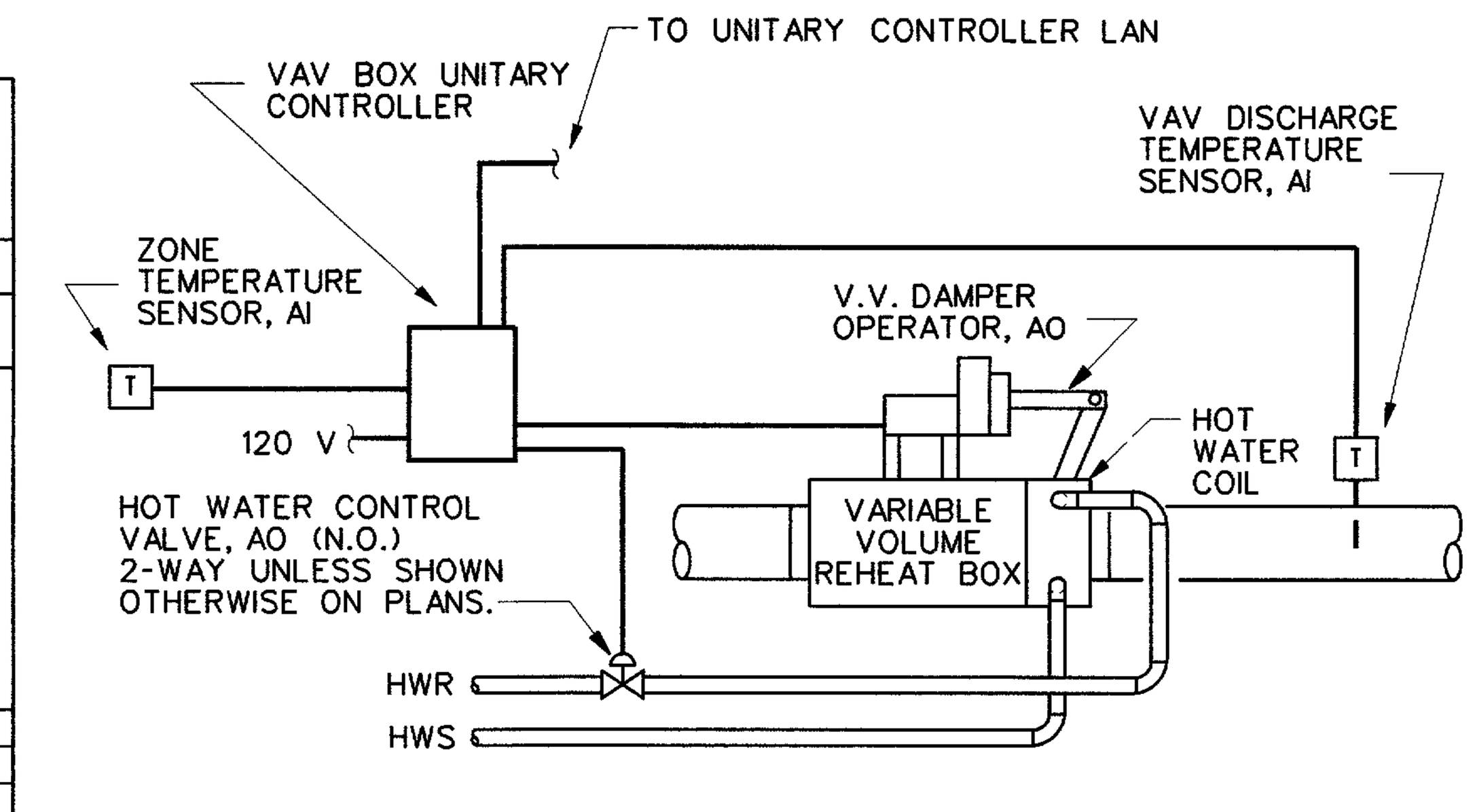
DDC CONTROL POINT SCHEDULE

PANEL DESIGNATION CHILLED WATER, CONDENSER WATER, & ICE BUILDING — FT. MEADE, DINFOS	INPUTS – ANALOG – MEASURED										INPUTS – ANALOG – CALC.						INPUTS – DIGITAL								
	TEMPERATURE	PRESSURE	RH	AIR FLOW	AIR QUALITY	KW	WATER FLOW	VOLTAGE	STEAM FLOW lbs./hr.	ICE LEVEL	KWH	ENTHALPY	RUN TIME	EFFICIENCY	SYS. CAP. (TONS)	BACNET INTERFACE	STATUS	FILTER	SMOKE	LOW TEMP.	AIR FLOW	METER	CURRENT SWITCH	FIRE ALARM	PRESSURE
CHILLERS:																									
CH-1 W/GATEWAY	X					X							X	X	X	X	X								
CH-2 W/GATEWAY	X					X							X	X	X	X	X								
CH-3 W/GATEWAY	X					X							X	X	X	X	X								
CH-4 W/GATEWAY	X					X							X	X	X	X	X								
CH-1 START/STOP																									
CH-2 START/STOP																									
CH-3 START/STOP																									
CH-4 START/STOP																									
CHILLED WATER SYSTEM:																									
PRIMARY PUMP P-1 START/STOP																									
PRIMARY PUMP P-2 START/STOP																									
PRIMARY PUMP P-3 START/STOP																									
PRIMARY PUMP P-11 START/STOP																									
PRIMARY PUMP P-12 START/STOP																									
PRIMARY PUMP P-1 STATUS																	X								
PRIMARY PUMP P-2 STATUS																	X								
PRIMARY PUMP P-3 STATUS																	X								
PRIMARY PUMP P-11 STATUS																	X								
SECONDARY PUMP P-7 VFD																X									
SECONDARY PUMP P-8 VFD																X									
SECONDARY PUMP P-7 STATUS																	X								
SECONDARY PUMP P-8 STATUS																	X								
CHILLED WTR DIFF. PRESS. (1 LOCATION)		X																							
SECONDARY CHWR TEMP. (SYS)	X														X										
SECONDARY CHWS TEMP. (SYS)	X														X										
