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**SCHWEIZER WALDROFF ARCHITECTS**  
 INCORPORATED  
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 ARCHITECTURE  
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 ARCHITECTURE LICENSE NO. AA-0003143  
**PORT ORANGE PRESBYTERIAN CHURCH**  
 PORT ORANGE, FLORIDA  
 1/11/2012  
 HVAC DETAILS/SCHEDULES  
 SHEET NUMBER  
**M2**

**HVAC SEQUENCE OF OPERATION**

**GENERAL:**

THE HVAC EQUIPMENT SHALL BE CONTROLLED BY A DIRECT DIGITAL CONTROL (DDC) SYSTEM AND SHALL INCLUDE TIME OF DAY SCHEDULING, TEMPERATURE CONTROL AND SYSTEM MONITORING.

**AIR HANDLING UNIT:**

UPON OCCUPANCY, ESTABLISHED BY TIME OF DAY CONTROL, THE AIR HANDLER FAN SHALL RUN CONTINUOUSLY AND THE OUTDOOR AIR DAMPER SHALL BE FULLY OPEN.

SUPPLY FAN SHALL SHUTDOWN ON HIGH STATIC DUCT PRESSURE (ADJUSTABLE).

IF ONE OR MORE ZONE THERMOSTATS CALL FOR COOLING THE SYSTEM WILL ENTER THE COOLING MODE. VAV BOXES CONTROL THE AMOUNT OF AIR TO EACH ZONE. AS ZONE THERMOSTATS FALL BELOW COOLING SET POINT ITS DAMPER WILL CLOSE. WHEN ALL TERMINALS ARE CLOSED THE SYSTEM LEAVES THE COOLING MODE. WHEN ALL ZONE COOLING AND HEATING DEMANDS ARE SATISFIED, ALL ZONE DAMPERS ARE OPEN TO THE MINIMUM AND THE SUPPLY FAN PROVIDES NEUTRAL AIR. THE CONTROLLER SHALL ENERGIZE THE COMPRESSOR TO MAINTAIN ROOM TEMPERATURE.

THE AIR HANDLER SHALL HAVE A MOTORIZED RETURN AIR DAMPER WHICH SHALL BE CONTROLLED BY AN AIR FLOW SENSOR INSTALLED IN THE OA DUCT. THE RETURN AIR DAMPER SHALL MODULATE TO MAINTAIN A CONSTANT VOLUME (CFM) OF OUTDOOR AIR TO THE AHU.

THE COMPRESSOR SHALL BE STAGED OFF AT OUTDOOR TEMPERATURES BELOW 58° F (ADJUSTABLE). THE OPPOSITE SHALL OCCUR WITH RISING TEMPERATURES.

