

REVISIONS	DATE
ADDENDUM NO. 1	09/18/09

DATE	STATUS
08/28/08	DSA PLAN CHECK
02/22/09	DSA BACK CHECK
09/18/09	BIDDING (RFP #06050)
09/18/09	CONSTRUCTION

FILE NO. 41-C1  
DIV. OF THE STATE ARCHITECT  
01-110074  
AC: PLS: SS  
DATE: \_\_\_\_\_

**BUILDINGS 5 & 6 RENOVATIONS**

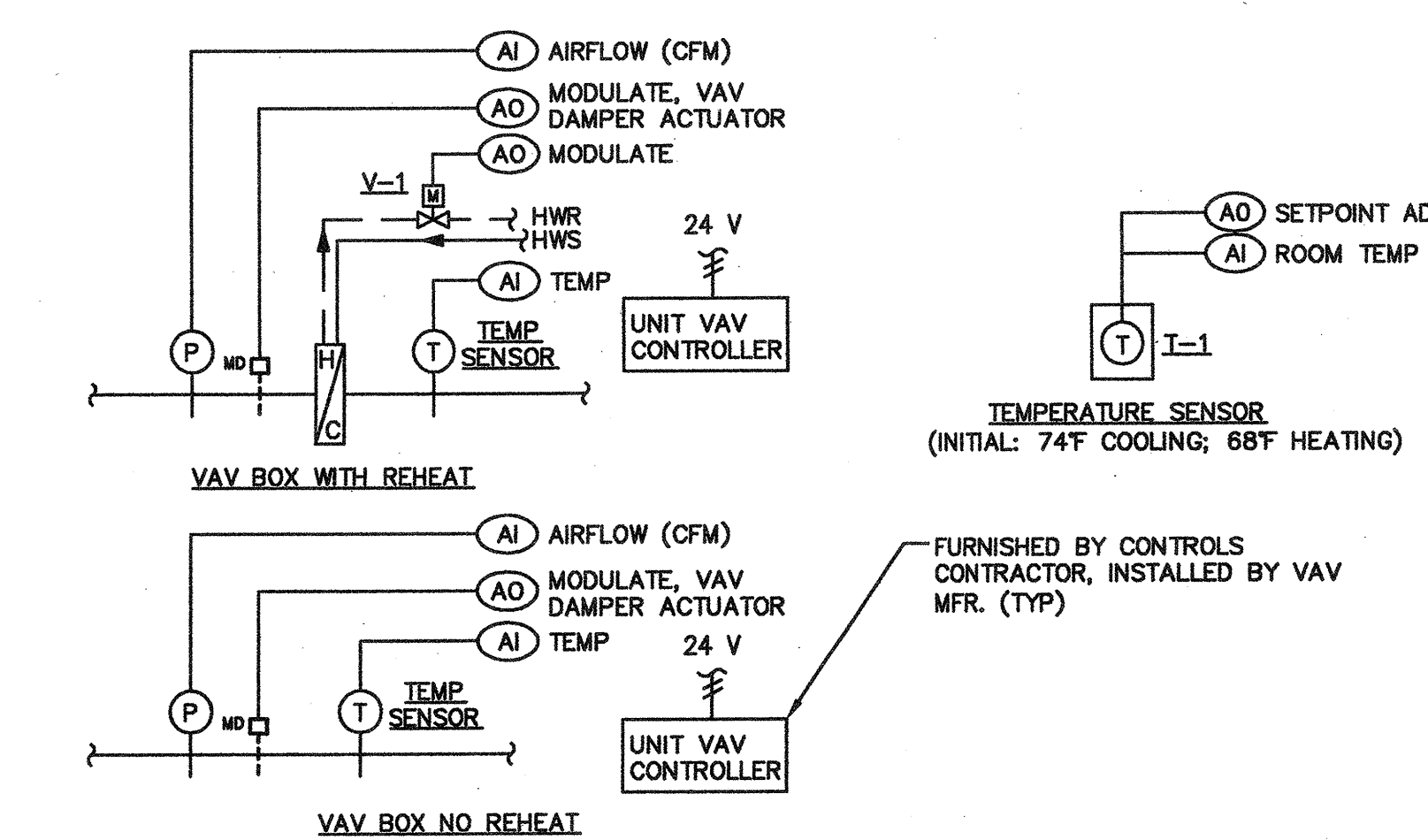
San Mateo County Community College District

