

FAILURE" SHALL BE REPORTED AT THE OPERATOR'S WORKSTATION.

SEQUENCE OF OPERATION

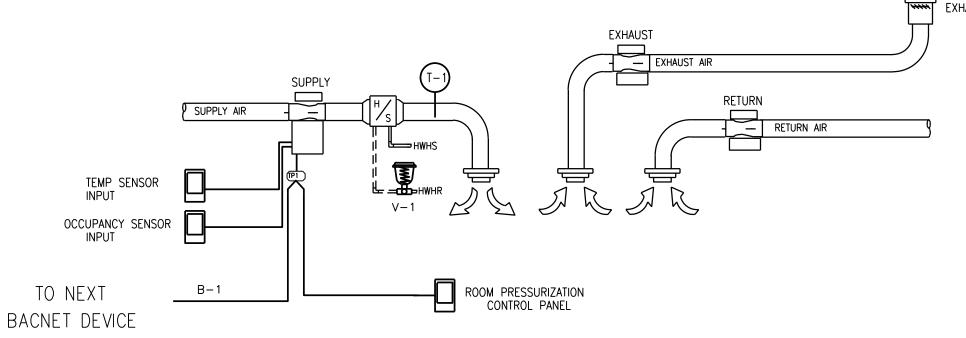
CONTROL MODE: THE CONTROL MODE OF THE GI PROCEDURE ROOM SHALL BE BASED ON THE STATUS OF THE ROOM CONTROLLER (NORMAL OR NEGATIVE MODE). DURING THE NORMAL OCCUPIED MODE, THE SUPPLY AIR TO THE SPACE SHALL MAINTAIN A MINIMUM AIRFLOW AS LISTED AS THE MINIMUM AIRFLOW ON THE SCHEDULE). IF THE ROOM IS SWITCHED TO NEGATIVE MODE, THE SUPPLY AIR TO THE SPACE SHALL MAINTAIN THE MAXIMUM SCHEDULED AIRFLOW. THE CONTROL MODE FOR THE GI PROCEDURE ROOM SHALL BE IN ISOLATION (NEGATIVE PRESSURE) AT ALL TIMES.

RETURN AIR VAV CONTROL: THE RETURN AIR VAV SHALL TRACK THE SUPPLY AIR VAV AND LAG IN AIRFLOW TO MAINTAIN POSITIVE SPACE PRESSURE (0.02" - ADJUSTABLE). DURING NEGATIVE ROOM MODE, THE RETURN AIR VALVE SHALL BE CLOSED. EXHAUST AIR VALVE: THE GI PROCEDURE AIR VALVE SHALL BE CLOSED DURING NORMAL ROOM MODE. DURING NEGATIVE ROOM MODE, THE VALVE SHALL BE OPEN TO THE MAXIMUM SCHEDULED AIRFLOW. FOR THE GI PROCEDURE ROOM, THE EXHAUST AIR VALVE SHALL BE OPEN TO MAXIMUM AIRFLOW AT ALL TIMES. EXHAUST FAN CONTROL: WHEN THE NEGATIVE MODE IS ACTIVATED, THE EXHAUST FAN SHALL BE TURNED (R-1) ON AFTER THE EXHAUST AIR VALVE HAS BEEN OPENED. WHEN ROOM IS RETURNED TO NORMAL MODE, THE FAN SHALL BE DISABLED. WHEN THE EXHAUST FAN IS CALLED TO RUN BUT IS NOT PROVEN RUNNING (CS-1), AN "EXHAUST FAN

HEATING COIL CONTROL: THE HOT WATER CONTROL VALVE (V-1) SHALL MODULATE TO MAINTAIN SPACE TEMPERATURE AT SET POINT. IF THE SPACE IS IN THE COOLING MODE, THE CONTROL VALVE SHALL BE CLOSED. THE DISCHARGE AIR TEMPERATURE (T-1) SHALL BE MONITORED AND AN ALARM SHALL BE GENERATED IF IT DROPS BELOW 50 DEGREES IN

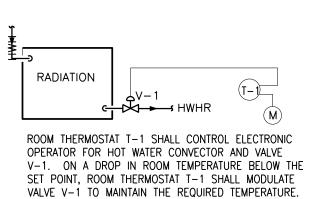
BACNET: THE ROOM PRESSURIZATION PANEL WILL BE PROVIDED WITH BACNET CONTROLS. PROVIDE ALL PROGRAMMING AND INTEGRATION INTO THE BUILDING AUTOMATION SYSTEM. THE BAS SHALL MONITOR THE ROOM PRESSURE (B-1) TRANSMITTED FROM THE PRESSURE MONITOR PANEL. IF THE PRESSURE IS REPORTED AT 0.00" FOR A MINIMUM OF 5 MINUTES (ADJUSTABLE), AN "GI PROCEDURE ROOM PRESSURE ALARM" SHALL BE REPORTED TO THE OPERATOR'S WORKSTATION.

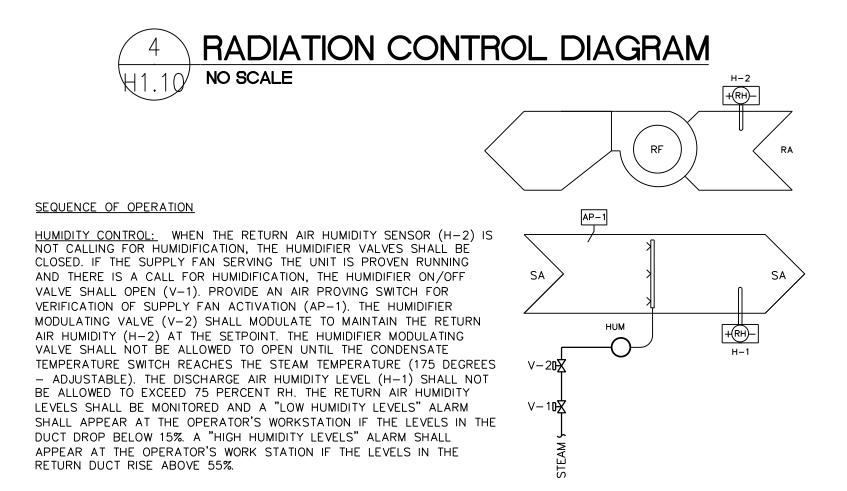
CONTROL WIRING: ALL WIRING ASSOCIATED WITH THE GI PROCEDURE ROOM AIRFLOW CONTROL VALVES, REHEAT VALVES, ETC. SHALL BE PROVIDED AND INSTALLED BY THI TEMPERATURE CONTROLS CONTRACTOR.



