

AIR HANDLER SCHEDULE																																											
TAG	BASIS OF DESIGN		SUPPLY AIR FLOW (CFM)	MIN. OUTSIDE AIR FLOW (CFM)	RETURN FAN					SUPPLY FAN					PRE-HEAT COIL PERFORMANCE										COOLING PERFORMANCE																		
	MANUFACTURER	MODEL			AIRFLOW (CFM)	E.S.P. (in.wg.)	T.S.P. (in.wg.)	HP	FAN QTY	VOLTAGE	AIRFLOW	E.S.P. (in.wg.)	T.S.P. (in.wg.)	HP	FAN QTY	VOLTAGE	SYSTEM TYPE	FACE AREA (sq.ft.)	FACE VELOCITY (ft/min)	ROWS	EAT D.B. (°F)	LAT D.B. (°F)	TOTAL CAP. (BTU/h)	E.W.T. (°F)	L.W.T. (°F)	STEAM PRESSURE (PSI)	CONDENSATE RATE (LBS/HR)	FLUID FLOW (GPM)	SYSTEM TYPE	FACE AREA (sq.ft.)	FACE VELOCITY (ft/min)	ROWS	EAT DB (°F)	EAT WB (°F)	LAT DB (°F)	LAT WB (°F)	TOTAL CAPACITY (BTU/h)	SENSIBLE CAPACITY (BTU/h)	EWT (°F)	LWT (°F)	FLUID FLOW RATE (GPM)	WEIGHT (LBS)	OPTIONS
AHU-1	TRANE	CSAA SIZE 40	17,500	4,500	17,500	1.50	2.30	8	2	460	21,000	2.50	5.94	20	2	460	STEAM	38	560	1	60	84	549,757	180	160	15.00	685		CHILLED WATER	39	550	6	79	65	53	53	726,236	592,723	46	56	180	11,065	1, 3, 4, 5, 6, 7, 8, 9, 10, 12, 13
RTU-1	TRANE	CSAA SIZE 10	4,500	1,300	4,000	2.00	3.24	5	2	460	4,000	2.00	6.23	7.5	2	460	HOT WATER	8	530	1	57	95	164,840	180	160			19	CHILLED WATER	8	500	6	82	67	53	53	173,810	127,250	46	56	35	4,202	1, 2, 5, 6, 7, 8, 9, 11, 13, 14, 15
OPTIONS: 1. SINGLE POINT ELECTRICAL CONNECTION FOR UNIT OPERATION. SEPERATE CIRCUITS FOR EACH LIGHTS, RECEPABLES, ETC. 2. RH COIL CONNECTION, LH ACCESS DOORS, ELECTRICAL & CONTROLS MOUNT. 3. LH COIL CONNECTION, RH ACCESS DOORS, ELECTRICAL & CONTROLS MOUNT. 4. 2" FOAM INJECTED R-13 INSULATED CONSTRUCTION WITH THERMAL BREAK. 5. MARINE LED LIGHTS IN ALL SECTIONS 6. ACCESS SECTIONS, DOORS WITH THERMAL WINDOWS, TEST PORTS. 7. DIFFERENTIAL PRESSURE TEST PORTS & MAGNAHELIC GAUGE ACROSS FILTER SECTIONS. 8. COPPER COIL, COPPER FINS ON ALL COILS. 9. VFD PER FAN, 2x PLENUM FAN ARRAY, SUPPLY & RETURN. 10. INTEGRAL BASE FRAME SIZED FOR PROPER CONDENSATE TRAP DEPTH CLEARANCE FROM FLOOR SLAB. 11. 14 INCH ROOF CURB 12. STEAM HUMIDIFIER SECTION WITH SLOPED STAINLESS STEEL DRAIN PAN. 13. AIRFLOW MONITORING DEVICE EQUAL TO ACCUTROL MODEL IAQ-Tek 2000. TRANSDUCER AND PROBE QUANTITY TO BE DETERMINED BY FINAL EQUIPMENT SELECTION. FINAL DUCT MOUNTING LOCATION TO BE DETERMINED BY MANUFACTURER RECOMMENDATIONS. 14. 2" FOAM INJECTED R-13 INSULATED CONSTRUCTION WITH THERMAL BREAK. CABINET TO BE SUITABLE FOR EXTERIOR USE WITH PITCHED ROOF FOR DRAINAGE. 15. PIPE CHASE WITH WEATHERPROOF ACCESS DOOR FOR HYDRONIC PIPING FROM BELOW.																																											

AIR DEVICE SCHEDULE						
TAG	MANUFACTURER	SERIES	DESCRIPTION	BORDER TYPE	MODULE SIZE	OPTIONS
A	TITUS	OMNI	ARCHITECTURAL SQUARE PLAQUE DIFFUSER	LAY-IN	24 x 24	1, 2
B	TITUS	OMNI	ARCHITECTURAL SQUARE PLAQUE DIFFUSER	SURFACE MOUNT	24 x 24	1, 2
D	TITUS	OMNI	ARCHITECTURAL SQUARE PLAQUE DIFFUSER	SURFACE MOUNT	12 x 12	1, 2
E	TITUS	50	EGGCRATE RETURN/EXHAUST GRILLE	LAY-IN	24 x 24	2
F	TITUS	50	EGGCRATE RETURN/EXHAUST GRILLE	SURFACE MOUNT	24 x 24	2
G	TITUS	50	EGGCRATE RETURN/EXHAUST GRILLE	LAY-IN	12 x 12	2
H	TITUS	50	EGGCRATE RETURN/EXHAUST GRILLE	SURFACE MOUNT	12 x 12	2
I	TITUS	TLF	LAMINAR PATTERN DIFFUSER	SURFACE MOUNT	48 x 24	2
J	TITUS	350	LOUVERED RETURN GRILLE	SURFACE MOUNT	16 x 16	2
K	TITUS	350	STAINLESS STEEL LOUVERED RETURN GRILLE	SURFACE MOUNT	18 x 30	2
OPTIONS: 1. INSULATED BACK PAN WITH MINIMUM 6 R-VALUE. 2. MANUFACTURER'S STANDARD WHITE FINISH.						

COMPUTER ROOM AIR CONDITIONING UNIT SCHEDULE									
TAG	MANUFACTURER	MODEL	TOTAL CAPACITY (BTU/h)	SENSIBLE CAPACITY (BTU/h)	CHILLED WATER FLOW RATE (GPM)	VOLTAGE	MCA	MOCP	OPTIONS
CRAC-1	DATA AIRE	GFCU-00734	25,000	21,900	6	460	11.30	15	1, 2, 3
OPTIONS: 1. 3.4 KW STEAM GENERATOR 2. FLOOR STAND 3. MOUNT UNIT ON 4" HOUSEKEEPING PAD									

