

- EQUIP. PE- LOCATION (SEE EDGE PLANS & 314)
- UH-1 1
 - UH-2 1
 - UH-3 1
 - UH-4 1
 - UH-5 6
 - UH-7 1
 - UH-8 1
 - UH-9 1
 - UH-10 1
 - UH-12 2
 - FC-1 1
- UH - FC-1 & FC-3 CONTROL

Inst. ID.	QTY.	CODE NO.	DESCRIPTION	RANGE SETTING	REMARKS	TASK
A-1	1	A4000-602	Filter			
C-1	1	C7351-3	Clock	120V	w/c 7351-103	
DO-1&2	2	D3153-5	Damper Operator	8-13#		
ENC-1	1	M8100-11	Enclosure	12"x18"	Priceau	
ENC-2	1	M8100-12	Enclosure	18"x24"	Priceau	
ENC-3	1	M8100-13	Enclosure	24"x24"	Priceau	
ENC-4	1		Enclosure		Stock	
EP1&2	2	VIIHAA-100	Sol. Air Valve	120V		
G-1	1	G2016-23	Gage	0-100PSI		
PE1-8	21	P108C-7	Press. Elec. SW.		See Dwg.	
PRV-1	1	A4000-101	Press. Reducer	15#		
PRV-2	1	A4000-101	Press. Reducer	20#		
R-1	1	KUP	Relay	24VDC		
RC-1	1	T9002-1	Receiver Control			
RTD-1	1	E421	RTD Sensor			
T-1	11	T4504-217	Thstat RA		T4002-124, T4002-2139	
T-2	2	T4504-203	Thstat DA			
T-3	1	T4504-217	Thstat RA			
TE-1	1	T26S-18	Thstat			
TI-1	1	T5500-1052	Temp. Indicator	40-240°F	T500-1605 s/well	
TI-2	1	T5500-1052	Temp. Indicator	0-100°F	T4002-124 s/well	
TI-3	1	T5210-1004	Temp. Trans.	40-240°F	T4002-124 s/well	
TI-4	1	T5210-1114	Temp. Trans.	0-100°F	T4002-124 s/well	
V-1	1	V4324-1001	Heating Valve	1"-2.2" cv	IC-1	
V-2	1	V4324-1001	Heating Valve	1"-2.2" cv	IC-2	
V-3	1	V5462-2	Steam Valve	1 1/2"-11cv	E. W. Converter	
W-1	22	R3710-2007	Restrictor		Stock	

SEQUENCE OF OPERATION

HOT WATER CONVERTER CONTROL

Outside air thermostat (TT-2) will reset the hot water supply temperature through reset controller (RC-1) which modulates steam valve (V-3). Pressure electric switch (PE-8) will start the hot water circulating pump before steam valve (V-3) opens.

UNIT HEATER AND FAN COIL UNIT CONTROL

Space thermostat (T-1) will operate pressure electric switch (PE-1) to starter units.

ROOFTOP UNIT AC-1 & 2

Thermostat (T-2) will start the unit fan through pressure electric switch if the hand/off/auto switch has been placed in its selected mode. T-2 will either modulate the hot water control valve or start the single stage cooling compressor as space conditions dictates.

AC-3

A pressure electric switch (PE-6) will stop AC-3 at night.

FAN F-10

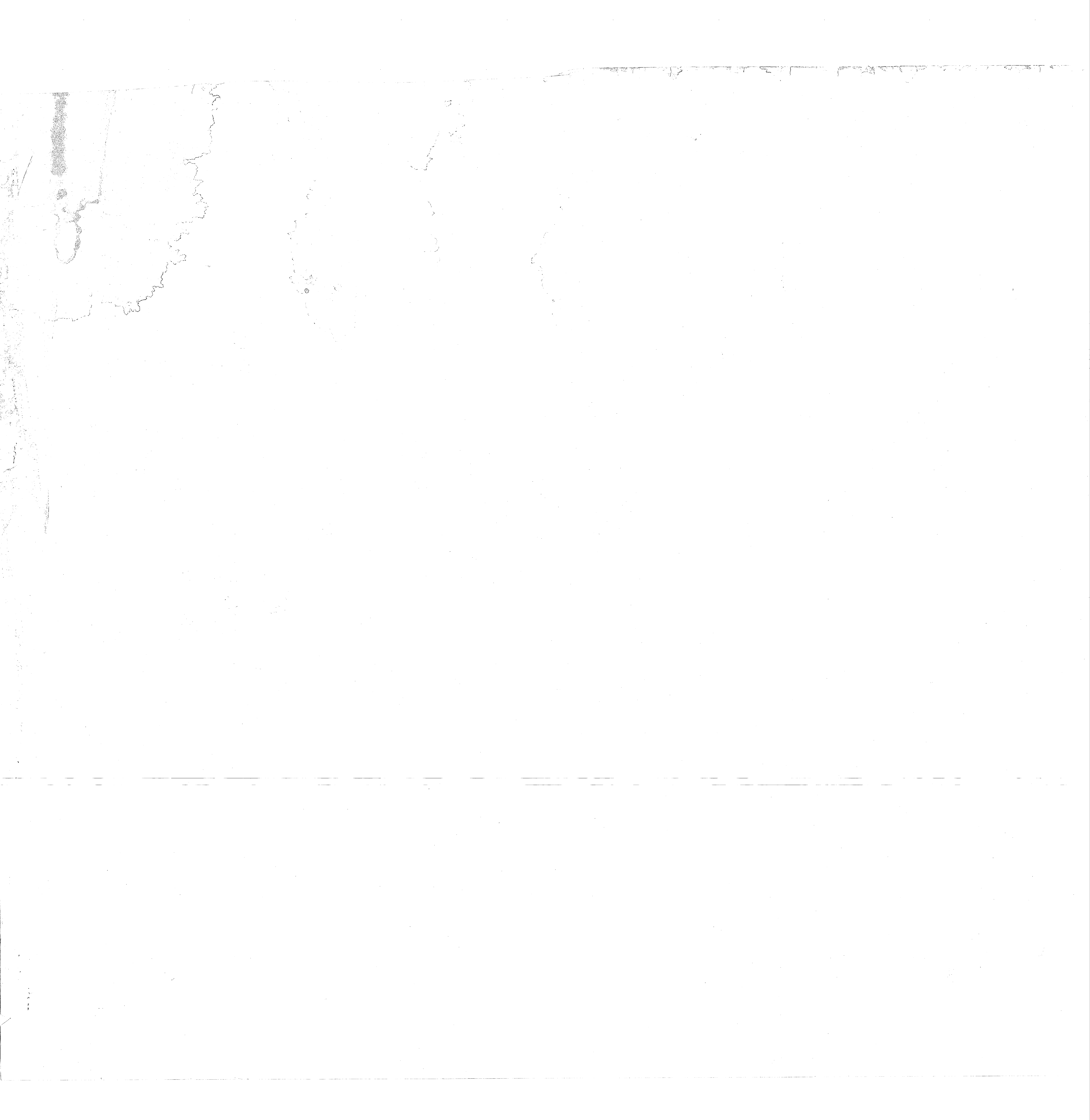
When fan F-10 switch is in the auto position, the fan will run under control of space thermostat (T-1).