CONTROL	POINT NAME	POINT DESCRIPTION		POINT TYPE				ALARM		
DEVICE	FOINT NAME	FOINT DESCRIPTION	Al	BI	AO	BO	HI	LOW	В	
R-1	ExhFanCtrl	EXHAUST FAN CONTROL RELAY				Х				
CS-1	ExhFanStatus	EXHAUST FAN STATUS		Х						
V-1	HtgValve	HEATING VALVE			Х					
T-1	DischTemp	DISCHARGE TEMPERATURE	Х					х		
B-1	BACNET	BACNET PRESSURE ALARM	Х				Х			
-										

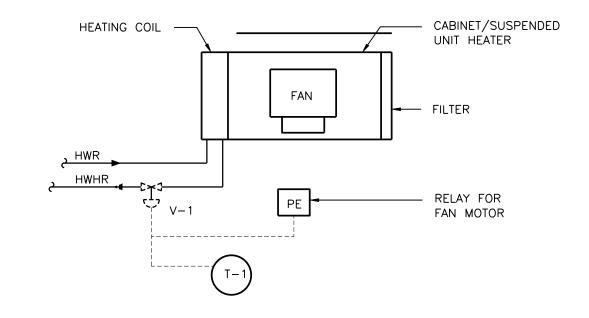
PROCEDURE ROOM AIRFLOW VALVE UNIT TRACKING CONTROL +110 NO SCALE





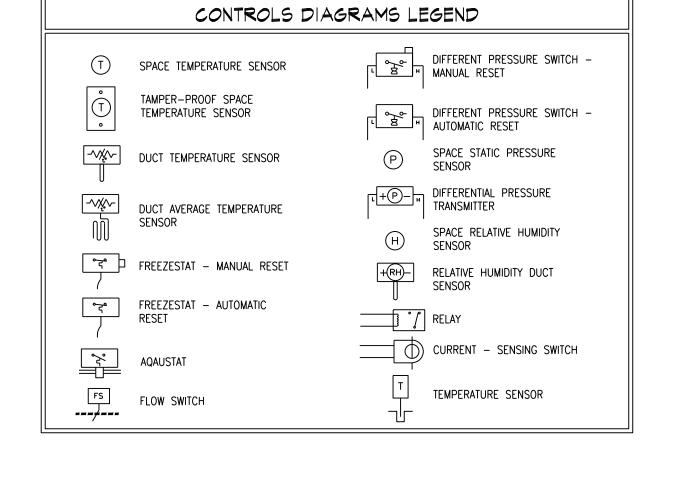
CONTROL	POINT NAME	NAME COINT DESCRIPTION		POINT TYPE				ALARM		
DEVICE	POINT NAME POINT DESCRIPTION	POINT DESCRIPTION	Al	BI	AO	во	Hì	LOW	BIN	TOTALIZE
H-1	DischRH	DISCHARGE RELATIVE HUMIDITY	Х				Х			
H-2	RetAirRH	RETURN AIR RELATIVE HUMIDITY	Х				Х	Х		
V-1	OnOffValve	ON/OFF HUMIDIFIER VALVE				X				
V-2	ModulValve	MODULATING HUMIDIFIER VALVE			Х					
AP-1	AirProveSw	AIR PROVING SWITCH		Х						

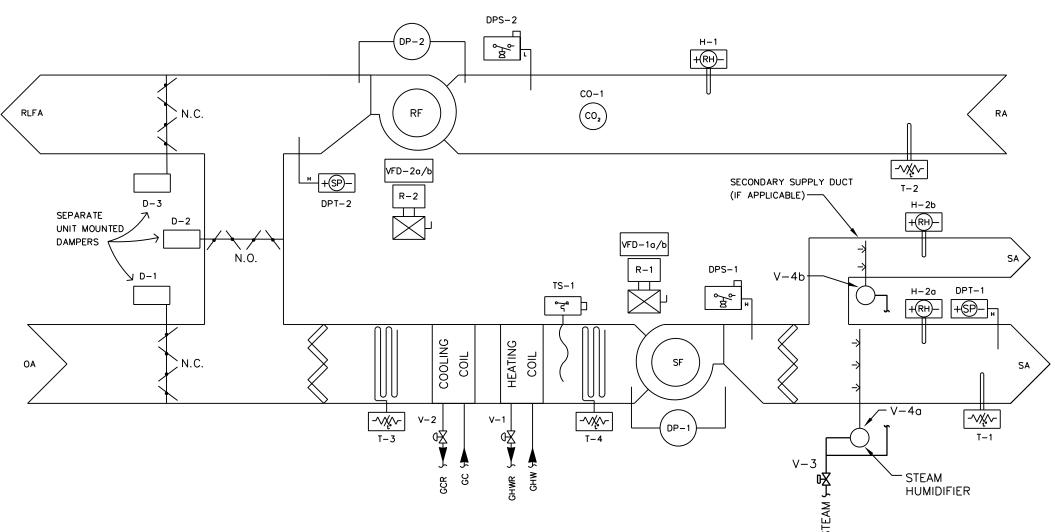
TERMINAL HUMIDIFIER CONTROL DIAGRAM NO SCALE



ROOM THERMOSTAT T-1 SHALL CONTROL ELECTRONIC-RELAY FOR FAN MOTOR AND HEATING COIL VALVE V-1 IN SEQUENCE. ON A DROP IN TEMPERATURE TO THE SET POINT OF ROOM THERMOSTAT T-1. THRU ELECTRONIC-ELECTRIC RELAY, SHALL START THE FAN. HEATING COIL VALVE V-1 SHALL REMAIN OFF. ON A DROP IN TEMPERATURE SLIGHTLY BELOW THE SET POINT T-1 SHALL MODULATE HEATING COIL VALVE V-1. FAN SHALL REMAIN ON.

## HOT WATER UNIT HEATER OR CABINET UNIT HEATER CONTROL DIAGRAM NO SCALE





MOUNTED D-2 PERS N.O.	UP1-2		TS−1 <sup>©</sup> द्द <sup>क</sup> ो	VFD-10/b  R-1  DPS-1	3 V-40	\ <i>[</i> ]	SA OPT-1
N.C.		COOLING	HEATING COIL	SF		→ → →	SA
		V-2 T-3 0X X X X X X X X X X X X X X X X X X X	V-1 T-4	DP-1	STEAM T	V-4a STEAM HUMIDIFIE	T-1  IE OF OF

SEQUENCE OF OPERATION:

OCCUPIED/UNOCCUPIED MODE: A TIME SCHEDULE SHALL CONTROL THE AIR HANDLING UNIT MODE. INITIALLY, THE TIME SCHEDULE (ADJUSTABLE) SHALL BE SET SO THAT THE AIR HANDLING UNIT IS IN THE OCCUPIED MODE 24 HOURS A DAY/7 DAYS A WEEK. SET UP INDIVIDUAL TIME SCHEDULES FOR THE UNITS IN COORDINATION WITH MAINTENANCE STAFF. THE UNIT WILL HAVE THE CAPABILITY OF BEING STARTED AND STOPPED REMOTELY AT THE BAS. THE H-O-A SWITCH SHALL BE KEPT IN THE "AUTO POSITION." "HAND" AND "OFF" SHALL BE USED FOR MAINTENANCE ONLY. WHEN THE UNIT IS "OFF", THE OUTSIDE AIR DAMPER (D-1) AND RELIEF AIR DAMPER (D-3) SHALL BE FULLY CLOSED. WHEN THE UNIT IS "ON", D-1 AND D-3 SHALL MODULATE IN ACCORDANCE WITH THE SEQUENCE BELOW.

FIRE ALARM SHUTDOWN: IN THE FIRE-ALARM CONTROL MODE (WHEN SMOKE IS DETECTED BY DUCT SMOKE DETECTOR), THE SUPPLY AND RETURN FANS VARIABLE FREQUENCY DRIVES SHALL BE SET TO OFF AND THE FREQUENCY SIGNALS SHALL BE SET TO ZERO AND AN ALARM SIGNAL SHALL BE TRANSMITTED TO THE FIRE ALARM SYSTEM. EXHAUST FANS SERVING SPACE OF THE SUPPLY FAN SHALL CONTINUE TO RUN. SUPPLY AND RETURN FANS SHALL RESTART WHEN FIRE ALARM CIRCUIT IS RESET.