TERMINAL UNIT SCHEDULE															
TAG	MANUFACTURER	MODEL	PRIMARY INLET (")	DESIGN COOLING AIRFLOW (CFM)	MIN COOLING AIRFLOW (CFM)	HEATING AIRFLOW (CFM)	MAX INLET S.P. (in.wg.)	APD @ COOLING AIRFLOW (in.wg.)	PRIMARY EDB (°F)	HEATING UNIT LAT (°F)	COIL HEATING CAPACITY (BTU/h)	HEATING ENT FLUID TEMP (°F)	HEATING DELTA T (°F)	HEATING FLOWRATE (GPM)	OPTIONS
TU-1	TRANE	VCWF	4"	125	125	125	0.75	0.750	55	95	5,407	180	20	0.54	1, 2, 3, 4, 5, 6
TU-2	TRANE	VCWF	4"	125	125	125	0.75	0.750	55	95	5,407	180	20	0.54	1, 2, 3, 4, 5, 6
TU-3	TRANE	VCWF	4"	125	125	125	0.75	0.750	55	95	5,407	180	20	0.54	1, 2, 3, 4, 5, 6
TU-4	TRANE	VCWF	4"	125	125	125	0.75	0.750	55	95	5,407	180	20	0.54	1, 2, 3, 4, 5, 6
TU-5	TRANE	VCWF	4"	125	125	125	0.75	0.750	55	95	5,407	180	20	0.54	1, 2, 3, 4, 5, 6
TU-6	TRANE	VCWF	5"	250	250	250	0.75	0.750	55	80	6,759	180	20	0.68	1, 2, 3, 4, 5, 6
TU-7	TRANE	VCWF	5"	145	145	145	0.75	0.000	55	80	3,920	180	20	0.39	1, 2, 3, 4, 5, 6
TU-8	TRANE	VCWF	5"	145	145	145	0.75	0.000	55	80	3,920	180	20	0.39	1, 2, 3, 4, 5, 6
TU-9	TRANE	VCWF	4"	125	125	125	0.75	0.750	55	95	5,407	180	20	0.54	1, 2, 3, 4, 5, 6
TU-10	TRANE	VCWF	8"	875	875	875	0.75	0.750	55	80	23,657	180	20	2.36	1, 2, 3, 4, 5, 6
TU-11	TRANE	VCWF	4"	125	125	125	0.75	0.750	55	95	5,407	180	20	0.54	1, 2, 3, 4, 5, 6
TU-12	TRANE	VCWF	4"	125	125	125	0.75	0.750	55	95	5,407	180	20	0.54	1, 2, 3, 4, 5, 6
TU-13	TRANE	VCWF	4"	125	125	125	0.75	0.750	55	95	5,407	180	20	0.54	1, 2, 3, 4, 5, 6
TU-14	TRANE	VCWF	4"	125	125	125	0.75	0.750	55	95	5,407	180	20	0.54	1, 2, 3, 4, 5, 6
TU-15	TRANE	VCWF	4"	125	225	225	0.75	0.750	55	80	3,380	180	20	0.34	1, 2, 3, 4, 5, 6
TU-16	TRANE	VCWF	4"	125	125	125	0.75	0.750	55	80	3,380	180	20	0.34	1, 2, 3, 4, 5, 6
TU-17	TRANE	VCWF	4"	125	125	125	0.75	0.750	55	80	3,380	180	20	0.34	1, 2, 3, 4, 5, 6
TU-18	TRANE	VCWF	4"	175	225	225	0.75	0.750	55	80	4,731	180	20	0.47	1, 2, 3, 4, 5, 6
TU-19	TRANE	VCWF	4"	175	175	175	0.75	0.750	55	80	4,731	180	20	0.47	1, 2, 3, 4, 5, 6
TU-20	TRANE	VCWF	8"	700	700	700	0.75	0.750	55	95	30,280	180	20	3.03	1, 2, 3, 4, 5, 6
OPTIONS: 1. INSTALL PER MANUFACTURER'S IOM. 2. ACCESS DOORS AT INLET OF BOX AND AT REHEAT COIL. 3. DOUBLE WALL 1" SOLID METAL LINER INSULATED CABINET. 4. WALL MOUNTED THERMOSTAT WITH TEMPERATURE ADJUSTMENT AND DIGITAL DISPLAY INTERLOCKED WITH EMS AND ASSOCIATED TERMINAL UNIT. 5. DDC - PROPORTIONAL HOT WATER CONTROL VALVE PACKAGE. 6. ACTUATOR AND CONTROLS TRANSFORMER TO BE PROVIDED AND INSTALLED BY CONTROLS CONTRACTOR.															

EXHAUST FAN SCHEDULE														
TAG	MANUFACTURER	MODEL	TYPE	AIRFLOW (CFM)	STATIC (IN.W.C.)	FAN RPM	MOTOR HP	BHP	DRIVE TYPE	SONES	VOLTAGE	PHASE	WEIGHT	OPTIONS
EF-1	GREENHECK	G-123	CENTRIFUGAL DOWNBLAST	805	0.50	1096	0.25	0.13	DIRECT	7.4	115	1	40	1, 3
EF-2	GREENHECK	SWB-110-4	BACKWARD INCLINED CENTRIFUGAL UTILITY FAN	500	0.50	1096	0.25	0.1	Belt	9	115	1	138	2, 3
EF-3	GREENHECK	VEKTOR-H-10	HIGH PLUME DILUTION BLOWER	460	1.50	2682	0.75	0.56	Belt	14	460	3	739	4, 5
OPTIONS: 1. PROVIDE 14" ROOF CURB 2. INSTALL ON 4" HOUSEKEEPING PAD. 3. FAN TO RUN CONTINUOUSLY. PROVIDE CURRENT TRANSDUCERS TO MONITOR OPERATION WITH ALARM TO EMS. 4. GREENHECK #MSEM MOTOR STARTER WITH NEMA 3R ENCLOSURE. INTEGRATE INTO EMS. 5. INSTALL EQUIPMENT SUPPORTS WITH BUILT IN CANTS AND BOLTED NEOPRENE ISOLATORS TO RAIL SUPPORT.														

OPERATING ROOM CEILING SYSTEM SCHEDULE										
TAG	MANUFACTURER	MODEL	DESCRIPTION	48"x24"	36"x24"	48" x 12"	ACCESS PANELS	LIGHT TROFFERS BY OTHERS	OVERALL SIZE	OPTIONS
CS-1	PRICE	HDOR	HEAVY DUTY WELDED CEILING SYSTEM	16	0	2	12	18	20' x 20'	1
CS-2	PRICE	HDOR	HEAVY DUTY WELDED CEILING SYSTEM	9	2	0	13	12	20' x 16'	1
CS-3	PRICE	HDOR	HEAVY DUTY WELDED CEILING SYSTEM	9	2	0	14	11	22' x 16'	1
CS-4	PRICE	HDOR	HEAVY DUTY WELDED CEILING SYSTEM	8	3	0	10	13	20' x 16'	1
OPTIONS: 1. COORDINATE SHOP DRAWING, ELECTRICAL LIGHTING RING & INSTALLATION WITH MEDICAL EQUIPMENT SUPPLIER CEILING BOOM LOCATIONS & ACCESSORIES.										

LOUVER SCHEDULE				
TAG	MANUFACTURER	MODEL	LOUVER WIDTH	LOUVER HEIGHT
LV-1	GREENHECK	ESD-435X	8'- 0"	8'- 0"
OPTIONS: 1. ACTUAL HEIGHT OF LOUVER MAY BE FIELD DETERMINED BY MEASURING FROM THE TOP OF THE EXISTING LOUVER TO APPX. 12" ABOVE FINISHED FLOOR, BUT SHALL BE NO LESS THAN 8'-0" TALL. INSTALL WITH BOTTOM OF LOUVER APPX. 12" ABOVE FINISHED FLOOR.				

HEPA FILTER BOX SCHEDULE					
TAG / QTY	MANUFACTURER	MODEL	BOX DIMENSIONS (W" x H" x D")	PRIMARY FILTER SIZE (W" x H" x D")	FILTER QTY. OPTIONS
FB-1	FLANDERS	C4F	24 x 27 x 24	24 x 24 x 11.5	1 1, 2, 3, 4, 5, 6
FB-2	FLANDERS	C4F	48 x 24 x 24	24 x 24 x 11.5	2 1, 2, 3, 4, 5, 6
FB-3	FLANDERS	C4F	48 x 52 x 24	24 x 24 x 11.5	4 1, 2, 3, 4, 5, 6
OPTIONS: 1. FLUID SEAL. 2. STAINLESS STEEL CONSTRUCTION. 3. MAGNAHELIC DIFFERENTIAL PRESSURE GAUGE. 4. DIFFERENTIAL PRESSURE MONITOR TIED IN TO BUILDING MANAGEMENT SYSTEM. 5. COORDINATE HAND OF UNIT & FINAL INSTALLATION LOCATION FOR SERVICE ACCESSIBILITY. 6. SUPPORT FROM STRUCTURE EACH CORNER WITH ALL TREAD ROD. SPRING ISOLATORS SIZED BY MANUFACTURER. SEE SPECIFICATIONS.					