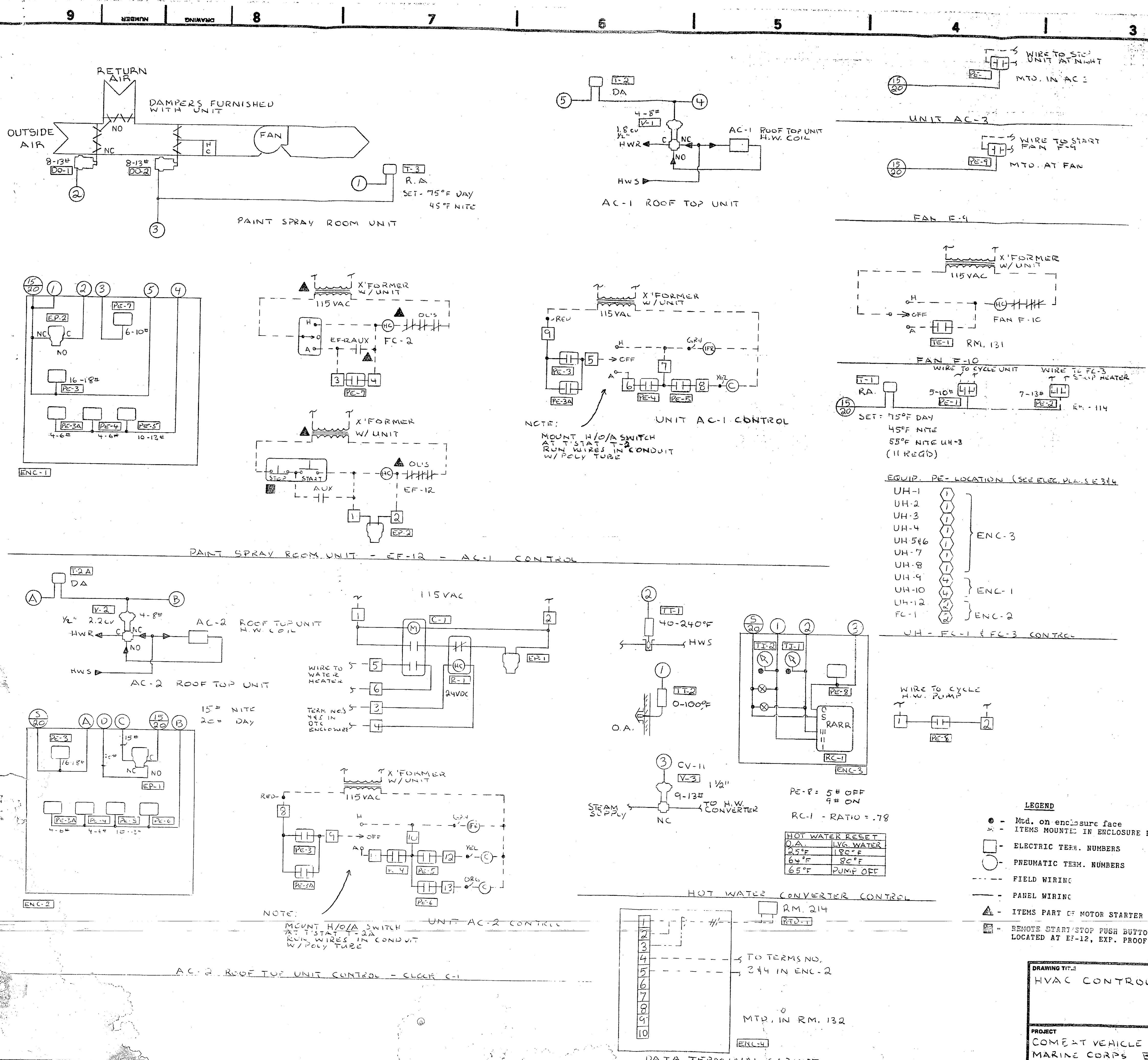
Time clock (C-1) will control the water heater and the day or night control of the controls.

- LEGEND**
- - Mod. on enclosure face
 - ⊗ - ITEMS MOUNTED IN ENCLOSURE ENC-2
 - - ELECTRIC TERM. NUMBERS
 - - PNEUMATIC TERM. NUMBERS
 - FIELD WIRING
 - PANEL WIRING
 - ⚡ - ITEMS PART OF MOTOR STARTER
 - ⊞ - REMOTE START/STOP PUSH BUTTON LOCATED AT EF-12, EXP. PROOF.

DRAWING TITLE		NO.		REVISION - LOCATION		DATE		BY	
HVAC CONTROLS		1 REDRAWN				3/28/84		RB	
PROJECT		APPLICATION ENGR.		DRAWN		CHECKED		APPROVED	
COMBAT VEHICLE SHOP		M. MOYSAK		BY: RB		DATE: 3/28/84		DATE:	
MARINE CORPS BASE								CONTRACT NUMBER	
CAMP LEJEUNE, N.C.								3121-0010	
								DRAWING NUMBER	
								1071	

1880





Inst. ID.	QTY.	CODE NO.	DESCRIPTION	RANGE SETTING	REMARKS	DATE
A-1	1	A4000-602	Filter			
C-1	1	C7351-3	Clock	120V	w/C7351-103	
DO-1&2	2	D3153-5	Damper Operator	6-13#		
ENC-1	1	MB100-11	Enclosure	120-18"	Poteau	
ENC-2	1	MB100-12	Enclosure	18"x24"	Poteau	
ENC-3	1	MB100-13	Enclosure	24"x24"	Poteau	
ENC-4	1		Enclosure		Stack	
EP1&2	2	VIIHAA-100	Sol. Air Valve	120V		
G-1	1	G2010-23	Gage	0-100PSI	2"	
PE1-8	21	P10BC-7	Press. Elec. SW.	See Dwg.		
PRV-1	1	A4000-101	Press. Reducer	15#		
PRV-2	1	A4000-101	Press. Reducer	20#		
R-1	1	KUP	Relay	24VDC		
RC-1	1	T9002-1	Receiver Control			
RTD-1	1	E421	RTD Sensor			
T-1	1	T4504-217	T'ostat RA		w/T4002-124, T4002-2139	
T-2	2	T4504-203	T'ostat DA			
T-3	1	T4504-217	T'ostat RA			
TE-1	1	T265-1R	T'ostat			
TI-1	1	T5500-1055	Temp. Indicator	40-240°F		
TI-2	1	T5500-1052	Temp. Indicator	0-100°F		
TT-1	1	T5210-1004	Temp. Trans.	40-240°F	T800-1605 w/well	
TT-2	1	T5210-1114	Temp. Trans.	0-100°F	SBL 10A-603R Sunshield	
V-1	1	V4324-1001	Heating Valve	1"-1.81v	AC-1	
V-2	1	V4324-1001	Heating Valve	1"-2.2 cv	AC-2	
V-3	1	V5462-2	Steam Valve	1 1/2"-11cv	H. W. Converter	
	2	R3710-2007	Restrictor			
	22		Terminal Block		Stock	

SEQUENCE OF OPERATION

HOT WATER CONVERTER CONTROL
 Outside air thermostat (TI-2) will reset the hot water supply temperature through reset controller (RC-1) which modulates steam valve (V-3). Pressure electric switch (PE-8) will start the hot water circulating pump before steam valve (V-3) opens.

