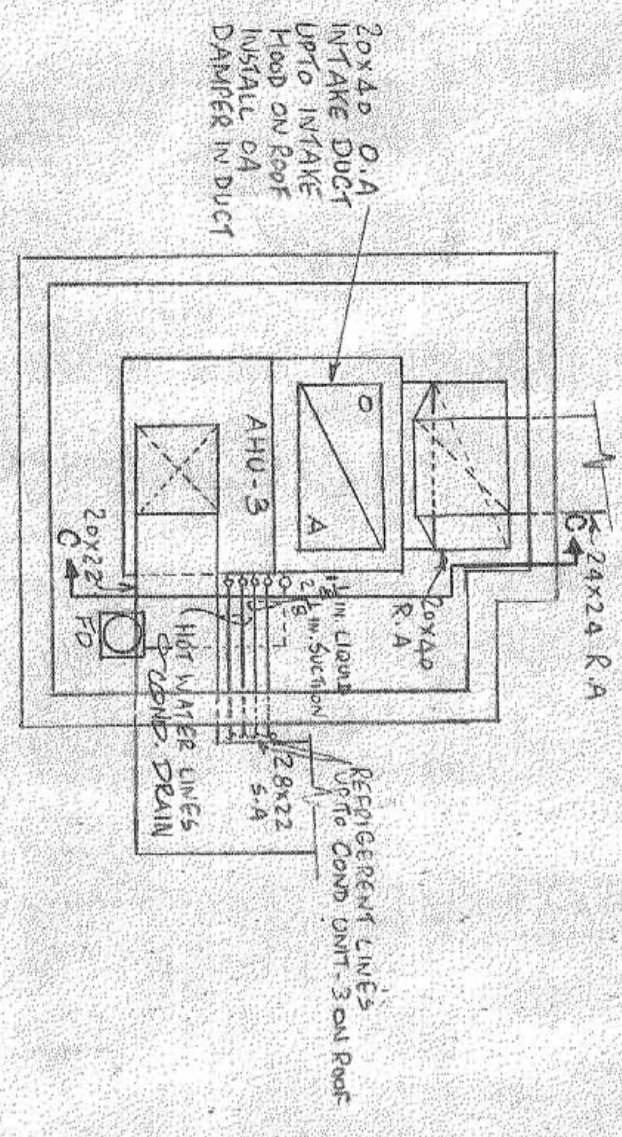
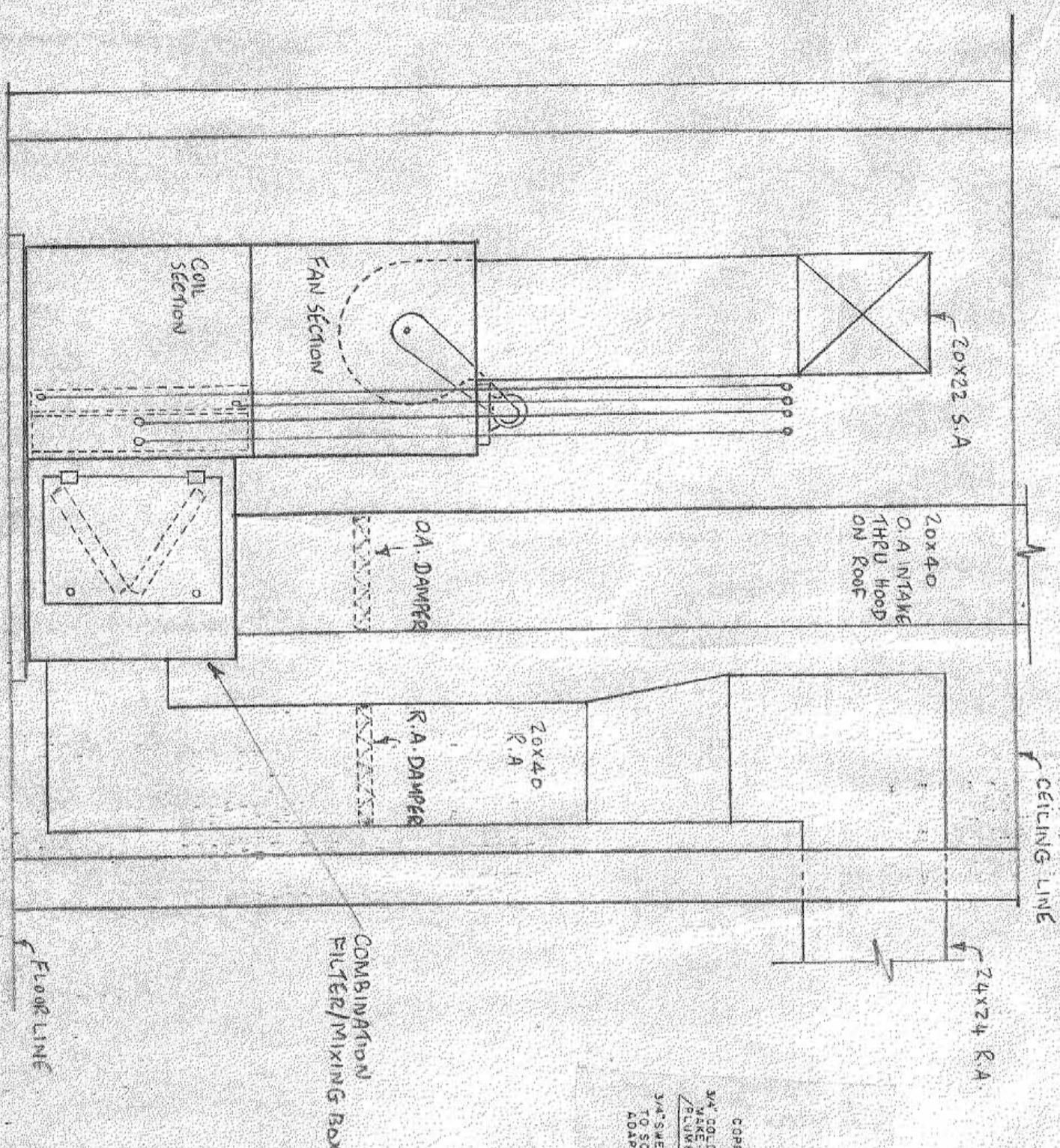


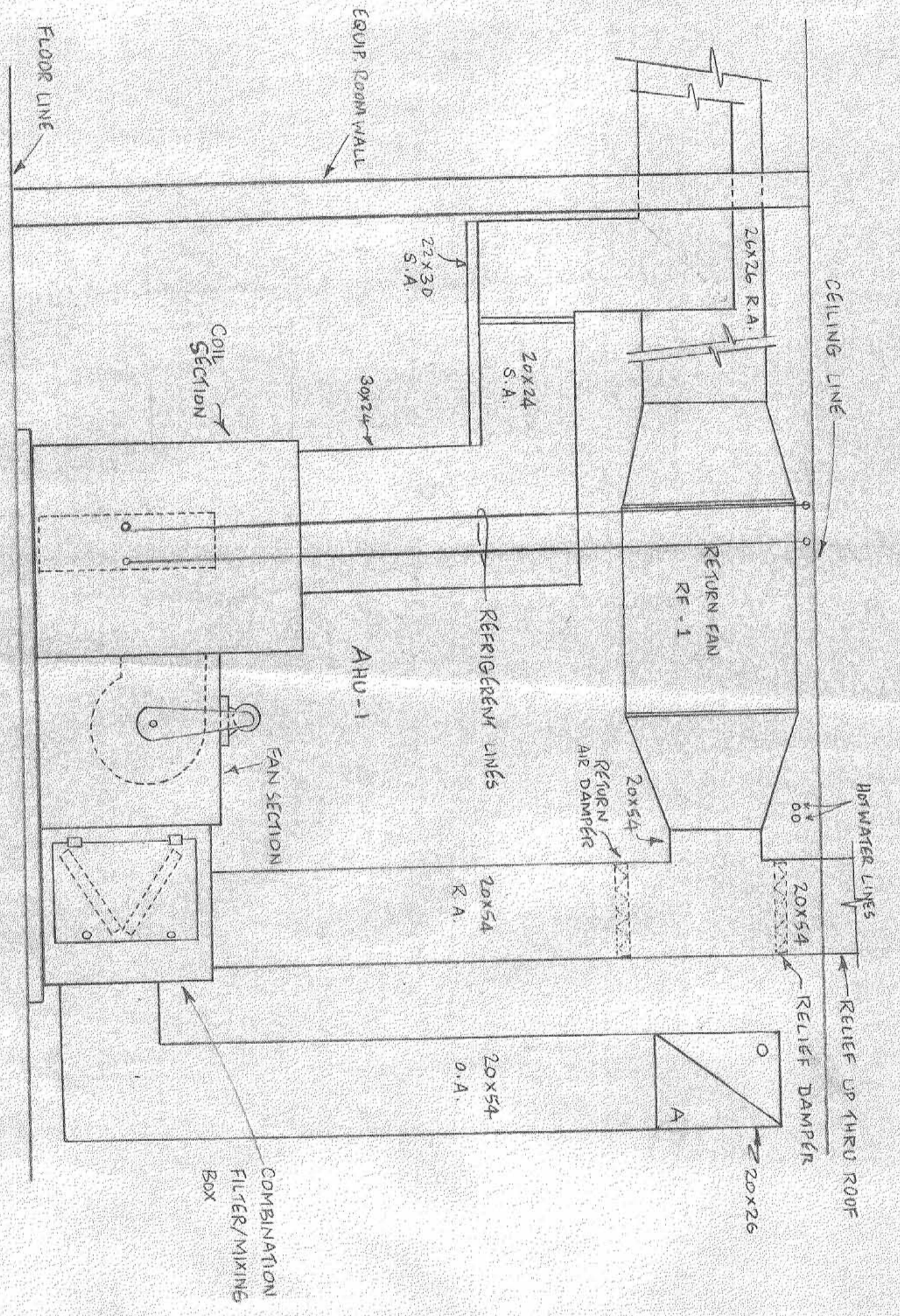
FLOOR PLAN - EQUIPMENT ROOM 1
SCALE: 1/4" = 1'-0"