ENTERING THERMAL STOR. RETURN WATER TEMP.	X																								
LEAVING THERMAL STOR. SUPPLY WATER TEMP.	X																								
ENTERING WATER TEMP. (CH-1)	X															X									
LEAVING WATER TEMP. (CH-1)	X															X									
ENTERING WATER TEMP. (CH-2)	X															X									
LEAVING WATER TEMP. (CH-2)	X															X									
ENTERING WATER TEMP. (CH-3)	X															X									
LEAVING WATER TEMP. (CH-3)	X															X									
ENTERING WATER TEMP. (CH-4)	X															X									
LEAVING WATER TEMP. (CH-4)	X															X									
PRIMARY CHILLED WTR TEMP.	X																								
DECOUPLE CHILLED WTR TEMP.	X																								
SECONDARY CHILLED WTR FLOW							X								X										
PRIMARY LOOP CHILLED WTR TONS															X	X									
ISOLATION VALVE V-10																									
TEMP. CONTROL VALVE V-14																									
CALMAC ICE LEVEL INDICATOR										X															
ISOLATION VALVE V-12, V-13																									
CONDENSER WATER SYSTEM:																									
COND. WTR. PUMP P-4 START/STOP																									
COND. WTR. PUMP P-5 START/STOP																									
COND. WTR. PUMP P-6 START/STOP																									
CONDENSER WTR. PUMP P-4 STATUS																	X								
CONDENSER WTR. PUMP P-5 STATUS																	X								
CONDENSER WTR. PUMP P-6 STATUS																	X								
ENTERING COND. WTR.TEMP. (CH-1, -2, -3)	X																								
LEAVING COND. WTR.TEMP. (CH-1, -2, -3)	X																								
CT-1 - TWO SPEED																									
CT-2 - TWO SPEED																									
CT-3 - TWO SPEED																									
COND WATER BYPASS VALVE V-20																									
ISOLATION VALVE V-21, V-22, V-23																									