UNIT HEATER AND FAN COIL UNIT CONTROL
 Space thermostat (T-1) will operate pressure electric switch (PE-1) to starter units.

ROOFTOP UNIT AC-1 & 2
 Thermostat (T-2) will start the unit fan through pressure electric switch if the hand/off/auto switch has been placed in its selected mode. T-2 will either modulate the hot water control valve or start the single stage cooling compressor as space conditions dictate.

AC-3
 A pressure electric switch (PE-6) will stop AC-3 at night.

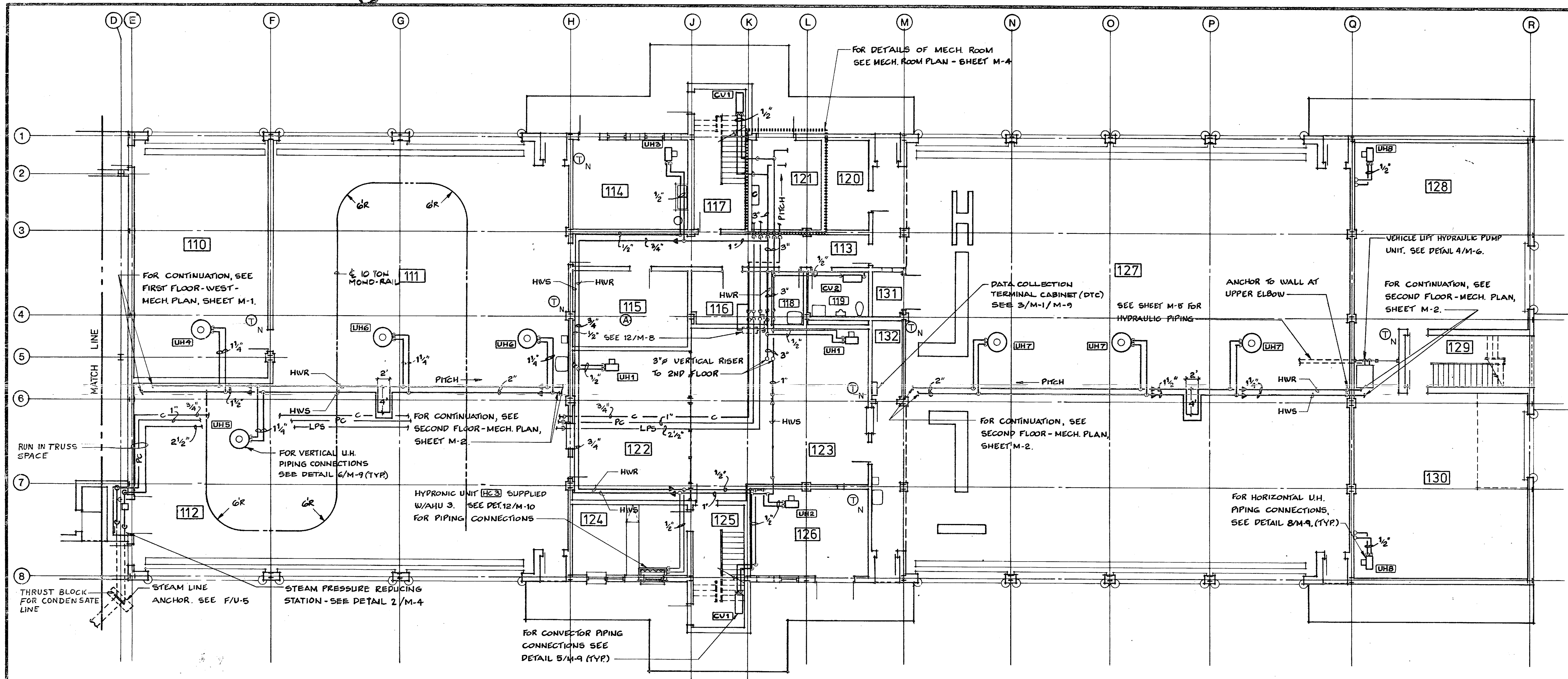
FAN F-10
 When fan F-10 switch is in the auto position, the fan will run under control of space thermostat (TE-1).

Time clock (C-1) will control the water heater and the day or night control of the controls.

DRAWING TITLE		NO. REDRAWN		DATE	
HVAC CONTROLS				3/28/84 RB	
PROJECT		APPLICATION ENGR.		DATE	
COMBAT VEHICLE SHOP		M. HOYSAR		6-14-83	
MARINE CORPS BASE		BY: RB		DATE	
CAMP LEJEUNE, N.C.					
CONTRACT NUMBER		APPROVED		DATE	
3121-0010		JOHNSON CONTROLS			
DRAWING NUMBER		Systems & Services Division			
1001					