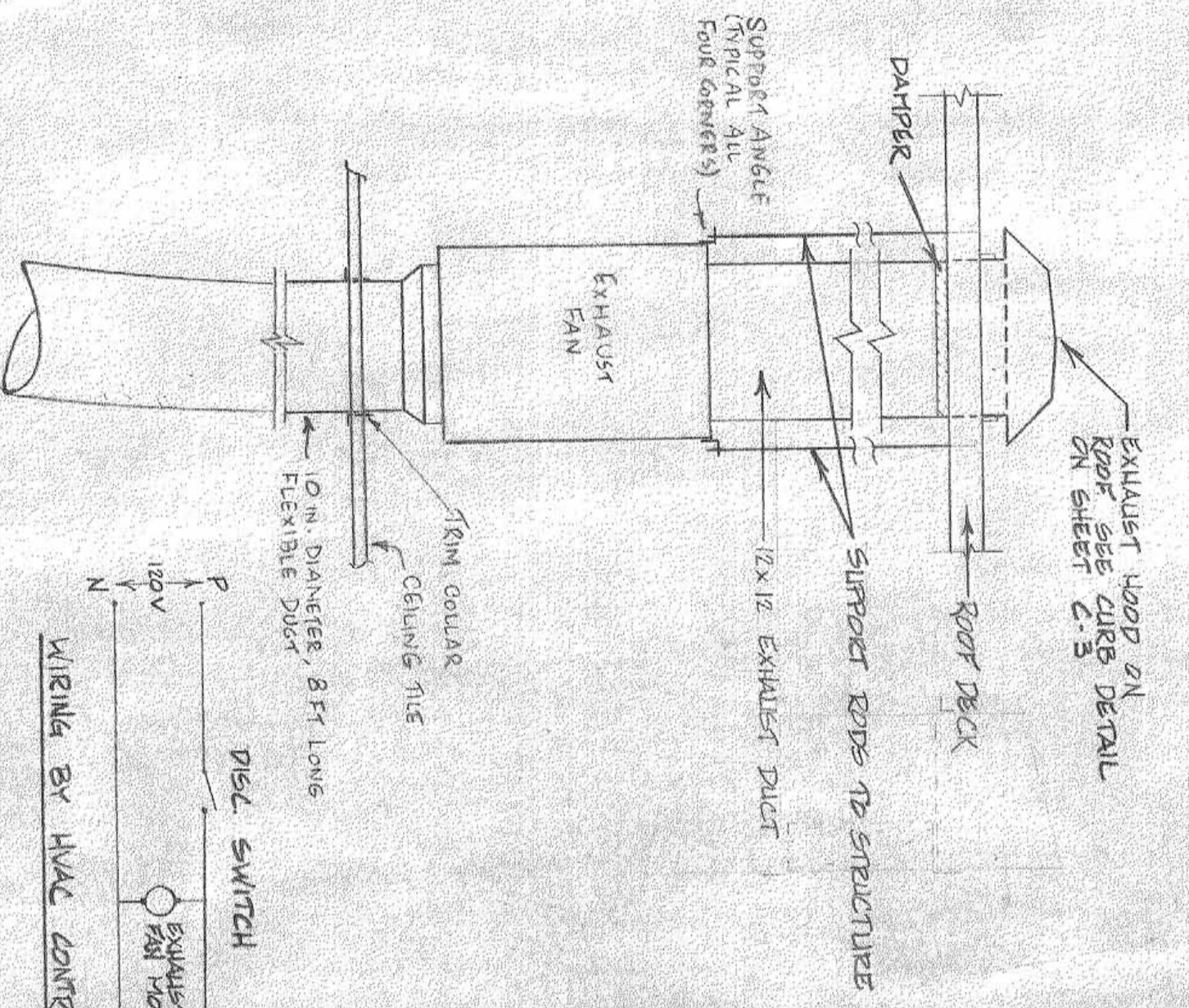
FLOOR PLAN - EQUIPMENT ROOM 2
SCALE: 1/4" = 1'-0"



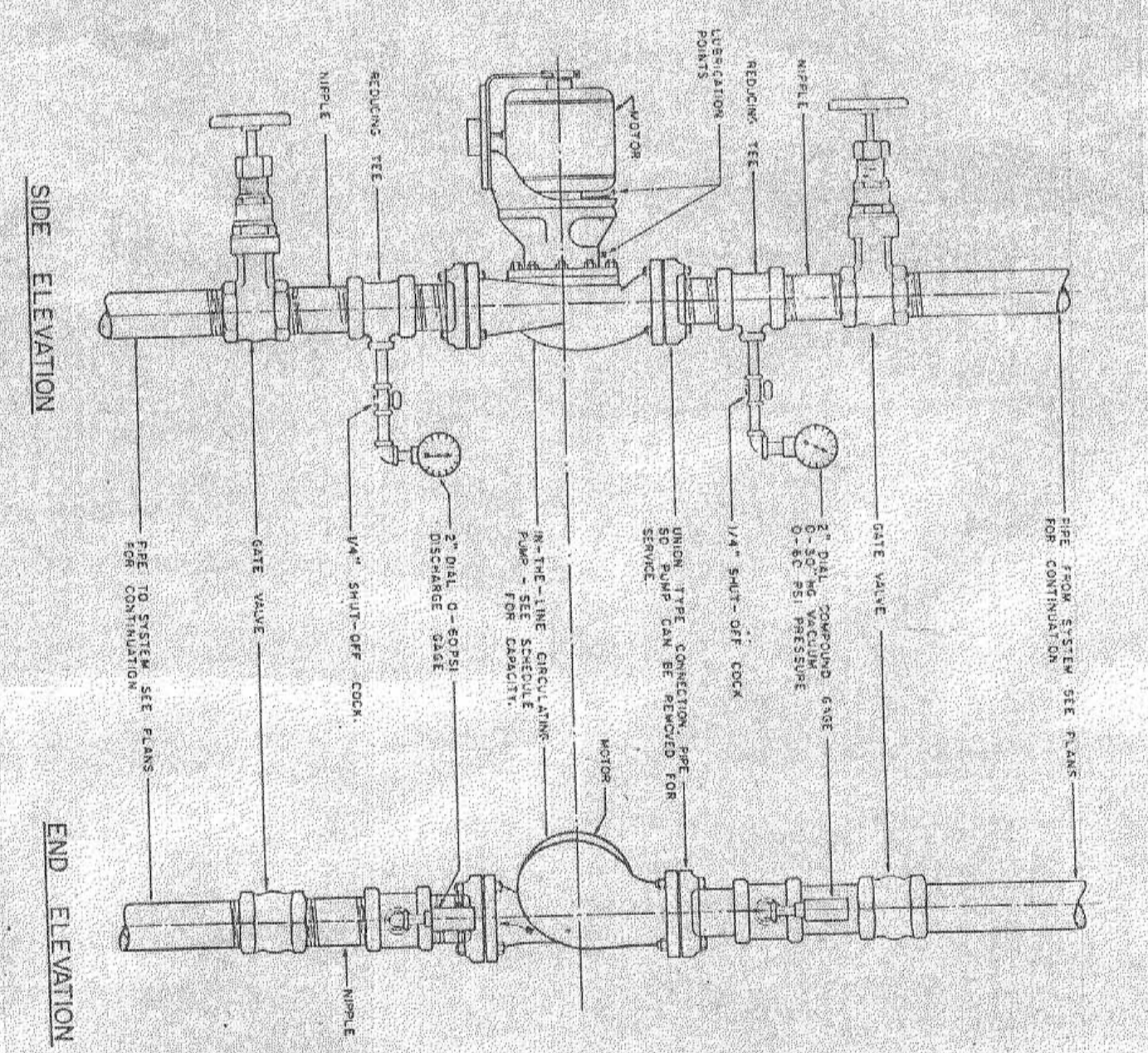
SECTION C-C
SCALE: 1/2" = 1'-0"