PANEL DESIGNATION CHILLED WATER, CONDENSER WATER, & ICE BUILDING — FT. MEADE, DINFOS	OUTPUTS – DIGITAL					OUTPUTS – ANALOG				SYSTEM FEATURES – ALARMS						SYSTEM FEATURES – PROGRAMS							
	ON-OFF	OFF-AUTO-ON	OFF-HIGH-LOW	OPEN-CLOSE	2-POSITION VALVES	DAMPER POSI.	VALVE POSI.	SET POINT ADJ.	4-20 mA	HI ANALOG	LOW ANALOG	HI BINARY	LOW BINARY	BINARY	PROOF	TIME SCHEDULING	DEMAND LIMITING	START/STOP OPTIM.	SPEED CONTROL	HOT WATER RESET	ALARM INSTRUCTION	LEAD/ LAG CONTROL	ICE BUILDING
CHILLERS:																							
CH-1 W/GATEWAY	X															X	X	X				X	
CH-2 W/GATEWAY	X															X	X	X				X	
CH-3 W/GATEWAY	X															X	X	X				X	
CH-4 W/GATEWAY	X															X		X					X
CH-1 START/STOP	X																					X	
CH-2 START/STOP	X																					X	
CH-3 START/STOP	X																					X	
CH-4 START/STOP	X																						X
CHILLED WATER SYSTEM:																							
PRIMARY PUMP P-1 START/STOP	X																						
PRIMARY PUMP P-2 START/STOP	X																						
PRIMARY PUMP P-3 START/STOP	X																						
PRIMARY PUMP P-11 START/STOP	X																					X	
PRIMARY PUMP P-12 START/STOP	X																					X	
PRIMARY PUMP P-1 STATUS																							
PRIMARY PUMP P-2 STATUS																							
PRIMARY PUMP P-3 STATUS																							
PRIMARY PUMP P-11 STATUS																							
SECONDARY PUMP P-7 VFD	X								X										X				
SECONDARY PUMP P-8 VFD	X								X										X				
SECONDARY PUMP P-7 STATUS																							
SECONDARY PUMP P-8 STATUS																							
CHILLED WTR DIFF. PRESS. (1 LOCATION)																							
SECONDARY CHWR TEMP. (SYS)																							
SECONDARY CHWS TEMP. (SYS)																							
ENTERING THERMAL STOR. RETURN WATER TEMP.																							
LEAVING THERMAL STOR. SUPPLY WATER TEMP.																							
ENTERING WATER TEMP. (CH-1)																							
LEAVING WATER TEMP. (CH-1)																							
ENTERING WATER TEMP. (CH-2)																							
LEAVING WATER TEMP. (CH-2)																							
ENTERING WATER TEMP. (CH-3)																							
LEAVING WATER TEMP. (CH-3)																							
ENTERING WATER TEMP. (CH-4)																							
LEAVING WATER TEMP. (CH-4)																							
PRIMARY CHILLED WTR TEMP.																							
DECOUPLE CHILLED WTR TEMP.																							
SECONDARY CHILLED WTR FLOW																							
PRIMARY LOOP CHILLED WTR TONS																							
ISOLATION VALVE V-10					X																	X	
TEMP. CONTROL VALVE V-14							X		X														
CALMAC ICE LEVEL INDICATOR																						X	
ISOLATION VALVE V-12, V-13					X																	X	
CONDENSER WATER SYSTEM:																							
COND. WTR. PUMP P-4 START/STOP	X																						
COND. WTR. PUMP P-5 START/STOP	X																						
COND. WTR. PUMP P-6 START/STOP	X																						
CONDENSER WTR. PUMP P-4 STATUS																							
CONDENSER WTR. PUMP P-5 STATUS																							
CONDENSER WTR. PUMP P-6 STATUS																							
ENTERING COND. WTR.TEMP. (CH-1, -2, -3)																							
LEAVING COND. WTR.TEMP. (CH-1, -2, -3)																							
CT-1 - TWO SPEED			X						X										X				
CT-2 - TWO SPEED			X						X										X				
CT-3 - TWO SPEED			X						X										X				
COND WATER BYPASS VALVE V-20									X														
ISOLATION VALVE V-21, V-22, V-23					X																		

