	HUMID.
X	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1600	1600	1600	1600	1600	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (°F):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (°F):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
	N	MA CONTROL	N	ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	N	(Y/N)							
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5265

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5265FC2

AIR HANDLING UNIT SURVEY OBSERVATIONS

FC-2	AHU NO.	BLDG PERIMETER	LOCATION (RM)
CV-2	REF. SYS. SERVING AHU	MAINTENANCE	SERVES AREA

UNIT TYPE:

	SINGLE ZN	X	2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:	24 HW UNIT HEATER FAN COILS							

NAMEPLATE:

NO NAME PLATE					MFG.				MODEL
2.6	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
59261	CFM-HTG	0	CFM-CLG	0%	MIN %OA	0%	MAX %OA	4.3%	% HTG AREA SERVED
COMMENT:	TOTAL CFM FOR ALL FAN COILS								

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		EVAP MEDIA		MOD VLV	HUMID.
X	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1600	1600	1600	1600	1600	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (°F):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (°F):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
	N	MA CONTROL	N	ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	N	(Y/N)							
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5265

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5265PMP1

REFRIGERATION EQUIPMENT SURVEY OBSERVATIONS

CHW PUMP	CHILLER/COMPRESSOR NO.	MECH. ROOM	LOCATION (RM)

UNIT TYPE:

	CENTRIFUGAL WITH WATER SIDE COOLING TOWER						OTHER
	RECIPROCATING WITH WATER SIDE COOLING TOWER					X	AHU'S SERVED AC-B-1 & AC-B-2
	RECIPROCATING WITH AIR COOLED CONDENSING UNIT						
	ABSORBTION WITH WATER SIDE COOLING TOWER						
	AIR COOLED CONDENSING UNIT						
	CHW		DX	X	OTHER		CHW PUMP ONLY

NAMEPLATE:

CHILLER		MFG.				MODEL			SERIAL NO.
	VOLTS		AMPS		PH		HZ		CAPACITY (TONS)
CONDENSER FANS		MFG.				MODEL			# OF FANS
	VOLTS		AMPS		PH		HZ		HP
CW PUMP		MFG.				MODEL			SERIAL NO.
	VOLTS		AMPS		PH		HZ	0.5	HP
CNW PUMP		MFG.				MODEL			SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP

COMMENTS:

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO TIMECLOCK
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1600	1600	1600	1600	1600	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
0	0	0	0	1	1	1	1	1	0	0	0

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		CWS (oF)		CWR (oF)		CNWS (oF)		CNWR (oF)	
PANEL INDICATORS									
- PRESSURE		LITE-HI		LITE-LOW		GAUGES			
- TEMPERATURE		LITE-HI		LITE-LOW		GAUGES			
- OTHER									

COMMENTS:

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5265

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5265PMP2

REFRIGERATION EQUIPMENT SURVEY OBSERVATIONS

CHW PUMP	CHILLER/COMPRESSOR NO.	MECH. ROOM	LOCATION (RM)

UNIT TYPE:

	CENTRIFUGAL WITH WATER SIDE COOLING TOWER						OTHER
	RECIPROCATING WITH WATER SIDE COOLING TOWER					X	AHU'S SERVED **AC-D-1 & AC-D-2**
	RECIPROCATING WITH AIR COOLED CONDENSING UNIT						
	ABSORBTION WITH WATER SIDE COOLING TOWER						
	AIR COOLED CONDENSING UNIT						
	CHW		DX	X	OTHER		**CHW PUMP ONLY**

NAMEPLATE:

CHILLER		MFG.				MODEL			SERIAL NO.
	VOLTS		AMPS		PH		HZ		CAPACITY (TONS)
CONDENSER FANS		MFG.				MODEL			# OF FANS
	VOLTS		AMPS		PH		HZ		HP
CW PUMP		MFG.				MODEL			SERIAL NO.
	VOLTS		AMPS		PH		HZ	0.75	HP
CNW PUMP		MFG.				MODEL			SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP

COMMENTS:

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO TIMECLOCK
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1600	1600	1600	1600	1600	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
0	0	0	0	1	1	1	1	1	0	0	0

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		CWS (oF)		CWR (oF)		CNWS (oF)		CNWR (oF)	
PANEL INDICATORS									
- PRESSURE		LITE-HI		LITE-LOW		GAUGES			
- TEMPERATURE		LITE-HI		LITE-LOW		GAUGES			
- OTHER									

COMMENTS:

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5265

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5265PMP3

REFRIGERATION EQUIPMENT SURVEY OBSERVATIONS

CHW PUMP	CHILLER/COMPRESSOR NO.	MECH. ROOM	LOCATION (RM)

UNIT TYPE:

	CENTRIFUGAL WITH WATER SIDE COOLING TOWER						OTHER
	RECIPROCATING WITH WATER SIDE COOLING TOWER					X	AHU'S SERVED AC-E-1
	RECIPROCATING WITH AIR COOLED CONDENSING UNIT						
	ABSORBTION WITH WATER SIDE COOLING TOWER						
	AIR COOLED CONDENSING UNIT						
	CHW		DX	X	OTHER		CHW PUMP ONLY

NAMEPLATE:

CHILLER		MFG.				MODEL			SERIAL NO.
	VOLTS		AMPS		PH		HZ	CAPACITY (TONS)	
CONDENSER FANS		MFG.				MODEL			# OF FANS
	VOLTS		AMPS		PH		HZ	HP	
CW PUMP		MFG.				MODEL			SERIAL NO.
	VOLTS		AMPS		PH		HZ 0.75	HP	
CNW PUMP		MFG.				MODEL			SERIAL NO.
	VOLTS		AMPS		PH		HZ	HP	
COMMENTS:									

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO TIMECLOCK
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1600	1600	1600	1600	1600	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
0	0	0	0	1	1	1	1	1	0	0	0

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		CWS (oF)		CWR (oF)		CNWS (oF)		CNWR (oF)	
PANEL INDICATORS									
- PRESSURE		LITE-HI		LITE-LOW		GAUGES			
- TEMPERATURE		LITE-HI		LITE-LOW		GAUGES			
- OTHER									
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5265

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5265PMP4

REFRIGERATION EQUIPMENT SURVEY OBSERVATIONS

CHW PUMP	CHILLER/COMPRESSOR NO.	MECH. ROOM	LOCATION (RM)

UNIT TYPE:

	CENTRIFUGAL WITH WATER SIDE COOLING TOWER						OTHER
	RECIPROCATING WITH WATER SIDE COOLING TOWER					X	AHU'S SERVED AC-F-1
	RECIPROCATING WITH AIR COOLED CONDENSING UNIT						
	ABSORBTION WITH WATER SIDE COOLING TOWER						
	AIR COOLED CONDENSING UNIT						
	CHW		DX	X	OTHER		CHW PUMP ONLY

NAMEPLATE:

CHILLER		MFG.				MODEL			SERIAL NO.
	VOLTS		AMPS		PH		HZ		CAPACITY (TONS)
CONDENSER FANS		MFG.				MODEL			# OF FANS
	VOLTS		AMPS		PH		HZ		HP
CW PUMP		MFG.				MODEL			SERIAL NO.
	VOLTS		AMPS		PH		HZ	2	HP
CNW PUMP		MFG.				MODEL			SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP
COMMENTS:									

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO TIMECLOCK
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1600	1600	1600	1600	1600	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
0	0	0	0	1	1	1	1	1	0	0	0

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC	DDC	COMMENTS
SETPOINTS		CWS (oF)		CWR (oF)		CNWS (oF)	CNWR (oF)	
PANEL INDICATORS								
- PRESSURE		LITE-HI		LITE-LOW		GAUGES		
- TEMPERATURE		LITE-HI		LITE-LOW		GAUGES		
- OTHER								
COMMENTS:								

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5265

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5265PMP5

REFRIGERATION EQUIPMENT SURVEY OBSERVATIONS

CHW PUMP	CHILLER/COMPRESSOR NO.	MECH. ROOM	LOCATION (RM)

UNIT TYPE:

	CENTRIFUGAL WITH WATER SIDE COOLING TOWER						OTHER
	RECIPROCATING WITH WATER SIDE COOLING TOWER					X	AHU'S SERVED **AC-K-1 & AC-K-2**
	RECIPROCATING WITH AIR COOLED CONDENSING UNIT						
	ABSORBTION WITH WATER SIDE COOLING TOWER						
	AIR COOLED CONDENSING UNIT						
	CHW		DX	X	OTHER		**CHW PUMP ONLY**

NAMEPLATE:

CHILLER		MFG.				MODEL			SERIAL NO.
	VOLTS		AMPS		PH		HZ		CAPACITY (TONS)
CONDENSER FANS		MFG.				MODEL			# OF FANS
	VOLTS		AMPS		PH		HZ		HP
CW PUMP		MFG.				MODEL			SERIAL NO.
	VOLTS		AMPS		PH		HZ	0.75	HP
CNW PUMP		MFG.				MODEL			SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP
COMMENTS:									

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO TIMECLOCK
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1600	1600	1600	1600	1600	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
0	0	0	0	1	1	1	1	1	0	0	0

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		CWS (oF)		CWR (oF)		CNWS (oF)		CNWR (oF)	
PANEL INDICATORS									
- PRESSURE		LITE-HI		LITE-LOW		GAUGES			
- TEMPERATURE		LITE-HI		LITE-LOW		GAUGES			
- OTHER									
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5265

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5265CV1

BOILER & CONVERTER SURVEY OBSERVATIONS

CV-1	BOILER/CONVERTER NO.	MECH. RM. NO. 6	LOCATION (RM)
	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	STEAM		PSIG		HW		TEMP.		BOILER TYPE:
	NO.2 OIL		NO.6 OIL		N.GAS		ELEC		FUELS:
	STM/HW	X	HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:
X	SPACE HEAT		DHW		OTHER				USE:
COMMENT:							0%		% HTG AREA SERVED
									BB RADIATION ONLY

NAMEPLATE:

NO NAME PLATE	MFG.		MODEL	6012900	CAPACITY OUTPUT (BTUH)
				6012900	CAPACITY INPUT (BTUH)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)
					CAPACITY INPUT (BTUH)
10	HW PUMP 1 - HP	GE	MFG.	5K215AL205D	MODEL
1	HW PUMP 2 - HP		MFG.		MODEL
	HW PUMP 3 - HP		MFG.		MODEL
COMMENT:					

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1600	1600	1600	1600	1600	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		PSIG	190	HW SUPPLY					
RESET CONTROL (oF)		HW HIGH		HW LOW		OA LOW		OA HIGH	
BURNER CONTROLS		O2 TRIM (Y/N)		OTHER					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5265

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5265CV2

BOILER & CONVERTER SURVEY OBSERVATIONS

CV-2	BOILER/CONVERTER NO.	MECH. RM. NO. 6	LOCATION (RM)
	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	STEAM		PSIG		HW		TEMP.		BOILER TYPE:
	NO.2 OIL		NO.6 OIL		N.GAS		ELEC		FUELS:
	STM/HW	X	HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:
X	SPACE HEAT		DHW		OTHER				USE:
COMMENT:							0%	% HTG AREA SERVED	
								BB RADIATION ONLY	

NAMEPLATE:

NO NAME PLATE	MFG.		MODEL	6012900	CAPACITY OUTPUT (BTUH)
				6012900	CAPACITY INPUT (BTUH)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)
					CAPACITY INPUT (BTUH)
10	HW PUMP 1 – HP	GE	MFG.	5K215AL205D	MODEL
0.5	HW PUMP 2 – HP		MFG.		MODEL
	HW PUMP 3 – HP		MFG.		MODEL
COMMENT:					

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1600	1600	1600	1600	1600	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		PSIG	190	HW SUPPLY					
RESET CONTROL (oF)		HW HIGH		HW LOW		OA LOW		OA HIGH	
BURNER CONTROLS		O2 TRIM (Y/N)		OTHER					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5265

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5265DHW1

DOMESTIC HW SURVEY OBSERVATIONS

DHW-1	BOILER/CONVERTER NO.	MECH RM NO. 3	LOCATION (RM)
ELEC.	SOURCE OF HEATING (PLANT)	AREAS J, K & L	SERVES AREA

UNIT TYPE:

	NO.2 OIL		NO.6 OIL		N.GAS	X	ELEC		FUELS:
	STM/HW		HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:
COMMENT:									

NAMEPLATE:

A.O. SMITH	MFG.	DRE80 8100	MODEL	3600	CAPACITY OUTPUT (WATTS)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)

DOMESTIC HW CIRCULATION PUMP: NONE

	HW PUMP 1 – HP		MFG.	MODEL
	HW PUMP 2 – HP		MFG.	MODEL
	HW PUMP 3 – HP		MFG.	MODEL

COMMENT:

DIMENSION:	26	DIAMETER (INCHES)	60	HEIGHT OR LENGTH (INCHES)	80 GALLON

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1600	1600	1600	1600	1600	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS				HW SUPPLY					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5265

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5265DHW2

DOMESTIC HW SURVEY OBSERVATIONS

DHW-2	BOILER/CONVERTER NO.	HALLWAY CLOSET	LOCATION (RM)
ELEC.	SOURCE OF HEATING (PLANT)	AREA B	SERVES AREA

UNIT TYPE:

	NO.2 OIL		NO.6 OIL		N.GAS	X	ELEC		FUELS:
	STM/HW		HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:
COMMENT:									

NAMEPLATE:

A.O. SMITH	MFG.	DRE120 810P	MODEL	4800	CAPACITY OUTPUT (WATTS)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)

DOMESTIC HW CIRCULATION PUMP: **NONE**

	HW PUMP 1 – HP		MFG.	MODEL
	HW PUMP 2 – HP		MFG.	MODEL
	HW PUMP 3 – HP		MFG.	MODEL

COMMENT:

DIMENSION:	DIAMETER (INCHES)		HEIGHT OR LENGTH (INCHES)	120 GALLON

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1600	1600	1600	1600	1600	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS				HW SUPPLY					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5265

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5265DHW3

DOMESTIC HW SURVEY OBSERVATIONS

DHW-3	BOILER/CONVERTER NO.	MECH RM NO. 6	LOCATION (RM)
ELEC.	SOURCE OF HEATING (PLANT)	AREAS C, D, & E	SERVES AREA

UNIT TYPE:

	NO.2 OIL		NO.6 OIL		N.GAS	X	ELEC		FUELS:
	STM/HW		HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:
COMMENT:									

NAMEPLATE:

RUUD	MFG.	EGL85-36-G	MODEL	3600	CAPACITY OUTPUT (WATTS)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)
DOMESTIC HW CIRCULATION PUMP:		NONE			
	HW PUMP 1 - HP		MFG.		MODEL
	HW PUMP 2 - HP		MFG.		MODEL
	HW PUMP 3 - HP		MFG.		MODEL
COMMENT:					

DIMENSION:	28	DIAMETER (INCHES)	56	HEIGHT OR LENGTH (INCHES)	80 GALLON

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1600	1600	1600	1600	1600	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS				HW SUPPLY					
COMMENTS:									

FIELD SURVEY NOTES

BUILDING 5267

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5267

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5267BLG

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 5267 BLDG NAME: DISPATCH

ZONE NO.	1	FUNCTION: ADMINISTRATION						
OCCUPANCY HOURS:	M-F	500	TO	2400	SAT	600	TO	1800
	SUN	600	TO	1800				
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F			
	SUMMER OCC	°F		UNOCC	°F			

ZONE NO.		FUNCTION:						
OCCUPANCY HOURS:	M-F		TO		SAT		TO	
	SUN		TO					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F			
	SUMMER OCC	°F		UNOCC	°F			

ZONE NO.		FUNCTION:						
OCCUPANCY HOURS:	M-F		TO		SAT		TO	
	SUN		TO					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F			
	SUMMER OCC	°F		UNOCC	°F			

REMARKS:

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5267

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5267AH1

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-1	AHU NO.	MECH. ROOM	LOCATION (RM)
C. PLANT	REF. SYS. SERVING AHU	ALL	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT	X	REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:	HAS INLET VANE CONTROL							

NAMEPLATE:

TRANE					MFG.				MODEL
3.0	SUPPLY FAN HP		WESTINGHOUSE		MFG.	G80B64DG41			MODEL
	RET/EXH FAN HP				MFG.				MODEL
6000	CFM-HTG	6000	CFM-CLG	10%	MIN %OA	100%	MAX %OA	100%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HEATING
	NONE		STM	X	HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE		DX	X	CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	YES,
REQUIRED START TIME	600	500	500	500	500	500	600	NO PINS
REQUIRED STOP TIME	1800	2400	2400	2400	2400	2400	1800	

MONTHS ON:			0									
J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):	72	OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	Y	EA (Y/N)	
		MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	YES		NO					
COMMENTS:	E.A. DAMPER LINKAGE DISCONNECTED								

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5267

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5267PMP1

BOILER & CONVERTER SURVEY OBSERVATIONS

HW PUMP	BOILER/CONVERTER NO.	**MECH. RM.**	LOCATION (RM)
C. PLANT	SOURCE OF HEATING (PLANT)	**ALL**	SERVES AREA

UNIT TYPE:

	STEAM		PSIG	X	HW		TEMP.		BOILER TYPE:
	NO.2 OIL		NO.6 OIL		N.GAS		ELEC		FUELS:
	STM/HW		HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:
X	SPACE HEAT		DHW		OTHER				USE:
COMMENT:									% HTG AREA SERVED
									BB RADIATION ONLY

NAMEPLATE:

	MFG.		MODEL		CAPACITY OUTPUT (BTUH)
					CAPACITY INPUT (BTUH)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)
					CAPACITY INPUT (BTUH)
0.5	HW PUMP 1 – HP	**GE**	MFG.	**5K36MU34AX**	MODEL
	HW PUMP 2 – HP		MFG.		MODEL
	HW PUMP 3 – HP		MFG.		MODEL
COMMENT:					

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	**0**	**0**	**0**	**0**	**0**	**0**	**0**	TIMECLOCK?
PRESENT STOP TIME	**2400**	**2400**	**2400**	**2400**	**2400**	**2400**	**2400**	
REQUIRED START TIME	**600**	**500**	**500**	**500**	**500**	**500**	**600**	
REQUIRED STOP TIME	**1800**	**2400**	**2400**	**2400**	**2400**	**2400**	**1800**	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	**1**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**1**

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		PSIG		HW SUPPLY					
RESET CONTROL (oF)		HW HIGH		HW LOW		OA LOW		OA HIGH	
BURNER CONTROLS		O2 TRIM (Y/N)		OTHER					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5267

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5267PMP2

REFRIGERATION EQUIPMENT SURVEY OBSERVATIONS

CHW PUMP	CHILLER/COMPRESSOR NO.	MECH. ROOM	LOCATION (RM)

UNIT TYPE:

	CENTRIFUGAL WITH WATER SIDE COOLING TOWER						OTHER
	RECIPROCATING WITH WATER SIDE COOLING TOWER					X	AHU'S SERVED **AHU-1**
	RECIPROCATING WITH AIR COOLED CONDENSING UNIT						
	ABSORBTION WITH WATER SIDE COOLING TOWER						
	AIR COOLED CONDENSING UNIT						
	CHW		DX	X	OTHER		**CHW PUMP ONLY**

NAMEPLATE:

CHILLER		MFG.				MODEL			SERIAL NO.
	VOLTS		AMPS		PH		HZ	CAPACITY (TONS)	
CONDENSER FANS		MFG.				MODEL			# OF FANS
	VOLTS		AMPS		PH		HZ	HP	
CW PUM **TACO**		MFG.				MODEL			SERIAL NO.
	VOLTS		AMPS		PH		HZ **0.33**	HP	
CNW PUMP		MFG.				MODEL			SERIAL NO.
	VOLTS		AMPS		PH		HZ	HP	
COMMENTS:									

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	**0**	**0**	**0**	**0**	**0**	**0**	**0**	TIMECLOCK?
PRESENT STOP TIME	**2400**	**2400**	**2400**	**2400**	**2400**	**2400**	**2400**	**NO TIMECLOCK**
REQUIRED START TIME	**600**	**500**	**500**	**500**	**500**	**500**	**600**	
REQUIRED STOP TIME	**1800**	**2400**	**2400**	**2400**	**2400**	**2400**	**1800**	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
0	**0**	**0**	**0**	**1**	**1**	**1**	**1**	**1**	**0**	**0**	**0**