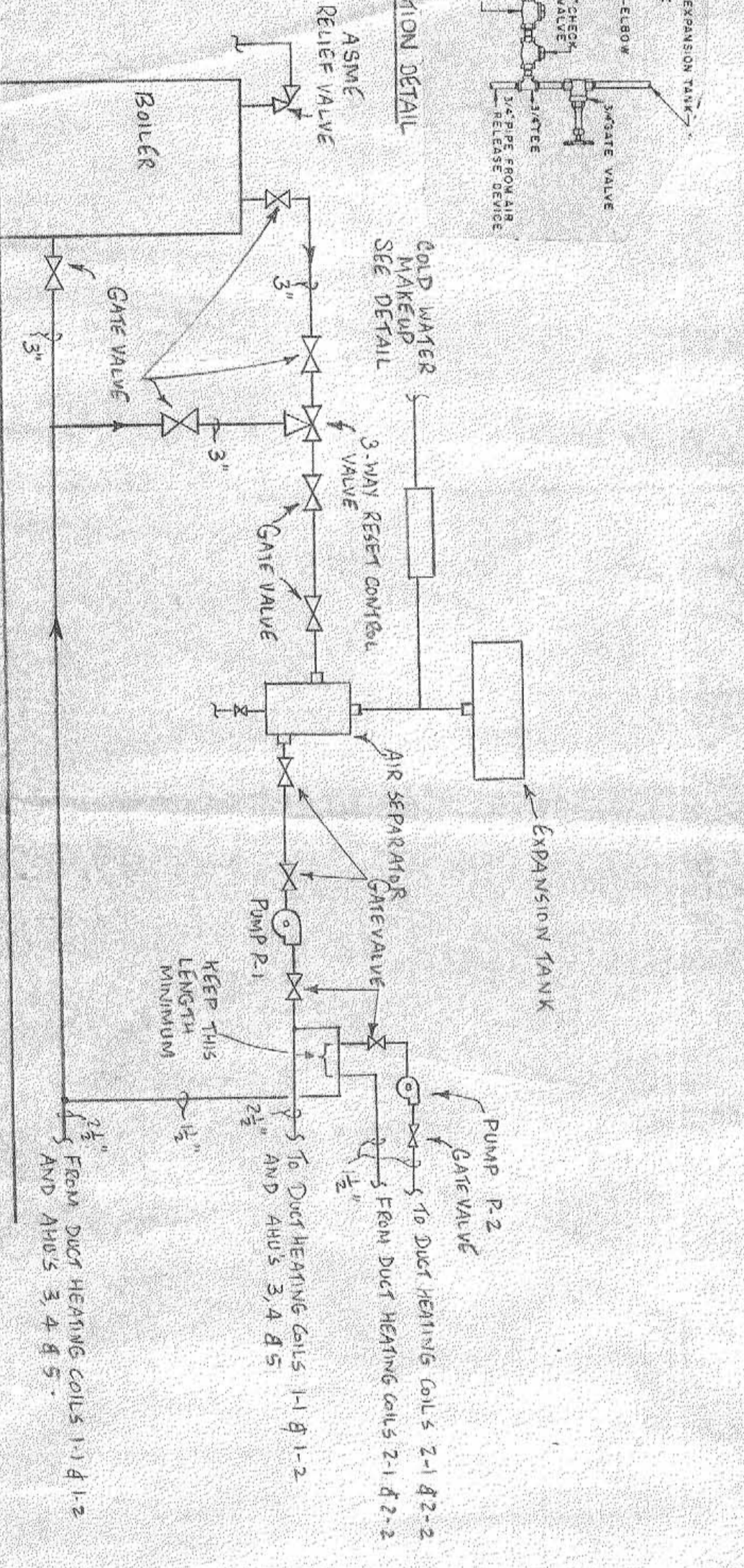
SECTION A-A
SCALE: 1/2" = 1'-0"



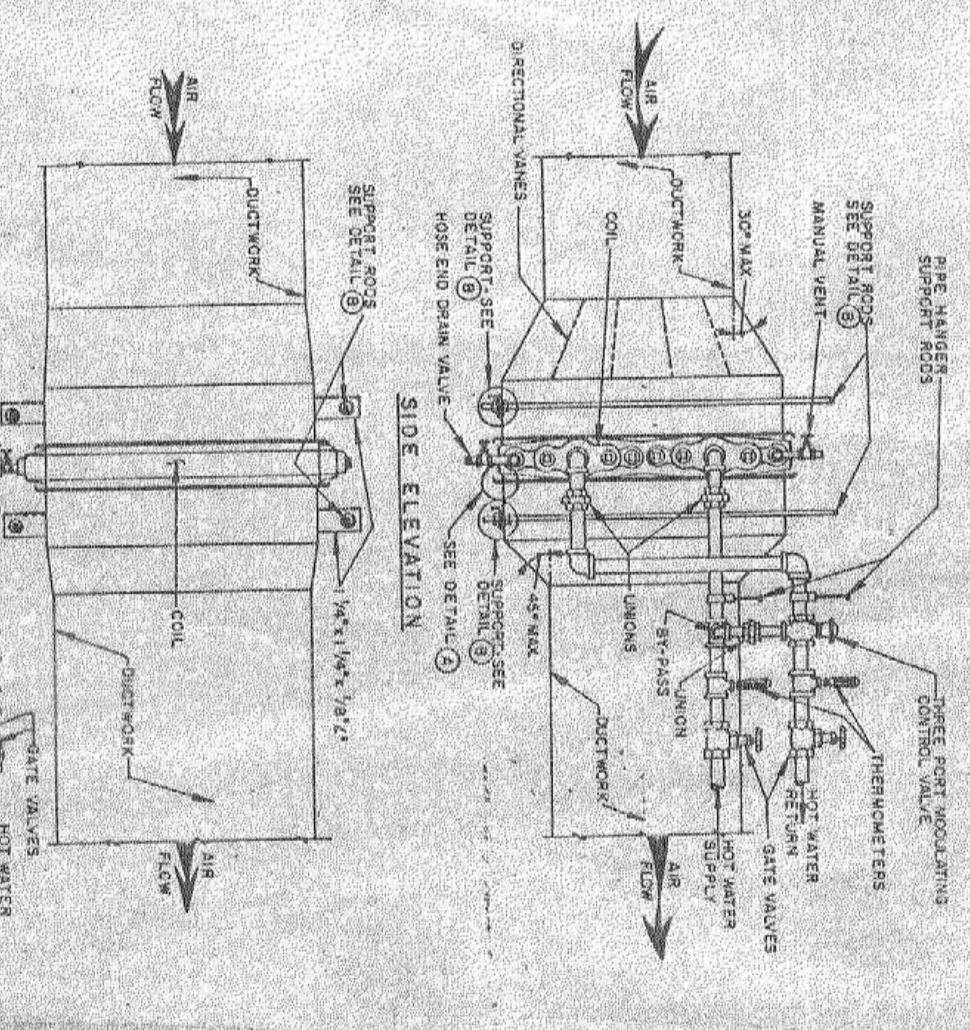
DETAIL OF INSTALLATION OF LASER LAB EXHAUST
NO SCALE