NOTE: PROVIDE DYNAMIC GRAPHIC REPRESENTATIVE OF EACH PIECE OF EQUIPMENT.



TYPICAL NEW & EXISTING VARIABLE VOLUME REHEAT BOX CONTROL

NOTES:

1. EXISTING BOXES SHALL HAVE VAV DISCHARGE TEMPERATURE SENSOR ADDED (ALL OTHER DEVICES ARE EXISTING).
2. SEE VAV SCHEDULE FOR MAXIMUM DISCHARGE AIR TEMPERATURES.

TYPICAL VARIABLE VOLUME

SEQUENCE OF OPERATION

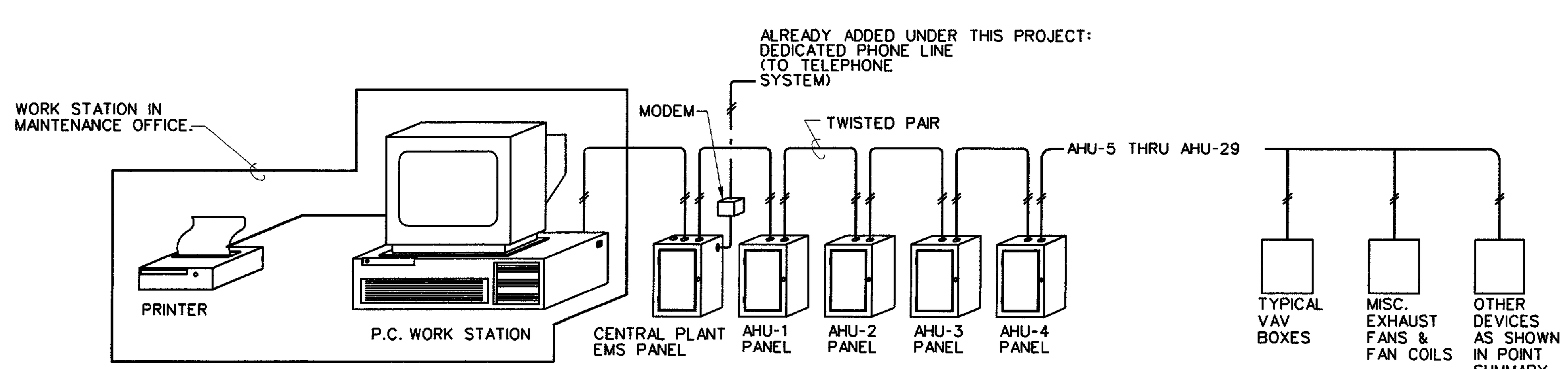
1. BOX STATUS (OCCUPIED/UNOCCUPIED): THE VARIABLE AIR VOLUME REHEAT BOX WILL HAVE TWO STATES OF OPERATION. DURING THE OCCUPIED MODE WHEN THE DEVICE IS SCHEDULED OR IN THE UNOCCUPIED MODE WHEN THE DEVICE IS SCHEDULED FOR OPTIMUM START OR NIGHT SETBACK (HEATING OR COOLING). IN EITHER CASE, THE DAMPER AND HOT WATER VALVE WILL BE ENABLED TO MAINTAIN THE SPACE TEMPERATURE SETPOINT. DURING THE UNOCCUPIED PERIODS, THE DAMPER WILL REMAIN AT THE MINIMUM (CFM) POSITION AND THE HOT WATER VALVE WILL REMAIN CLOSED EXCEPT TO SATISFY NIGHT SETBACK SETPOINTS OF 85°LAT (ADJUSTABLE) FROM APRIL TO SEPTEMBER AND 55°LAT (ADJUSTABLE) FROM OCTOBER TO MARCH.
2. DAMPER MODULATION: DURING THE OCCUPIED STATE, THE DDC CONTROLLER WILL MODULATE THE AIR VOLUME DAMPER BETWEEN MAXIMUM (CFM) AND MINIMUM (CFM) AIRFLOW. ON A RISE IN SPACE TEMPERATURE, AIRFLOW IS INCREASED FROM MINIMUM TO MAXIMUM. ON A DECREASE IN TEMPERATUE, AIRFLOW IS DECREASED FROM MAXIMUM TO MINIMUM.
3. REHEAT VALVE MODULATION: DURING THE OCCUPIED STATE, THE DDC CONTROLLER WILL MODULATE THE HOT WATER CONTROL VALVE BETWEEN FULLY OPEN AND CLOSED POSITION. ON A RISE IN TEMPERATURE, THE HOT WATER VALVE MODULATES FROM FULLY OPEN TO CLOSED AND SEQUENTIAL DAMPER MODULATION BEGINS. ON A DROP IN SPACE TEMPERATURE, ONCE THE AIR DAMPER IS AT A MINIMUM (CFM) POSITION, THE DDC CONTROLLER WILL MODULATE THE HOT WATER VALVE FROM CLOSED TO FULLY OPEN.
4. HEATING AND COOLING REQUESTS: ANY VARIABLE AIR VOLUME BOX MAY INITIATE A REQUEST TO ITS RESPECTIVE AIR HANDLING UNIT FOR HEATING OR COOLING. DURING THE UNOCCUPIED STATE WHEN AIR IS REQUIRED FOR OPTIMUM START OR NIGHT SETBACK (HEATING OR COOLING), THE AIR HANDLING UNIT WILL START TO SATISFY THE ZONE SERVED BY THE VARIABLE AIR VOLUME BOX. IN ADDITION, EACH DEVICE WILL BE ABLE TO REQUEST THE RESPECTIVE HEAT SOURCE (HOT WATER PUMPS/BOILER) DURING THIS UNOCCUPIED STATE.