DISCHARGE DUCT STATIC PRESSURE SETPOINT OPTIMIZATION: 1. THE BUILDING AUTOMATION SYSTEM (BAS) SHALL CONTINUOUSLY MONITOR THE DAMPER POSITION OF ALL VAV TERMINAL UNITS. THE DISCHARGE DUCT STATIC PRESSURE (DPT-1) SHALL BE SENSED DIRECTLY AT THE DISCHARGE OF EACH AIR HANDLER. THE SENSOR MUST BE MOUNTED IN A NON-TURBULENT LOCATION.

2. WHEN ANY VAV DAMPER IS MORE THAN 75% (ADJ.) OPEN, THE SUPPLY FAN DISCHARGE DUCT STATIC PRESSURE SETPOINT SHALL BE

RESET UPWARD BY 0.1 IN W.C. (ADJ.), AT A FREQUENCY OF 15 MINUTES (ADJ.), UNTIL NO DAMPER IS MORE THAN 75% OPEN OR THE STATIC PRESSURE SETPOINT HAS RESET UPWARD TO THE SYSTEM MAXIMUM DUCT STATIC PRESSURE SETPOINT OR THE AHU VARIABLE-FREQUENCY DRIVE IS AT THE MAXIMUM SPEED SETTING. 3. WHEN ALL VAV DAMPERS ARE LESS THAN 65% (ADJ.) OPEN, THE SUPPLY FAN DISCHARGE DUCT STATIC PRESSURE SETPOINT SHALL BE

RESET DOWNWARD BY 0.1 IN W.C.(ADJ.), AT A FREQUENCY OF 15 MINUTES (ADJ.), UNTIL AT LEAST ONE DAMPER IS MORE THAN 65% OPEN OR THE STATIC PRESSURE SETPOINT HAS RESET DOWNWARD TO THE SYSTEM MINIMUM DUCT STATIC PRESSURE SETPOINT OR THE AHU VARIABLE-FREQUENCY DRIVE IS AT THE MINIMUM SPEED SETTING. 4. THE CONTROL BANDS, SETPOINT INCREMENT VALUES, SETPOINT DECREMENT VALUES AND ADJUSTMENT FREQUENCIES SHALL BE ADJUSTED TO MAINTAIN MAXIMUM STATIC PRESSURE OPTIMIZATION WITH STABLE SYSTEM CONTROL AND MAXIMUM COMFORT CONTROL.

5. THE BAS SHALL HAVE THE CAPABILITY TO ALLOW THE OPERATOR TO EXCLUDE PROBLEM ZONES THAT SHOULD NOT BE CONSIDERED WHEN DETERMINING THE OPTIMIZED SETPOINT. 6. THE BAS SHALL ALSO READ THE STATUS OF THE SUPPLY AIR STATIC PRESSURE SENSOR AND DISPLAY THE ACTIVE DUCT STATIC

PRESSURE READING ON THE STATUS SCREEN. 7. THE BAS SHALL HAVE THE ABILITY TO IDENTIFY, AND DISPLAY TO THE USER, THE VAV BOX THAT SERVES THE CRITICAL ZONE (THAT IS, THE ZONE WITH THE MOST WIDE-OPEN VAV DAMPER). THIS INFORMATION SHALL UPDATE DYNAMICALLY AS THE LOCATION OF THE

CRITICAL ZONE CHANGES BASED ON BUILDING LOAD, AND DUCT STATIC PRESSURE SETPOINT OPTIMIZATION CONTROL. 8. DURING THE COMMISSIONING/CHECK-OUT PROCESS, THE CONTROLS CONTRACTOR SHALL DEMONSTRATE THE PERFORMANCE OF FAN PRESSURE OPTIMIZATION

UNOCCUPIED CASING TEMPERATURE CONTROL: WHEN THE UNIT IS OFF, THE HEATING COIL VALVE SHALL MODULATE WHEN THE

FAN SHALL BE STOPPED AND "LOW STATIC PRESSURE" ALARM SHALL BE DISPLAYED ON THE OPERATOR WORKSTATION.

TEMPERATURE DROPS BELOW 45 DEGREES (ADJUSTABLE) TO MAINTAIN 60 DEGREES (ADJUSTABLE) IN THE AIR HANDLER CASING LOW TEMPERATURE DETECTION CONTROL: THE STATUS OF A MANUAL LOW TEMPERATURE DETECTION SWITCH (TS-1) INSTALLED ON THE

LEAVING SIDE OF THE HEATING COIL SHALL BE MONITORED. IF THE AIR TEMPERATURE AS SENSED BY TS-1 FALLS BELOW 45 DEGREES (ADJUSTABLE), A "LOW AIR TEMPERATURE" ALARM SHALL BE GENERATED AT THE OPERATOR'S WORKSTATION. IF THE TEMPERATURE DROPS BELOW 40 DEGREES (ADJUSTABLE), THE SUPPLY AND RETURN FANS SHALL BE STOPPED AND A CRITICAL "LOW AIR TEMPERATURE" ALARM SHALL BE DISPLAYED ON THE OPERATOR WORKSTATION. THE OPERATOR SHALL HAVE THE ABILITY TO MANUALLY RESTART THE SUPPLY

THE SUPPLY FAN SHALL BE MONITORED. WHENEVER A HIGH STATIC PRESSURE CONDITION IS DETECTED (EXCEEDING 3-INCHES), THE SUPPLY FAN SHALL BE STOPPED AND "HIGH STATIC PRESSURE" ALARM SHALL BE DISPLAYED ON THE OPERATOR WORKSTATION. LOW STATIC PRESSURE CONTROL: THE STATUS OF A LOW STATIC PRESSURE SWITCH (DPS-2) INSTALLED ON THE INLET SIDE OF THE RETURN FAN SHALL BE MONITORED. WHENEVER A LOW STATIC PRESSURE CONDITION IS DETECTED (EXCEEDING 3-INCHES). THE RETURN

HIGH STATIC PRESSURE CONTROL: THE STATUS OF A HIGH STATIC PRESSURE SWITCH (DPS-1) INSTALLED ON THE DISCHARGE SIDE OF

CONTROL	SONT NAME	POINT SCHEDUL		POINT TYPE				ALARM		
DEVICE	POINT NAME	POINT DESCRIPTION	Al	ВІ	AO	ВО	HI	LOW	ВІ	
T-1	DischAirTemp	DISCHARGE AIR TEMPERATURE	Х				Х	Х		
T-2	RetAirTemp	RETURN AIR TEMPERATURE	X							
T-3	MixAirTemp	MIXED AIR TEMPERATURE	Х					Х		
T-4	LeavHeatCoilTemp	LEAVING HEATING COIL TEMPERATURE	Х							
DPT-1	SupDuctSP	SUPPLY DUCT STATIC PRESSURE	X				Х	X		
DPT-2	RetDuctSP	RETURN DUCT STATIC PRESSURE	X				Х	Х		
DPS-1	HiPressSw	HIGH DUCT PRESSURE SWITCH		X					>	
DPS-2	LoPressSw	LOW DUCT PRESSURE SWITCH		х					;	
DP-1	SupFanStatus	SUPPLY FAN STATUS		Х					;	
DP-2	RetFanStatus	RETURN FAN STATUS		X						
VFD−1 a	SupFanSpeed	SUPPLY FAN VFD SPEED			Х					
VFD−1 b	VFDPnts	VFD POINTS	Х	Х			Х	Х		
VFD−2 a	RetFanSpeed	RETURN FAN VFD SPEED			Х					
VFD−2 b	VFDPnts	VFD POINTS	Х	X			Х	Х		
R-1	SupFanCtrl	SUPPLY FAN CONTROL				Х				
R-2	RetFanCtrl	RETURN FAN CONTROL				Х				
D-1	OADamper	OUTDOOR AIR DAMPER			Х					
D-2	RADamper	RETURN AIR DAMPER			Х					
D-3	RLFADamper	RELIEF AIR DAMPER			Х					
TS-1	Freezestat	FREEZESTAT		Х					,	
V-1	HtgValve	HEATING VALVE			Х					
V-2	ClgValve	COOLING VALVE			Х					
V-3	OnOffHumValve	ON/OFF HUMIDIFIER VALVE				х				
V-4a/b	ModHumValve	MODULATING HUMIDIFIER VALVE			Х					
H-1	RetHumSens	RETURN AIR HUMIDITY SENSOR	Х							
H-2a/b	SupHumSens	SUPPLY AIR HUMIDITY SENSOR	Х				Х			
CO-1	CarbonSen	CARBON DIOXIDE SENSOR	х				x			