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		CWS (oF)		CWR (oF)		CNWS (oF)		CNWR (oF)	
PANEL INDICATORS									
- PRESSURE		LITE-HI		LITE-LOW		GAUGES			
- TEMPERATURE		LITE-HI		LITE-LOW		GAUGES			
- OTHER									
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 5267

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 5267DHW1

DOMESTIC HW SURVEY OBSERVATIONS

DHW-1	BOILER/CONVERTER NO.	MECH RM	LOCATION (RM)
ELEC.	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	NO.2 OIL		NO.6 OIL		N.GAS	X	ELEC		FUELS:
	STM/HW		HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:
COMMENT:									

NAMEPLATE:

A.O. SMITH	MFG.	DEN 30 102	MODEL	4500	CAPACITY OUTPUT (WATTS)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)

DOMESTIC HW CIRCULATION PUMP: NO

	HW PUMP 1 – HP		MFG.		MODEL
	HW PUMP 2 – HP		MFG.		MODEL
	HW PUMP 3 – HP		MFG.		MODEL

COMMENT:

DIMENSION:	19	DIAMETER (INCHES)	46	HEIGHT OR LENGTH (INCHES)	30 GALLON

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	600	500	500	500	500	500	600	
REQUIRED STOP TIME	1800	2400	2400	2400	2400	2400	1800	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS				HW SUPPLY					
COMMENTS:									

FIELD SURVEY NOTES

BUILDING 6150

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 6150

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 6150BLG

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 6150 BLDG NAME: ADMINISTRATION/MAINTENANCE

ZONE NO.	1	FUNCTION:							
OCCUPANCY HOURS:	M-F	700	TO	1600	SAT	0	TO	0	
	SUN	0	TO	0					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

REMARKS:

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 6150

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 6150AH1

AIR HANDLING UNIT SURVEY OBSERVATIONS

HVAC-1	AHU NO.	MECH. RM.	LOCATION (RM)
ACCU-1, BLR-1	REF. SYS. SERVING AHU	ADMIN. OFFICES	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
X	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
3	NUMBER OF ZONES				OTHER				
	COMMENT:	PNEUMATIC ACTUATORS							

NAMEPLATE:

AIRTHERM					MFG.	2N982H			MODEL
2.0	SUPPLY FAN HP		DAYTON		MFG.				MODEL
1.5	RET/EXH FAN HP				MFG.				MODEL
2850	CFM-HTG	2850	CFM-CLG	20%	MIN %OA	100%	MAX %OA	24%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE	X	DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	YES,
REQUIRED START TIME	0	700	700	700	700	700	0	DOES NOT WORK
REQUIRED STOP TIME	0	1600	1600	1600	1600	1600	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	Y	EA (Y/N)	
	Y	MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	YES		NO					
COMMENTS:	R.A. AND O.A. SHARE THE SAME ACTUATOR								

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 6150

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 6150AH2

AIR HANDLING UNIT SURVEY OBSERVATIONS

HV-1	AHU NO.	MECH. RM.	LOCATION (RM)
BLR-1	REF. SYS. SERVING AHU	WORK SHOP	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR	X	H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:	FACE & BYPASS DAMPERS							

NAMEPLATE:

					MFG.				MODEL
5.0	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
6350	CFM-HTG	6350	CFM-CLG	100%	MIN %OA	100%	MAX %OA	9%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV PREHEAT
	NONE	X	STM		HW		ELEC		MOD VLV HEATING
X	NONE		STM		HW		ELEC		MOD VLV REHEAT
X	NONE		STM		HW		ELEC		MOD VLV HUMID.
X	NONE		DX		CW				MOD VLV COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1600	1600	1600	1600	1600	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
	N	MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	N	YES		NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 6150

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 6150FC1

AIR HANDLING UNIT SURVEY OBSERVATIONS

FC-1	AHU NO.	WORK BAY	LOCATION (RM)
BLR-1	REF. SYS. SERVING AHU	WORK BAY	SERVES AREA

UNIT TYPE:

	SINGLE ZN	X	2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:	11 HW UNIT HEATER FAN COILS							

NAMEPLATE:

NO NAME PLATE					MFG.				MODEL
0.4	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
4600	CFM-HTG	0	CFM-CLG	0%	MIN %OA	0%	MAX %OA	67.0%	% HTG AREA SERVED
COMMENT:	TOTAL CFM FOR 4 FAN COILS								

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		EVAP MEDIA		MOD VLV	HUMID.
X	NONE		DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1600	1600	1600	1600	1600	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:		SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (°F):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (°F):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
	N	MA CONTROL		ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	N	(Y/N)							
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 6150

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 6150CH1

REFRIGERATION EQUIPMENT SURVEY OBSERVATIONS

ACCU-1	CHILLER/COMPRESSOR NO. .	OUTSIDE BLDG	LOCATION (RM)

UNIT TYPE:

	CENTRIFUGAL WITH WATER SIDE COOLING TOWER						OTHER
	RECIPROCATING WITH WATER SIDE COOLING TOWER					X	AHU'S SERVED HVAC-1
	RECIPROCATING WITH AIR COOLED CONDENSING UNIT						
	ABSORBTION WITH WATER SIDE COOLING TOWER						
X	AIR COOLED CONDENSING UNIT						
	CHW	X	DX		OTHER		

NAMEPLATE:

CHILLER FEDDERS	MFG.				MODEL				SERIAL NO.
208 VOLTS	44	AMPS	3	PH	60	HZ	8.8	CAPACITY (TONS)	
CONDENSER FANS	MFG.				MODEL			2	# OF FANS
208 VOLTS	2.2	AMPS	3	PH	60	HZ	0.33	HP	
DTW PUMP	MFG.				MODEL				SERIAL NO.
VOLTS		AMPS		PH		HZ		HP	
CNW PUMP	MFG.				MODEL				SERIAL NO.
VOLTS		AMPS		PH		HZ		HP	

COMMENTS:

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1600	1600	1600	1600	1600	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
0	0	0	0	1	1	1	1	1	0	0	0

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		CWS (oF)		CWR (oF)		CNWS (oF)		CNWR (oF)	
PANEL INDICATORS									
- PRESSURE		LITE-HI		LITE-LOW		GAUGES			
- TEMPERATURE		LITE-HI		LITE-LOW		GAUGES			
- OTHER									

COMMENTS: FM RADIO CONTROL SWITCH

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 6150

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 6150BLR

BOILER & CONVERTER SURVEY OBSERVATIONS

BLR-1	BOILER/CONVERTER NO.	MECH. RM.	LOCATION (RM)
	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

X	STEAM		PSIG		HW		TEMP.		BOILER TYPE:
X	NO.2 OIL		NO.6 OIL		N.GAS		ELEC		FUELS:
	STM/HW		HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:
X	SPACE HEAT		DHW		OTHER				USE:
COMMENT:							0.0%		% HTG AREA SERVED
									BB RADIATION ONLY

NAMEPLATE:

WEIL-McLAIN	MFG.	BL-584-S-W	MODEL	633000	CAPACITY OUTPUT (BTUH)
				791250	CAPACITY INPUT (BTUH)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)
					CAPACITY INPUT (BTUH)
	HW PUMP 1 - HP		MFG.		MODEL
	HW PUMP 2 - HP		MFG.		MODEL
0.33	COND PUMP 1 - HP		MFG.		MODEL
COMMENT:					

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1600	1600	1600	1600	1600	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC	DDC	COMMENTS
SETPOINTS		PSIG		HW SUPPLY				
RESET CONTROL (oF)		HW HIGH		HW LOW		OA LOW	OA HIGH	
BURNER CONTROLS		O2 TRIM (Y/N)		OTHER				
COMMENTS:								

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 6150

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: DR
CHECKED BY: CEL
FILE: 6150CV1

BOILER & CONVERTER SURVEY OBSERVATIONS

CV-1	BOILER/CONVERTER NO.	MECH. RM.	LOCATION (RM)
BLR-1	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	STEAM		PSIG		HW		TEMP.	BOILER TYPE:
	NO.2 OIL		NO.6 OIL		N.GAS		ELEC	FUELS:
X	STM/HW		HTHW/HW		HTHW/STM		OTHER	CONVERTER TYPE:
X	SPACE HEAT		DHW		OTHER			USE:
COMMENT:							0%	% HTG AREA SERVED
								BB RADIATION ONLY

NAMEPLATE:

N/A	MFG.	N/A	MODEL	345000	CAPACITY OUTPUT (BTUH)
				345000	CAPACITY INPUT (BTUH)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)
					CAPACITY INPUT (BTUH)

1.5	HW PUMP 1 - HP	GOULD	MFG.	8-332749-1	MODEL
	HW PUMP 2 - HP		MFG.		MODEL
	HW PUMP 3 - HP		MFG.		MODEL

COMMENT:

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK' NO
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1600	1600	1600	1600	1600	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

	X	PNEUMATIC		ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		PSIG		HW SUPPLY					
RESET CONTROL (oF)		HW HIGH		HW LOW		OA LOW		OA HIGH	
BURNER CONTROLS		O2 TRIM (Y/N)		OTHER					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 6150

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 6150DHW1

DOMESTIC HW SURVEY OBSERVATIONS

DHW-1	BOILER/CONVERTER NO.	MECH RM	LOCATION (RM)
ELEC.	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	NO.2 OIL		NO.6 OIL		N.GAS	X	ELEC		FUELS:
	STM/HW		HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:

COMMENT:

NAMEPLATE:

JACKSON	MFG.		MODEL	4500	CAPACITY OUTPUT (WATTS)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)

DOMESTIC HW CIRCULATION PUMP: NONE

	HW PUMP 1 – HP		MFG.		MODEL
	HW PUMP 2 – HP		MFG.		MODEL
	HW PUMP 3 – HP		MFG.		MODEL

COMMENT:

DIMENSION:	36	DIAMETER (INCHES)	60	HEIGHT OR LENGTH (INCHES)	80 GALLON

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	700	700	700	700	700	0	
REQUIRED STOP TIME	0	1600	1600	1600	1600	1600	0	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS				HW SUPPLY					

COMMENTS:

FIELD SURVEY NOTES

BUILDING 6505

FIELD SURVEY NOTES

TO: FILE, FT. LEONARD WOOD
FR: CARL LUNDSTROM
DT: 16 NOVEMBER 1992

RE: BLDG 6505, WELL PUMPS AND WATER TREATMENT

Regarding controls:

- One well pump and three distribution pumps to monitor
- Ground reservoir
- Inject chlorine
- They need to monitor flow.
- Could check status of pumps

Regarding remote wells:

- They have remote wells at 1420, 5282, 10309, and 10222.

ENERGY CALCULATIONS

BUILDING 7391

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 7391

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 7391BLG

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 7391 BLDG NAME: NCO CLUB

ZONE NO.	1	FUNCTION: ENGINEERING CLUB							
OCCUPANCY HOURS:	M-F	700	TO	2400	SAT	1400	TO	2400	
	SUN	0	TO	400					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.	2	FUNCTION: CONFERENCE ROOM, DINING							
OCCUPANCY HOURS:	M-F	700	TO	2400	SAT	1400	TO	2400	
	SUN	0	TO	400					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

REMARKS:
SIMILAR TO BLDG 4109
NEED SCHEDULE AND TEMPERATURE OVERRIDE IN CASHIERS CAGE
NEED BETTER TEMPERATURE CONTROL BY OCCUPANT
PROBLEMS WITH TEMPERATURE CONTROL
DCFA MANAGES CLUBS AND AAFES
SUPERVISER IN CHARGE OVER NCO CLUBS:
LAN NGUYEN PH. NO. 329-6533
ENGINEERING CLUB (NCO)
BLDG. 7391, FT LEONARD WOOD, MO. 65473

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 7391

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 7391AH1

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-1	AHU NO.	ROOM B4	LOCATION (RM)
CH-1	REF. SYS. SERVING AHU	MAIN DINING	SERVES AREA

UNIT TYPE:

X	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

McQUAY					MFG.	LS222H			MODEL
7.5	SUPPLY FAN HP		LINCOLN		MFG.	S.N. 472543			MODEL
	RET/EXH FAN HP				MFG.				MODEL
11750	CFM-HTG	11750	CFM-CLG	43%	MIN %OA	100%	MAX %OA	26%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE		DX	X	CW			X	MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	YES,
REQUIRED START TIME	0	700	700	700	700	700	1400	NO PINS
REQUIRED STOP TIME	400	2400	2400	2400	2400	2400	2400	

MONTHS ON: 0

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC		ELECTRIC	X	ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:	X	SINGLE STPT		DUAL SETPNT		SETBACK			J.C. CONTROLS
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
	Y	MA CONTROL	N	ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	(Y/N)							
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 7391

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 7391AH2

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-2	AHU NO.	ROOM B4	LOCATION (RM)
CH-1	REF. SYS. SERVING AHU	MEETING ROOM	SERVES AREA

UNIT TYPE:

X	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

McQUAY					MFG.	LS214H			MODEL
5.0	SUPPLY FAN HP		LINCOLN		MFG.	S.N. 490830			MODEL
	RET/EXH FAN HP				MFG.				MODEL
6500	CFM-HTG	6500	CFM-CLG	46%	MIN %OA	100%	MAX %OA	14%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE		DX	X	CW			X	MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	YES,
REQUIRED START TIME	0	700	700	700	700	700	1400	NO PINS
REQUIRED STOP TIME	400	2400	2400	2400	2400	2400	2400	

MONTHS ON: 0

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC		ELECTRIC	X	ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:	X	SINGLE STPT		DUAL SETPNT		SETBACK			J.C. CONTROLS
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
	Y	MA CONTROL	N	ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	(Y/N)							
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 7391

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 7391AH3

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-3	AHU NO.	ROOM B4	LOCATION (RM)
CH-1	REF. SYS. SERVING AHU	LOOKOUT BAR	SERVES AREA