PANEL DESIGNATION FT. MEADE, DINFOS — LOCATION: VAV BOX CONTROLS — POINT DESCRIPTION	HARDWARE – OUTPUT (O) – DIGITAL			HARDWARE – OUTPUT (O) – ANALOG			HARDWARE – INPUT (T,D,V,C) – DIGITAL					HARDWARE – INPUT (T,D,V,C) – ANALOG					SOFTWARE – ALARMS – DIGITAL		SOFTWARE – ALARMS – ANALOG			SOFTWARE – HARDWARE											
	Control Relay	Solenoid	Contactor	Pneumatic Transducer	Electrical Transducer	4-20MA Module	Pressure Switch	Flow Switch	Switch Closure	Auxiliary Contact	KW	Temperature	Relative Humidity	PSIg, PSIa, PSId	Position	Flow	Equipment Status	Maintenance	High Limit	Low Limit	Run Time	Scheduled Start/Stop	Optimum Start/Stop	Duty Cycling	Demand Limiting	Night Setback	Economizer	Ventilation/Recirculation	Temperature Control	Hot Water Reset	Chiller Optimization	Chilled Water Reset	Position
ZONE TEMPERATURE												●							●	●						●							
VAV DISCHARGE TEMP.												●							●	●						●							
FLOW (CFM)																●			●	●													
CONTROL OUTPUT-DAMPER						●																							●				●
CONTROL OUTPUT-VALVE						●																							●				●
UNIT ENABLE/DISABLE	●																					●	●										
UNIT STATUS									●								●																