**BID ADDENDA**

APPROVED  
DIV. OF THE STATE ARCHITECT  
AC: PLS: SS: JFB  
APPL. NO. 110074 DATE 2/17/10

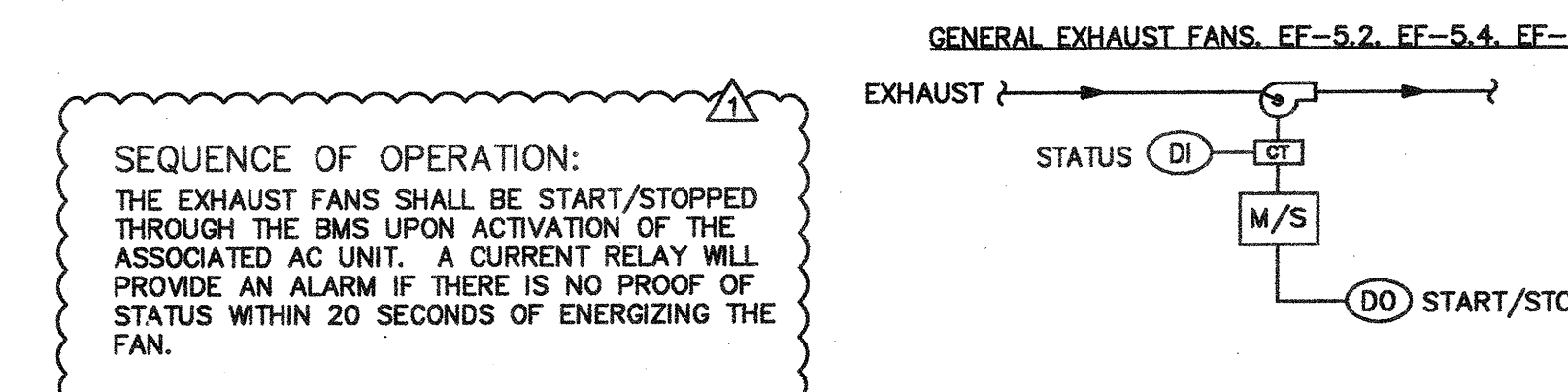
**CAÑADA COLLEGE**  
4200 Farm Hill Boulevard  
Redwood City, CA 94061