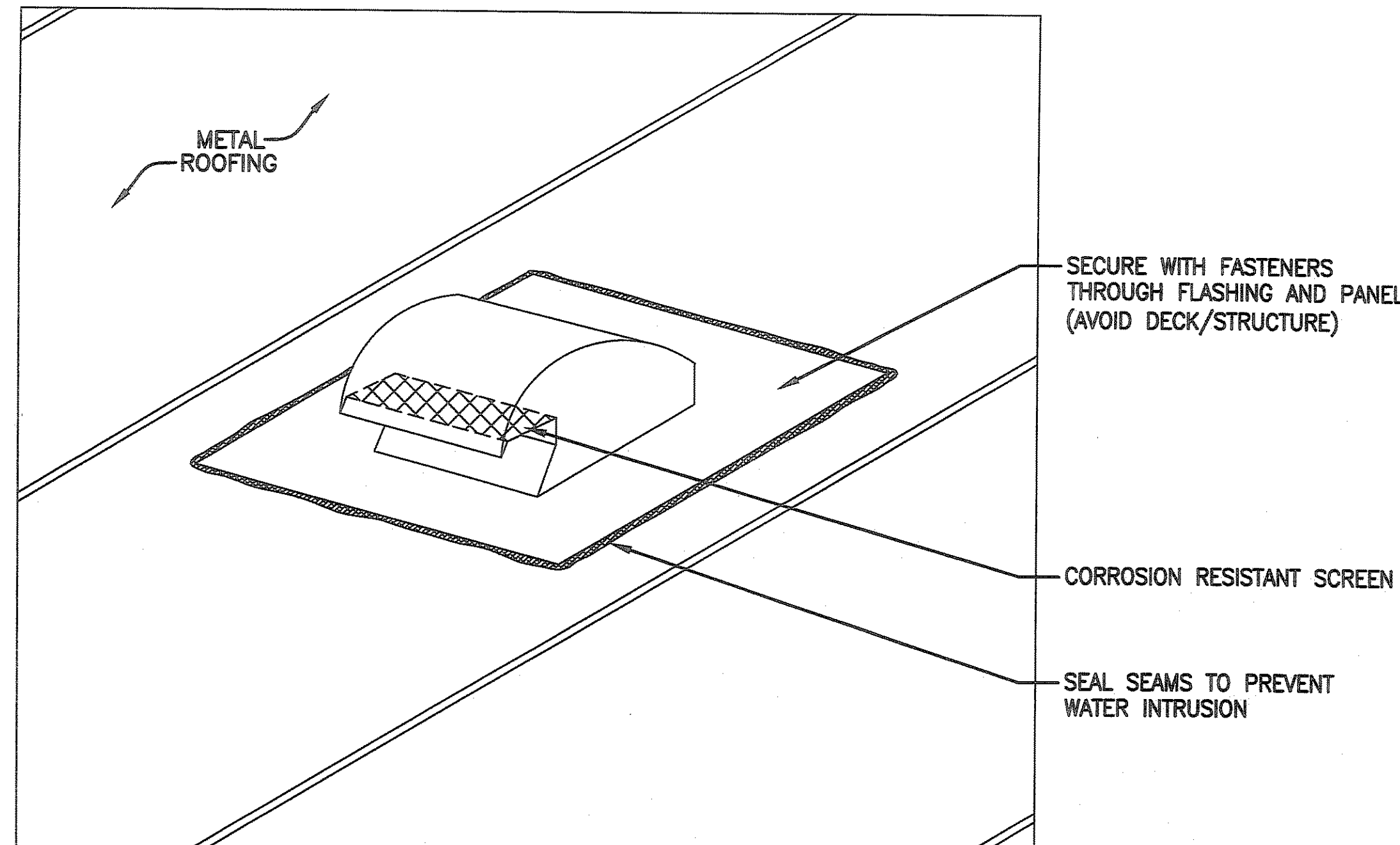
**HEATING:**

THE AIR SIDE SYSTEM SHALL GO INTO HEATING MODE WHEN THE AMBIENT TEMPERATURE IS BELOW 68° F (ADJUSTABLE). IF ONE OR MORE ZONE THERMOSTATS CALL FOR HEATING THE AHU AND HEATING ELEMENTS SHALL ENERGIZE. VAV BOXES CONTROL THE AMOUNT OF AIR TO EACH ZONE. AS ZONE THERMOSTATS RISE ABOVE HEATING SET POINT ITS DAMPER WILL CLOSE. WHEN ALL TERMINALS ARE CLOSED THE SYSTEM DE-ENERGIZES AND LEAVES THE HEATING MODE.