TEMPERATURE CONTROL: THE SUPPLY AIR TEMPERATURE, SENSED BY T-1, SHALL BE MAINTAINED AT SET POINT BY BAS MODULATING V-1 OR D-1 AND D-2 OR V-2 IN SEQUENCE. THE SUPPLY AIR TEMPERATURE SET POINT SHALL BE VARIED FROM 55 TO 60 DEGREES F (ADJUSTABLE) AS THE RETURN AIR TEMPERATURE VARIES FROM 78 TO 72 DEGREES F (ADJUSTABLE). D-3 SHALL BE POSITIONED OPPOSITE D-2 EITHER THROUGH A MECHANICAL LINKAGE OR THROUGH A SEPARATE ACTUATOR FROM THE SAME DDC OUTPUT. UPON LOSS OF AIR FLOW SENSOR BY DPS-1, V-1 SHALL MODULATE TO MAINTAIN 55 DEG. F (ADJUSTABLE) UNIT CASING TEMPERATURE MONITORED

- a. COOLING CONTROL: WHEN THE TEMPERATURE OF THE OUTSIDE AIR IS ABOVE 65 DEG. F, THE DCP SHALL PREVENT THE MODULATION OF D-1, D-2 AND D-3 AND SHALL ASSUME THE MINIMUM OUTSIDE AIR POSITION. THE DCP SHALL MODULATE THE COOLING VALVE (V-2) TO MAINTAIN THE SUPPLY AIR TEMPERATURE SENSED BY T-1.
- b. ECONOMIZER CONTROL: WHEN THE TEMPERATURE OF THE OUTSIDE AIR IS BETWEEN 65 DEG. F (ADJUSTABLE) AND THE SUPPLY AIR TEMPERATURE, SENSED BY T-1, DAMPERS D-1, D-2, AND D-3 SHALL MODULATE TO MAINTAIN THE MIXED AIR TEMPERATURE AT 2 DEGREES LESS THAN THE SCHEDULED SUPPLY AIR TEMPERATURE. THE BAS SHALL MODULATE THE COOLING VALVE (V-2) TO MAINTAIN THE SUPPLY AIR TEMPERATURE, SENSED BY T-1 AS REQUIRED.
- c. HEATING AND ECONOMIZER CONTROL: WHEN THE TEMPERATURE OF THE OUTSIDE AIR IS BELOW THE SUPPLY AIR TEMPERATURE, SENSED BY T-1, DAMPERS D-2 AND D-3 SHALL MODULATE TO MAINTAIN THE MIXED AIR TEMPERATURE AT 2 DEGREES LESS THAN THE SCHEDULED SUPPLY AIR TEMPERATURE. D-1 SHALL BE POSITIONED OPPOSITE D-2. IF D-1 IS CLOSED TO MINIMUM
- OUTSIDE AIR, D-2 IS OPEN, AND D-3 IS CLOSED TO MINIMUM RELIEF AIR IN THIS MODE, THEN THE HEATING VALVE (V-1) SHALL BE MODULATED TO MAINTAIN THE SUPPLY AIR TEMPERATURE.

SUPPLY FAN CONTROL: THE CAPACITY OF THE SUPPLY FAN SHALL BE CONTROLLED BY A VARIABLE FREQUENCY DRIVE. IN THE OCCUPIED MODE, THE SUPPLY FAN SHALL START (R-1) AND THE SPEED OF THE SUPPLY FAN (VFD-1A) SHALL MODULATE TO MAINTAIN THE SUPPLY DUCT STATIC PRESSURE (DPT-1) AT 1.0" W.C. (ADJUSTABLE). IN THE "OFF" MODE, THE SUPPLY FAN SHALL BE OFF AND THE SPEED SHALL BE SET TO 0 HZ. THE STATUS OF THE SUPPLY FAN (DP-1) SHALL BE MONITORED. WHENEVER THE SUPPLY FAN IS COMMANDED TO RUN AND THE STATUS CANNOT BE PROVEN, A "SUPPLY FAN FAILURE" ALARM SHALL BE DISPLAYED ON THE OPERATOR

RETURN FAN CONTROL: THE CAPACITY OF THE RETURN FAN SHALL BE CONTROLLED BY A VARIABLE FREQUENCY DRIVE. THE RETURN FAN SHALL START (R-2) WHENEVER THE SUPPLY FAN IS PROVEN RUNNING. THE RETURN FAN VFD SHALL BE SET TO MAINTAIN A CONSTANT SPEED DIFFERENCE (VFD-2A) BETWEEN THE SPEED OF THE SUPPLY FAN AND THE SPEED OF THE RETURN FAN. THE RETURN STATIC PRESSURE (DPT-2) SHALL BE MONITORED. THE VARIABLE FREQUENCY DRIVE SHALL BE OFF AND THE SPEED SHALL BE SET TO 0 HZ IF THE SUPPLY FAN IS NOT RUNNING. WHENEVER THE RETURN FAN IS COMMANDED TO RUN AND THE STATUS (DP-2) CANNOT BE PROVEN, A "RETURN FAN FAILURE" ALARM SHALL BE DISPLAYED ON THE OPERATOR WORKSTATION.

OUTSIDE AIR DAMPER CONTROL: INITIALLY, THE OUTSIDE AIR DAMPER (D-1) SHALL BE SET TO THE MINIMUM AMOUNT AS INDICATED ON THE AIR HANDLER SCHEDULE AND COORDINATED WITH THE TESTING & BALANCING CONTRACTOR. THE OUTSIDE AIR DAMPER SHALL FURTHER BE CONTROLLED BY THE CARBON DIOXIDE SENSOR (CO-1) IN THE RETURN AIR DUCTWORK. THE OUTSIDE AIR DAMPER SHALL MODULATE TO MAINTAIN A 700 PPM (ADJ.) OFFSET BETWEEN OUTSIDE AIR AND AIR IN THE RETURN DUCT. (THE MINIMUM OUTSIDE AIR QUANTITIES FOR EACH AIR HANDLER ARE AS FOLLOWS: M-AHU-12 - 1400 CFM, M-AHU-13 - 700 CFM, M-AHU-23 - 1800 CFM, M-AHU-47 - 550 CFM, M-AHU-52 - 350 CFM, M-AHU-53 - 400 CFM, M-AHU-54 - 350 CFM, M-AHU-60 - 225 CFM, M-AHU-4 -