MECHANICAL CONTROL DIAGRAMS



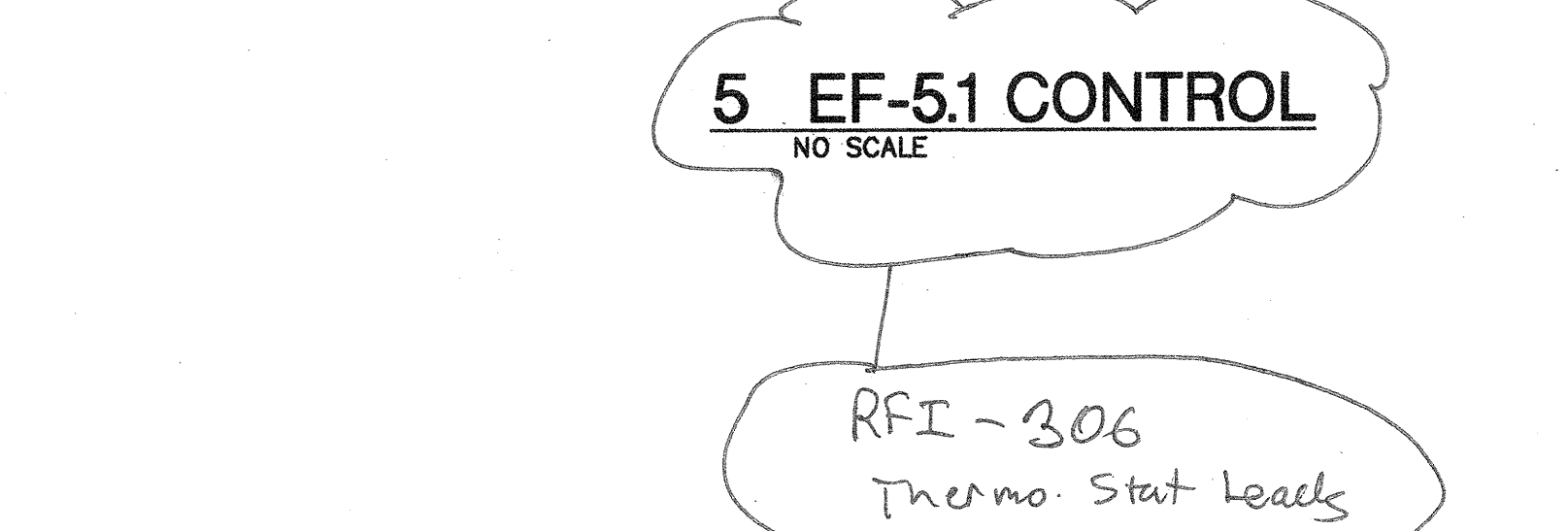
**SEQUENCE OF OPERATION:**  
**OCCUPIED COOLING:**  
THE TERMINAL UNIT CONTROLLER SHALL TAKE AN INPUT FROM THE ROOM TEMPERATURE SENSOR TO MODULATE THE VAV DAMPER ACTUATOR TO MAINTAIN THE SPACE ROOM TEMPERATURE.  
**OCCUPIED HEATING:**  
ONCE THE ZONE TEMPERATURE DROPS BELOW THE HEATING SETPOINT THE TERMINAL UNIT WILL GO INTO THE HEATING MODE. PRIMARY CFM SETPOINT WILL CHANGE TO THE HEATING FLOW INDICATED IN THE VAV TERMINAL UNIT SCHEDULE. THE HEATING HOT WATER VALVE (Y-1) WILL MODULATE TO MAINTAIN SPACE SETPOINT TEMPERATURE (OPERATOR DEFINABLE). A TWO (2) DEGREE ABOVE SETPOINT DEADBAND WILL BE UTILIZED TO MINIMIZE CYCLING (OPERATOR DEFINABLE).  
**UNOCCUPIED MODE:** T-1 SET TO TITLE 24 SET-BACK TEMPERATURE; Y-1 CLOSED.  
**ALARMS:** SEND AN ALARM IF VALVES ARE COMMANDED OPEN/CLOSE BUT DISCHARGE TEMPERATURE DOES NOT INDICATE CHANGE IN TEMPERATURE.