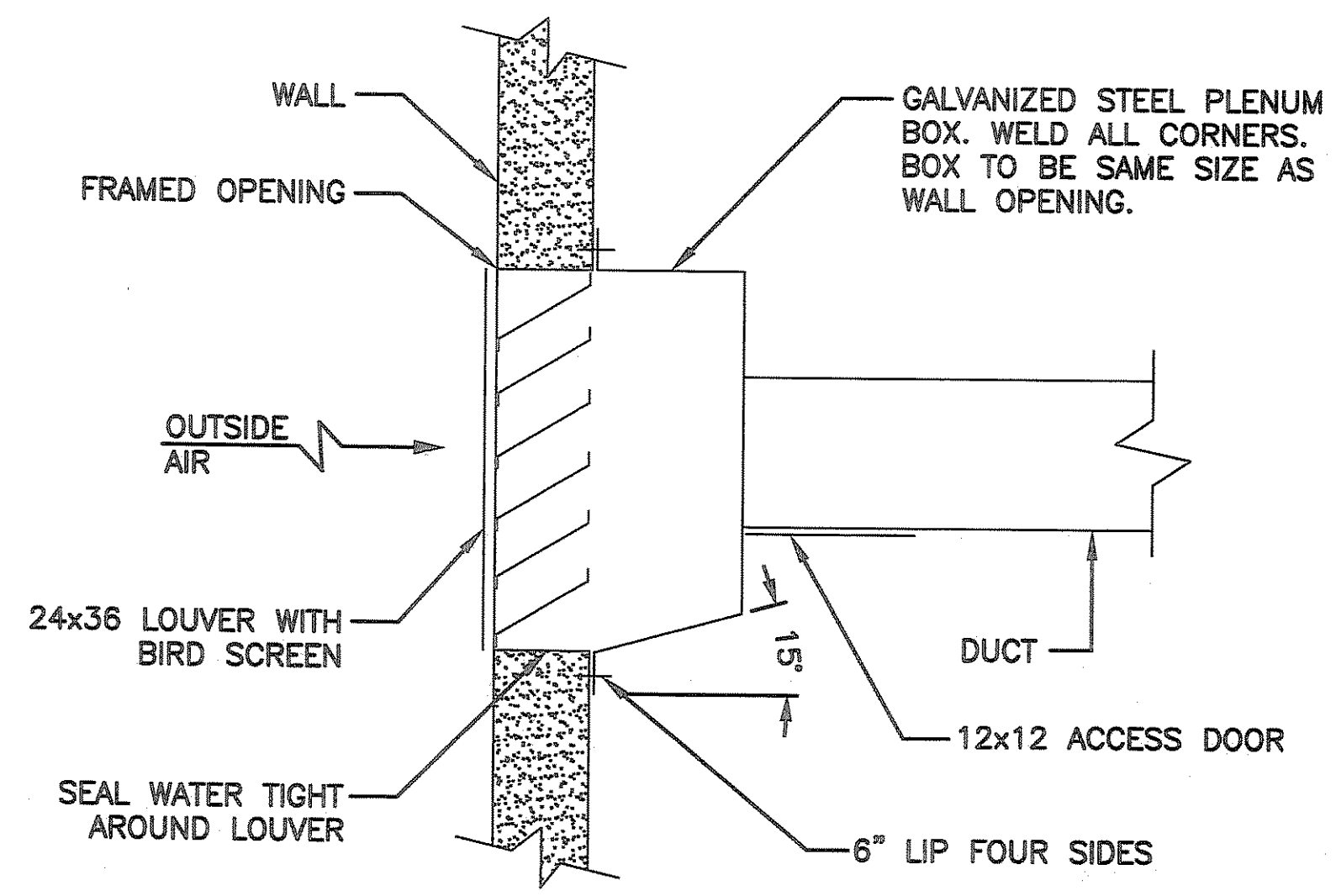
**UNOCCUPIED:**

DURING UNOCCUPIED PERIODS, THE OUTDOOR AIR DAMPER SHALL BE CLOSED. ANY TIME THE OUTDOOR AIR DAMPER IS CLOSED THE CONTROLLER SHALL COMMAND THE AHU RETURN AIR DAMPER TO A FULL OPEN POSITION ON THE AIR HANDLER.