HUMIDITY CONTROL: (NOT REQUIRED FOR M-AHU-47) WHEN THE SYSTEM IS NOT CALLING FOR HUMIDITY, SENSED BY H-1, "ON-OFF" TWO WAY CONTROL VALVE V-3 SHALL REMAIN CLOSED. WHEN THE SYSTEM IS CALLING FOR HUMIDITY V-3 SHALL REMAIN OPEN. THE RETURN AIR HUMIDITY, SENSED BY H-1, SHALL BE MAINTAINED AT SET POINT BY THE SYSTEM MODULATING HUMIDITY CONTROL VALVE V-40/V-4b TO MAINTAIN THE DESIRED RELATIVE HUMIDITY. THE CONTROLS SYSTEM SHALL OVERRIDE THIS CONTROL TO MAINTAIN MAXIMUM HUMIDITY OF 80% (ADJUSTABLE) AS SENSED BY H-2. THE CONTROLS SYSTEM SHALL CLOSE VALVE V-3 WHENEVER THE SUPPLY FAN IS OFF. VALVE V-4a/V-4b SHALL BE INTERLOCKED WITH A TEMPERATURE SWITCH TO KEEP THE HUMIDIFIER OFF UNTIL CONDENSATE TEMPERATURE APPROACHES STEAM TEMPERATURE. IF APPLICABLE, PROVIDE A SEPARATE MODULATING CONTROL VALVE FOR SYSTEMS WHERE THE SUPPLY DUCT IS SPLIT IN TWO WITH TWO SEPARATE HUMIDIFIERS. EACH DUCT SHALL BE PROVIDED WITH A SEPARATE HIGH LIMIT DUCT HUMIDITY SENSOR (H-2a/H-2b). ANY OF THE HIGH LIMIT SENSORS SHALL HAVE THE CAPABILITY TO OVERRIDE THE HUMIDIFIER TO MAINTAIN A MAXIMÙM OF 80% IN EITHER DUCT. EACH MODULATING VALVE SHALL BE CONTROLLED BY THE RETURN AIR HUMIDITY SENSOR

TEMPERATURE MONITORING: MONITOR THE SUPPLY AIR TEMPERATURE (T-1), RETURN AIR TEMPERATURE (T-2), LEAVING HEATING COIL TEMPERATURE (T-4), MIXED AIR TEMPERATURE (T-3), AND RETURN AIR CARBON DIOXIDE LEVELS (CO-1).

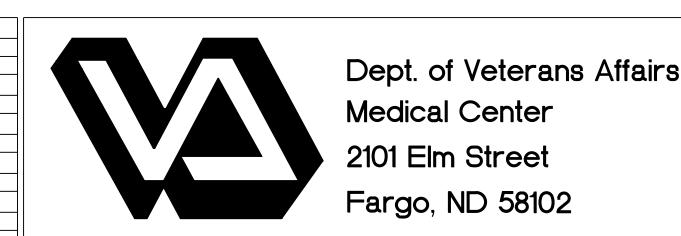
EMERGENCY CONSTANT SPEED OPERATION: ON ALL VARIABLE SPEED FANS IN VAV SYSTEMS UPON FAILURE OF THE VFD, THE FANS SHALL BE STARTED/STOPPED MANUALLY AT THE UNIT OR THE ECC THROUGH THE BY-PASS STARTER. FANS SHALL THEN BE OPERATED AT

POWER OUTAGE OPERATION: ON THE EVENT OF A POWER OUTAGE AIR HANDLING UNIT SHALL AUTOMATICALLY RESTART WHEN POWER HAS BEEN RE-ESTABLISHED.

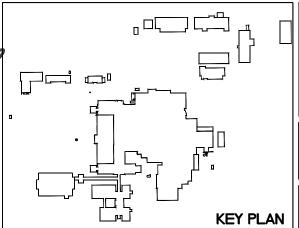
<u>UNIT START-UP:</u> ON UNIT START-UP, ENABLE SUPPLY AND RETURN FANS FOR A MINIMUM OF 5 MINUTES (ADJUSTABLE) BEFORE STARTING PROGRAM IN ORDER TO EQUALIZE ALL UNIT SENSORS.

## VARIABLE VOLUME AIR HANDLING UNIT CONTROL H1.10/ NO SCALE

CONSTANT SPEED.