**2 VAV CONTROL**  
NO SCALE

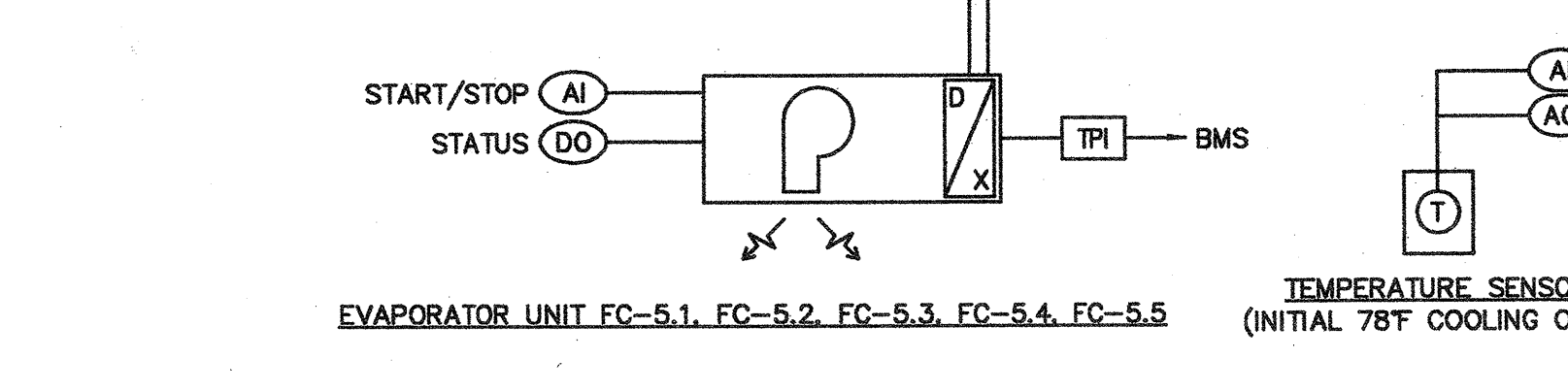


**4 EF-5.2, EF-5.3, EF-5.4, AND EF-5.5 CONTROL**  
NO SCALE

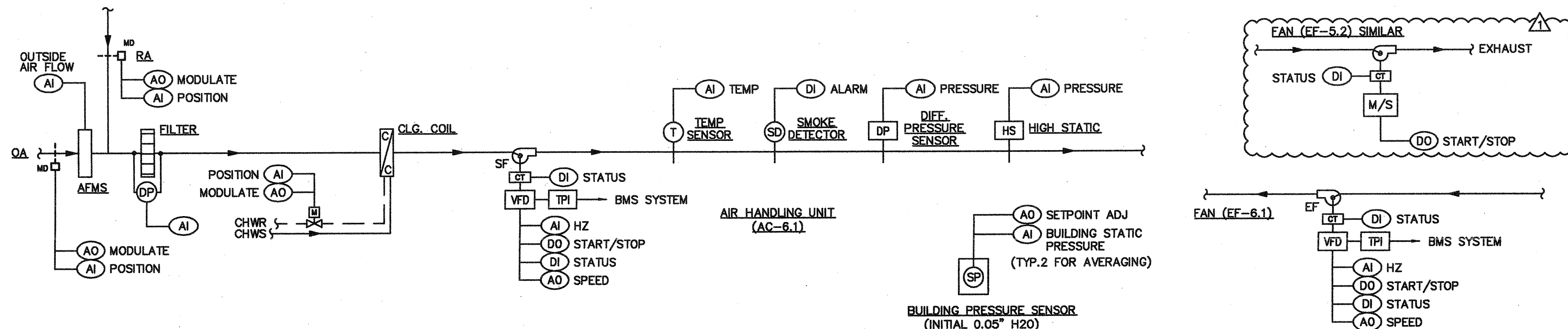
**SEQUENCE OF OPERATION:**  
THE EXHAUST FANS SHALL BE START/STOPPED THROUGH THE BMS UPON ACTIVATION OF THE ASSOCIATED AO UNIT. A CURRENT RELAY WILL PROVIDE AN ALARM IF THERE IS NO PROOF OF STATUS WITHIN 20 SECONDS OF ENERGIZING THE FAN.  
**UNOCCUPIED OVERRIDE:**  
AREA WARM-UP OR COOL-DOWN ONE HOUR PRIOR TO OCCUPANCY.  
DURING WARM-UP, THE EXHAUST FAN SHALL BE OFF. THE OA DAMPER SHALL BE DRIVEN CLOSED POSITION AND THE RA DAMPER SHALL BE DRIVEN OPENED. THIS WILL CONTINUE UNTIL THE SPACE TEMPERATURE IS AT THE ADJUSTABLE SETPOINT. THE SYSTEM AT THIS POINT SHALL RETURN TO NORMAL OPERATION.  
DURING COOL-DOWN, IF OAT < RAT, THE OA DAMPER AND EA FAN SHALL BE FULLY OPENED AND THE RA DAMPER SHALL BE CLOSED. THE SUPPLY FAN AND EXHAUST FAN SHALL BE STARTED. WHEN THE SPACE TEMPERATURE < ADJUSTABLE SETPOINT, THE SYSTEM SHALL RETURN TO NORMAL OPERATION.  
UPON SMOKE INDICATION IN THE SUPPLY AIR DUCT, THE SUPPLY AND EXHAUST FAN SHALL BE STOPPED THROUGH THE DDC CONTROLLERS. SYSTEM WILL OPERATE IN SHUT DOWN MODE.