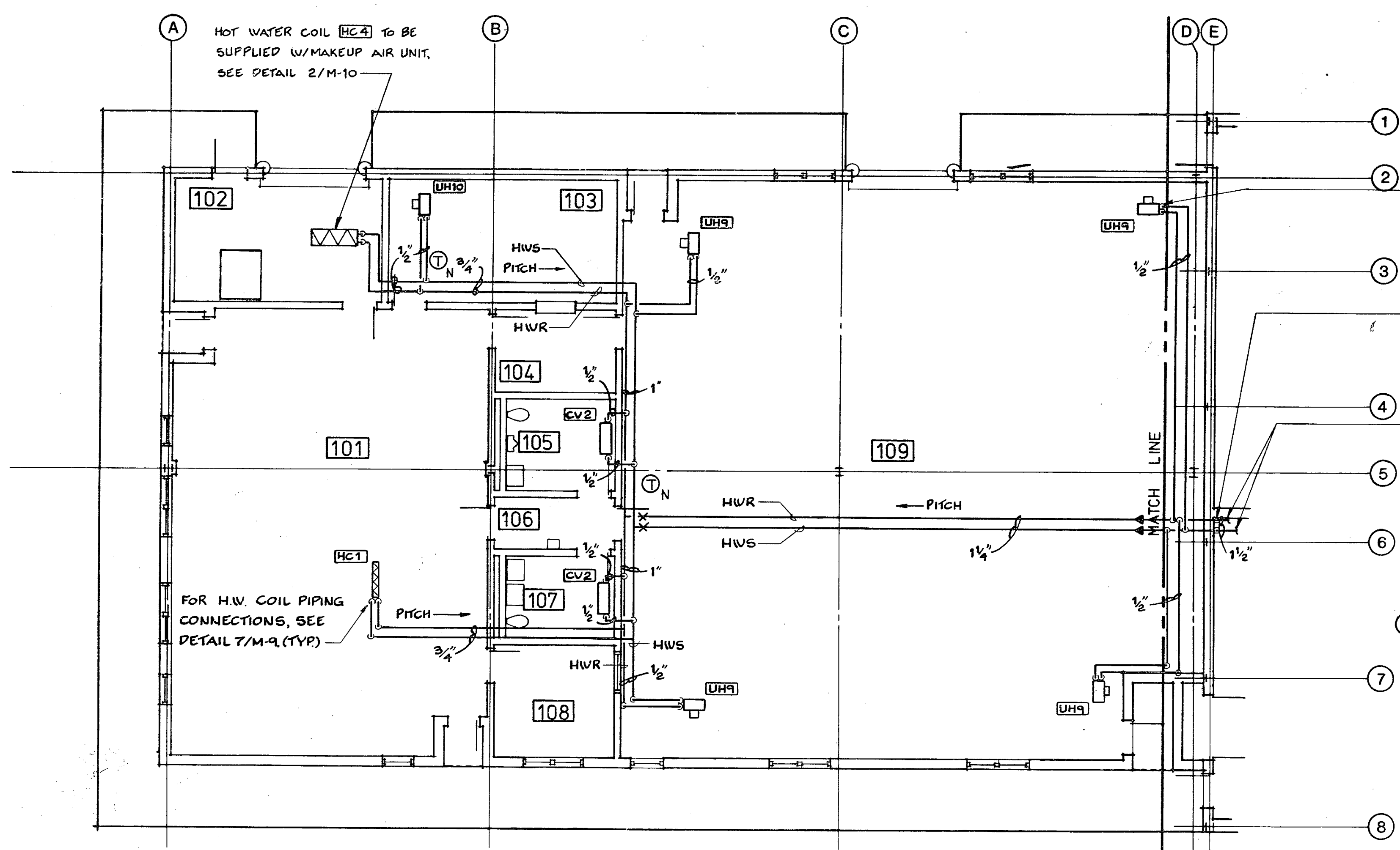


REVISIONS		
BYM	DESCRIPTION	DATE APPROVED
(A)	REVISED AS BUILT	9/18/86 T.B.D.



LEGEND	
SCHEDULE MARK	UHT
CONDENSATE	C
PUMPED CONDENSATE	PC
HIGH PRESSURE STEAM	HPS
LOW PRESSURE STEAM	LPS
HOT WATER SUPPLY	HWS
HOT WATER RETURN	HWR
HOT WATER COIL	HC
THERMOSTAT	T
THERMOSTAT W/NIGHT SETBACK	TN
FLAT ON TOP	F.O.T.
HORIZONTAL FIRE DAMPER	FD
ACCESS DOOR	A.D.
VERTICAL FIRE DAMPER	FD
SPLITTER DAMPER	SD
STAINLESS STEEL FLEX DUCT	SSFD
SUPPLY AIR DIFFUSER	SA
RETURN CRILLE	RC
ROOFTOP EXHAUST FAN	REF
HORIZONTAL UNIT HEATER	HUH
VERTICAL UNIT HEATER	VUH
HOT WATER CONVECTOR	HWC
GATE VALVE	GV
CHECK VALVE	CV
GLOBE VALVE	GV
STRAINER	STR
UNION	UN
PRESSURE GAUGE	PG
FLOAT & THERMOSTATIC STEAM TRAP	FSTST
INVERTED BUCKET TRAP	IBT
PIPE REDUCER	PR
PIPE ANCHOR	PA
CONTROL PANEL	CP
REMOTE STOP/START PUSHBUTTON STATION	RSS

FIRST FLOOR-EAST-MECHANICAL PLAN
1/8" = 1'-0"

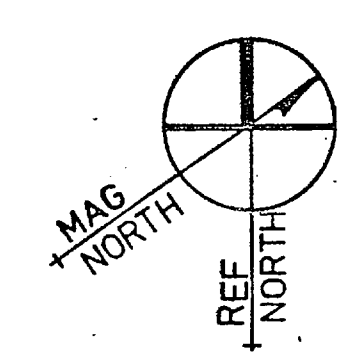
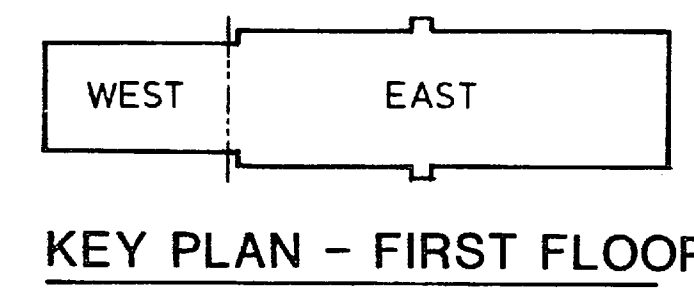


FIRST FLOOR-WEST-MECHANICAL PLAN
1/8" = 1'-0"

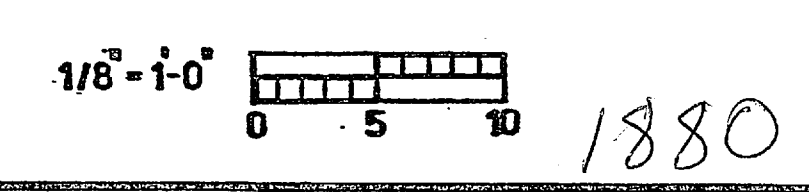
GENERAL NOTES

1. PIPING FOR HOT WATER HEATING TO RUN IN TRUSS SPACE
2. FOR HEATING TERMINAL DETAILS SEE SHEET M-9
3. FOR HEATING CONTROL SCHEMATICS SEE SHEET M-8 & M-9
4. FOR TERMINAL UNITS SCHEDULE SEE SHEET M-2
5. PROVIDE 1/8" MANUAL VENTS AT ALL HIGH POINTS IN HOT WATER SUPPLY & RETURN PIPING.
6. ALL PIPE SLEEVES THRU WALLS FOR HOT WATER PIPING TO BE 2" I.D. LARGER THAN PIPE AND INSULATION TO PROVIDE FOR MOVEMENT.