FAN COIL SCHEDULE										
TAG	MANUFACTURER	MODEL	CABINET	OUTDOOR UNIT TAG	FAN CFM	E.S.P. (W.C.)	COOLING CAPACITY (BTU/h)	ELECTRICAL VOLTAGE	PHASE	WEIGHT (LBS)
FC-1	CARRIER	40MHHC09	WALL MOUNTED	AC-1	260	-	9,000	208	1	21
OPTIONS: 1. INDOOR UNIT TO RECIEVE POWER FROM OUTDOOR UNIT. 2. PROVIDE CONDENSATE PUMP. 53DS900118 3. PROVIDE WIRED WALL MOUNT 7-DAY PROGRAMMABLE CONTROLLER										

MINI-SPLIT AIR CONDITIONER SCHEDULE						
TAG	MANUFACTURER	MODEL	NOMINAL COOLING CAP. (BTU/h)	VOLTAGE	PHASE	WEIGHT (LBS.)
AC-1	CARRIER	38MHRCC09A	9,000	208	1	60

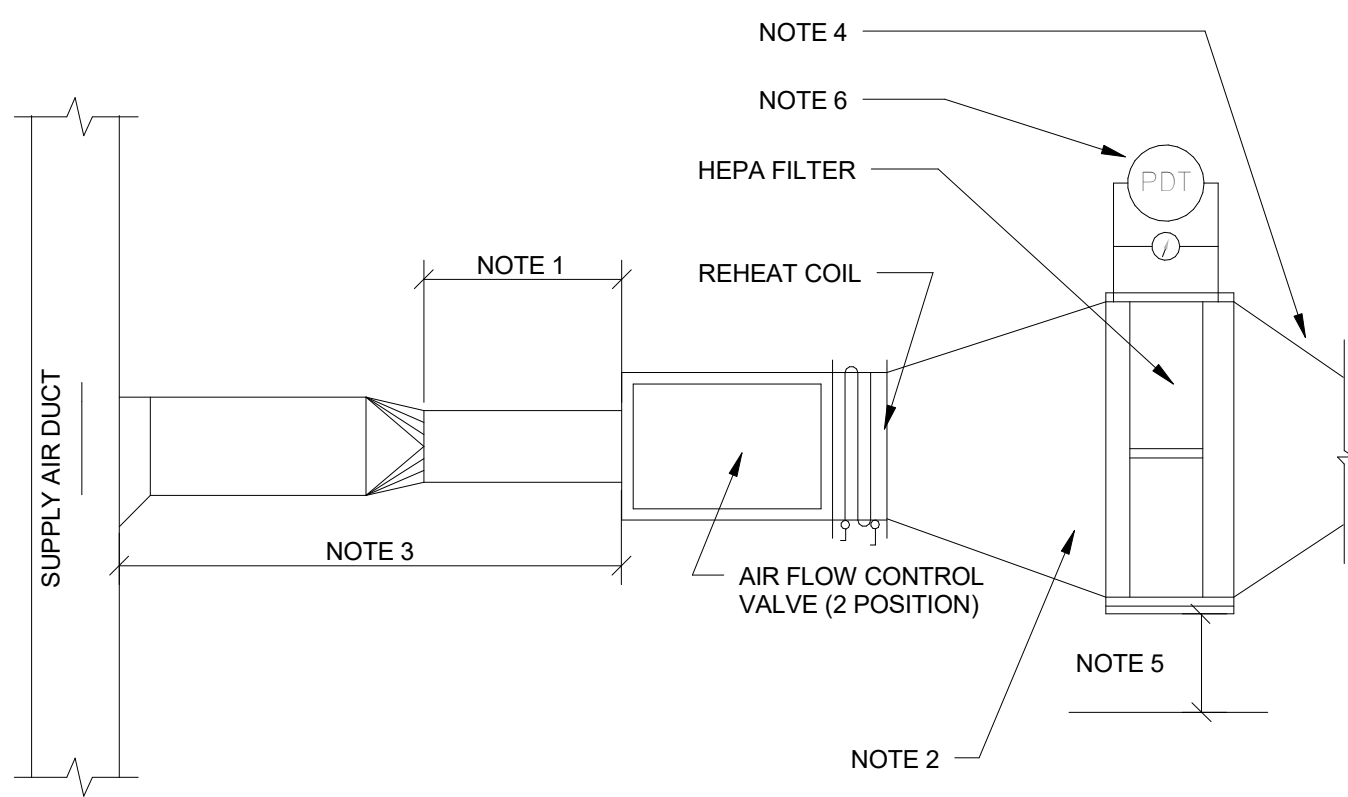
HOT WATER HEATING COIL SCHEDULE										
TAG	MANUFACTURER	AIRFLOW (CFM)	ENT. AIR D.B. (°F)	LVG. AIR D.B. (°F)	ENT. WATER TEMP. (°F)	LVG. WATER TEMP. (°F)	HEATING DELTA T (°F)	HEATING FLOWRATE (GPM)	HTG. CAPACITY (BTU/h)	OPTIONS
WC-01	TEMPROL	400	55	80	180	160	20	1.08	10,814	1, 2, 3
WC-02	TEMPROL	3,700	55	80	180	160	20	9.99	100,033	1, 2, 3
WC-03	TEMPROL	3,100	55	80	180	160	20	8.37	83,812	1, 2, 3
WC-04	TEMPROL	2,500	55	80	180	160	20	6.75	67,590	1, 2, 3
WC-05	TEMPROL	2,500	55	80	180	160	20	6.75	67,590	1, 2, 3
WC-06	TEMPROL	1,600	55	80	180	160	20	4.32	43,258	1, 2, 3
WC-07	TEMPROL	300	55	80	180	160	20	0.81	8,111	1, 2, 3
WC-08	TEMPROL	300	55	80	180	160	20	0.81	8,111	1, 2, 3
WC-09A	TEMPROL	1,620	55	80	180	160	20	4.38	43,798	1, 2, 3
WC-09B	TEMPROL	700	55	80	180	160	20	1.89	18,925	1, 2, 3
WC-10	TEMPROL	175	55	80	180	160	20	0.47	4,731	1, 2, 3
WC-11	TEMPROL	350	55	95	180	160	20	1.51	15,140	1, 2, 3
WC-12	TEMPROL	150	55	80	180	160	20	0.41	4,055	1, 2, 3
WC-13	TEMPROL	200	55	95	180	160	20	0.86	8,652	1, 2, 3

CONTROLS SYMBOLS

	ROOM THERMOSTAT/TRANSMITTER - WALL MOUNT
	ROOM HUMIDISTAT (MOISTURE)/TRANSMITTER - WALL MOUNT
	TEMPERATURE TRANSMITTER
	TEMPERATURE TRANSMITTER, AVERAGING ELEMENT
	MOISTURE (HUMIDITY) TRANSMITTER
	PRESSURE TRANSMITTER
	STATIC PRESSURE SENSOR
	FLOW TRANSMITTER
	CURRENT TRANSMITTER
	CONDUCTIVITY TRANSMITTER
	SMOKE DETECTOR
	PRESSURE DIFFERENTIAL TRANSMITTER
	PRESSURE DIFFERENTIAL SWITCH
	HAND SWITCH (HAND-OFF-AUTO SWITCH)
	VALVE OR DAMPER POSITION CONTROLLER
	LOCAL RECORDING TIME CLOCK (RUNTIME)
	TEMPERATURE SWITCH, LOW (FREEZE/STAT)
	TEMPERATURE SWITCH, HIGH (FREEZE/STAT)
	LEVEL CONTROLLER
	LEVEL TRANSMITTER
	PRESSURE SWITCH HIGH
	PRESSURE SWITCH LOW
	ELECTRONIC TO PNEUMATIC TRANSDUCER
	CARBON DIOXIDE TRANSMITTER
	CARBON MONOXIDE TRANSMITTER
	OCCUPANCY SENSOR
	LOCAL TEMPERATURE CONTROL PANEL
	HVAC CONTROL PANEL
	VARIABLE SPEED MOTOR CONTROLLER
	AIRFLOW MONITORING DEVICE
	INTEGRATE CONTROL POINT ON REMOTE GRAPHICS WORKSTATION AT ENERGY CONTROL CENTER
	TEMPERATURE CONTROLLER - SEE SEQUENCE OF OPERATION
	PRESSURE CONTROLLER - SEE SEQUENCE OF OPERATION
	SPEED CONTROLLER - SEE SEQUENCE OF OPERATION
	FLOW CONTROLLER - SEE SEQUENCE OF OPERATION
	FLOW SWITCH HIGH
	FLOW SWITCH LOW
	TIME CLOCK CONTROLLING EQUIPMENT ON A SCHEDULE
	TEMPERATURE SENSING ELEMENT FOR TRANSMITTING TEMPERATURE TO EMCS (PROVIDE 12 INCHES [300mm] MINIMUM LENGTH IN DUCT WHEN SPACE PERMITS.)
	SENSOR WITH AVERAGING ELEMENT TO TRANSMIT TEMPERATURE TO EMCS
	MOTOR STARTER
	ELECTRIC OPERATED CONTROL DAMPER/OR VALVE

NOTE:
NOT ALL DETAILS REFERENCED IN THESE DETAILS AND SCHEMATICS ARE SHOWN IN THESE DOCUMENTS. REFER TO THE DEPARTMENT OF VETERANS AFFAIRS WEBSITE FOR A COMPLETE LIST OF VA DETAILS.

<https://www.dcm.va.gov/vaDetail.asp>

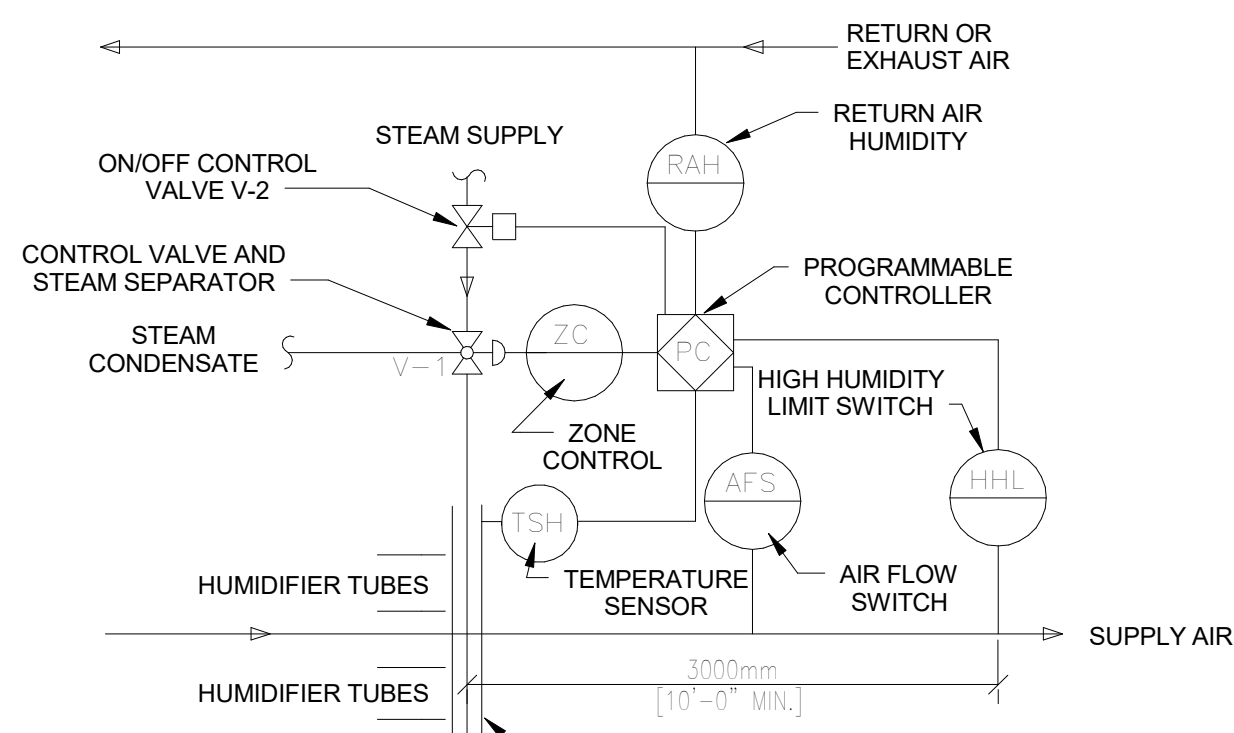


NOTE:

1. RIGID STRAIGHT TERMINAL UNIT INLET LENGTH SHALL BE A MINIMUM OF 3 TIMES THE DIAMETER OF INLET.
2. ALL DUCTWORK UPSTREAM OF THE HEPA FILTER SHALL BE GALVANIZED STEEL. A BRANCH DUCT SERVING AN INDIVIDUAL BOX MAY BE THE SAME SIZE AS THE BOX INLET, PROVIDED THE EQUIVALENT LENGTH OF THE BRANCH DUCT, AS SHOWN, DOES NOT EXCEED 10 FEET [3M]. FOR LONGER LENGTHS, INCREASE THE DUCT SIZE AND PROVIDE A DUCT TRANSITION TO MAINTAIN THE DUCT STATIC PRESSURE DROP AT OR BELOW 0.1" W.G. (0.6894 Pa/m).
3. ALL DUCTWORK DOWNSTREAM OF THE HEPA FILTER SHALL BE STAINLESS STEEL, PROVIDE ACCESS DOOR FOR CLEANING. SEE DETAIL SD233100-27 FOR LOCATION.
4. PROVIDE SIDE ACCESS FOR FILTER SERVICE. SEE MANUFACTURER'S SPECIFICATION FOR CLEARANCES.
5. PROVIDE SIDE ACCESS FOR FILTER SERVICE. SEE MANUFACTURER'S SPECIFICATION FOR CLEARANCES.
6. PRESSURE DIFFERENTIAL TRANSMITTER TO EMS.

1 AIR TERMINAL UNITS WITH HEPA FILTER

M-003 NOT TO SCALE

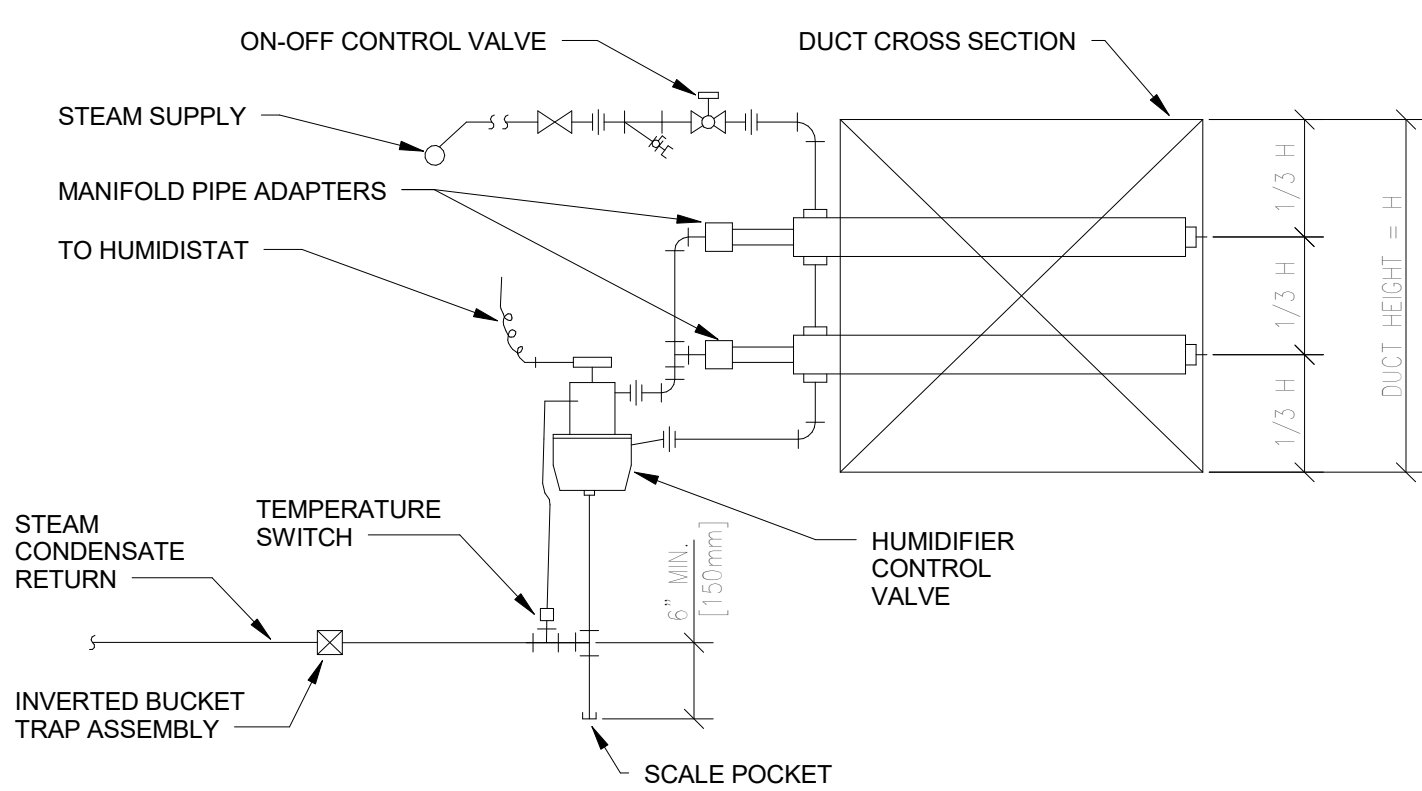


STEAM HUMIDIFIER CONTROL NOTES:

RETURN (OR EXHAUST) AIR HUMIDITY SHALL BE MONITORED, ON A CALL FOR HUMIDIFICATION, HUMIDIFIER VALVE V-1 SHALL MODULATE TO MAINTAIN THE RETURN (OR EXHAUST) AIR HUMIDITY SET POINT TO 35% (ADJUSTABLE). PRIOR TO ACTIVATION OF V-1, THE ON/OFF CONTROL VALVE V-2 SHALL BE ENABLED THROUGH ECC AND JACKET TEMPERATURE SENSED BY TSH SHALL BE WARM ENOUGH TO PREVENT CONDENSATION. THE HIGH LIMIT HUMIDITY SENSOR, LOCATED IN THE SUPPLY AIR DUCT 300MM (10 FEET) AWAY FROM THE HUMIDIFIER SHALL DISABLE THE HUMIDIFIER AND GIVE AN ALARM SIGNAL TO THE ECC. IF THE SUPPLY AIR HUMIDITY EXCEEDS 90% RH (ADJUSTABLE), THE AIRFLOW SWITCH SHALL PROVE AIRFLOW BEFORE HUMIDITY CONTROLS ARE ACTIVATED.

2 JACKETED STEAM HUMIDIFIER CONTROLS

M-003 NOT TO SCALE



NOTE:
SEE MANUFACTURER'S PIPING RECOMMENDATIONS FOR FINAL LAYOUT

DESIGNER NOTE:
PROVIDE ADDITIONAL CONTROLS FOR VAV OPERATION AND FOR PREVENTING OVER SATURATION OF THE SUPPLY AIR.

3 STEAM HUMIDIFIER - PIPING CONNECTIONS

M-003 NOT TO SCALE

SEQUENCE OF OPERATION FOR AIR HANDLING UNIT FOR SURGICAL SUITE (VAV)

1. GENERAL

UNIT IS NORMALLY STARTED AND STOPPED REMOTELY AT THE ECC. THE UNIT WILL NORMALLY OPERATE 24 HOUR/DAY. H-O-A SWITCH SHALL BE KEPT IN THE "AUTO" POSITION. "HAND" AND "OFF" POSITIONS SHALL BE USED ONLY FOR MAINTENANCE. WHEN THE UNIT IS "OFF" D-1 AND D-3 SHALL BE FULLY CLOSED. WHEN THE UNIT IS "ON" SD-1 AND SD-2 SHALL BE FULLY OPEN. D-1, D-2 AND D-3 SHALL MODULATE IN ACCORDANCE WITH THE FOLLOWING SEQUENCE:

2. TEMPERATURE CONTROL

SUPPLY AIR TEMPERATURE, SETPOINT (AS SET BY ECC), SENSED BY SENSOR TT-1, SHALL BE MAINTAINED BY SEQUENCING V-1 AND V-2. HEATING AND COOLING CONTROL VALVES SHALL BE MODULATED VIA PID CONTROL LOOP TO MAINTAIN THE SUPPLY AIR TEMP. VALVES V-1 AND V-2 SHALL NOT BE OPENED SIMULTANEOUSLY.

WHEN THE OUTSIDE AIR ENTHALPY AS CALCULATED BY TT-2 AND MT-3 IS LOWER THAN THE RETURN AIR ENTHALPY AS CALCULATED BY TT-4 AND MT-1 AND THE OUTSIDE AIR DRY BULB IS LESS THAN THE RETURN EXHAUST DRY BULB TT-4 THE UNIT ECONOMIZER MODE SHALL BE ENABLED. WHEN THE ECONOMIZER IS ENABLED DAMPERS D-1, D-2, AND D-3 SHALL MODULATE TO MAINTAIN THE DISCHARGE AIR SETPOINT AS SENSED BY THE DISCHARGE AIR SENSOR TT-1.

WHEN THE OUTSIDE AIR ENTHALPY, OR TEMPERATURE, IS HIGHER THAN THE RETURN AIR ENTHALPY, OR TEMPERATURE, THE ECONOMIZER SHALL BE DISABLED. DAMPER D-1 SHALL MODULATE TO MAINTAIN THE MINIMUM OUTSIDE AIR FLOW CFM SETPOINT AND D-2 AND D-3 SHALL MODULATE TO MAINTAIN OVERALL AIRFLOW CFM SETPOINT.

3. AIR FLOW CONTROL

THE SUPPLY AIR FLOW SHALL BE CONTROLLED BY THE DIGITAL CONTROL PANEL MODULATING THE SUPPLY FAN VARIABLE SPEED MOTOR CONTROLLER TO MAINTAIN THE TOTAL SUPPLY AIR CFM DURING OCCUPIED MODE. RESET SUPPLY AIR CFM AS EACH 2 POSITION AIR TERMINAL UNIT SWITCHES TO UNOCCUPIED MODE.

THE DIGITAL CONTROL PANEL, USING TOTAL SUPPLY AIR AND RETURN AIR FLOW SIGNALS, SHALL RESET THE RETURN AIR FAN TO MAINTAIN A CONSTANT AIR FLOW DIFFERENCE BETWEEN THE SUPPLY AIR AND THE RETURN AIR EQUAL TO MINIMUM OUTSIDE AIR.

USING HIGH PRESSURE SENSOR PSH LOCATED AT THE SUPPLY FAN DISCHARGE, SHALL PREVENT THE SUPPLY FAN FROM DEVELOPING OVER 3" (75mm) OF STATIC PRESSURE (FIELD ADJUSTABLE). IF STATIC PRESSURE AT PSH DOES EXCEED 3" (75mm) THE SUPPLY AIR FAN SHALL STOP. PSH SHALL BE HARDWIRED TO THE SUPPLY FAN AND UNIT SHALL BE SHUTDOWN IN HAND, AUTO OR BYPASS MODE. PSH WILL REQUIRE MANUAL RESET AT THE DEVICE.

USING LOW PRESSURE SENSOR PSL LOCATE AT THE RETURN FAN INLET, SHALL PREVENT THE RETURN FAN FROM DEVELOPING OVER -3" (75mm) OF NEGATIVE STATIC PRESSURE (FIELD ADJUSTABLE) IF STATIC PRESSURE AT PSL DOES EXCEED -3" (75mm) THE RETURN AIR FAN SHALL STOP. PSL SHALL BE HARDWIRED TO THE RETURN FAN AND UNIT SHALL BE SHUTDOWN IN HAND, AUTO OR BYPASS MODE. PSL WILL REQUIRE MANUAL RESET.

4. HUMIDITY CONTROL

WHEN THE DIGITAL CONTROL PANEL IS NOT CALLING FOR HUMIDITY, SENSED BY RETURN AIR HUMIDITY MT-1, 2-WAY "ON-OFF" CONTROL VALVE V-3 SHALL REMAIN CLOSED. WHEN THE DIGITAL CONTROL PANEL IS CALLING FOR HUMIDITY, V-3 SHALL REMAIN OPEN.

RETURN AIR HUMIDITY SHALL BE MAINTAINED AT SETPOINT OF 42° F [5.6° C] DEW POINT (ADJ.) VIA DIGITAL CONTROL PANEL BY MODULATING CONTROL VALVE V-4 TO MAINTAIN THE DESIRED HUMIDITY. THE DRYBULB TRANSMITTER T-4 AND HUMIDITY TRANSMITTER H-1 IN RETURN AIR SHALL BE USED TO CALCULATE RETURN AIR DEW POINT TEMPERATURE. V-3 SHALL BE CLOSED WHENEVER THE RETURN AIR DEWPOINT IS > 45° F [7° C]. DCP SHALL CLOSE VALVE V-3 WHENEVER THE SUPPLY FAN IS OFF. VALVE V-4 SHALL BE INTERLOCKED WITH A TEMPERATURE SWITCH TO KEEP THE HUMIDIFIER OFF UNTIL CONDENSATE TEMPERATURE APPROACHES STEAM TEMPERATURE.

5. FREEZE PROTECTION

IF THE AIR TEMPERATURE AS SENSED BY TT-3 FALLS BELOW 45° F [7° C], AN ALARM SIGNAL SHALL INDICATE AT THE DCP AND ECC. IF THIS TEMPERATURE FALLS BELOW 40° F [4.4° C] AS SENSED BY THE TSL THE SUPPLY AND RETURN FANS SHALL SHUT DOWN AND A CRITICAL ALARM SHALL INDICATE AT THE DIGITAL CONTROL PANEL AND ECC. TSL SHALL BE HARDWIRED TO THE SUPPLY FAN AND RETURN FAN AND BOTH SHALL BE SHUTDOWN IN HAND, AUTO OR BYPASS MODE. TSL WILL REQUIRE MANUAL RESET AT THE DEVICE.

6. LOSS OF COOLING PROTECTION

IF THE AIR TEMPERATURE AS SENSED BY TT-1 RAISES ABOVE 65° F [18° C], AN ALARM SIGNAL SHALL INDICATE AT THE DCP AND ECC. IF THIS TEMPERATURE RAISES ABOVE 70° F [21° C], AS SENSED BY TT-1 THE SUPPLY AND RETURN FANS SHALL SHUT DOWN AND A CRITICAL ALARM SHALL INDICATE AT THE DIGITAL CONTROL PANEL AND ECC.

7. AUTOMATIC SMOKE SHUTDOWN/RESTART

WHEN SMOKE IS DETECTED BY DUCT SMOKE DETECTOR, SD, THE SUPPLY AND RETURN FANS SHALL SHUT "OFF" AND AN ALARM SIGNAL SHALL BE TRANSMITTED TO THE FIRE ALARM SYSTEM. ALL SMOKE DAMPERS IN THE SUPPLY AND RETURN DUCTS SHALL CLOSE.

EXHAUST FANS SERVING AREA OF THE SUPPLY FAN SHALL CONTINUE TO RUN. SUPPLY AND RETURN FANS SHALL RESTART AND SMOKE DAMPERS SHALL OPEN WHEN FIRE ALARM CIRCUIT IS RESET.

8. EMERGENCY CONSTANT SPEED OPERATION

UPON FAILURE OF THE VSMC, THE SUPPLY AND RETURN FANS SHALL BE STARTED/STOPPED MANUALLY AT THE DIGITAL CONTROL PANEL OR THE ECC THROUGH THE BY-PASS STARTER. FANS SHALL THEN BE OPERATED AT CONSTANT SPEED.

SEQUENCE OF OPERATION FOR PACU AHU (VAV)

1. GENERAL

UNIT IS NORMALLY STARTED AND STOPPED REMOTELY AT THE ECC. H-O-A SWITCH SHALL BE KEPT IN THE "AUTO" POSITION. "HAND" AND "OFF" POSITIONS SHALL BE USED ONLY FOR MAINTENANCE. WHEN THE UNIT IS "OFF" D-1, D-3 SHALL BE FULLY CLOSED. WHEN THE UNIT IS "ON" D-1, SD-1 AND SD-2 SHALL BE FULLY OPEN. D-2 AND D-3 SHALL MODULATE IN ACCORDANCE WITH THE FOLLOWING SEQUENCE:

2. TEMPERATURE CONTROL

SUPPLY AIR TEMPERATURE, SENSED BY TT-1, SHALL BE MAINTAINED AT SETPOINT VIA DIGITAL CONTROL PANEL BY MODULATING V-1 OR D-2 AND D-3 OR V-2 IN SEQUENCE.

WHEN THE TEMPERATURE OF THE OUTSIDE AIR, SENSED BY TT-2, IS ABOVE 75° F [23.8° C], THE DIGITAL CONTROL PANEL SHALL PREVENT THE MODULATION OF D-2 AND D-3 AND SHALL ASSUME THE MINIMUM OUTSIDE AIR POSITION (D-2 FULLY OPENED AND D-3 FULLY CLOSED). THE DIGITAL CONTROL PANEL SHALL MODULATE V-1 TO MAINTAIN THE SUPPLY AIR TEMPERATURE, SENSED BY TT-1.

WHEN THE TEMPERATURE OF THE OUTSIDE AIR, SENSED BY TT-2, IS BETWEEN 65° F [18.3° C] AND THE SUPPLY AIR TEMPERATURE SENSED BY TT-1, DAMPER D-2 SHALL FULLY CLOSE AND D1 AND D3 SHALL BE FULLY OPEN (MAXIMUM OUTSIDE AIR POSITION). THE DIGITAL CONTROL PANEL SHALL MODULATE V-1 TO MAINTAIN THE SUPPLY AIR TEMPERATURE, SENSED BY TT-1.

WHEN THE TEMPERATURE OF THE OUTSIDE AIR, SENSED BY TT-2, IS BELOW THE SUPPLY AIR TEMPERATURE, SENSED BY TT-1, DAMPERS D1, D-2 AND D-3 SHALL MODULATE TO MAINTAIN THE SCHEDULED SUPPLY AIR TEMPERATURE. IF D-2 IS OPEN AND D-3 IS CLOSED TO MINIMUM OUTSIDE AIR, V-2 SHALL MODULATE OPEN TO MAINTAIN THE SUPPLY AIR TEMPERATURE, SENSED BY TT-1.

3. AIR FLOW CONTROL

THE SUPPLY AIR FLOW SHALL BE CONTROLLED BY THE DIGITAL CONTROL PANEL MODULATING THE SUPPLY FAN VARIABLE SPEED MOTOR CONTROLLER TO MAINTAIN 1.0" (25mm) OF DUCT STATIC PRESSURE (FIELD ADJUSTABLE), SENSED BY SPS-1. RESET STATIC PRESSURE BASED ON ACTUAL BUILDING LOAD BY POLLING ALL ATU

THE DIGITAL CONTROL PANEL, USING TOTAL SUPPLY AIR AND RETURN AIR FLOW SIGNALS, SHALL RESET THE RETURN AIR FAN VSMC TO MAINTAIN A CONSTANT AIR FLOW DIFFERENCE BETWEEN THE SUPPLY AIR AND THE RETURN AIR EQUAL TO MINIMUM OUTSIDE AIR PLUS 200 CFM FOR POSITIVE BUILDING PRESSURIZATION.

USING HIGH PRESSURE SENSOR SPS-2 LOCATED AT THE SUPPLY FAN DISCHARGE, SHALL PREVENT THE SUPPLY FAN FROM DEVELOPING OVER 3" (75mm) OF STATIC PRESSURE (FIELD ADJUSTABLE). IF STATIC PRESSURE AT SPS-2 DOES EXCEED 3" (75mm) THE SUPPLY AIR FAN SHALL STOP. SPS-2 SHALL BE HARDWIRED TO THE SUPPLY FAN VSMC AND UNIT SHALL BE SHUTDOWN IN HAND, AUTO OR BYPASS MODE. SPS-2 WILL REQUIRE MANUAL RESET AT THE DEVICE.

4. HUMIDITY CONTROL

WHEN THE DIGITAL CONTROL PANEL IS NOT CALLING FOR HUMIDITY, SENSED BY RETURN AIR HUMIDITY H-1, 2-WAY "ON-OFF" CONTROL VALVE V-3 SHALL REMAIN CLOSED. WHEN THE DIGITAL CONTROL PANEL IS CALLING FOR HUMIDITY, V-3 SHALL REMAIN OPEN.

RETURN AIR HUMIDITY SHALL BE MAINTAINED AT SETPOINT OF 35% RH (ADJ.) VIA DIGITAL CONTROL PANEL BY MODULATING CONTROL VALVE V-4 TO MAINTAIN THE DESIRED HUMIDITY. THE DCP SHALL OVERRIDE THIS CONTROL TO MAINTAIN HUMIDITY OF 30% AS SENSED BY H-2. DCP SHALL CLOSE VALVE V-3 WHENEVER THE SUPPLY FAN IS OFF. VALVE V-4 SHALL BE INTERLOCKED WITH A TEMPERATURE SWITCH TO KEEP THE HUMIDIFIER OFF UNTIL CONDENSATE TEMPERATURE APPROACHES STEAM TEMPERATURE.

5. FREEZE PROTECTION

IF THE AIR TEMPERATURE AS SENSED BY TT-3 FALLS BELOW 45° F [7° C], AN ALARM SIGNAL SHALL INDICATE AT THE DCP AND ECC. IF THIS TEMPERATURE FALLS BELOW 40° F [4.4° C] AS SENSED BY THE TSL THE SUPPLY AND RETURN FANS SHALL SHUT DOWN AND A CRITICAL ALARM SHALL INDICATE AT THE DIGITAL CONTROL PANEL AND ECC. TSL SHALL BE HARDWIRED TO THE SUPPLY FAN UPD AND UNIT SHALL BE SHUTDOWN IN HAND, AUTO OR BYPASS MODE. TSL WILL REQUIRE MANUAL RESET AT THE DEVICE.

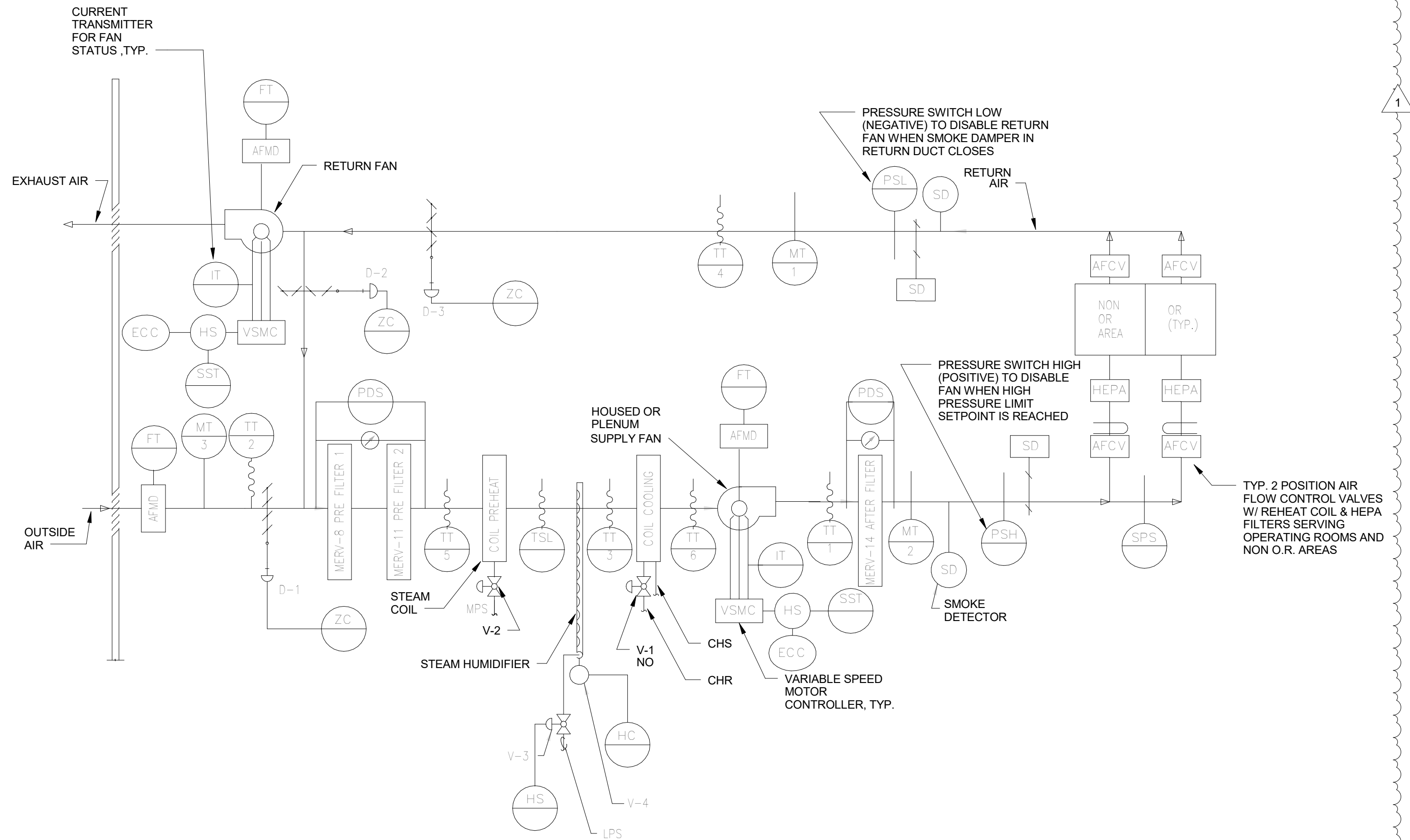
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EXHAUST FANS SERVING AREA OF THE SUPPLY FAN SHALL CONTINUE TO RUN. SUPPLY AND RETURN FANS SHALL RESTART AND SMOKE DAMPERS SHALL OPEN WHEN FIRE ALARM CIRCUIT IS RESET.

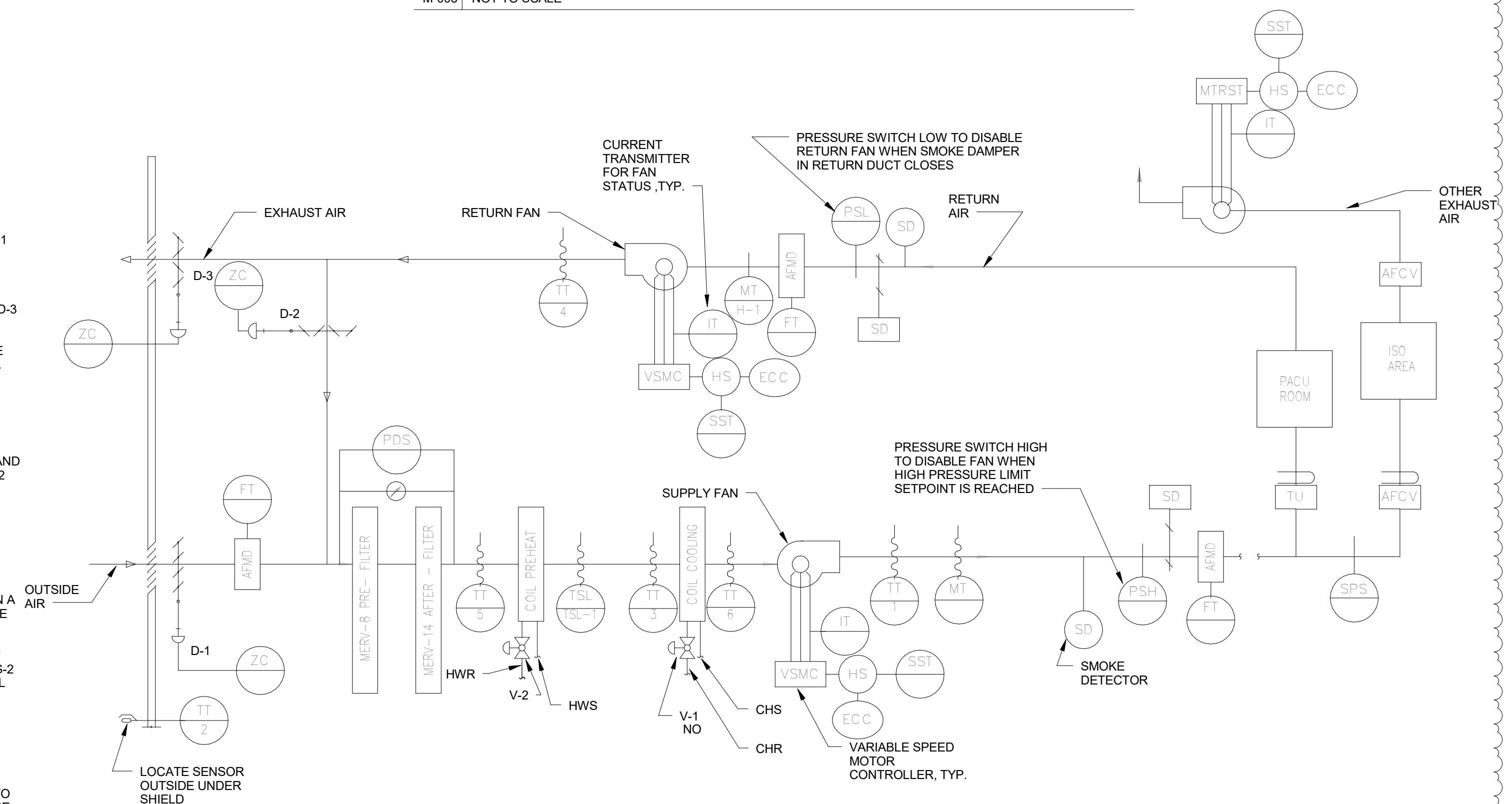
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4 AIR HANDLING UNIT FOR SURGICAL SUITE (VAV)

M-003 NOT TO SCALE



5 AIR HANDLING UNIT FOR PACU (VAV)

M-003 NOT TO SCALE

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Drawing Title
MECHANICAL SCHEMATICS

Project Location
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VA MEDICAL CENTER

Project Title
100% BID SET
RENOVATE OR SUITE

Location
6439 GARNERS FERRY ROAD COLUMBIA, SC

Date
12/21/2017

Checked
SAP

Drawn
SCC

Project Number
544-16-100


Building Number
100

Drawing Number
M-003

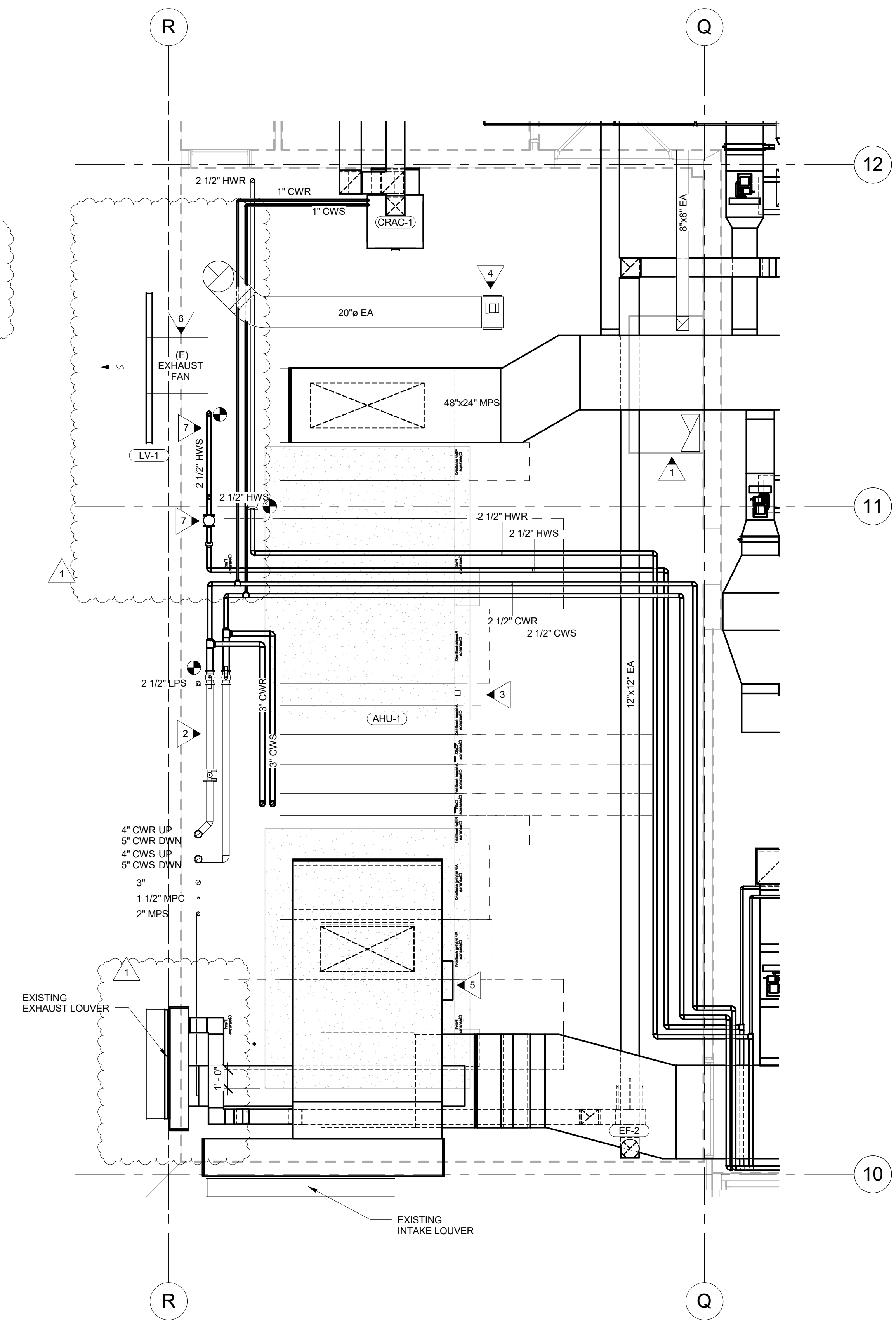
Dwg. of


Office of
Construction
and Facilities
Management

VA U.S. Department
of Veterans Affairs

MD001	6" = 1'-0"
	NORTH

VA FORM 08-6231



MH105	1/4" = 1'-0"
	NORTH

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