**SEQUENCE OF OPERATION:**  
THE EXHAUST FANS SHALL BE START/STOPPED THROUGH BY A HOOD SWITCH. A CURRENT RELAY WILL PROVIDE AN ALARM IF THERE IS NO PROOF OF STATUS WITHIN 20 SECONDS OF ENERGIZING THE FAN, OR IF THE SUPPLY FAN FOR IS NOT ENERGIZED.  
**UNOCCUPIED OVERRIDE:**  
AREA WARM-UP OR COOL-DOWN ONE HOUR PRIOR TO OCCUPANCY.  
DURING WARM-UP, THE EXHAUST FAN SHALL BE OFF. THE OA DAMPER SHALL BE DRIVEN CLOSED POSITION AND THE RA DAMPER SHALL BE DRIVEN OPENED. THIS WILL CONTINUE UNTIL THE SPACE TEMPERATURE IS AT THE ADJUSTABLE SETPOINT. THE SYSTEM AT THIS POINT SHALL RETURN TO NORMAL OPERATION.  
DURING COOL-DOWN, IF OAT < RAT, THE OA DAMPER AND EA FAN SHALL BE FULLY OPENED AND THE RA DAMPER SHALL BE CLOSED. THE SUPPLY FAN AND EXHAUST FAN SHALL BE STARTED. WHEN THE SPACE TEMPERATURE < ADJUSTABLE SETPOINT, THE SYSTEM SHALL RETURN TO NORMAL OPERATION.  
UPON SMOKE INDICATION IN THE SUPPLY AIR DUCT, THE SUPPLY AND EXHAUST FAN SHALL BE STOPPED THROUGH THE DDC CONTROLLERS. SYSTEM WILL OPERATE IN SHUT DOWN MODE.