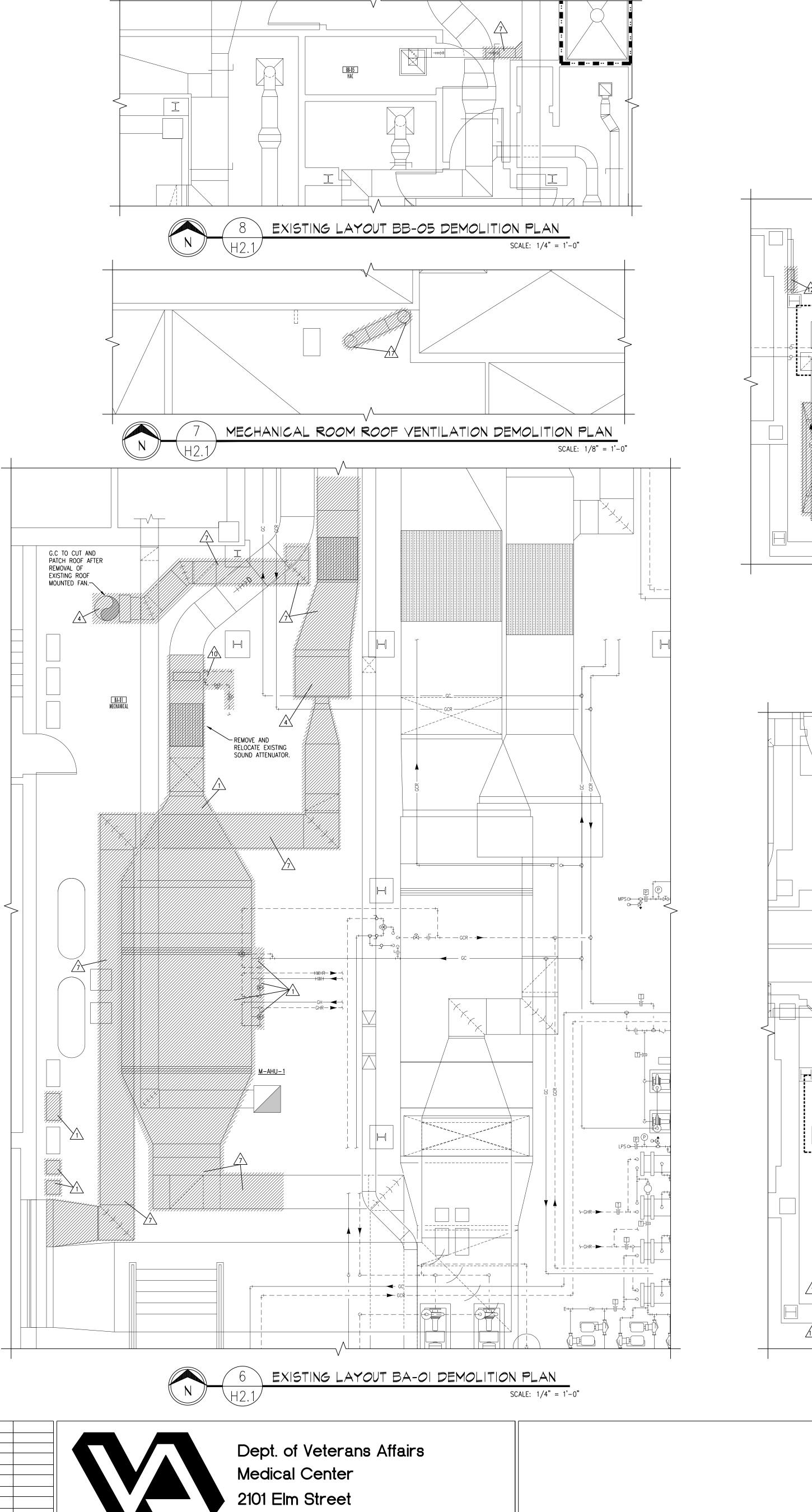


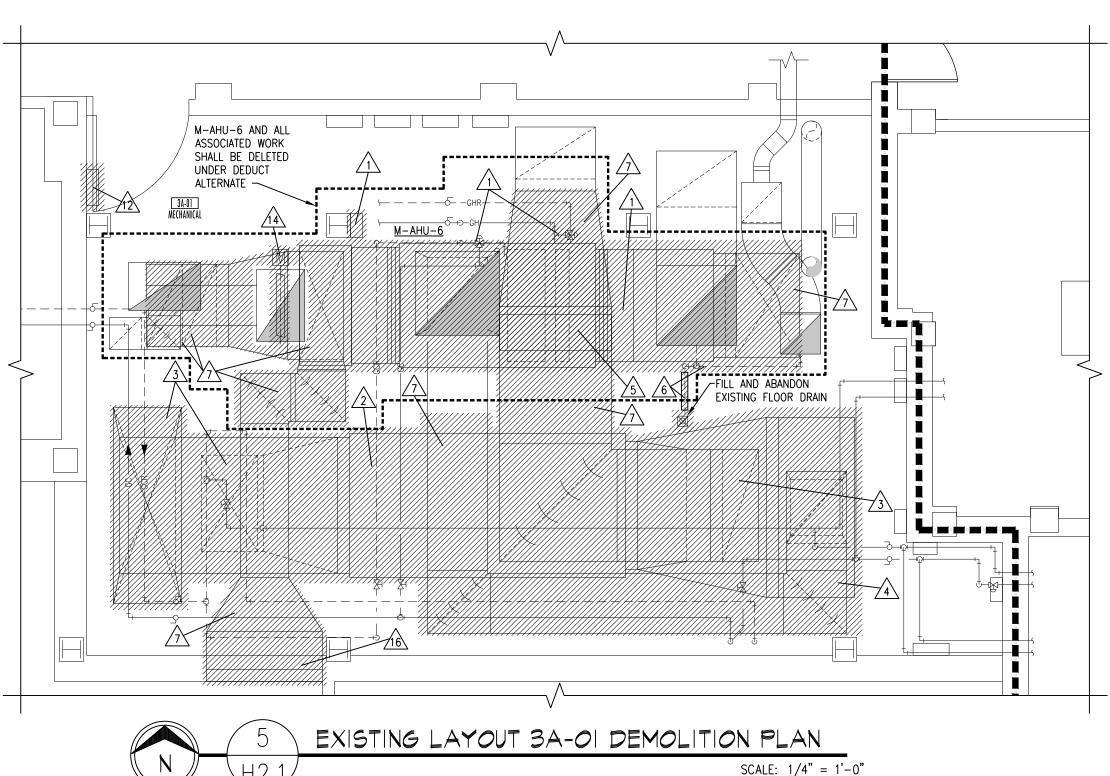


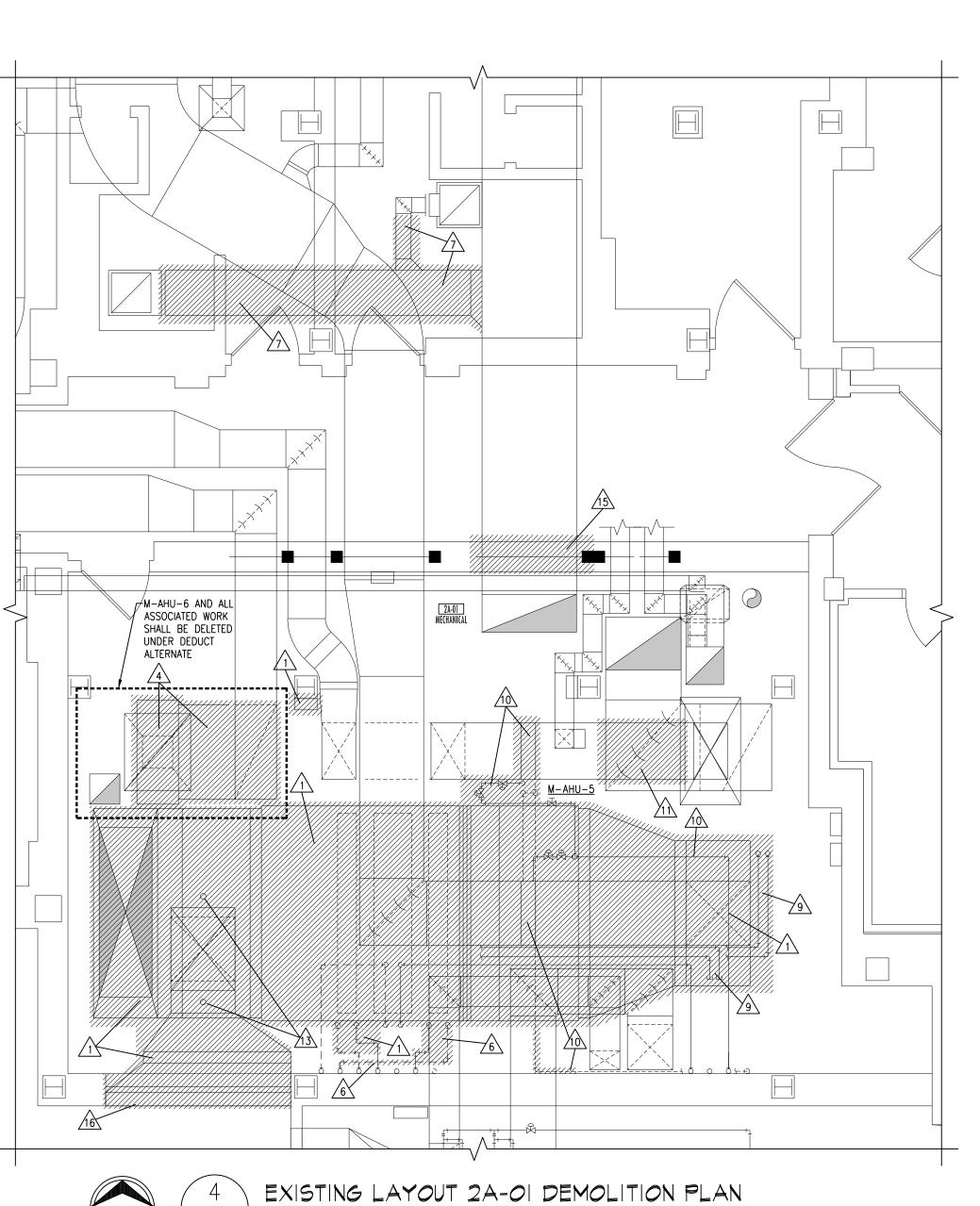


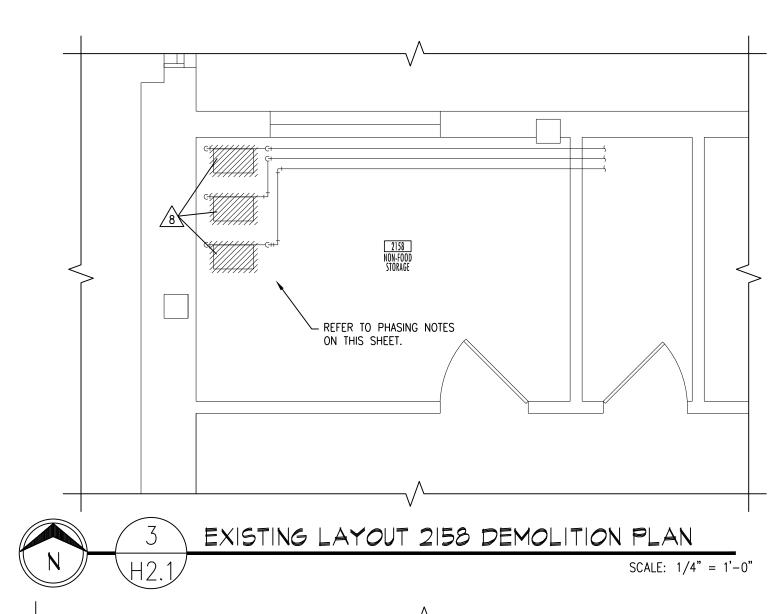
	CONTROL DIAGRAMS	Project Title REPL SY	Date			
Project Phase	HASE 1				Scale:	
VA Project No. 437-13-111	Contract No. VA263-P-1218 VA263-C-	Designed By JP	Checked By JP	Drawn By JF	Drawi	
Building No.  VAMC CAMPUS	AutoCAD File Name 2012273-PHI.10.DWG		Location FARGO VA HEALTH CARE SYSTEM FARGO, NORTH DAKOTA			

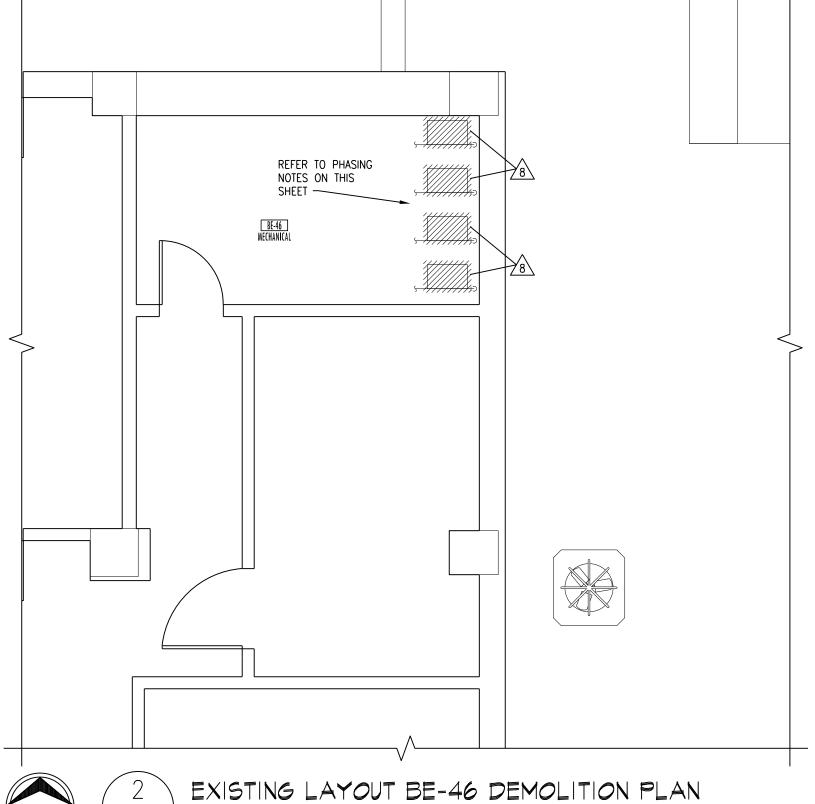
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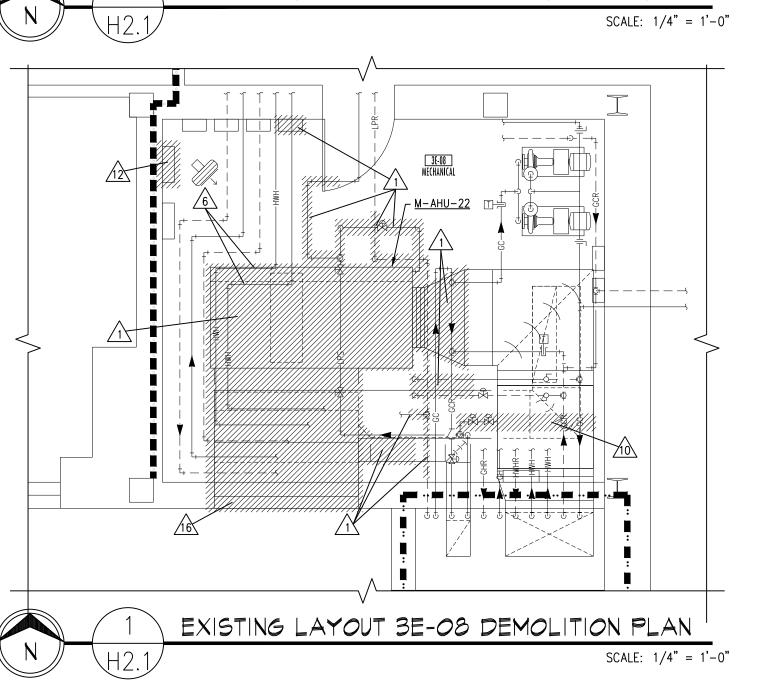












COOLER/FREEZER COMPRESSOR PHASING NOTES: COMPLETE ALL WORK ON EVENING, OVERTIME, OR

WEEKEND HOURS IN CAREFUL COORDINATION WITH THE COORDINATE SHUTDOWN WITH THE OWNER CAREFULLY AND ONLY WORK ON ONE COMPRESSOR AT A TIME. OUTDOOR UNIT SHALL BE INSTALLED AND OPERATIONAL BEFORE ANY SHUTDOWNS SHALL OCCUR. GIVE A MINIMUM OF 2 WEEKS NOTICE PRIOR TO ANY

SHUTDOWN.

PAURI THAIRIDLER PHASING NOTES: ALL AIR HANDLER REPLACEMENTS SHALL BE PERFORMED IN APRIL/MAY OR SEPTEMBER/OCTOBER

MONTHS IN CAREFUL COORDINATION WITH THE OWNER.