NOTE:
(A) TRAP ASSEMBLY WAS NOT NEEDED SINCE PANEL WAS RUN UNDERNEATH BEAMS

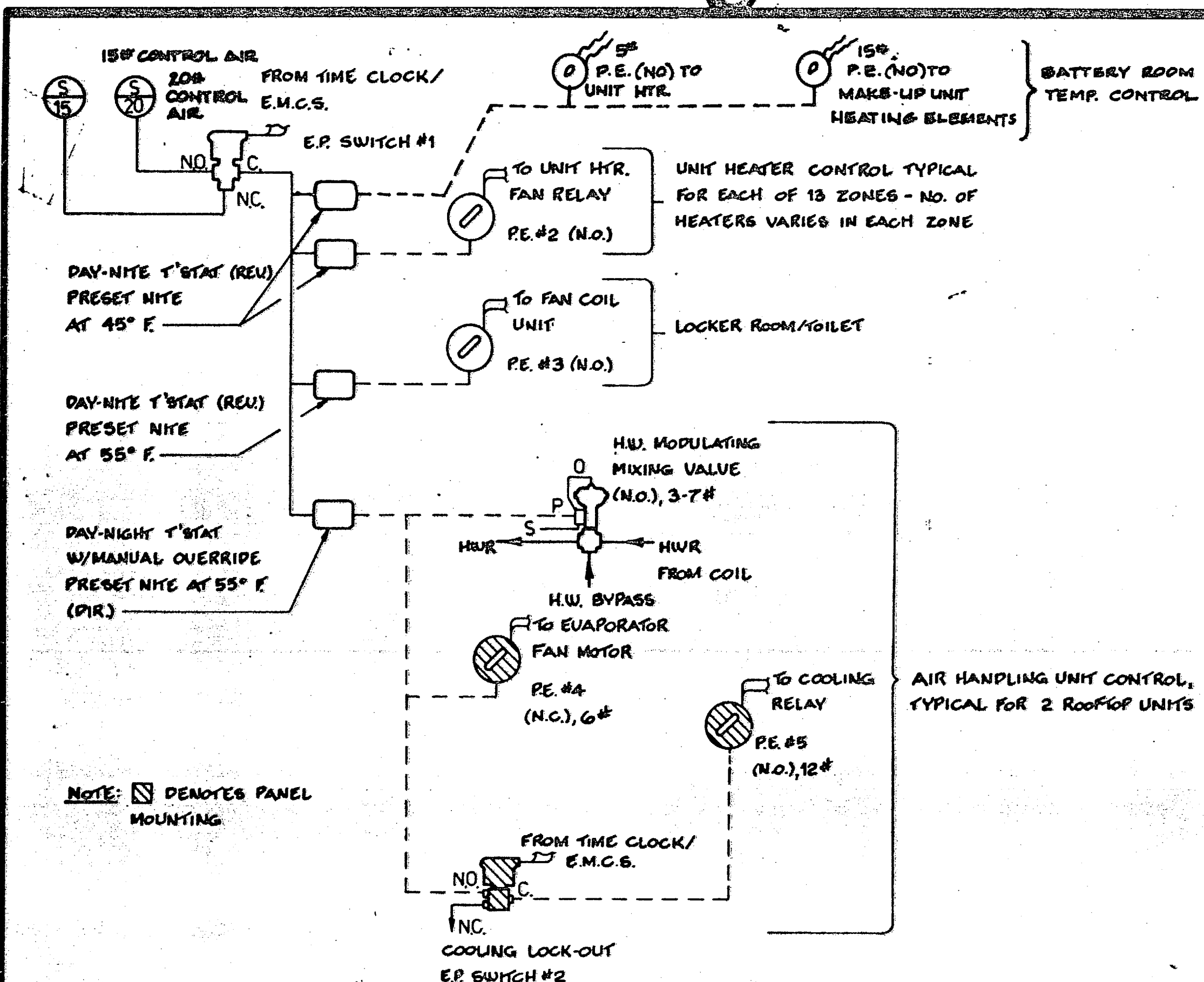


RECORD DRAWING		M-1
LETTER DATED AUG 18 1986		
OLSEN ASSOCIATES RALEIGH, N. CAROLINA ENGINEERS & ARCHITECTS	DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND NAVAL STATION NORFOLK, VIRGINIA	
DES. RLP DR. RLP CHK. TLP	MARINE CORPS BASE CAMP LEJEUNE, N.C.	
PROJ. MGR. DNL. CH. ENGR.	COMBAT VEHICLE MAINTENANCE SHOP	
SUBMITTED BY: DATE: 8-1-86	HEATING - FIRST FLOOR PLAN	
FIRM MEMBER: PRINCIPAL	SIZE: CODE IDENT. NO. NAVFAC DRAWING NO. 4089043	
EFD: TYPIC BVD: EDEJ	CONSTR. CONTR. NO. N62470-81-C-1131	
APPROVED: DATE: 8/18/86	SCALE: AS SHOWN SPEC. C5-81-1131	SHEET 35 OF 51
ACTIVITY - SATISFACTORY TO	FOR THE FOR COMMANDER NAVFAC	