NOTE: PROVIDE DYNAMIC GRAPHIC REPRESENTATIVE OF EACH PIECE OF EQUIPMENT

INTERLOCK SCHEDULE

ENERGIZE EXHAUST FAN	SERVING	WHEN AHU MIN. OSA DAMPER(S) ARE OPEN ON AHU(S)
EF-1A	TOILETS (1108-1110) & (2104-2106)	AHU-6 & AHU-26
EF-1B	TOILETS (1136-1138) & (2142-2144)	AHU-6 & AHU-26
EF-1C	TOILETS (1206-1208) &(2226-2228)	AHU-10 & AHU-19
EF-1D	TOILETS (1166-1168) & (2166-2168)	AHU-21 & AHU-20
EF-2	TOILET 1163	AHU-28
EF-3A	EQUIPMENT ROOM 1165	AHU-21
EF-3B	EQUIPMENT ROOM 1112	AHU-6
EF-3C	EQUIPMENT ROOM 1216	AHU-9
EF-8A	VERSAMAT 1148	AHU-15
EF-8B	VERSAMAT 1146	AHU-15
EF-9	APPLIED IMAGERY	AHU-15
EF-10	COLOR PRINTING (1175, 1177A,B, C, & D, & 1172)	AHU-21
EF-11	AUTOMATIC COLOR FINISHING (1178, 1186)	AHU-14
EF-12	B & W PRINT FINISHING (1179A, 1188, 1190)	AHU-13 & AHU-14
EF-13	B & W PRINTING AUTOMATIC (1194, 1196)	AHU-13
EF-14	CORRIDOR 1197	AHU-10
EF-15	PROCESSING LAB (1185, 1187, 1189, 1191, 1193)	AHU-12
EF-16	LOGISTICS SUPPLY & PHOTO EQUIPT MAINT (1205, 1212C)	AHU-10
EF-17	MACHINE SHOP (1201) & PROCESS MAINT LAB (1198, 1199)	AHU-10 & AHU-29
EF-18	DEMO WORKSTATIONS (2196, 2197) & TRANS. LAB (2205)	AHU-19 & AHU-20



EXISTING ANDOVER ENERGY MANAGEMENT SYSTEM NETWORK WIRING SCHEMATIC

EXISTING ANDOVER CONTROL SYSTEM:

1. REUSE AS MUCH OF THE EXISTING SYSTEM AS POSSIBLE.
2. ALL VALVE AND DAMPER ACTUATORS SERVING NEW AND EXISTING ROOF MOUNTED AHU(S) SHALL BE ALL ELECTRIC. CAP EXISTING PNEUMATIC LINES WHERE APPLICALBE.
3. EXISTING VALVE ACUTATORS LOCATED IN MAIN MECHANICAL ROOM UNTOUCHED BY THIS UPGRADE SHALL REMAIN PNUMATIC.

LEGEND	
▲	LOCATE PILOT LGT IN STARTER COVER
▲▲	LOCATE PILOT LGT IN LOCAL CONTROL PANEL
AO	ANALOG OUTPUT
AI	ANALOG INPUT
DO	DIGITAL OUTPUT
DI	DIGITAL INPUT
NO	NORMALLY OPEN
NC	NORMALLY CLOSED

THESE DOCUMENTS HAVE BEEN PREPARED PRIMARILY BASED ON INFORMATION PROVIDED BY OTHERS. I.C. THOMASSON HAS NOT VERIFIED THE ACCURACY OF ALL INFORMATION PROVIDED BY OTHERS. SEE LIMIT OF LIAIBILITIES STATEMENT ON COVER SHEET.

US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

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DEFENSE INFORMATION SCHOOL
FT. MEADE MARYLAND
VAV CONTROLS

Sheet reference number: M-800