PROVIDE A MINIMUM OF 2 WEEKS NOTICE PRIOR TO BEGINNING WORK. FOR TEMPORARY AIR HANDLER OPERATION, PROVIDE A TEMPORARY FAN EQUAL TO THE UNIT AIRFLOW/HORSE POWER, AND HEPA FILTER TO BE MOUNTED TO THE SUPPLY DUCTWORK PRIOR TO REMOVING UNIT. REFER TO FLOOR PLANS FOR SUGGESTED TEMPORARY SUPPLY FAN LOCATION. FAN SHALL RUN CONTINUOUSLY. MAINTAIN THE MECHANICAL ROOM TEMPERATURE AT A MINIMUM OF 55 DEGREES AND MAXIMUM OF 70 DEGREES DURING AHU CHANGE OUT USING EXISTING HEATING UNITS OR TEMPORARY COOLING/HEATING UNITS. OUTSIDE AIR, RETURN AIR, RELIEF AIR, AND SUPPLY AIR DUCTS SHALL BE LEFT OPEN TO USE THE MECHANICAL ROOM AS A PLENUM. ALL UNIT SHUTDOWN WORK SHALL BE COMPLETED

EXPEDITE WORK. ALL CONTROLS WORK THAT CAN BE COMPLETED BEFORE AND SHALL BE COORDINATED. WORK SHALL BE COMPLETED DURING SPRING, FALL, OR WINTER MONTHS. . DISASSEMBLE NEW AIR HANDLERS TO THEIR SMALLEST

OF UNIT SHALL BE COMPLETED AS QUICKLY AS

POSSIBLE WITH MULTIPLE SHIFTS REQUIRED TO

DURING WEEKEND AND EVENING HOURS. REPLACEMENT

COMPONENTS AS REQUIRED TO FIT THROUGH EXISTING DOORS. TEMPORARILY REMOVE EXISTING MECHANICAL ROOM DOORS AS NECESSARY.