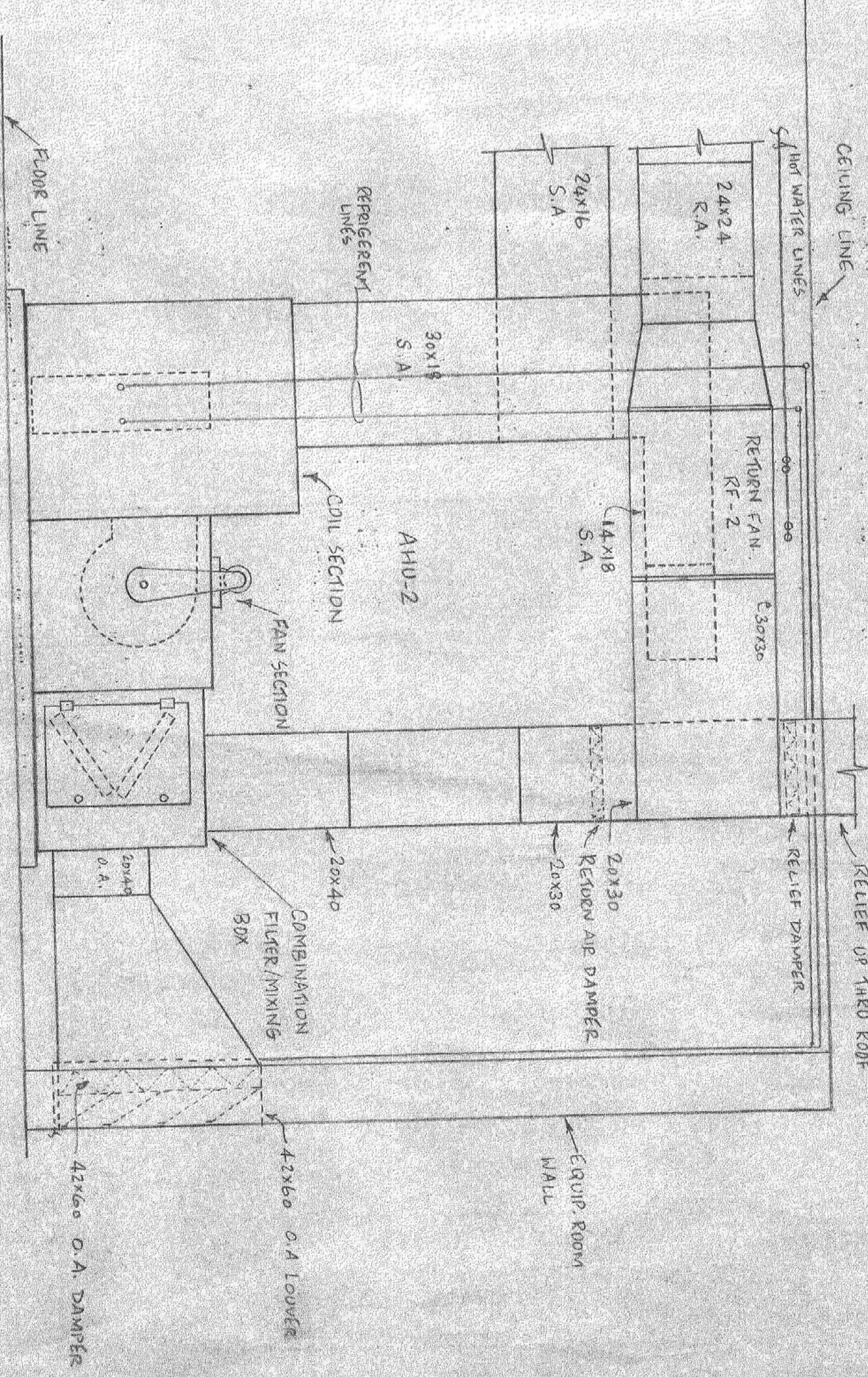
DETAIL OF INSTALLATION OF IN-LINE CIRCULATING PUMP
NO SCALE



PIPING SCHEMATIC
NO SCALE



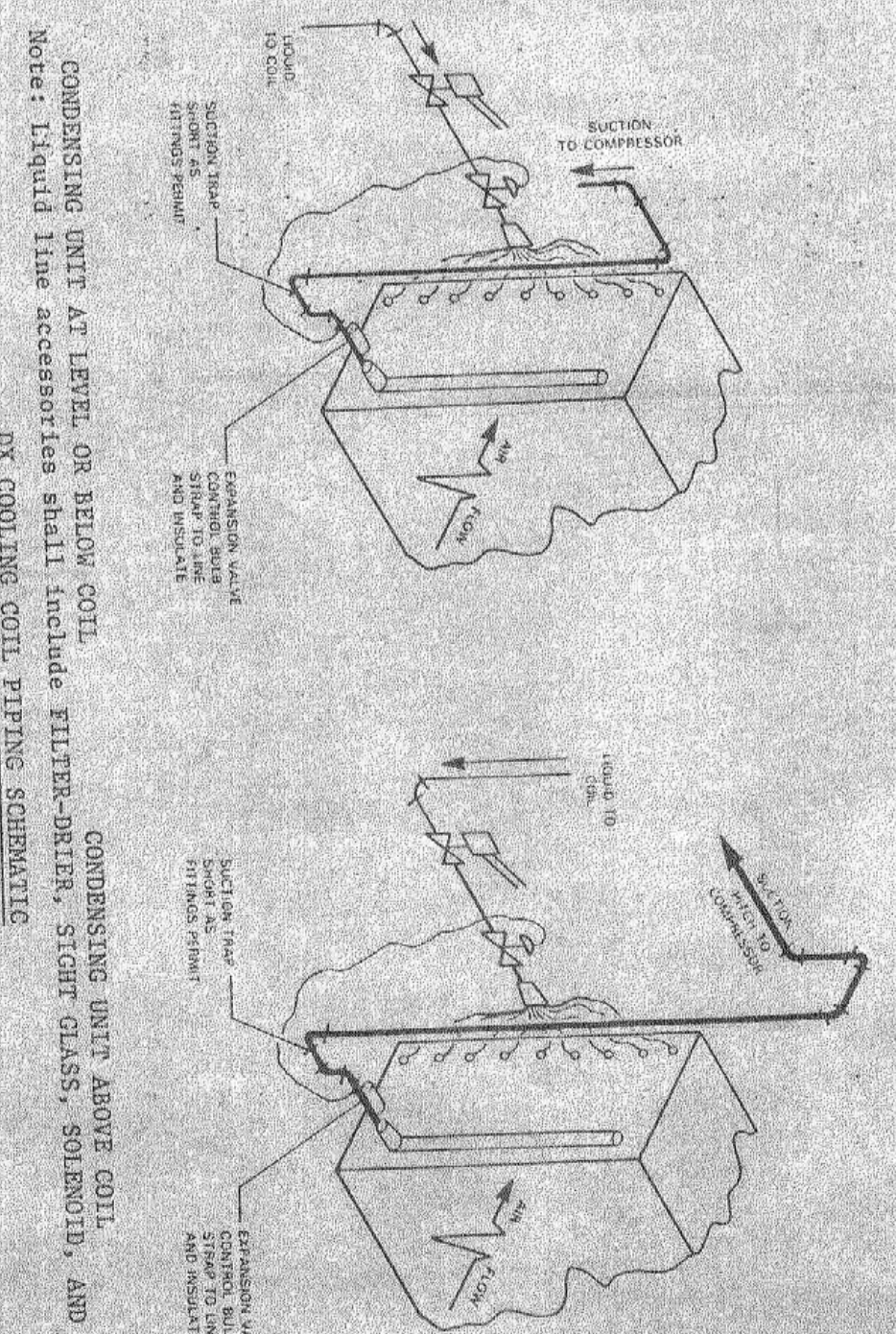
DETAIL OF INSTALLATION OF DUCT MOUNTED HEATING COIL
NO SCALE



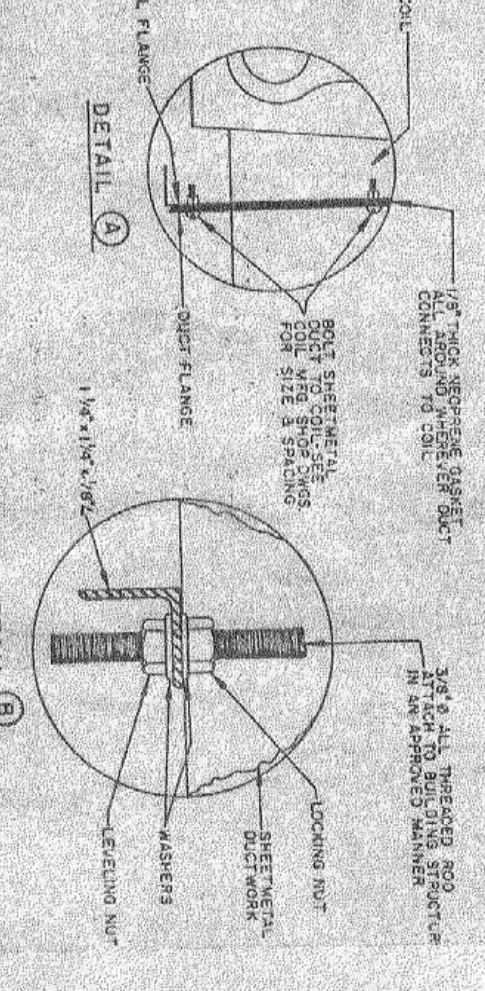
SECTION B-B
SCALE: 1/2" = 1'-0"

INSTALLATION NOTES

1. All units shall be installed with level and square.
2. All units shall be installed with level and square.
3. All units shall be installed with level and square.
4. All units shall be installed with level and square.
5. All units shall be installed with level and square.
6. All units shall be installed with level and square.
7. All units shall be installed with level and square.
8. All units shall be installed with level and square.
9. All units shall be installed with level and square.
10. All units shall be installed with level and square.



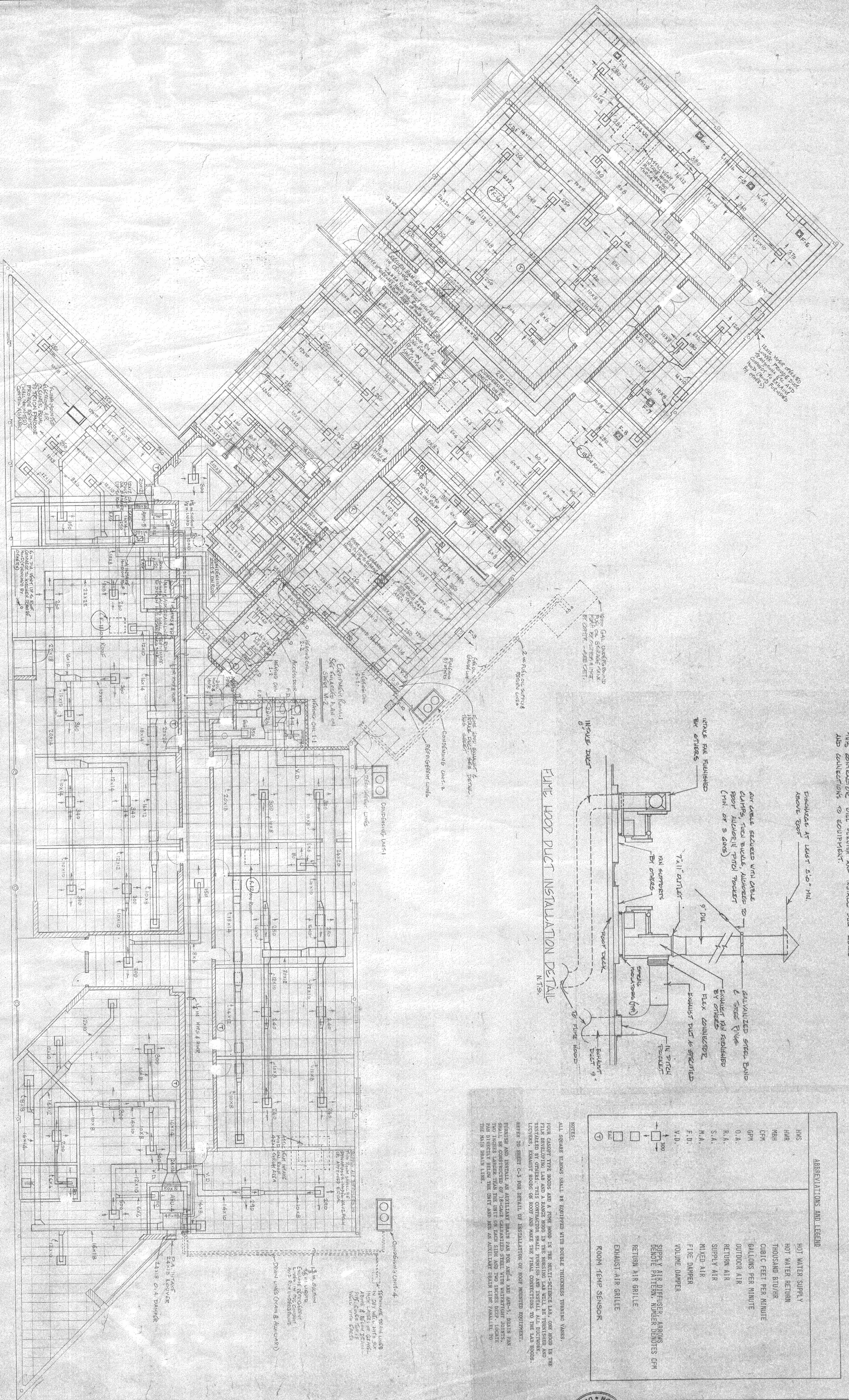
COIL PIPING SCHEMATIC
NO SCALE



DETAIL OF INSTALLATION OF DUCT MOUNTED HEATING COIL
NO SCALE

SUD ASSOCIATES, P.A.
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1802 CHAPEL HILL ROAD
DURHAM, NORTH CAROLINA

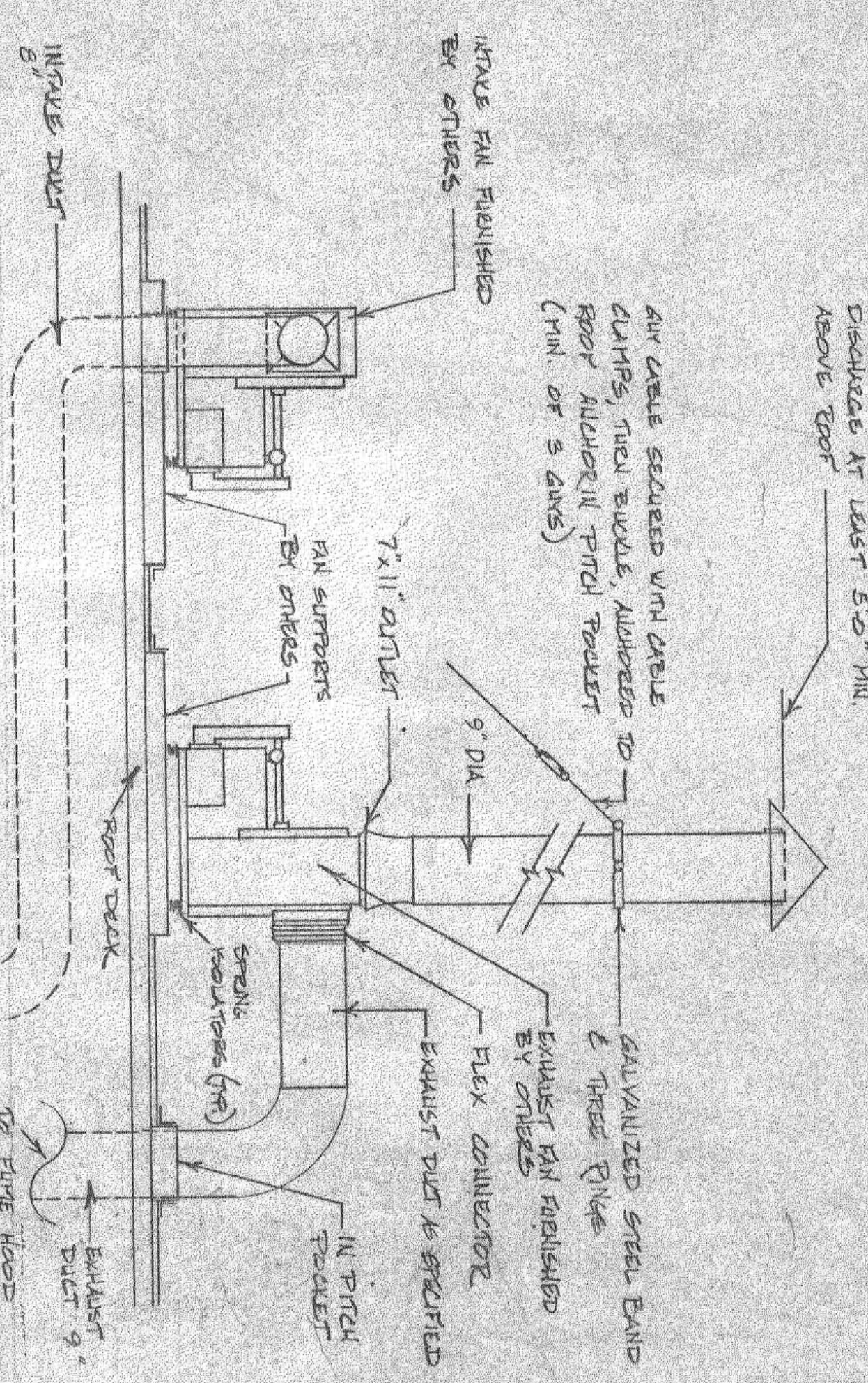




HVAC FLOOR PLAN
SCALE: 1/8" = 1'-0"

NOTE: EXHAUST AND INTAKE PANS TO BE FINISHED BY OTHERS. THIS CONTRACTOR WILL FINISH AND INSTALL DUCT WORK AND CONNECTIONS TO EQUIPMENT.

FUME HOOD DUCT INSTALLATION DETAIL
N.T.S.



ABBREVIATIONS AND LEGEND	
HWS	HOT WATER SUPPLY
HWR	HOT WATER RETURN
TBS	THOUSAND BTU/HR
CFM	CUBIC FEET PER MINUTE
GPM	GALLONS PER MINUTE
O.A.	OUTDOOR AIR
R.A.	RETURN AIR
S.A.	SUPPLY AIR
M.A.	MIXED AIR
F.D.	FIRE DAMPER
V.D.	VOLUME DAMPER
S.A.D.	SUPPLY AIR DIFFUSER, AIRWAYS
R.P.	RETURN AIR GRILLE
R.P.D.	RETURN AIR GRILLE
R.T.S.	ROOM TEMP SENSOR

NOTES:
ALL SQUARE FEET SHALL BE LISTED WITH NUMBER THICKNESS THROUGH WALLS.
FOR EXCEPT THE ROOMS AND A ROOM ROOM IN THE GREAT-ROOMS LAB, THE ROOMS TO BE INSTALLED BY OTHERS. THIS CONTRACTOR SHALL FINISH AND INSTALL ALL DUCTWORK, LINES, EXHAUST HOODS OR HOODS AND MAKE THE FINAL CONNECTIONS TO THE LAB ROOMS. REFER TO SHEET C-3 FOR DETAIL OF INSTALLATION OF ROOM VENTED EQUIPMENT.
ROOMS AND INSTALL AN AUXILIARY DRAIN FOR ROOM AIR-4 AND AIR-5. DRAIN PAN SHALL BE CONSTRUCTED OF 18-GAUGE GALVANIZED STEEL WITH WATER-TIGHT JOINTS. TWO INCHES LARGER THAN THE DRAIN PAN SHALL BE INSTALLED AND SHALL BE CONNECTED TO THE MAIN DRAIN LINE.

SUD ASSOCIATES, P.A.
CONSULTING ENGINEERS
1805 CHAPEL HILL ROAD
DURHAM, NORTH CAROLINA



REVISIONS
DATE
BY

AIR HANDLING UNIT SCHEDULE

AHU No	CFM	G.A. CFM MIN/MAX	TOTAL STATIC PRESS. IN. WG	FAN MOTOR HP	FAN MOTOR PHASE	COOLING COIL		HEATING COIL		CONDENSING UNIT SCHEDULE			
						EAUT. COIL	EAUT. COIL CAPACITY BTU/HR	EAUT. COIL	EAUT. COIL CAPACITY BTU/HR	LOCATION	MANUFACTURER AND MODEL	UNIT No	MINIMUM CAPACITY BTU/HR
1	5210	1000/2310	2.0	5	208	3	82-7/8" x 6"	55-9/16" x 4"	235860	208	3	GROUND	McQUAY AIR-021C OR EQUAL
2	3570	2000/370	2.1	5	208	3	88-5/16" x 6"	55-9/16" x 5"	230880	208	3	GROUND	McQUAY AIR-021C OR EQUAL
3	4230	1350/230	2.1	5	208	3	82-5/8" x 7"	53-1/2" x 6"	213830	208	3	ROOF	McQUAY AIR-021C OR EQUAL
4	2370	400/400	1.5	3	208	3	80-6/16" x 7"	53-1/2" x 5"	95080	208	3	GROUND	McQUAY AIR-021C OR EQUAL
5	1200	300/300	1.5	3/4	120	1	81-5/8" x 5"	53-1/2" x 4"	52220	208	3	ROOF	McQUAY AIR-021C OR EQUAL

Note: CONDENSING UNIT CAPACITIES ARE BASED ON 40°F DBT AND 94°F AMBIENT AIR TEMPERATURE. MAXIMUM WATER PRESSURE DROP FOR HEATING COILS IS 2.0 FT. H₂O.

DUCT HEATING COIL SCHEDULE

COIL No	AIR SIDE		WATER SIDE		CAPACITY BTU/HR	LOCATION	
	EAUT. LAT. VELOCITY FT./MIN	MAX. FACE MAX. EWT. LWT. GPM	EAUT. LAT. VELOCITY FT./MIN	MAX. FACE MAX. EWT. LWT. GPM			
1-1	2340	57-8/16" x 4"	550	0.20	160	67220	AHU-1, ZONE 1
1-2	2870	57-8/16" x 6"	550	0.20	160	83690	AHU-1, ZONE 2
2-1	1380	38-3/16" x 6"	550	0.20	160	61550	AHU-2, ZONE 1
2-2	2190	38-3/16" x 6"	550	0.20	160	97680	AHU-2, ZONE 2

RETURN FAN SCHEDULE

FAN No	CFM	STATIC PRESS. IN. WG	FAN MOTOR HP	VOLT. PHASE	TYPE	MANUFACTURER AND MODEL	LOCATION	MANUFACTURER AND MODEL	UNIT No	MINIMUM CAPACITY BTU/HR	PHASE	LOCATION	MANUFACTURER AND MODEL	
														EAUT. COIL
RF-1	5210	0.70	1/2	208	3	N-LINE CENTRIFUGAL GREENHECK 850-24	1	McQUAY LHM-110-36	1	235860	208	3	GROUND	McQUAY AIR-021C OR EQUAL
RF-2	3570	0.75	1	208	3	N-LINE CENTRIFUGAL GREENHECK 850-24	2	McQUAY LHM-108-36	2	230880	208	3	GROUND	McQUAY AIR-021C OR EQUAL
RF-3	4230	0.80	1 1/2	208	3	N-LINE CENTRIFUGAL GREENHECK 850-21	3	McQUAY LHM-108-36	3	213830	208	3	ROOF	McQUAY AIR-021C OR EQUAL

DIFFUSER SCHEDULE

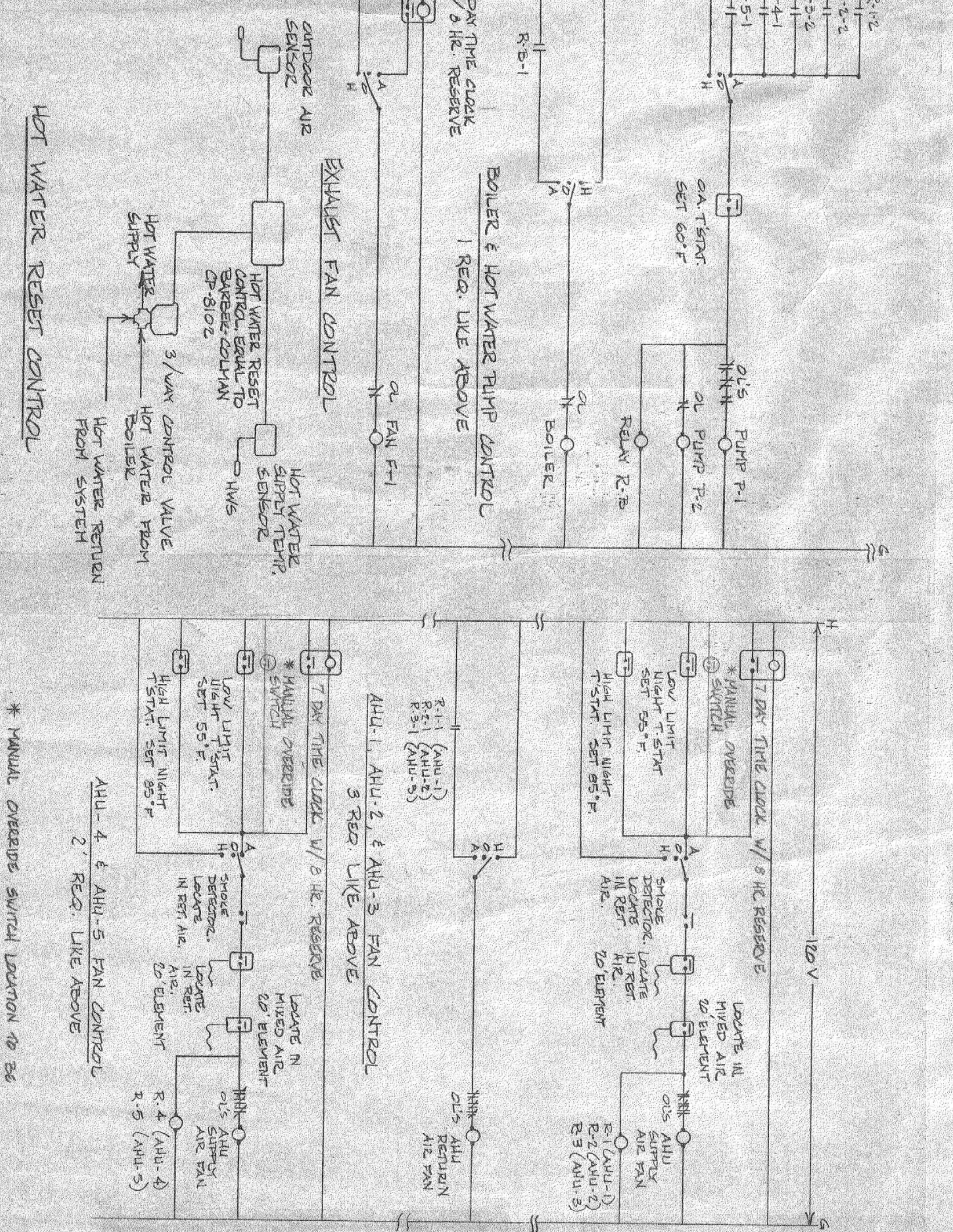
CFM RANGE	INCK. SIZE
125 - 200	6 x 6
200 - 275	8 x 8
275 - 350	9 x 9
350 - 500	10 x 10
500 - 750	12 x 12

EXHAUST FAN SCHEDULE

FAN No	CFM	START PRESS. IN. WG	MOTOR HP	VOLT. PHASE	TYPE OF FAN	TYPE OF DRIVE	SEWING	TYPE OF CONTROL	MANUFACTURER AND MODEL	REMARKS
F-1	1150	0.300	1/4	120	1	VENTILATOR	TOLFIN TRANS. CONTROL	THREEDRUM	GREENHECK 98-14	
F-2	400	0.150	1/8	120	1	ROOM EXHAUST	CHEMICAL STORAGE	MANUAL	GREENHECK-DI-10-0	
F-3, F-4, F-5, F-6, F-7, F-8	300	0.400	1/8	120	1	N-LINE CENTRIFUGAL	LABS	MANUAL	GREENHECK-DI-10-0	
F-9	1000	0.125	1/2	120	1	VAL. EXHAUST	MULTI-ZONE LAB	MANUAL	GREENHECK-50F-12	
F-10	2000	0.125	1/2	120	1	VAL. EXHAUST	EQUIPMENT RM. 1	MANUAL	GREENHECK-50F-18	
F-11, F-12, F-13, F-14	5000	0.125	1/2	120	1	POWER ROOF EXHAUST	THRESHOLD	THRESHOLD	GREENHECK-98-36	

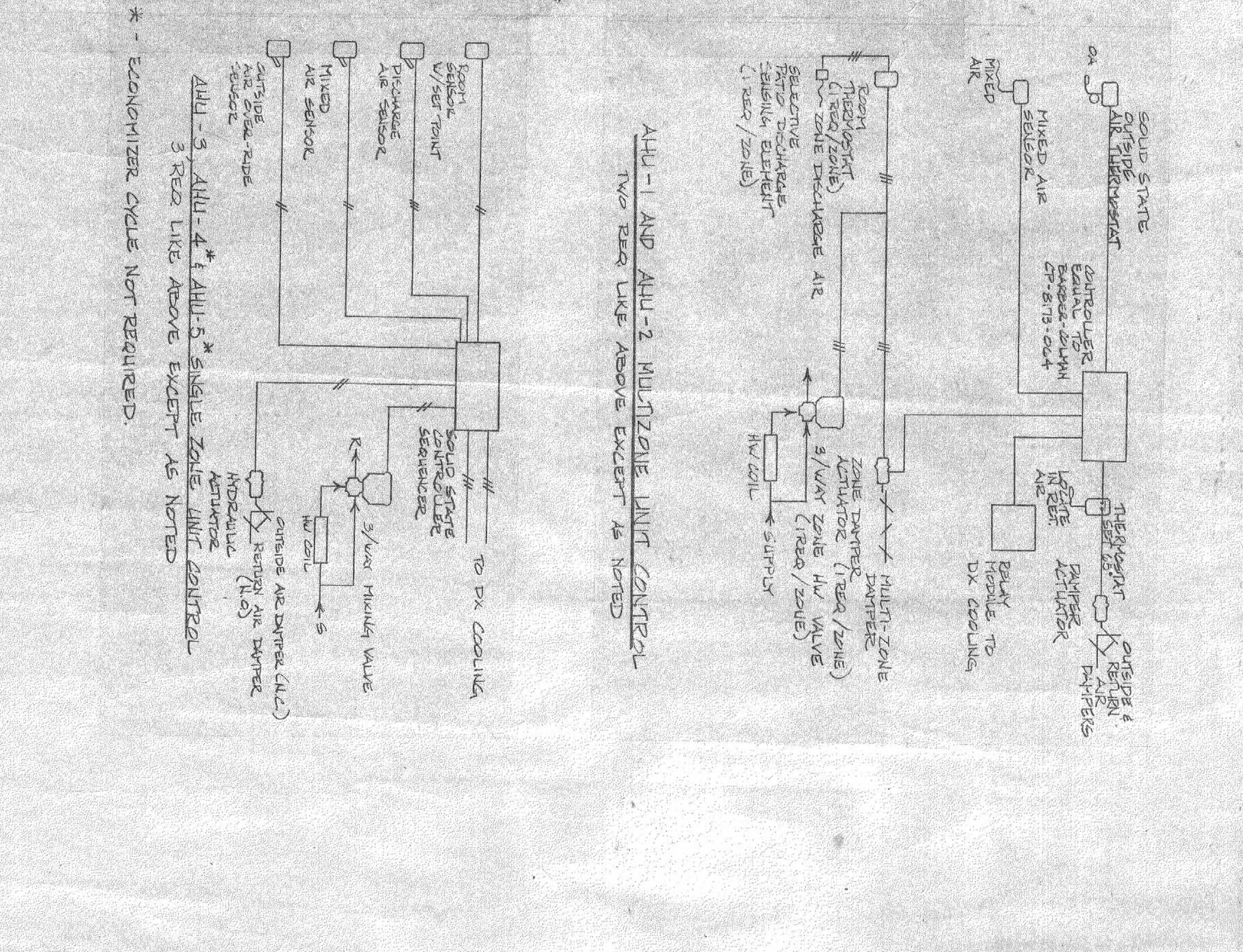
BOILER SCHEDULE

Boiler No	Type	Pressure Rating	Fuel	Input MBH	Gross Output MBH	Firing Rate GAL/HR	Boiler Motor HP	MANUFACTURER AND MODEL
1	HOT WATER FORCED DRAWT	90 PSI	#2 OIL	1050	840	7.5	1/3	ATXV SERIES W/ DR. EQUIP.



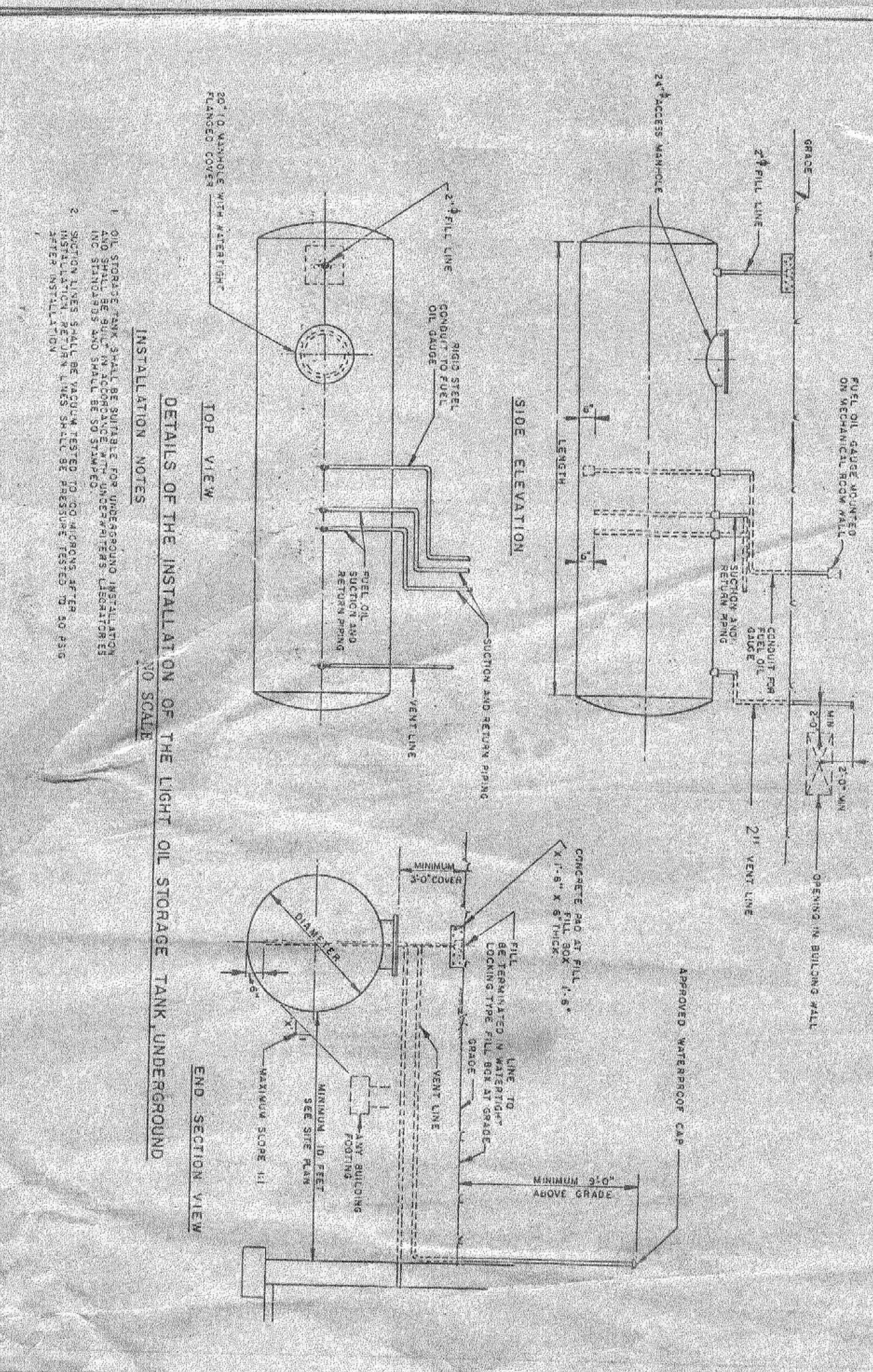
PUMP SCHEDULE

PUMP No	Service	GPM	Head, Ft	FRM	MOTOR HP	VOLT. PHASE	TYPE	MANUFACTURER AND MODEL
P-1	HOT WATER	57	30	1750	1 1/2	208	3	B&S SERIES 80
P-2	HOT WATER	16	12	1750	1/4	120	1	B&S SERIES 60



SEQUENCE OF OPERATION

200-1
 Occupied Mode:
 Room temperature sensor in series with discharge sensor shall control the room temperature. On starting, during heating season, when full heating is called for, the OA damper shall be kept closed and return air shall be recirculated, providing full heating capacity. As the space warms up to approximately 65 F, the OA damper shall be re-opened to maintain minimum position. As the space temperature increases to the setpoint of 68 F, the OA damper shall be closed.
 If the space temperature continues to rise and if the outdoor air temperature is less than 65 F, the outdoor air damper shall re-open. Mechanical cooling shall be energized if the outdoor air temperature is higher than 65 F, the outdoor air damper shall be closed.
 Unoccupied Mode:
 Control shall be similar to occupied mode except that a setback temperature of 55 F and a setpoint temperature of 65 F shall be maintained. Also, outdoor air damper shall be kept closed when heating is maintained in occupied mode.
 OA damper shall be kept closed whenever the zone air is not energized. Purge and install a smoke detector in the return air duct. Supply and return fans shall be stopped if (a) smoke detector senses smoke in the RA, (b) if the RA temperature sensor senses a rise in temperature, and (c) if the RA temperature is less than freeze-setpoint.
200-2
 Occupied Mode:
 Room temperature sensor in series with discharge sensor shall control the room temperature. On starting, during heating season, when full heating is called for, the OA damper shall be kept closed and return air shall be recirculated, providing full heating capacity. As the space warms up to approximately 65 F, the OA damper shall be re-opened to maintain minimum position. As the space temperature increases to the setpoint of 68 F, the OA damper shall be closed.
 If the space temperature continues to rise and if the outdoor air temperature is less than 65 F, the outdoor air damper shall re-open. Mechanical cooling shall be energized if the outdoor air temperature is higher than 65 F, the outdoor air damper shall be closed.
 Unoccupied Mode:
 Control shall be similar to occupied mode except that a setback temperature of 55 F and a setpoint temperature of 65 F shall be maintained. Also, outdoor air damper shall be kept closed when heating is maintained in occupied mode.
 OA damper shall be kept closed whenever the zone air is not energized. Purge and install a smoke detector in the return air duct. Supply and return fans shall be stopped if (a) smoke detector senses smoke in the RA, (b) if the RA temperature sensor senses a rise in temperature, and (c) if the RA temperature is less than freeze-setpoint.
200-3
 Occupied Mode:
 Room temperature sensor in series with discharge sensor shall control the room temperature. On starting, during heating season, when full heating is called for, the OA damper shall be kept closed and return air shall be recirculated, providing full heating capacity. As the space warms up to approximately 65 F, the OA damper shall be re-opened to maintain minimum position. As the space temperature increases to the setpoint of 68 F, the OA damper shall be closed.
 If the space temperature continues to rise and if the outdoor air temperature is less than 65 F, the outdoor air damper shall re-open. Mechanical cooling shall be energized if the outdoor air temperature is higher than 65 F, the outdoor air damper shall be closed.
 Unoccupied Mode:
 Control shall be similar to occupied mode except that a setback temperature of 55 F and a setpoint temperature of 65 F shall be maintained. Also, outdoor air damper shall be kept closed when heating is maintained in occupied mode.
 OA damper shall be kept closed whenever the zone air is not energized. Purge and install a smoke detector in the return air duct. Supply and return fans shall be stopped if (a) smoke detector senses smoke in the RA, (b) if the RA temperature sensor senses a rise in temperature, and (c) if the RA temperature is less than freeze-setpoint.



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HIGH TECHNOLOGY BUILDING CENTRAL CAROLINA HARNETT COUNTY CAMPUS