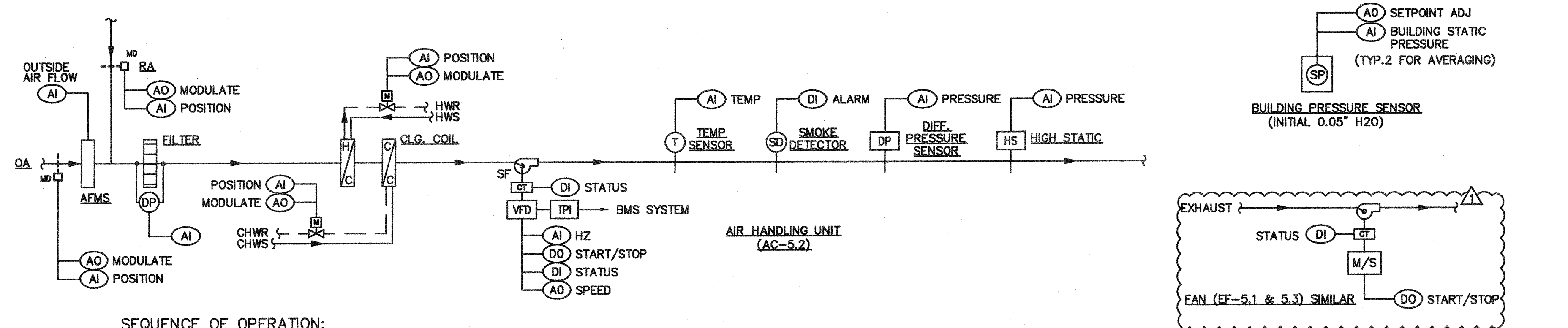


**7 FC AND CU CONTROL**  
NO SCALE



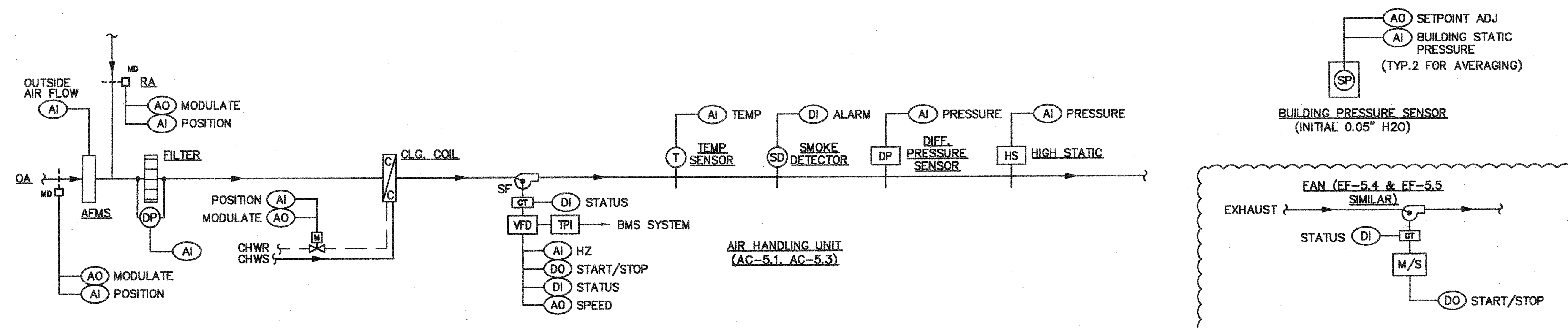
**SEQUENCE OF OPERATION:**  
THE OPERATOR WORKSTATION / NETWORK CONTROLLER, THROUGH A USER PROGRAMMABLE SCHEDULE, SHALL ENABLE THE OPERATION OF AHU & ASSOCIATED EXHAUST FAN.  
WHEN IN OPERATION THE SUPPLY AND EXHAUST FAN SHALL BE START/STOPPED BY THE AHU CONTROLLER. FAN STATUS ON THE SUPPLY AND EXHAUST FAN SHALL BE MONITORED. AN ALARM MESSAGE SHALL BE INDICATED WHEN THE FAN IS NOT CORRECTLY OPERATING AT THE OPERATOR WORKSTATION. A HIGH LIMIT DUCT PRESSURE SWITCH SHALL DISABLE THE VFD'S THROUGH THE AHU CONTROLLER WHEN THE HIGH LIMIT IN THE SUPPLY AIR DUCT IS REACHED. AN ALARM MESSAGE SHALL BE INDICATED AT THE OPERATOR WORKSTATION WHEN THIS OCCURS.  
THE VFD ON THE SUPPLY FAN SHALL BE USED TO MODULATE THE FAN TO MAINTAIN SPACE TEMPERATURE AND ON THE EXHAUST FAN (EF-6.1) TO MAINTAIN SPACE PRESSURE (0.05 IN H2O ADJUSTABLE). EF-5.2 RUNS CONTINUOUSLY DURING AC-6.1 OPERATION.  
FILTER STATUS SHALL BE MONITORED. AN ALARM MESSAGE SHALL BE INDICATED AT THE OPERATOR WORKSTATION WHEN THE ADJUSTABLE ACCEPTABLE PRESSURE DROP HAS BEEN SURPASSED. (0.75 IN H2O)  
THE AIRFLOW MEASURING STATION SHALL ASSURE THAT THE MINIMUM CFM IS PROVIDED BY THE AIRFLOW MEASURING STATION OUTSIDE AIR DAMPER.  
THE DISCHARGE TEMPERATURE SHALL BE MAINTAINED AT AN ADJUSTABLE SETPOINT THROUGH THE MODULATION OF THE RETURN AIR (RA), HOT WATER VALVE, OUTSIDE AIR (OA) DAMPERS, EXHAUST FAN AND CHILLED WATER VALVE IN SEQUENCE.  
THE OUTSIDE, DISCHARGE, RETURN, AND MIXED AIR TEMPERATURES SHALL ALL BE MONITORED THROUGH THE AHU FOR USE IN THE FOLLOWING ENERGY MANAGEMENT SEQUENCES:  
**ECONOMIZER:**  
WHEN THE OUTSIDE AIR TEMPERATURE (OAT) < FREE COOLING ADJUSTABLE SETPOINT:  
THE OUTSIDE(OA), RETURN(RA) DAMPERS, AND EXHAUST FAN SHALL MODULATE TO MAINTAIN THE DESIRED DISCHARGE TEMPERATURE. IF ADDITIONAL COOLING IS REQUIRED, THE COOLING COIL SHALL BE USED TO MAINTAIN THE DESIRED DISCHARGE TEMPERATURE.  
WHEN THE OAT > FREE COOLING ADJUSTABLE SETPOINT, OA, RA DAMPERS, EXHAUST FAN AND COOLING COIL SHALL MODULATE IN SEQUENCE TO MAINTAIN THE DESIRED DISCHARGE TEMPERATURE.  
**UNOCCUPIED OVERRIDE:**  
AREA WARM-UP OR COOL-DOWN ONE HOUR PRIOR TO OCCUPANCY.  
DURING WARM-UP, THE EXHAUST FAN SHALL BE OFF. THE OA DAMPER SHALL BE DRIVEN CLOSED POSITION AND THE RA DAMPER SHALL BE DRIVEN OPENED. THIS WILL CONTINUE UNTIL THE SPACE TEMPERATURE IS AT THE ADJUSTABLE SETPOINT. THE SYSTEM AT THIS POINT SHALL RETURN TO NORMAL OPERATION.  
DURING COOL-DOWN, IF OAT < RAT, THE OA DAMPER AND EA FAN SHALL BE FULLY OPENED AND THE RA DAMPER SHALL BE CLOSED. THE SUPPLY FAN AND EXHAUST FAN SHALL BE STARTED. WHEN THE SPACE TEMPERATURE < ADJUSTABLE SETPOINT, THE SYSTEM SHALL RETURN TO NORMAL OPERATION.  
UPON SMOKE INDICATION IN THE SUPPLY AIR DUCT, THE SUPPLY AND EXHAUST FAN SHALL BE STOPPED THROUGH THE DDC CONTROLLERS. SYSTEM WILL OPERATE IN SHUT DOWN MODE.

**1 AC-6.1 WITH EF-6.1 AND EF-5.2 CONTROL**  
NO SCALE



**SEQUENCE OF OPERATION:**  
THE OPERATOR WORKSTATION / NETWORK CONTROLLER, THROUGH A USER PROGRAMMABLE SCHEDULE, SHALL ENABLE THE OPERATION OF AHU & ASSOCIATED EXHAUST FAN.  
FAN STATUS ON THE SUPPLY AND EXHAUST FAN SHALL BE MONITORED. AN ALARM MESSAGE SHALL BE INDICATED WHEN THE FAN IS NOT CORRECTLY OPERATING AT THE OPERATOR WORKSTATION. A HIGH LIMIT DUCT PRESSURE SWITCH SHALL DISABLE THE VFD'S THROUGH THE AHU CONTROLLER WHEN THE HIGH LIMIT IN THE SUPPLY AIR DUCT IS REACHED. AN ALARM MESSAGE SHALL BE INDICATED AT THE OPERATOR WORKSTATION WHEN THIS OCCURS.  
THE VFD ON THE SUPPLY FAN SHALL BE USED TO MODULATE THE FAN TO MAINTAIN SPACE TEMPERATURE AND PROVIDE THE REQUIRED MAKE-UP AIR TO THE KITCHEN. IF EF-5.1 OR EF-5.3 IS COMMANDED ON, THEN AC-5.2 SUPPLY FAN MUST SUPPLY A MINIMUM VALUE OF EXHAUSTED AIR.  
FILTER STATUS SHALL BE MONITORED. AN ALARM MESSAGE SHALL BE INDICATED AT THE OPERATOR WORKSTATION WHEN THE ADJUSTABLE ACCEPTABLE PRESSURE DROP HAS BEEN SURPASSED. (0.75 IN H2O)  
THE DISCHARGE TEMPERATURE SHALL BE MAINTAINED AT AN ADJUSTABLE SETPOINT THROUGH THE MODULATION OF THE RETURN AIR (RA), HOT WATER VALVE, OUTSIDE AIR (OA) DAMPERS, EXHAUST FAN AND CHILLED WATER VALVE IN SEQUENCE.  
THE OUTSIDE, DISCHARGE, RETURN, AND MIXED AIR TEMPERATURES SHALL ALL BE MONITORED THROUGH THE AHU FOR USE IN THE ENERGY MANAGEMENT.  
**UNOCCUPIED OVERRIDE:**  
AREA WARM-UP OR COOL-DOWN ONE HOUR PRIOR TO OCCUPANCY.  
DURING WARM-UP, THE EXHAUST FAN SHALL BE OFF. THE OA DAMPER SHALL BE DRIVEN CLOSED POSITION AND THE RA DAMPER SHALL BE DRIVEN OPENED. THIS WILL CONTINUE UNTIL THE SPACE TEMPERATURE IS AT THE ADJUSTABLE SETPOINT. THE SYSTEM AT THIS POINT SHALL RETURN TO NORMAL OPERATION.  
DURING COOL-DOWN, IF OAT < RAT, THE OA DAMPER AND EA FAN SHALL BE FULLY OPENED AND THE RA DAMPER SHALL BE CLOSED. THE SUPPLY FAN AND EXHAUST FAN SHALL BE STARTED. WHEN THE SPACE TEMPERATURE < ADJUSTABLE SETPOINT, THE SYSTEM SHALL RETURN TO NORMAL OPERATION.  
UPON SMOKE INDICATION IN THE SUPPLY AIR DUCT, THE SUPPLY AND EXHAUST FAN SHALL BE STOPPED THROUGH THE DDC CONTROLLERS. SYSTEM WILL OPERATE IN SHUT DOWN MODE.

**3 AC-5.2 WITH EF-5.1, AND EF-5.3 CONTROL**  
NO SCALE



**SEQUENCE OF OPERATION:**  
THE OPERATOR WORKSTATION / NETWORK CONTROLLER, THROUGH A USER PROGRAMMABLE SCHEDULE, SHALL ENABLE THE OPERATION OF AHU & ASSOCIATED EXHAUST FAN.  
WHEN IN OPERATION THE SUPPLY FAN SHALL BE START/STOPPED BY THE AHU. FAN STATUS ON THE SUPPLY FAN SHALL BE MONITORED. AN ALARM MESSAGE SHALL BE INDICATED WHEN THE FAN IS NOT CORRECTLY OPERATING AT THE OPERATOR WORKSTATION. A HIGH LIMIT DUCT PRESSURE SWITCH SHALL DISABLE THE VFD'S THROUGH THE AHU CONTROLLER WHEN THE HIGH LIMIT IN THE SUPPLY AIR DUCT IS REACHED. AN ALARM MESSAGE SHALL BE INDICATED AT THE OPERATOR WORKSTATION WHEN THIS OCCURS. THE ASSOCIATED EXHAUST FAN SHALL BE COMMANDED ON UPON AHU OPERATION.  
THE VFD ON THE SUPPLY FAN SHALL BE USED TO MODULATE THE FAN TO MAINTAIN SPACE TEMPERATURE AND TO MAINTAIN SPACE PRESSURE (0.05 IN H2O)  
FILTER STATUS SHALL BE MONITORED. AN ALARM MESSAGE SHALL BE INDICATED AT THE OPERATOR WORKSTATION WHEN THE ADJUSTABLE ACCEPTABLE PRESSURE DROP HAS BEEN SURPASSED. (0.75 IN H2O)  
THE AIRFLOW MEASURING STATION SHALL ASSURE THAT THE MINIMUM CFM IS PROVIDED BY THE AIRFLOW MEASURING STATION OUTSIDE AIR DAMPER.  
THE DISCHARGE TEMPERATURE SHALL BE MAINTAINED AT AN ADJUSTABLE SETPOINT THROUGH THE MODULATION OF THE RETURN AIR (RA), HOT WATER VALVE, OUTSIDE AIR (OA) DAMPERS, EXHAUST FAN AND CHILLED WATER VALVE IN SEQUENCE.  
THE OUTSIDE, DISCHARGE, RETURN, AND MIXED AIR TEMPERATURES SHALL ALL BE MONITORED THROUGH THE AHU FOR USE IN THE FOLLOWING ENERGY MANAGEMENT SEQUENCES:  
**UNOCCUPIED OVERRIDE:**  
AREA WARM-UP OR COOL-DOWN ONE HOUR PRIOR TO OCCUPANCY.  
DURING WARM-UP, THE EXHAUST FAN SHALL BE OFF. THE OA DAMPER SHALL BE DRIVEN CLOSED POSITION AND THE RA DAMPER SHALL BE DRIVEN OPENED. THIS WILL CONTINUE UNTIL THE SPACE TEMPERATURE IS AT THE ADJUSTABLE SETPOINT. THE SYSTEM AT THIS POINT SHALL RETURN TO NORMAL OPERATION.  
DURING COOL-DOWN, IF OAT < RAT, THE OA DAMPER AND EA FAN SHALL BE FULLY OPENED AND THE RA DAMPER SHALL BE CLOSED. THE SUPPLY FAN AND EXHAUST FAN SHALL BE STARTED. WHEN THE SPACE TEMPERATURE < ADJUSTABLE SETPOINT, THE SYSTEM SHALL RETURN TO NORMAL OPERATION.  
UPON SMOKE INDICATION IN THE SUPPLY AIR DUCT, THE SUPPLY AND EXHAUST FAN SHALL BE STOPPED THROUGH THE DDC CONTROLLERS. SYSTEM WILL OPERATE IN SHUT DOWN MODE.

**6 AC-5.1 WITH EF-5.4 AND AC-5.3 WITH EF-5.5 CONTROL**  
NO SCALE