MECHANICAL **DEMOLITION NOTES:** . DEMOLITION DRAWINGS ARE DIAGRAMMATIC ONLY AND ARE BASED ON FIELD OBSERVATION AND EXISTING RECORD DRAWINGS. CONTRACTOR SHALL VERIFY ALL

EXISTING CONDITIONS PRIOR TO BEGINNING WORK AND NOTIFY THE ARCHITECT/ENGINEER OF ANY DISCREPANCIES BETWEEN THE "AS-BUILT" CONDITIONS AND THESE DRAWINGS. PROVIDE ADDITIONAL DEMOLITION AS REQUIRED BASED ON FIELD CONDITIONS. THIS CONTRACTOR SHALL OPEN ALL WALLS AND/OR CEILINGS FOR DEMOLITION OF EXISTING HVAC PIPING, DUCTWORK, EQUIPMENT, ETC. AS REQUIRED.

THIS CONTRACTOR IS RESPONSIBLE FOR PATCHING ALL HOLES/WALLS AND OR CEILINGS FROM DEMOLISHED HVAC PIPING, DUCTWORK, EQUIPMENT, ETC. IN FLOORS, WALLS, AND CEILINGS TO MATCH EXISTING. 1\ DISCONNECT AND REMOVE EXISTING AHU AND ALL ASSOCIATED DUCTWORK, HANGERS, PIPING, CONTROLS, VFD'S, STEEL RAIL, ETC. PREPARE REMAINING DUCTWORK AND PIPING FOR NEW CONNECTION. 2 DISCONNECT AND REMOVE EXISTING ERU AND ALL ASSOCIATED DUCTWORK, HANGERS, PIPING, CONTROLS

 $\sqrt{3}$  DISCONNECT AND REMOVE EXISTING DUCTWORK AND ALL ASSOCIATED HANGERS, DAMPERS, ETC. PATCH OPENINGS TO MATCH EXISTING.

 $\sqrt{4}$  DISCONNECT AND REMOVE EXISTING FAN AND ALL ASSOCIATED DUCTWORK, HANGERS, CONTROLS, VFD'S, 5 DISCONNECT AND REMOVE EXISTING FILTER BOX AND

ALL ASSOCIATED DUCTWORK, HANGERS, ETC. PREPARE REMAINING DUCTWORK FOR NEW CONNECTION.

ETC. PREPARE REMAINING DUCTWORK FOR NEW

6 DISCONNECT AND REMOVE EXISTING HVAC PIPING AND ALL ASSOCIATED HANGERS, VALVES, ETC. PREPARE REMAINING PIPING FOR NEW CONNECTION. DISCONNECT AND REMOVE EXISTING DUCTWORK AND ALL ASSOCIATED HANGERS, DAMPERS, ETC. PREPARE REMAINING DUCTWORK FOR NEW CONNECTION. DISCONNECT EXISTING REFRIGERANT PIPING AT HEAT EXCHANGER CONNECTIONS IN PREPARATION FOR NEW

PIPING TO REMOTE AIR-COOLED CONDENSERS. 9 DISCONNECT AND REMOVE EXISTING HVAC PIPING AND ALL ASSOCIATED HANGERS, VALVES, ETC. CAP PIPING BACK AT MAIN 10 DISCONNECT AND REMOVE EXISTING HUMIDIFIER AND ALL ASSOCIATED STEAM AND CONDENSING PIPING,

VALVES, CONTROLS, ETC. PREPARE REMAINING DUCTWORK FOR NEW CONNECTION. 11 DISCONNECT AND REMOVE EXISTING DUCTWORK FOR INSTALLATION OF NEW HUMIDIFIER. PREPARE REMAINING DUCTWORK FOR NEW CONNECTION.

12\ REMOVE EXISTING PNEUMATIC TEMP. CONTROL PANEL COMPONENTS THAT ARE BEING REPLACED BY NEW DDC PANEL. LEAVE ANY PNEUMATIC COMPONENTS OPERATIONAL THAT ARE NOT BEING REPLACED OR SERVE OTHER UNITS. 13 DISCONNECT AND REMOVE EXISTING SPRINKLER HEADS

AND ALL ASSOCIATED PIPING, HANGERS, ET. IN AREAS WHERE EXISTING DUCTWORK IS BEING DEMO. PREPARE REMAINING PIPING FOR NEW CONNECTION. 14 DISCONNECT AND REMOVE EXISTING MOTORIZED DAMPER IN EXISTING RELIEF AIR DUCT. CUT AND PATCH EXISTING DUCTWORK AND REMOVE AND REPLACE EXISTING HOOD ON ROOF ABOVE AS REQUIRED.

15\ DISCONNECT AND REMOVE EXISTING FIRE DAMPER IN EXISTING RETURN DUCT AND ALL ASSOCIATED FRAMING/SLEEVES. PATCH, RE-INSULATE, AND REINSTALL EXISTING DUCT AS REQUIRED. 16 DISCONNECT AND REMOVE EXISTING LOUVER TEMPORARILY FOR REMOVAL OF EXISTING AIR HANDLER AND DELIVERY OF NEW AIR HANDLER EQUIPMENT.

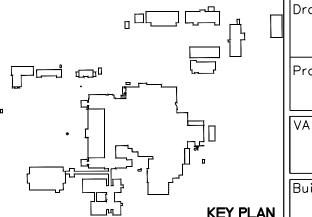
EXISTING MOTORIZED DAMPERS ADJACENT TO LOUVERS SHALL BE REMOVED WITH ALL ASSOCIATED CONTROLS, WIRING, ACTUATORS, ETC. 1) DISCONNECT AND REMOVE EXISTING DUCTWORK AND ALL ASSOCIATED HANGERS, SUPPORTS, ETC.. DUCTWORK EXTENDS UP TO 5TH FLOOR PENTHOUSE ROOF. PATCH EXISTING EXTERIOR WALLS AS REQUIRED TO MATCH EXISTING. PREPARE EXISTING ROOF PENETRATION FOR

INSTALLATION OF NEW CURB CAP.

Fargo, ND 58102



SCALE: 1/4" = 1'-0"



	Drawing Title BASEMENT, SECOND FLOOR, AND THIRD FLOOR
	LARGE SCALE DEMOLITION PLANS
	Project Phase
	PHASE 2
- 1	IVA Project No.

||Project Title REPLACE OR UPGRADE HVAC SYSTEM COMPONENTS

SEPT. 14, 2016 AS SHOWN rawing No.

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Designed By Checked By Drawn By VA263-P-1218 VA263-C-AutoCAD File Name FARGO VA HEALTH CARE SYSTEM VAMC CAMPUS FARGO, NORTH DAKOTA 2012273-PH2.1.DWG

Date