UNIT TYPE:

X	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

McQUAY					MFG.	LS106H			MODEL
1.5	SUPPLY FAN HP		LINCOLN		MFG.	S.N. 478607			MODEL
	RET/EXH FAN HP				MFG.				MODEL
2800	CFM-HTG	2800	CFM-CLG	54%	MIN %OA	100%	MAX %OA	8%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE		DX	X	CW			X	MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	YES,
REQUIRED START TIME	0	700	700	700	700	700	1400	NO PINS
REQUIRED STOP TIME	400	2400	2400	2400	2400	2400	2400	

MONTHS ON: 0

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC		ELECTRIC	X	ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:	X	SINGLE STPT		DUAL SETPNT		SETBACK			J.C. CONTROLS
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
	Y	MA CONTROL	N	ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	(Y/N)							
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 7391

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 7391AH4

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-4	AHU NO.	MECH. RM NO. 2	LOCATION (RM)
CH-1	REF. SYS. SERVING AHU	DINING ROOM	SERVES AREA

UNIT TYPE:

X	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

McQUAY					MFG.	LS108H			MODEL
1.5	SUPPLY FAN HP		LINCOLN		MFG.	1430			MODEL
	RET/EXH FAN HP				MFG.				MODEL
3800	CFM-HTG	3800	CFM-CLG	40%	MIN %OA	100%	MAX %OA	14%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE		DX	X	CW			X	MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	YES,
REQUIRED START TIME	0	700	700	700	700	700	1400	NO PINS
REQUIRED STOP TIME	400	2400	2400	2400	2400	2400	2400	

MONTHS ON: 0

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC		ELECTRIC	X	ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:	X	SINGLE STPT		DUAL SETPNT		SETBACK			J.C. CONTROLS
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
	Y	MA CONTROL	N	ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	(Y/N)							
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 7391

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 7391AH5

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-5	AHU NO.	MECH. RM NO. 2	LOCATION (RM)
CH-1	REF. SYS. SERVING AHU	LOBBY, RESTROOMS	SERVES AREA

UNIT TYPE:

X	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

McQUAY					MFG.	LS111H			MODEL
3.0	SUPPLY FAN HP		LINCOLN		MFG.	S.N. 481754			MODEL
	RET/EXH FAN HP				MFG.				MODEL
4950	CFM-HTG	4950	CFM-CLG	40%	MIN %OA	100%	MAX %OA	18%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE		DX	X	CW			X	MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	YES,
REQUIRED START TIME	0	700	700	700	700	700	1400	NO PINS
REQUIRED STOP TIME	400	2400	2400	2400	2400	2400	2400	

MONTHS ON: 0

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC		ELECTRIC	X	ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:	X	SINGLE STPT		DUAL SETPNT		SETBACK			J.C. CONTROLS
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
	Y	MA CONTROL	N	ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	(Y/N)							
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 7391

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 7391AH6

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-6	AHU NO.	MECH. RM NO. 2	LOCATION (RM)
CH-1	REF. SYS. SERVING AHU	BAR, STORE	SERVES AREA

UNIT TYPE:

X	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

McQUAY					MFG.	LS111H			MODEL
3.0	SUPPLY FAN HP		LINCOLN		MFG.	S.N. 481755			MODEL
	RET/EXH FAN HP				MFG.				MODEL
4800	CFM-HTG	4800	CFM-CLG	67%	MIN %OA	100%	MAX %OA	9%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE		DX	X	CW			X	MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	YES,
REQUIRED START TIME	0	700	700	700	700	700	1400	NO PINS
REQUIRED STOP TIME	400	2400	2400	2400	2400	2400	2400	

MONTHS ON: 0

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC		ELECTRIC	X	ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:	X	SINGLE STPT		DUAL SETPNT		SETBACK			J.C. CONTROLS
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
	Y	MA CONTROL	N	ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	(Y/N)							
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 7391

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 7391AH7

AIR HANDLING UNIT SURVEY OBSERVATIONS

AHU-7	AHU NO.	MECH. RM NO. 2	LOCATION (RM)
CH-1	REF. SYS. SERVING AHU	KITCHEN	SERVES AREA

UNIT TYPE:

	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR	X	H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:								

NAMEPLATE:

CARRIER					MFG.	39EH11			MODEL
5.0	SUPPLY FAN HP		CENTURY		MFG.	6-355825-01			MODEL
	RET/EXH FAN HP				MFG.				MODEL
4000	CFM-HTG	0	CFM-CLG	75%	MIN %OA	100%	MAX %OA	11%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
	NONE		STM	X	HW		ELEC	X	MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE		DX	X	CW			X	MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	YES,
REQUIRED START TIME	0	700	700	700	700	700	1400	NO PINS
REQUIRED STOP TIME	400	2400	2400	2400	2400	2400	2400	

MONTHS ON: 0

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC		ELECTRIC	X	ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:	X	SINGLE STPT		DUAL SETPNT		SETBACK			J.C. CONTROLS
SPACE SETPOINT (oF):		OCC HEAT		UNOCC HEAT		OCC COOL		UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	Y	MAX OA (Y/N)	Y	RA (Y/N)	N	EA (Y/N)	
	Y	MA CONTROL	N	ECONO-DB		ECONO-ENT		OTHER	
DEMAND LIMIT:	Y	(Y/N)							
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 7391

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 7391CH1

REFRIGERATION EQUIPMENT SURVEY OBSERVATIONS

CH-1	CHILLER/COMPRESSOR NO.	MECH. ROOM NO. 2	LOCATION (RM)

UNIT TYPE:

	CENTRIFUGAL WITH WATER SIDE COOLING TOWER						OTHER	
	RECIPROCATING WITH WATER SIDE COOLING TOWER					X	AHU'S SERVED	AHU-1, AHU-2,
X	RECIPROCATING WITH AIR COOLED CONDENSING UNIT							AHU-3, AHU-4,
	ABSORBTION WITH WATER SIDE COOLING TOWER							AHU-5, AHU-6,
	AIR COOLED CONDENSING UNIT							
X	CHW		DX		OTHER			

NAMEPLATE:

CHILLER	CARRIER	MFG.	38AE064510			MODEL	X197855			SERIAL NO.
208	VOLTS	119	AMPS	3	PH	60	HZ	144	CAPACITY (TONS)	
CONDENSER FANS		MFG.				MODEL			6	# OF FANS
200	VOLTS	4.6	AMPS	1	PH	60	HZ	0.5	HP	
CW PUM	CENTURY	MFG.	6-311460-1			MODEL				SERIAL NO.
208	VOLTS	16	AMPS	3	PH	60	HZ	5	HP	
CNW PUMP		MFG.				MODEL				SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP	
COMMENTS:		BACKUP CW PUMP IS TYPICAL								

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	700	700	700	700	700	1400	
REQUIRED STOP TIME	400	2400	2400	2400	2400	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
0	0	0	0	1	1	1	1	1	0	0	0