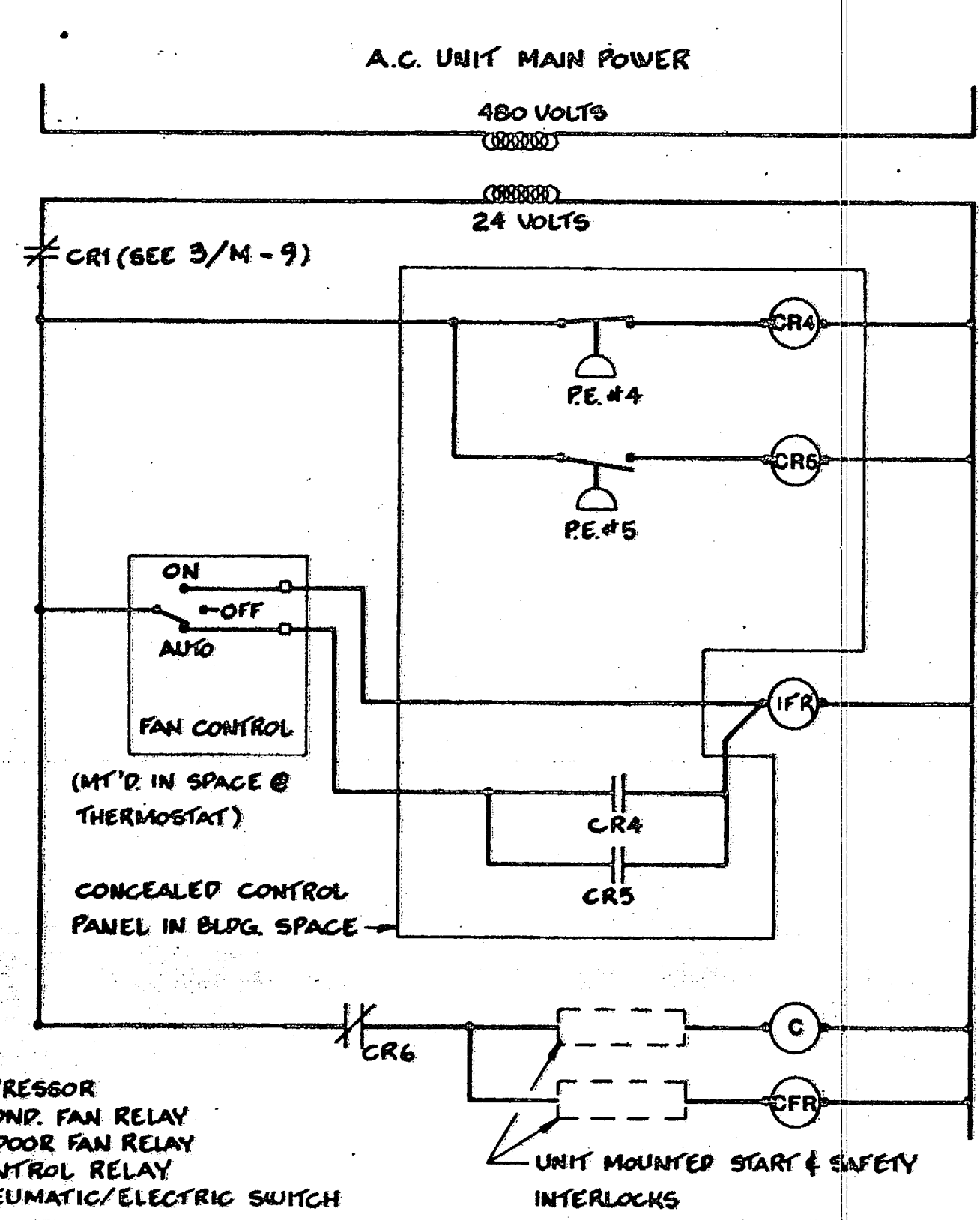


SHEET COMPOSITION
East Sheet
034
01/02

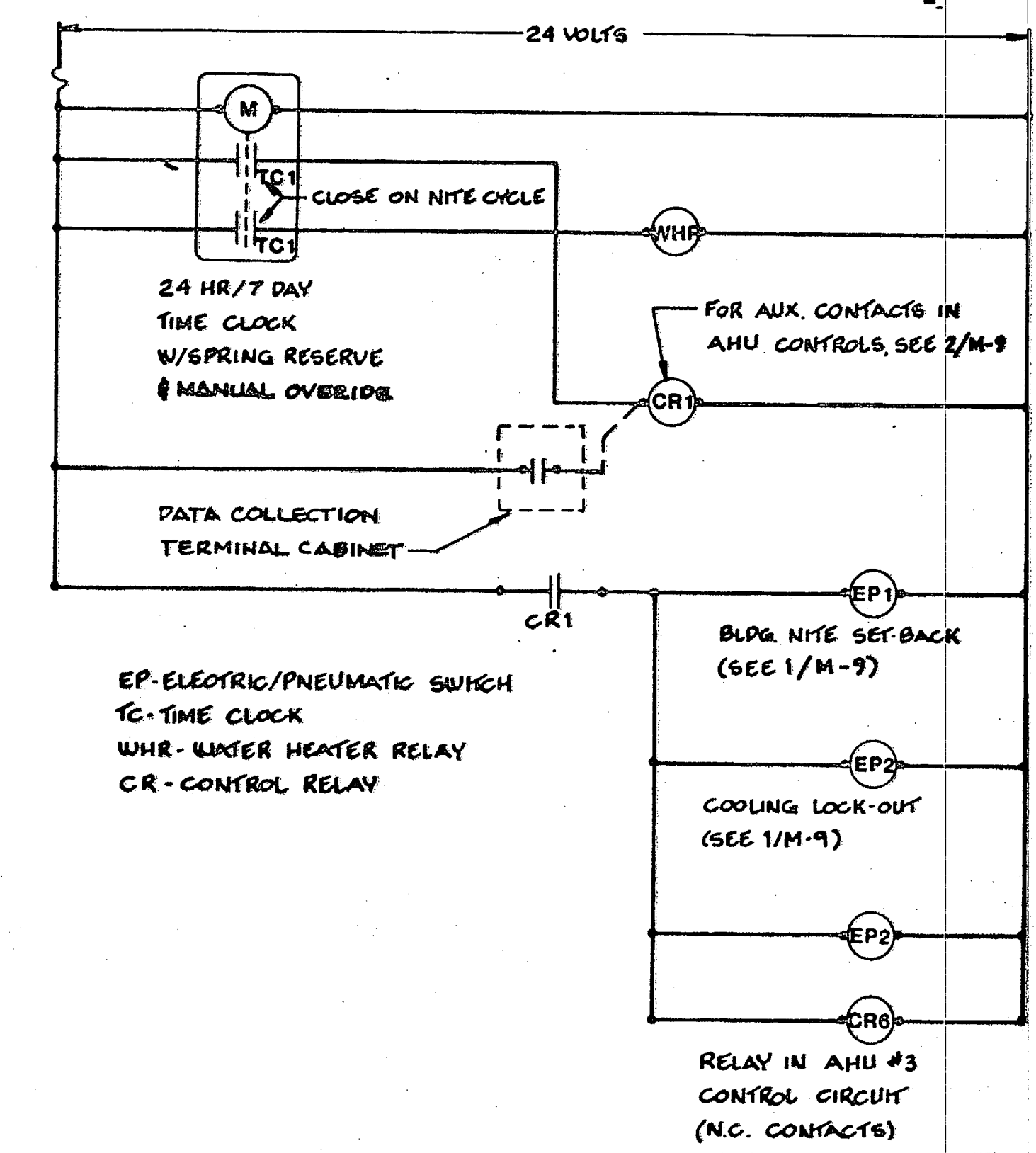




1 HEATING & AIR CONDITIONING PNEUMATIC CONTROL DIAGRAM
 M-2 M-1 M-9 NO SCALE
 M-3 M-4