THE CONTROLLER SHALL MONITOR SPACE TEMPERATURE WITHIN THE BUILDING. ON A RISE IN TEMPERATURE ABOVE 80° F (ADJUSTABLE) THE AHU AND COMPRESSOR SHALL BE ENERGIZED TO DROP SPACE TEMPERATURE TO ESTABLISHED SET POINT. THE OUTSIDE AIR DAMPER SHALL REMAIN CLOSED AND THE RETURN AIR DAMPER AND ASSOCIATED VAV SHALL OPEN. NOTE: ALL EXHAUST FANS SHALL BE SCHEDULED OFF, AS WELL AS OUTSIDE AIR DAMPERS.



**EXHAUST FAN VENT DETAIL 1**  
NOT TO SCALE



**LOUVER DETAIL 2**  
NOT TO SCALE

**BUILDING AIR BALANCE SCHEDULE**

ZONE	ROOM NAME	OCCUPANTS	DURATION	SUPPLY AIR CFM	RETURN AIR CFM	EXHAUST AIR CFM	MAXIMUM FRESH AIR CFM	SHORT DURATION OCCUPANCY FRESH AIR CFM
1	MEETING ROOM 1	23	<3 HRS	802	802	0	345	78
1	MEETING ROOM 2	22	<3 HRS	435	435	0	330	74
1	MENS RESTROOM	0	N/A	100	0	100	0	29
2	MEETING ROOM 3	24	<3 HRS	458	458	0	360	82
2	MEETING ROOM 4	20	<3 HRS	478	478	0	300	68
2	WOMENS RESTROOM	0	N/A	100	0	100	0	31
3	CORRIDOR	0	N/A	25	25	0	0	37
3	LOBBY	0	N/A	984	984	0	0	58
3	FLEXIBLE MEETING ROOM	50	<3 HRS	1652	1652	0	750	169
<b>TOTALS</b>	-	139	-	5034	4834	200	2085	626

**NOTE:**  
SHORT DURATION OCCUPANCY OUTSIDE AIR FLOW RATES WHERE CALCULATED BASED ON ASHRAE 62.1 SECTION 6.2.6.

**EXHAUST FAN SCHEDULE**

PLAN MARK	CFM	DESCRIPTION
☒	100	BROAN L100 FLUSH MOUNTED CEILING EXHAUST FAN OR EQUAL

**NOTES:**  
DUCTING TO BE FIELD ROUTED TO ROOF VENT.

**DIFFUSER/GRILL SCHEDULE**

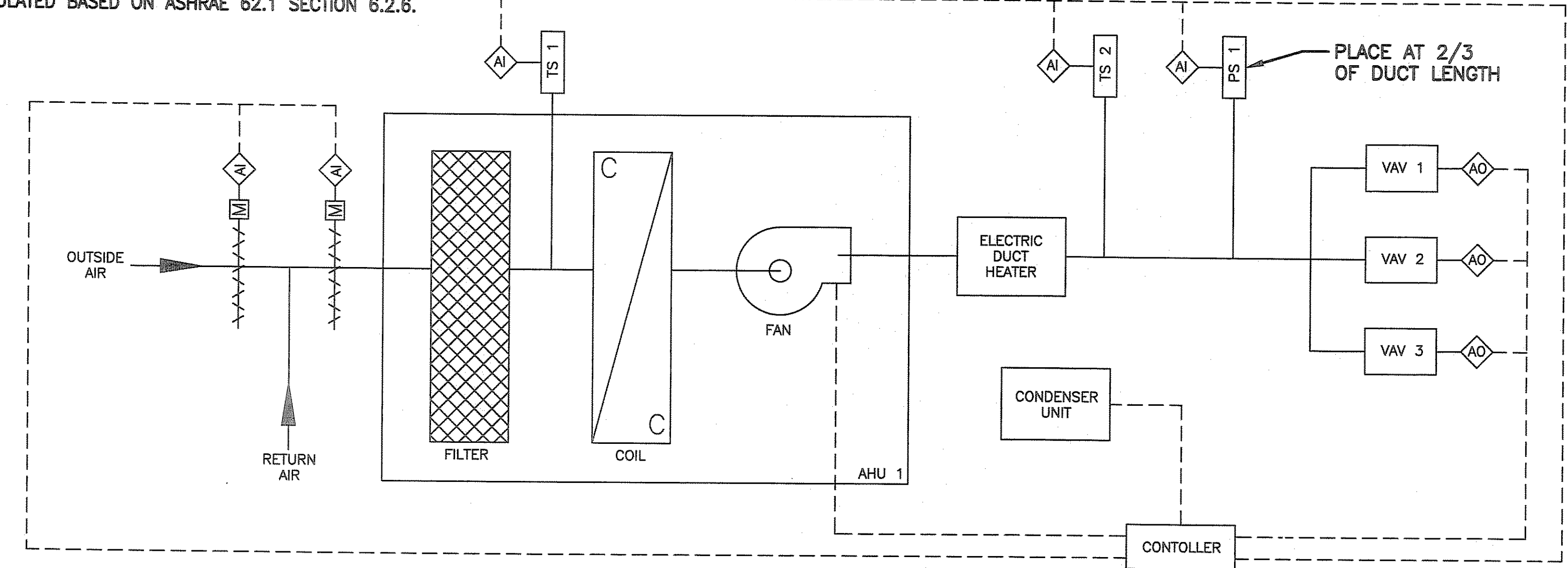
PLAN MARK	DIFFUSER TYPE	MOUNTING	MATERIAL	CFM	NECK SIZE	DESCRIPTION
☒	D-1	LAY-IN	ALUMINUM	250-900	12" Ø	24" X 24", 360° PATTERN SUPPLY AIR DIFFUSER (TITUS TMS-AA OR EQUAL)
☒	D-2	LAY-IN	ALUMINUM	75-100	6" Ø	24" X 24", 360° PATTERN SUPPLY AIR DIFFUSER (TITUS TMS-AA OR EQUAL)
▨	D-3	DUCT	ALUMINUM	250-500	-	10" X 24", LINEAR BAR SUPPLY AIR DIFFUSER (TITUS CT-480 OR EQUAL)
▨	D-4	DUCT	ALUMINUM	100-200	-	10" X 18", LINEAR BAR SUPPLY AIR DIFFUSER (TITUS CT-480 OR EQUAL)
☒	D-5	LAY-IN	ALUMINUM	250-900	12" Ø	24" X 24", PERFORATED CEILING RETURN AIR DIFFUSER (TITUS PAR-AA OR EQUAL)

**NOTES:**  
SPECIFIC DIFFUSERS AND GRILLS CAN BE SELECTED BY USER. FOR THE DESIGN TO OPERATE PROPERLY THE SPECIFIED CFM RANGES SHOULD BE FOLLOWED.

**HVAC UNIT SCHEDULE**

UNIT NUMBER	MODEL	TYPE	AIR FLOW		FAN & MOTOR DATA					COOLING CAPACITY				HEATING CAPACITY MBH/COP	ELECTRICAL			
			TOTAL CFM	OA CFM	EXT SP	DRIVE TYPE	MAX RPM	HP	CONDENSING	EVAPORATING	TOTAL	SEN	STEPS		AMB TEMP	EER	VOLT /PH	UNIT MCA
			ENT	LVG	DB	DB	MBH	MBH	90/80	55.1	110	88	2		90	10.60	58.5/3.66	208/3
AHU1/CU1	CARRIER 39L10/38AKS OR EQUAL	DX SPLIT	5,000	625	0.6	BELT	1137	1.5	90/80	55.1	110	88	2	90	10.60	58.5/3.66	208/3	45/50

**HVAC CONTROL DIAGRAM**



NOT TO SCALE

**LEGEND**

- AI ANALOG INPUT
- AO ANALOG OUTPUT
- AIR FLOW DIRECTION
- TS # TEMPERATURE SENSOR
- PS # PRESSURE SENSOR
- MOTORIZED DAMPER

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