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		CWS (oF)		CWR (oF)		CNWS (oF)		CNWR (oF)	
PANEL INDICATORS									
- PRESSURE		LITE-HI		LITE-LOW		GAUGES			
- TEMPERATURE		LITE-HI		LITE-LOW		GAUGES			
- OTHER									

COMMENTS:

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 7391

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 7391BLR1

BOILER & CONVERTER SURVEY OBSERVATIONS

BLR-1	BOILER/CONVERTER NO.	MECH. RM.	LOCATION (RM)
	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	STEAM		PSIG	X	HW		TEMP.		BOILER TYPE:
	NO.2 OIL		NO.6 OIL	X	LP GAS		ELEC		FUELS:
	STM/HW		HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:
X	SPACE HEAT		DHW		OTHER				USE:
COMMENT:							0.0%		% HTG AREA SERVED
									BB RADIATION ONLY

NAMEPLATE:

PEERLESS	MFG.	G-712FDA-WUP	MODEL	1884000	CAPACITY OUTPUT (BTUH)
				2355000	CAPACITY INPUT (BTUH)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)
					CAPACITY INPUT (BTUH)

3	HW PUMP 1 - HP	U.S. ELECTRIC	MFG.	6136DN01L302R055F	MODEL
1.5	HW PUMP 2 - HP	LINCOLN	MFG.	3552	MODEL
	HW PUMP 3 - HP		MFG.		MODEL

COMMENT:

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	700	700	700	700	700	1400	
REQUIRED STOP TIME	400	2400	2400	2400	2400	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	0	0	0	0	0	1	1	1

CONTROLS:

		PNEUMATIC		ELECTRIC	X	ELEC'NIC		DDC	COMMENTS
SETPOINTS		PSIG		HW SUPPLY					
RESET CONTROL (oF)	165	HW HIGH	140	HW LOW		OA LOW		OA HIGH	
BURNER CONTROLS		O2 TRIM (Y/N)		OTHER					

COMMENTS:

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 7391

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 7391DHW1

DOMESTIC HW SURVEY OBSERVATIONS

DHW-1	BOILER/CONVERTER NO.	MECH RM	LOCATION (RM)
LP GAS	SOURCE OF HEATING (PLANT)		SERVES AREA

UNIT TYPE:

	NO.2 OIL		NO.6 OIL	X	LP GAS		ELEC		FUELS:
	STM/HW		HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:
COMMENT:									

NAMEPLATE:

RUUD	MFG.	RF98-180	MODEL	180000	CAPACITY OUTPUT (BTUH)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)

DOMESTIC HW CIRCULATION PUMP: NONE

	HW PUMP 1 - HP		MFG.	MODEL
	HW PUMP 2 - HP		MFG.	MODEL
	HW PUMP 3 - HP		MFG.	MODEL

COMMENT:

DIMENSION:	24	DIAMETER (INCHES)	60	HEIGHT OR LENGTH (INCHES)	97 GALLON

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	700	700	700	700	700	1400	
REQUIRED STOP TIME	400	2400	2400	2400	2400	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS			145	HW SUPPLY					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 7391

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 7391DHW2

DOMESTIC HW SURVEY OBSERVATIONS

DHW-2	BOILER/CONVERTER NO.	MECH RM	LOCATION (RM)
LP GAS	SOURCE OF HEATING (PLANT)		SERVES AREA

UNIT TYPE:

	NO.2 OIL		NO.6 OIL	X	LP GAS		ELEC		FUELS:
	STM/HW		HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:
COMMENT:									

NAMEPLATE:

RUUD	MFG.	RF76-250	MODEL	250000	CAPACITY OUTPUT (BTUH)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)

DOMESTIC HW CIRCULATION PUMP: **NONE**

	HW PUMP 1 - HP		MFG.		MODEL
	HW PUMP 2 - HP		MFG.		MODEL
	HW PUMP 3 - HP		MFG.		MODEL

COMMENT:

DIMENSION:	24	DIAMETER (INCHES)	48	HEIGHT OR LENGTH (INCHES)	76	GALLON

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	700	700	700	700	700	1400	
REQUIRED STOP TIME	400	2400	2400	2400	2400	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS			140	HW SUPPLY					
COMMENTS:									

FIELD SURVEY NOTES

BUILDING 9000

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 9000

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 9000BLG

VI. BUILDING DATA SURVEY OBSERVATIONS

BLDG NO: 9000 BLDG NAME: FRONT GATE

ZONE NO.	1	FUNCTION: SECURITY CHECK POINT							
OCCUPANCY HOURS:	M-F	0	TO	2400	SAT	0	TO	2400	
	SUN	0	TO	2400					
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

ZONE NO.		FUNCTION:							
OCCUPANCY HOURS:	M-F		TO		SAT		TO		
	SUN		TO						
PRESENT TEMP	WINTER OCC	°F		UNOCC	°F				
	SUMMER OCC	°F		UNOCC	°F				

REMARKS:

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 9000

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 9000AC1

AIR HANDLING UNIT SURVEY OBSERVATIONS

ACU-1	AHU NO.	MECH. ROOM	LOCATION (RM)
ACCU-1	REF. SYS. SERVING AHU	RECEPTION AREA	SERVES AREA

UNIT TYPE:

X	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:	GAS-FIRED FURNANCE							

NAMEPLATE:

LENNOX					MFG.	C16541			MODEL
1.0	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
900	CFM-HTG	900	CFM-CLG	0%	MIN %OA	0%	MAX %OA	60%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE	X	DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	0	0	0	0	0	0	
REQUIRED STOP TIME	2400	2400	2400	2400	2400	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:	X	SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):	70	OCC HEAT	70	UNOCC HEAT	72	OCC COOL	72	UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
	N	MA CONTROL	N	ECONO-DB	N	ECONO-ENT	N	OTHER	
DEMAND LIMIT:	Y	YES		NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 9000

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 9000AC2

AIR HANDLING UNIT SURVEY OBSERVATIONS

ACU-2	AHU NO.	MECH. ROOM	LOCATION (RM)
ACCU-2	REF. SYS. SERVING AHU	OFFICE AREA	SERVES AREA

UNIT TYPE:

X	SINGLE ZN		2-PIPE FC		4-PIPE FC		UNIT HTR		H&V
	MULTIZONE		DOUBLE DT		REHEAT		INDUCTION		VAV
	NUMBER OF ZONES				OTHER				
	COMMENT:	GAS-FIRED FURNANCE							

NAMEPLATE:

RUUD					MFG.				MODEL
0.3	SUPPLY FAN HP				MFG.				MODEL
	RET/EXH FAN HP				MFG.				MODEL
550	CFM-HTG	550	CFM-CLG	0%	MIN %OA	0%	MAX %OA	40%	% HTG AREA SERVED
COMMENT:									

COILS:

X	NONE		STM		HW		ELEC		MOD VLV	PREHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HEATING
X	NONE		STM		HW		ELEC		MOD VLV	REHEAT
X	NONE		STM		HW		ELEC		MOD VLV	HUMID.
	NONE	X	DX		CW				MOD VLV	COOLING