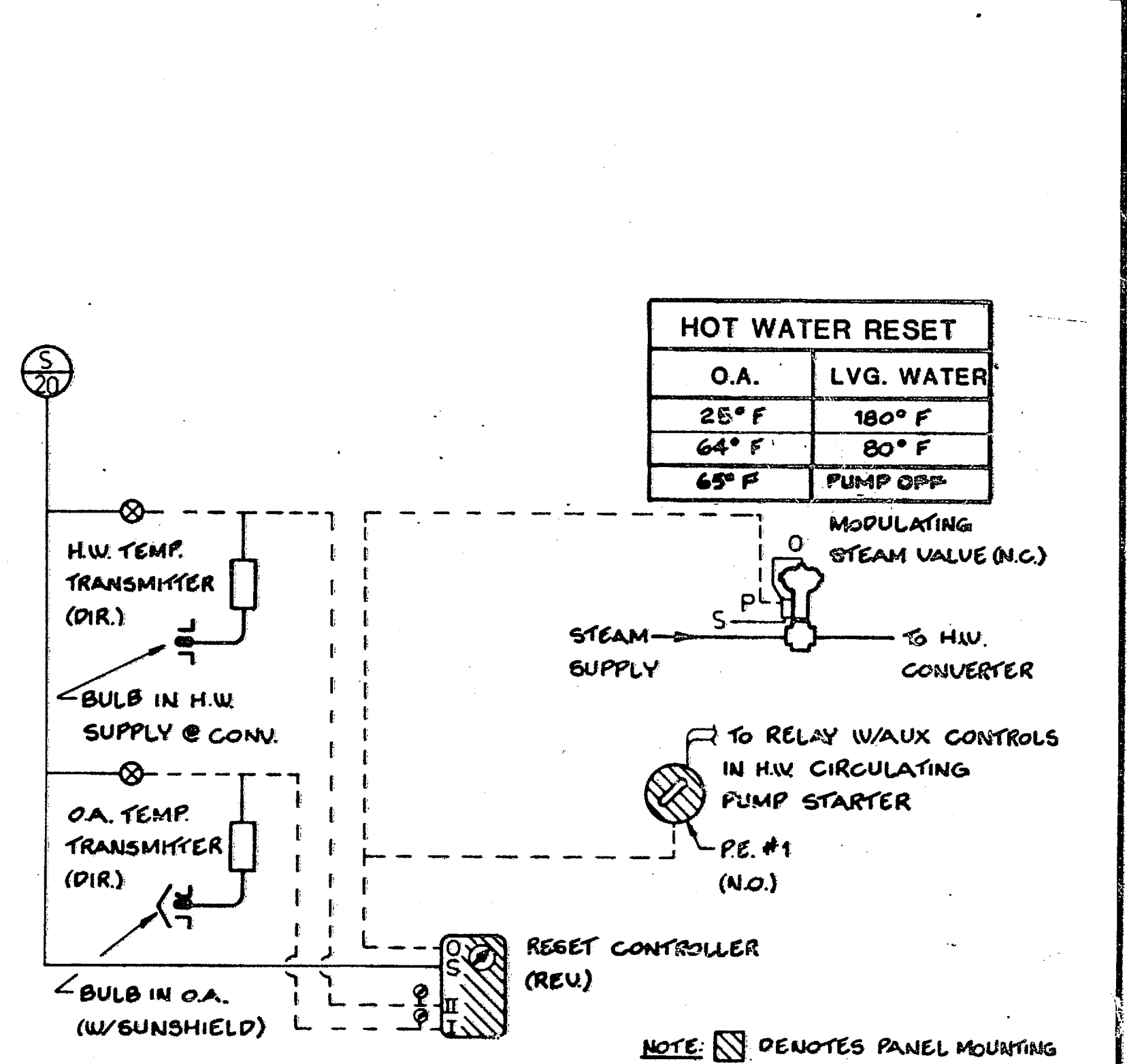


2 TYPICAL ROOFTOP A/C UNIT CONTROL WIRING
 M-2 M-1 M-9 NO SCALE
 M-3 M-4

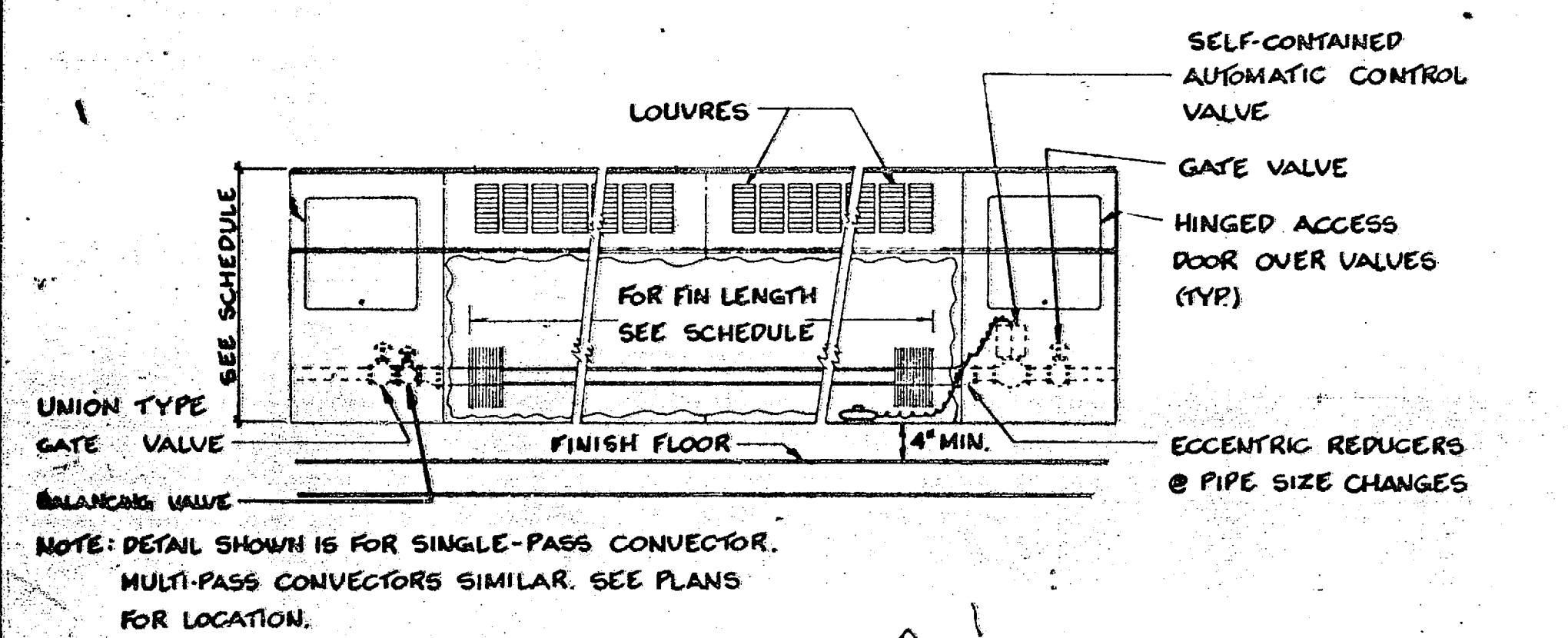


3 BUILDING MASTER CONTROL
 M-2 M-1 M-9 NO SCALE
