

# ROANOKE COUNTY

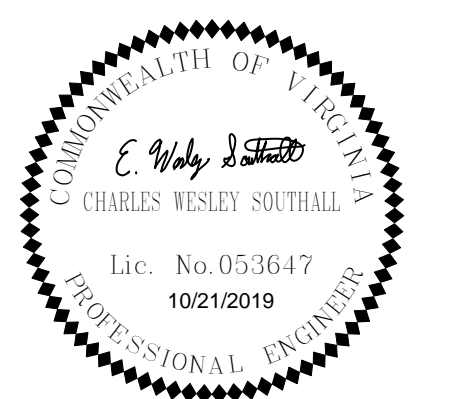
## SOUTH COUNTY LIBRARY MEETING ROOM DEHUMIDIFICATION PROJECT



**Contract Drawings -  
IFC Submission**

10/21/19

118508

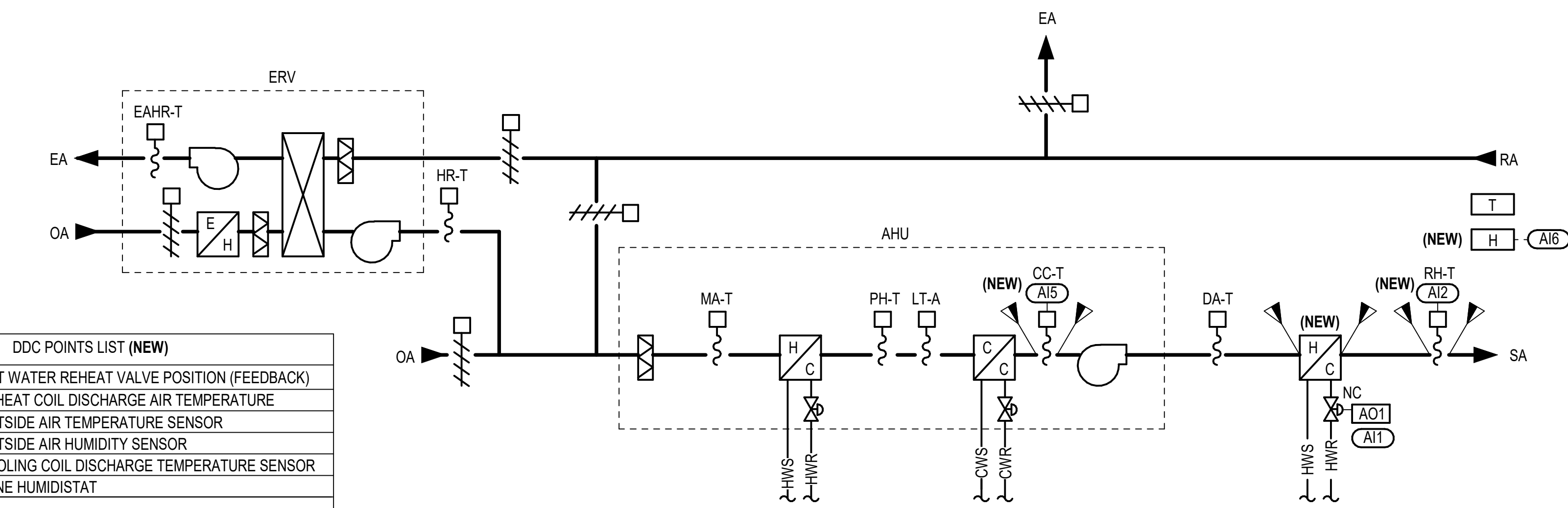


no.	date	by	ckd	description
A	10/11/19	CWS	RMB	DRAFT SUBMISSION
B	10/21/19	CWS	RMB	IFC SUBMISSION



HEATING HOT WATER REHEAT COIL													
MARK	CFM	EAT	LAT	EWT	LWT	CAPACITY (MBh)	GPM	MAX WATER PRESSURE DROP (FT WC)	MAX AIR PRESSURE DROP (FT WC)	COIL SIZE (WxH)	FOULING FACTOR (HR-FT <sup>2</sup> -F/BTU)	ROWS	COIL CONNECTION SIZE (IN)
AHU-1-RH	1220	51.9	75.0	180	160	30.4	3.0	2.0	0.08	20"x18"	0.00025	1	3/4
AHU-2-RH	1360	52.6	75.0	180	160	32.9	3.3	2.0	0.08	20"x18"	0.00025	1	3/4

DDC POINTS LIST (NEW)	
AI1	HOT WATER REHEAT VALVE POSITION (FEEDBACK)
AI2	REHEAT COIL DISCHARGE AIR TEMPERATURE
AI3	OUTSIDE AIR TEMPERATURE SENSOR
AI4	OUTSIDE AIR HUMIDITY SENSOR
AI5	COOLING COIL DISCHARGE TEMPERATURE SENSOR
AI6	ZONE HUMIDISTAT
AO1	HOT WATER REHEAT VALVE POSITION



**AHU-1.2 and ERV-1.2 Sequence of Operations (existing)**

**SUPPLY FAN CONTROL:**  
The constant speed supply fan will be started based on occupancy schedule. When the supply fan status indicates the fan started, the control sequence will be enabled. Upon a loss of airflow, the system will automatically restart.

**ECONOMIZER CONTROL:**  
When the outdoor air is cooler than the economizer setpoint, the economizer will act as the initial stage of cooling, working in sequence with the cooling coil.

**ENERGY RECOVERY VENTILATOR (ERV) CONTROL:**  
The energy recovery ventilator will be enabled to operate when the air-handling unit is in occupied mode. The fresh air intake of the unit will be limited to prevent the mixed air temperature from falling below the low limit setpoint. Upon a loss of ERV fan status, the system will automatically restart.

**ERV HEAT WHEEL FROST PROTECTION:**  
The energy recovery ventilator shall be disabled if the exhaust air heat recovery temperature (EAHR-T) falls below setpoint to prevent frost from collecting on the wheel when the EAHR-T rises above setpoint, plus a differential, the ERV shall be re-started.

**TEMPERATURE CONTROL: (humidity control - NEW)**  
The unit will control to maintain the zone temperature setpoint as sensed by the zone temperature sensor, unless the unit enters dehumidification mode in which case the unit shall control cooling coil valve to maintain zone humidity setpoint as sensed by the zone humidistat and unit shall control reheat coil valve to maintain zone temperature setpoint as sensed by the space temperature sensor.

**OCCUPIED MODE:**  
The occupancy mode will be controlled via a network input. The occupancy model can also be overridden by a temporary occupancy switch on the zone temperature sensor.

**UNOCCUPIED MODE:**  
The unit will cycle to maintain unoccupied zone setpoints during unoccupied periods.

**PREHEAT COIL:**  
The preheat coil will modulate to maintain the temperature setpoint. When the unit is shutdown, the preheat coil will be off. Upon a loss of airflow, the preheat coil will be commanded to a preset position should the outdoor air temperature fall below the low outdoor air temperature setpoint.

**COOLING COIL:**  
The cooling coil will modulate to maintain the temperature setpoint. When the unit is shutdown, the cooling coil will be off. Upon a loss of airflow, the cooling coil will be off.

**DEHUMIDIFICATION MODE: (NEW)**  
When the zone humidistat indicates space humidity is above setpoint, enable dehumidification mode. Economizer Control shall be locked out. The AHU cooling coil control valve will modulate to maintain room humidity at setpoint. The reheat coil control valve will modulate to maintain the space temperature at setpoint.

**UNIT ENABLE:**  
A network unit enable signal will control the mode of the unit.

**ADDITIONAL POINTS MONITORED BY THE EMS:**  
Preheat air temperature (PH-T)  
Discharge air temperature (DA-T)  
Heat Recover Temperature (HR-T)  
Exhaust air Heat Recovery Temperature (EAHR-T)  
Low temperature alarm (LT-A)  
ERV Heat Wheel Status (HRW-S)  
ERV Exhaust Fan Status (EF-S)  
Cooling Coil Discharge Air Temperature (CC-T) (NEW)  
Reheat Coil Discharge Air Temperature (RH-T) (NEW)  
Space Humidistat ZN-H, (user adjustable from 50%-60%) (NEW)

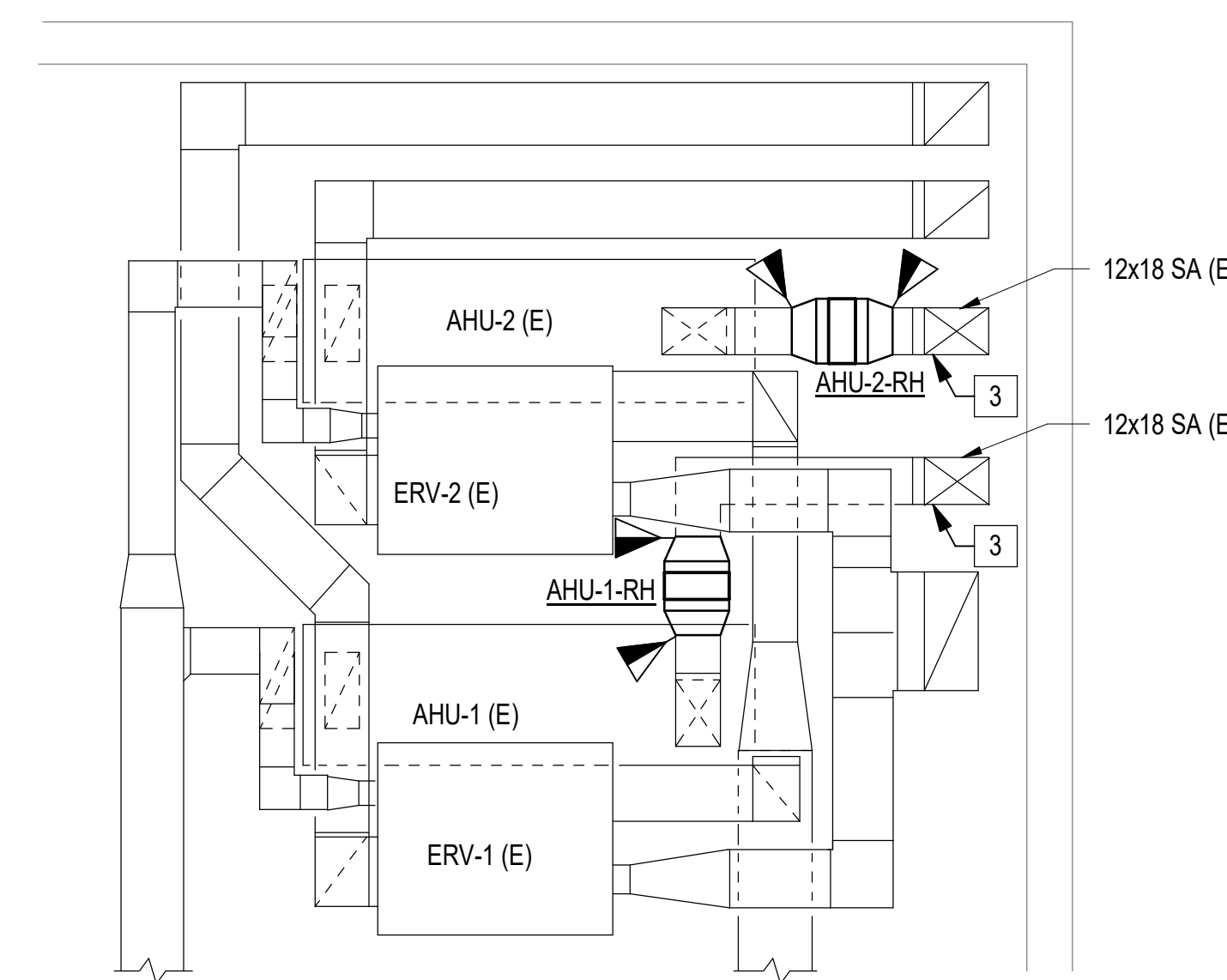
**AHU CONTROLS**

**GENERAL NOTES**

- SEE SHEET M-001 FOR MECHANICAL LEGEND, GENERAL NOTES, AND SPECIFICATIONS.

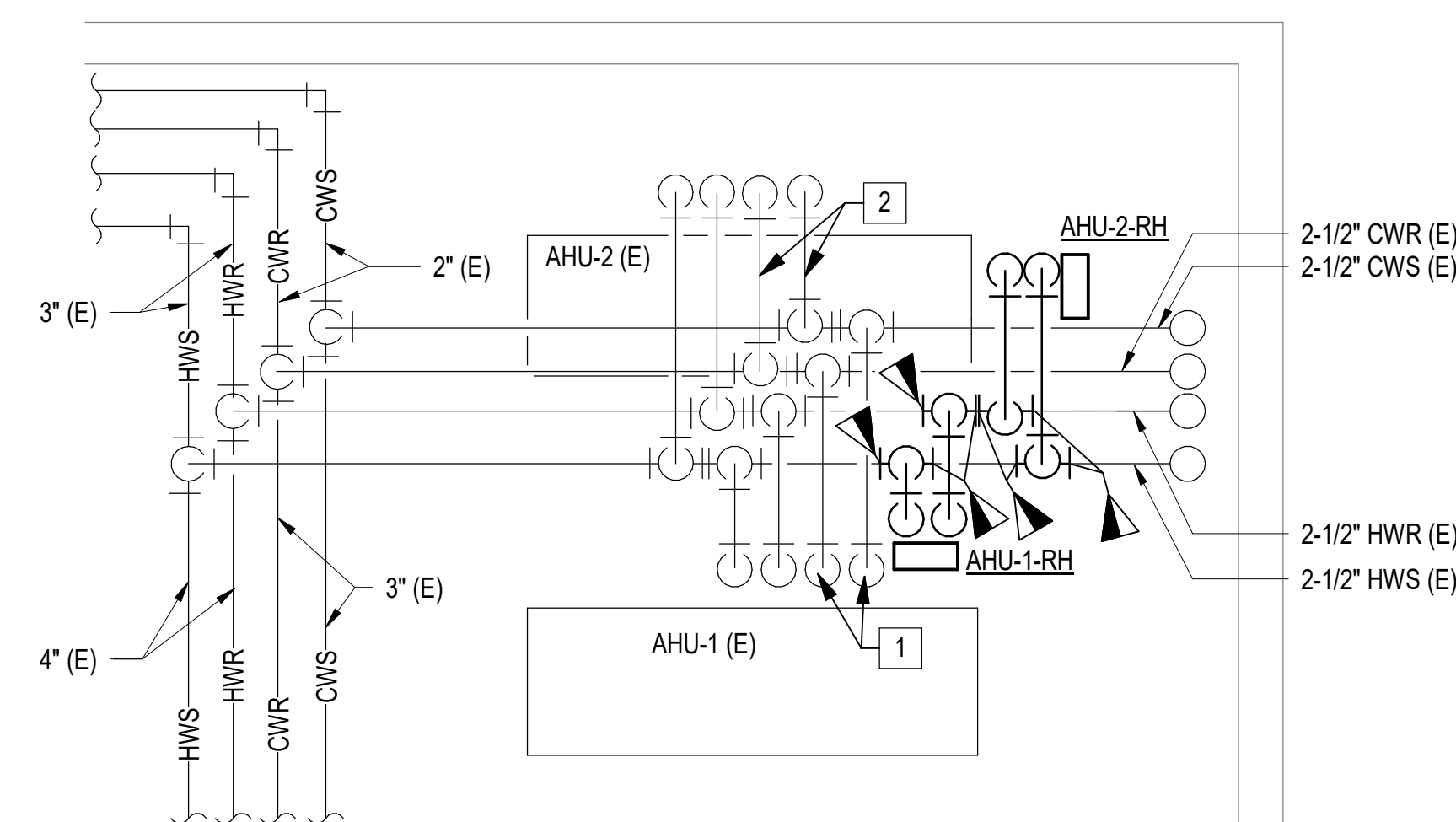
**KEYNOTES #**

- PROVIDE NEW BALANCING VALVE SIZED FOR 13.0 GPM. CONFIRM BALANCE VALVE PRESSURE DIFFERENTIAL AND COOLING COIL TEMPERATURE OF 51.9°F DURING TAB.
- PROVIDE NEW BALANCING VALVE SIZED FOR 14.5 GPM. CONFIRM BALANCE VALVE PRESSURE DIFFERENTIAL AND COOLING COIL TEMPERATURE OF 52.6°F DURING TAB.
- LOCATE DUCT MOUNTED REHEAT COIL DISCHARGE TEMPERATURE SENSOR IN VERTICAL RISE IN SUPPLY AIR DUCT IN MECHANICAL ROOM BEFORE FLOOR PENETRATION.



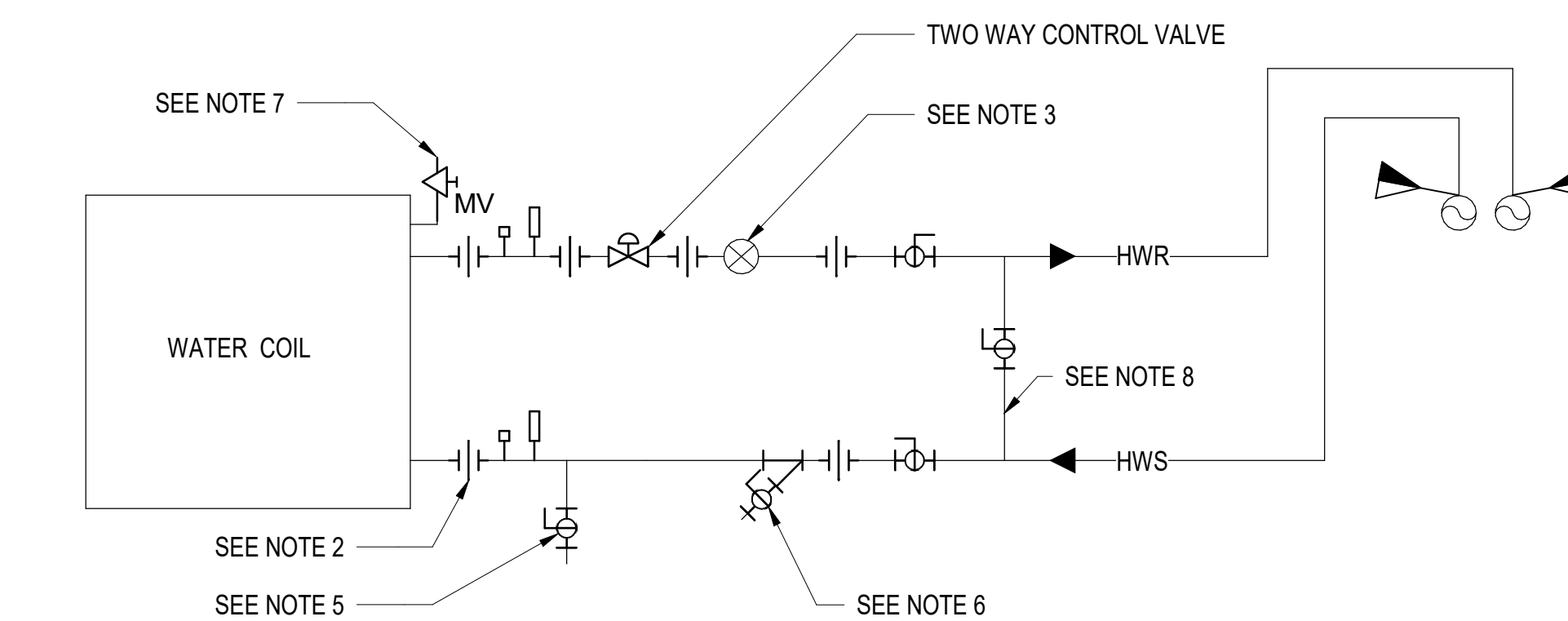
**1 MECHANICAL ROOM DUCTWORK PLAN**

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



**2 MECHANICAL ROOM PIPING PLAN**

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



**NOTES:**

- INDIVIDUAL PIPE SIZES SHALL BE SHOWN ON HEATING HOT WATER REHEAT SCHEDULE.
- LOCATE FLANGES AND UNIONS TO ALLOW FOR REMOVAL OF ALL COILS AND CONTROL VALVES.
- AUTOMATIC FLOW CONTROL BALANCING VALVES SHALL BE INSTALLED IN CONFORMANCE WITH MANUFACTURER'S RECOMMENDED SPACING PROVIDING STRAIGHT LENGTHS OF UNOBSTRUCTED PIPING UPSTREAM AND DOWNSTREAM FROM "PIPE CHANGES IN DIRECTION" AND FROM "OTHER VALVES AND COMPONENTS" IN PIPING.
- ALL COILS SHALL BE PIPED FOR COUNTERFLOW ARRANGEMENT; I.E. HOTTEST WATER ENTERS COIL NEAREST COIL FACE WHERE HOTTEST AIR LEAVES.
- PROVIDE 3/4" BALL OR GATE VALVE WITH 3/4" HOSE CONNECTION FOR DRAINING AND FLUSHING. ALL COIL DRAIN CONNECTIONS SHALL BE INSTALLED THROUGH HVAC UNIT CASING TO PERMIT COMPLETE DRAINAGE OF COILS FROM UNIT EXTERIOR. TYPICAL ALL DRAIN AND FLUSH CONNECTIONS.
- PROVIDE STRAINER WITH 3/4" BALL OR GATE VALVE WITH 3/4" HOSE CONNECTION FOR FLUSHING. TYPICAL ALL STRAINERS.
- VENTS SHALL BE INSTALLED THROUGH HVAC UNIT CASING TO PERMIT COMPLETE VENTING OF COILS FROM UNIT EXTERIOR. TYPICAL ALL VENT CONNECTIONS.
- PROVIDE FULL SIZE BYPASS FOR FLUSHING.
- UTILIZE REDUCERS WHERE NEEDED FOR CONTROL VALVES AND AUTOMATIC BALANCING VALVES THAT ARE SMALLER THAN PIPE SIZE.

**3 WATER COIL, 2-WAY CONTROL VALVE**

SCALE: NOT TO SCALE

no.	date	by	ckd	description
A	10/11/19	CWS	RMB	DRAFT SUBMISSION
B	10/21/19	CWS	RMB	IFC SUBMISSION



110 FRANKLIN ROAD SE SUITE 700  
ROANOKE, VA 24011  
BMCD LICENSE NO

date	detailed
10/07/19	CWS
designed	checked
CWS	RMB

6303 MERRIMAN ROAD  
ROANOKE, VA 24018

**PROJECT NAME**  
MECHANICAL PLANS  
MEETING ROOM DEHUMIDIFICATION

project	contract		
118508	CONTRACT		
drawing	rev.		
<b>M-101</b>	<b>B</b>		
sheet	of	of	sheets
3	3	3	
file			