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENTS
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	0	0	0	0	0	0	
REQUIRED STOP TIME	2400	2400	2400	2400	2400	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
THERMOSTAT TYPE:	X	SINGLE STPT		DUAL SETPNT		SETBACK			
SPACE SETPOINT (oF):	70	OCC HEAT	70	UNOCC HEAT	72	OCC COOL	72	UNOCC COOL	
OTHER SETPOINTS (oF):		HOT DECK		COLD DECK		MIXED AIR		OTHER	
DAMPER CONTROL:	N	MIN OA (Y/N)	N	MAX OA (Y/N)	N	RA (Y/N)	N	EA (Y/N)	
	N	MA CONTROL	N	ECONO-DB	N	ECONO-ENT	N	OTHER	
DEMAND LIMIT:	Y	YES		NO					
COMMENTS:									

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 9000

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 9000CH1

REFRIGERATION EQUIPMENT SURVEY OBSERVATIONS

ACCU-1	CHILLER/COMPRESSOR NO.	OUTSIDE BLDG	LOCATION (RM)

UNIT TYPE:

	CENTRIFUGAL WITH WATER SIDE COOLING TOWER						OTHER
	RECIPROCATING WITH WATER SIDE COOLING TOWER					X	AHU'S SERVED ACU-1
	RECIPROCATING WITH AIR COOLED CONDENSING UNIT						
	ABSORBTION WITH WATER SIDE COOLING TOWER						
X	AIR COOLED CONDENSING UNIT						
	CHW	X	DX		OTHER		

NAMEPLATE:

CHILLER	GE	MFG.	BGTA860R1D01			MODEL	209089606		SERIAL NO.
230	VOLTS	32.2	MCA	1	PH	60	HZ	3	CAPACITY (TONS)
CONDENSER FANS		MFG.				MODEL		1	# OF FANS
230	VOLTS	2.3	AMPS		PH		HZ	0.33	HP
DTW PUMP		MFG.				MODEL			SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP
CNW PUMP		MFG.				MODEL			SERIAL NO.
	VOLTS		AMPS		PH		HZ		HP
COMMENTS:									

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	0	0	0	0	0	0	
REQUIRED STOP TIME	2400	2400	2400	2400	2400	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
0	0	0	0	1	1	1	1	1	0	0	0

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELECTNIC		DDC	COMMENTS
SETPOINTS		CWS (oF)		CWR (oF)		CNWS (oF)		CNWR (oF)	
PANEL INDICATORS									
- PRESSURE	N	LITE-HI		LITE-LOW		GAUGES			
- TEMPERATURE	N	LITE-HI		LITE-LOW		GAUGES			
- OTHER									
COMMENTS:	FM RADIO CONTROL SWITCH								

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 9000

EMC NO.: #3204-000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 9000CH2

REFRIGERATION EQUIPMENT SURVEY OBSERVATIONS

ACCU-2	CHILLER/COMPRESSOR NO.	OUTSIDE BLDG	LOCATION (RM)

UNIT TYPE:

	CENTRIFUGAL WITH WATER SIDE COOLING TOWER						OTHER
	RECIPROCATING WITH WATER SIDE COOLING TOWER					X	AHU'S SERVED ACU-2
	RECIPROCATING WITH AIR COOLED CONDENSING UNIT						
	ABSORBTION WITH WATER SIDE COOLING TOWER						
X	AIR COOLED CONDENSING UNIT						
	CHW	X	DX		OTHER		

NAMEPLATE:

CHILLER	RUUD	MFG.	UACC024JAS		MODEL	3110F10860328			SERIAL NO.
208	VOLTS	13	AMPS	1 PH	60	HZ	1.5	CAPACITY (TONS)	
CONDENSER FANS		MFG.			MODEL			1	# OF FANS
	VOLTS		AMPS	PH		HZ	0.1	HP	
DTW PUMP		MFG.			MODEL				SERIAL NO.
	VOLTS		AMPS	PH		HZ		HP	
CNW PUMP		MFG.			MODEL				SERIAL NO.
	VOLTS		AMPS	PH		HZ		HP	

COMMENTS:

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	0	0	0	0	0	0	
REQUIRED STOP TIME	2400	2400	2400	2400	2400	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
0	0	0	0	1	1	1	1	1	0	0	0

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS		CWS (oF)		CWR (oF)		CNWS (oF)		CNWR (oF)	
PANEL INDICATORS									
- PRESSURE	N	LITE-HI		LITE-LOW		GAUGES			
- TEMPERATURE	N	LITE-HI		LITE-LOW		GAUGES			
- OTHER									

COMMENTS:

E M C ENGINEERS, INC.

PROJECT: EEAP, EMCS EXPANSION FEASIBILITY STUDY
CLIENT CONTRACT NO.: DACA 41-92-C-0098
CLIENT PROJ. ENG: DOUG CAGE
LOCATION: FT. LEONARD WOOD BLDG: 9000

EMC NO.: #3204.000
DATE: Mar-93
PREPARED BY: AJN
CHECKED BY: CEL
FILE: 9000DHW1

DOMESTIC HW SURVEY OBSERVATIONS

DHW-1	BOILER/CONVERTER NO.	MECH RM	LOCATION (RM)
ELEC.	SOURCE OF HEATING (PLANT)	ALL	SERVES AREA

UNIT TYPE:

	NO.2 OIL		NO.6 OIL		N.GAS	X	ELEC		FUELS:
	STM/HW		HTHW/HW		HTHW/STM		OTHER		CONVERTER TYPE:

COMMENT:

NAMEPLATE:

RUUD	MFG.	PLP15-1	MODEL	2000	CAPACITY OUTPUT (WATTS)
	MFG.		MODEL		CAPACITY OUTPUT (BTUH)

DOMESTIC HW CIRCULATION PUMP: NONE

	HW PUMP 1 - HP		MFG.	MODEL
	HW PUMP 2 - HP		MFG.	MODEL
	HW PUMP 3 - HP		MFG.	MODEL

COMMENT:

DIMENSION:	18	DIAMETER (INCHES)	24	HEIGHT OR LENGTH (INCHES)	15 GALLON

OPERATION:

HOURS ON:	S	M	T	W	T	F	S	COMMENT
PRESENT START TIME	0	0	0	0	0	0	0	TIMECLOCK?
PRESENT STOP TIME	2400	2400	2400	2400	2400	2400	2400	NO
REQUIRED START TIME	0	0	0	0	0	0	0	
REQUIRED STOP TIME	2400	2400	2400	2400	2400	2400	2400	

MONTHS ON:

J	F	M	A	M	J	J	A	S	O	N	D
1	1	1	1	1	1	1	1	1	1	1	1

CONTROLS:

		PNEUMATIC	X	ELECTRIC		ELEC'NIC		DDC	COMMENTS
SETPOINTS				HW SUPPLY					

COMMENTS: