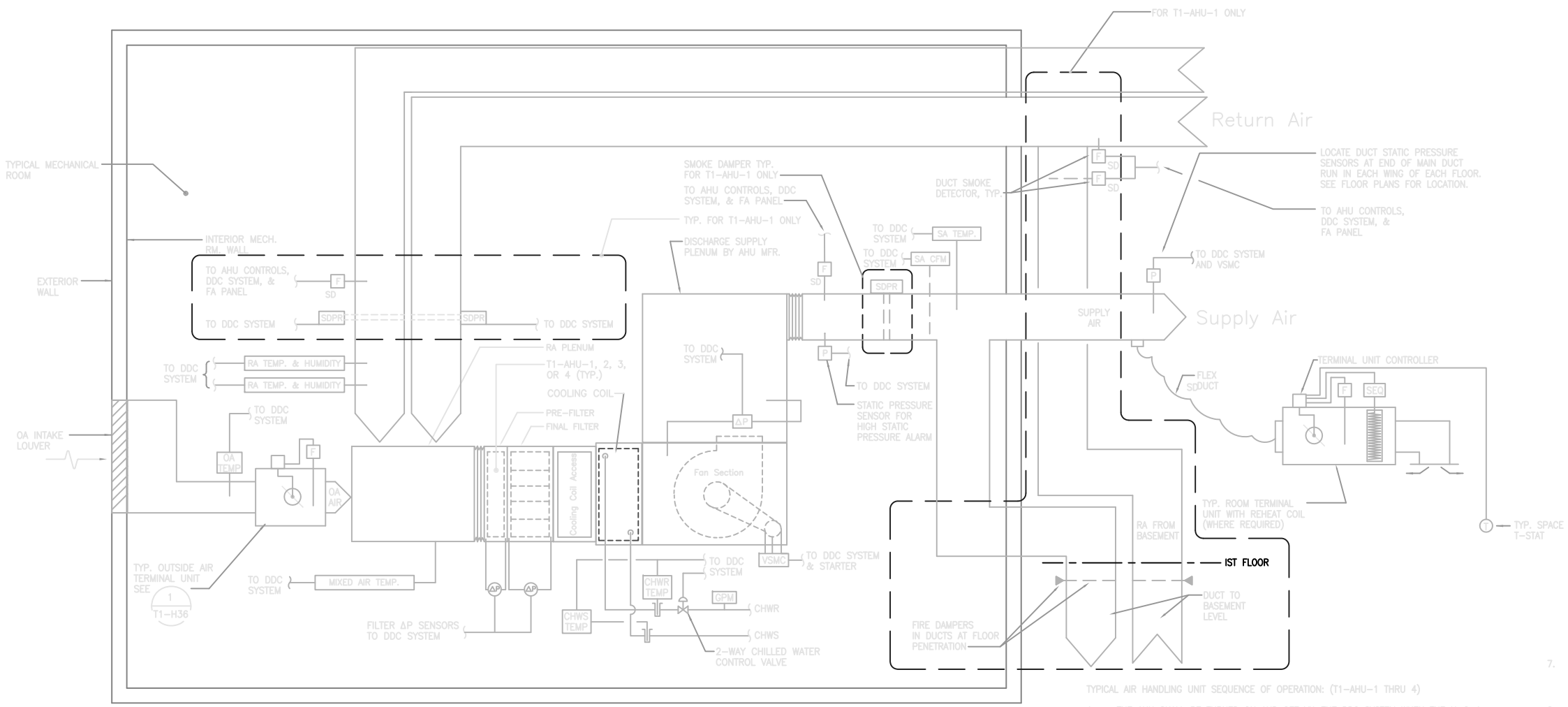
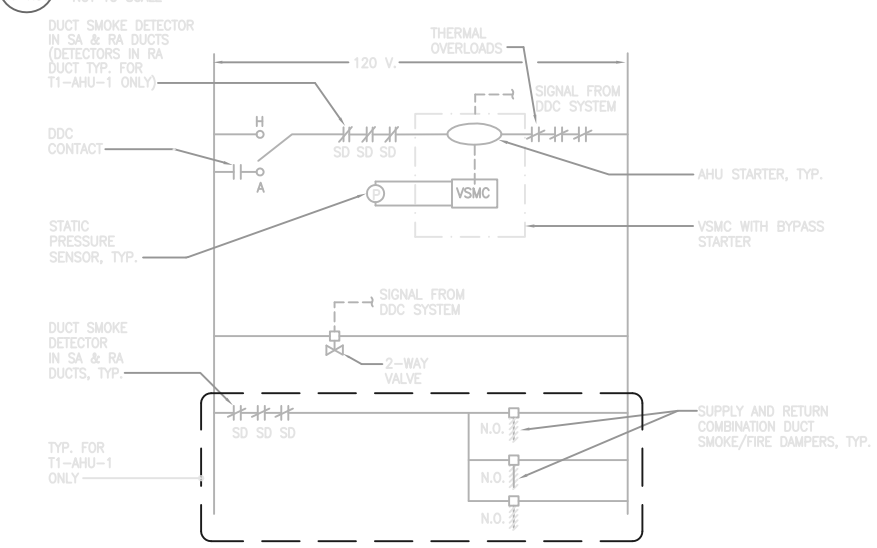


1 TYPICAL AIR HANDLING UNIT SCHEMATIC DIAGRAM (T1-AHU-1 THRU 4)

T1-H35 NOT TO SCALE



2 TYPICAL AIR HANDLING UNIT CONTROL DIAGRAM (T1-AHU-1 THRU 4)

T1-H35 NOT TO SCALE

TYPICAL AIR HANDLING UNIT SEQUENCE OF OPERATION: (T1-AHU-1 THRU 4)

1. THE AHU SHALL BE TURNED ON AND OFF VIA THE DDC SYSTEM WHEN THE H-O-A SWITCH IS PLACED IN THE "AUTO" MODE. THE UNIT SHALL ALSO BE OPERATED MANUALLY WHEN THE H-O-A SWITCH IS PLACED IN THE "HAND" MODE. ALL AIR HANDLERS AND THE ROOFTOP EXHAUST FANS SHALL OPERATE ON THE SAME TIME SCHEDULE PROGRAMMED INTO THE DDC SYSTEM AND SHALL ALL BE OPERATIONAL AT THE SAME TIME.

2. T1-AHU-1 THRU 4, AND T1-EF-1 THRU 11, & T1-EF-13 SHALL OPERATE ON A TIME SCHEDULE FROM 6:00 A.M. TO 6:00 P.M. ON WEEKDAYS.

3. AT START-UP FOR EACH AHU, THE DDC SYSTEM SHALL OPEN THE CHILLED WATER FLOW CONTROL VALVE TO ALLOW FLOW THROUGH THE AHU COOLING COIL. THE VSMC SHALL BE PROGRAMMED TO SOFT START THE AHU MOTOR AT START-UP TO PREVENT OVER-PRESSURIZATION OF THE DUCTWORK.

4. THE CHILLED WATER CONTROL VALVE SHALL MODULATE TO MAINTAIN THE SUPPLY AIR TEMPERATURE AT 55°F.

5. THE AIR DAMPER IN EACH ZONE TERMINAL UNIT SHALL MODULATE TO MAINTAIN THE ZONE SPACE TEMPERATURE AT SETPOINT. THE PRESSURE IN THE SUPPLY DUCT SHALL BE MEASURED BY THE STATIC PRESSURE SENSOR AND THE SIGNAL RELAYED TO THE VARIABLE FREQUENCY DRIVE PANEL. THE PANEL SHALL ADJUST THE FREQUENCY OF THE POWER SUPPLIED TO THE AHU MOTOR TO INCREASE OR DECREASE ITS SPEED TO MAINTAIN THE DUCT STATIC PRESSURE AT 0.75" SP. THE REQUIRED SETPOINT SHALL BE ADJUSTED AFTER RECEIVING INPUT FROM THE BALANCING CONTRACTOR.

6. ON A FALL IN RETURN AIR TEMPERATURE BELOW 75°F, THE SUPPLY AIR TEMPERATURE MAINTAINED BY THE CHILLED WATER CONTROL VALVE SHALL BE RESET BASED ON THE HIGHER SETPOINT DERIVED FROM THE FOLLOWING RETURN AIR TEMPERATURES AND HUMIDITY SETPOINT SCHEDULES:

RETURN AIR TEMPERATURE	SUPPLY AIR SETPOINT
78°F	55°F
76°F ≤ T < 78°F	57°F
74°F ≤ T < 76°F	59°F
70°F ≤ T < 74°F	61°F

HUMIDITY (% RH)	SUPPLY AIR SETPOINT
50%	55°F
45% ≤ RH < 50%	57°F
40% ≤ RH < 45%	59°F
RH ≤ 40%	61°F

7. A HIGH LIMIT STATIC PRESSURE SENSOR SHALL BE INSTALLED ON THE DISCHARGE DUCTWORK. THE HIGH LIMIT STATIC PRESSURE SENSOR SHALL SHUT DOWN THE UNIT & SOUND AN ALARM IF THE SENSOR MEASURES A STATIC PRESSURE OF 3" OR MORE.

8. THE DDC SYSTEM SHALL ALSO MONITOR AND ALARM THE FOLLOWING POINTS FOR EACH AIR HANDLING UNIT:

   A. DUCT SMOKE DETECTOR ALARM
   B. AIR HANDLER FAILURE ALARM
   C. PRE FILTER HIGH DIFFERENTIAL PRESSURE ALARM
   D. AFTER FILTER HIGH DIFFERENTIAL PRESSURE ALARM
   E. SUPPLY AIR TEMPERATURE AND FLOW
   F. RETURN AIR TEMPERATURE, HUMIDITY, AND FLOW. (RA FLOW SHALL BE BASED ON SA-OA=RA)
   G. OUTSIDE AIR TEMPERATURE & FLOW. (OA FLOW SHALL BE ASSUMED TO BE THE DEFAULT VALUE)
   H. MIXED AIR TEMPERATURE
   I. AIR HANDLER ON/OFF STATUS
   J. CHILLED WATER SUPPLY TEMPERATURE
   K. CHILLED WATER RETURN TEMPERATURE
   L. HIGH STATIC PRESSURE
   M. OPERATIONAL STATIC PRESSURE

9. THE OUTSIDE AIR TERMINAL UNIT FOR EACH AIR HANDLER SHALL MODULATE ITS DAMPER POSITION TO MAINTAIN THE DESIGN OUTSIDE AIR FLOW TO THE AIR HANDLER INDEPENDENT OF THE PRESSURE CHANGES IN THE SYSTEM.

10. FOR AHU-4, PROVIDE BYPASS CONTROL VALVE. SEE SHEET H-37 FOR SEQUENCE OF OPERATION.

11. FOR AHU-1, ACTIVATION OF ANY DUCT DETECTOR SHALL AUTOMATICALLY SHUTDOWN THE AIR HANDLER VIA A HARD-WIRED INTERLOCK AND ALL SMOKE DAMPERS SHALL AUTOMATICALLY CLOSE. ACTIVATION OF ANY DUCT DETECTOR SHALL ALSO AUTOMATICALLY ALARM THE FIRE ALARM SYSTEM & ENGINEERING CONTROL CENTER.

12. FOR AHU-1, THE SMOKE DAMPERS SHALL BE PROVEN FULLY OPEN BEFORE THE AHU IS RE-STARTED AFTER SHUTDOWN DUE TO A SMOKE ACTIVATION MODE.

Revisions	Date

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This work was prepared by me or under my supervision and construction of this project will be under my supervision.

Signature

NOTE: Contractor to check and verify all dimensions at job before proceeding with work.

JOEL P. FORD LICENSED PROFESSIONAL ENGINEER No. 5805-S HAWAII, U.S.A.

Drawing Title: TYPICAL AHU CONTROL DIAGRAMS AND SEQUENCE OF OPERATION

Approved: Area Project Manager

Project Title: AMBULATORY CARE CLINIC AND RENOVATE E-WING PHASE II, E-WING RENOVATION

Building Number: T1

Location: VAMROC, HONOLULU, HAWAII

Checked | Drawn

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