 M-3 M-4

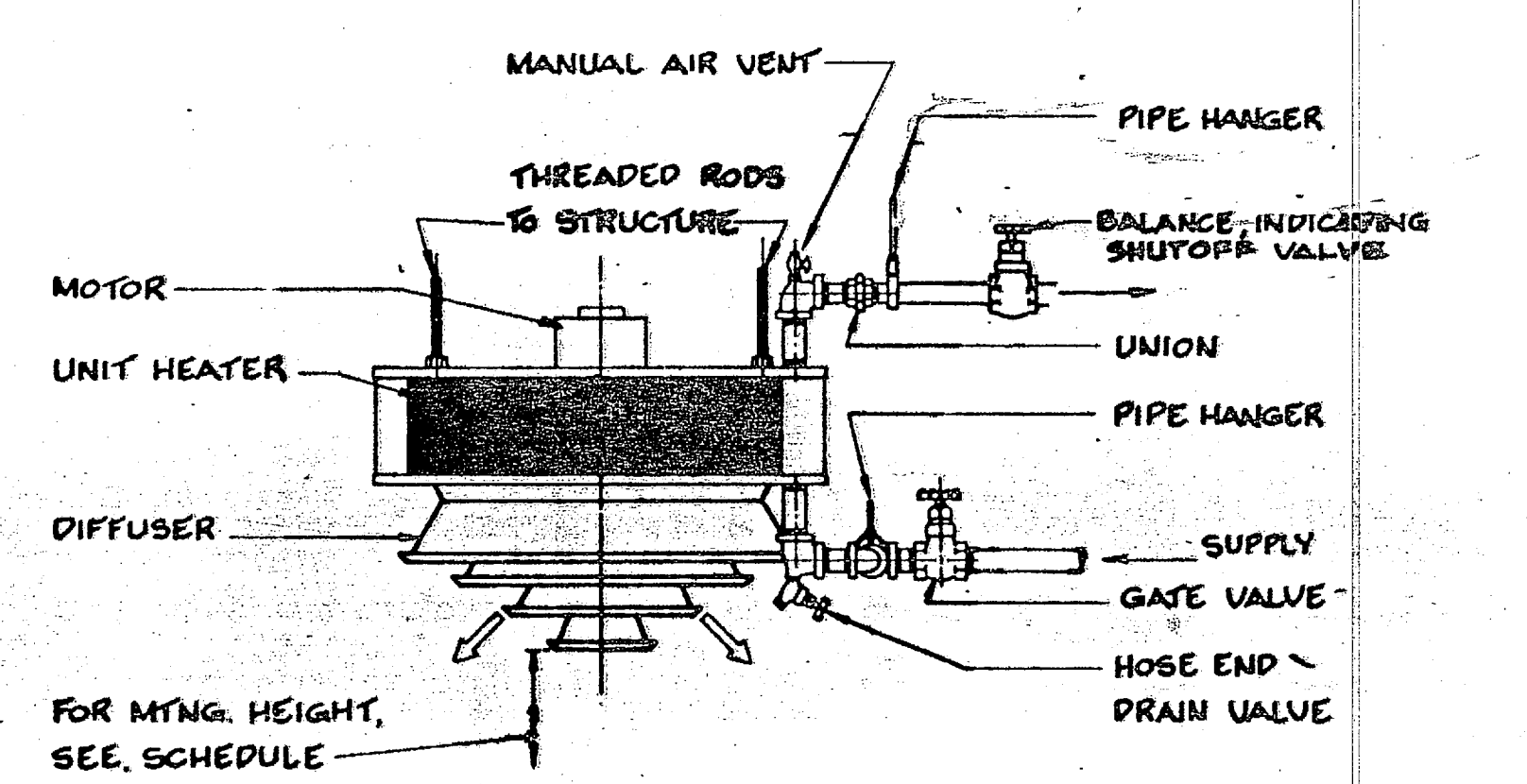
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED



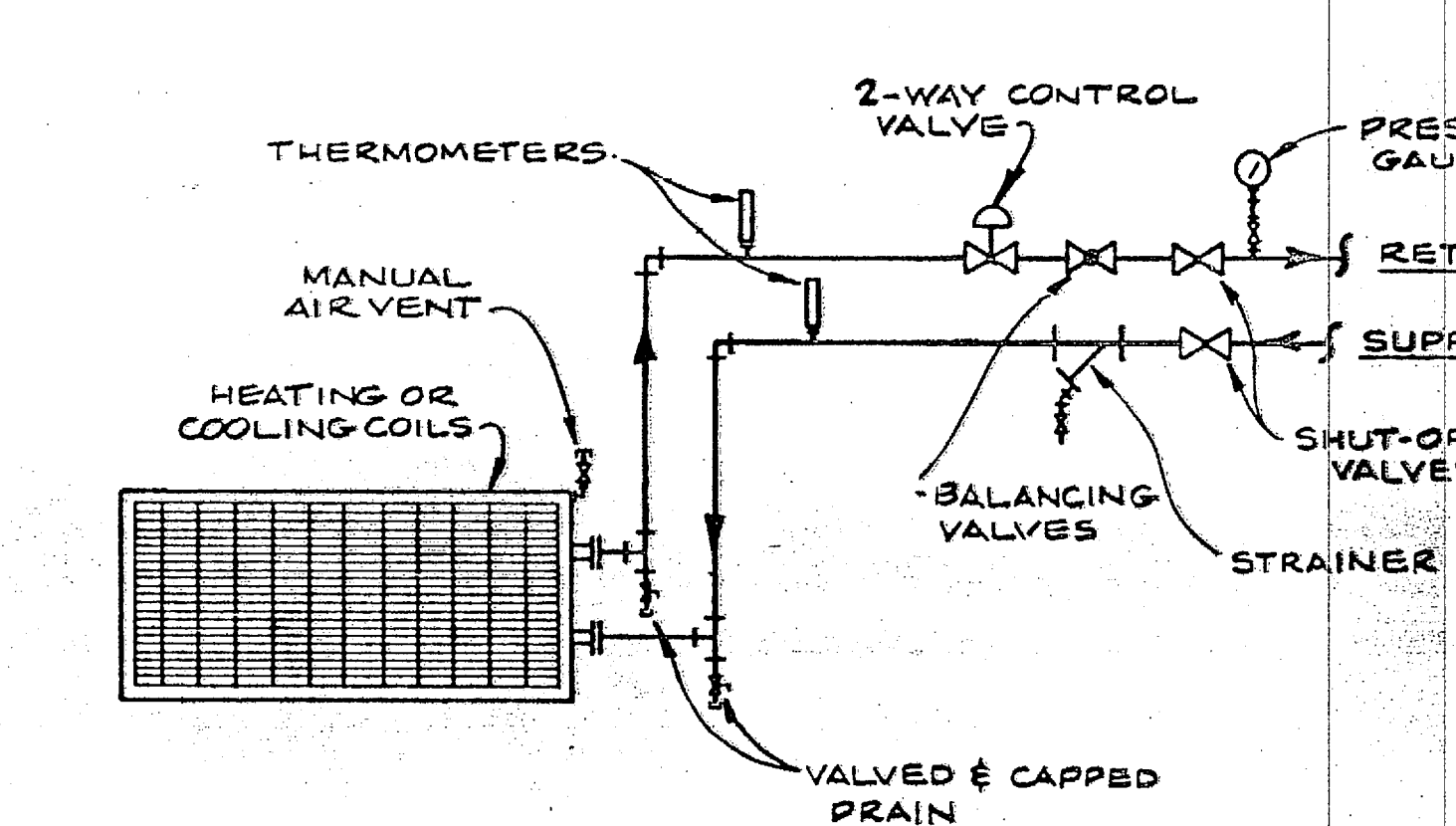
4 HOT WATER CONVERTER CONTROL
 M-2 M-1 M-9 NO SCALE
 M-3 M-4



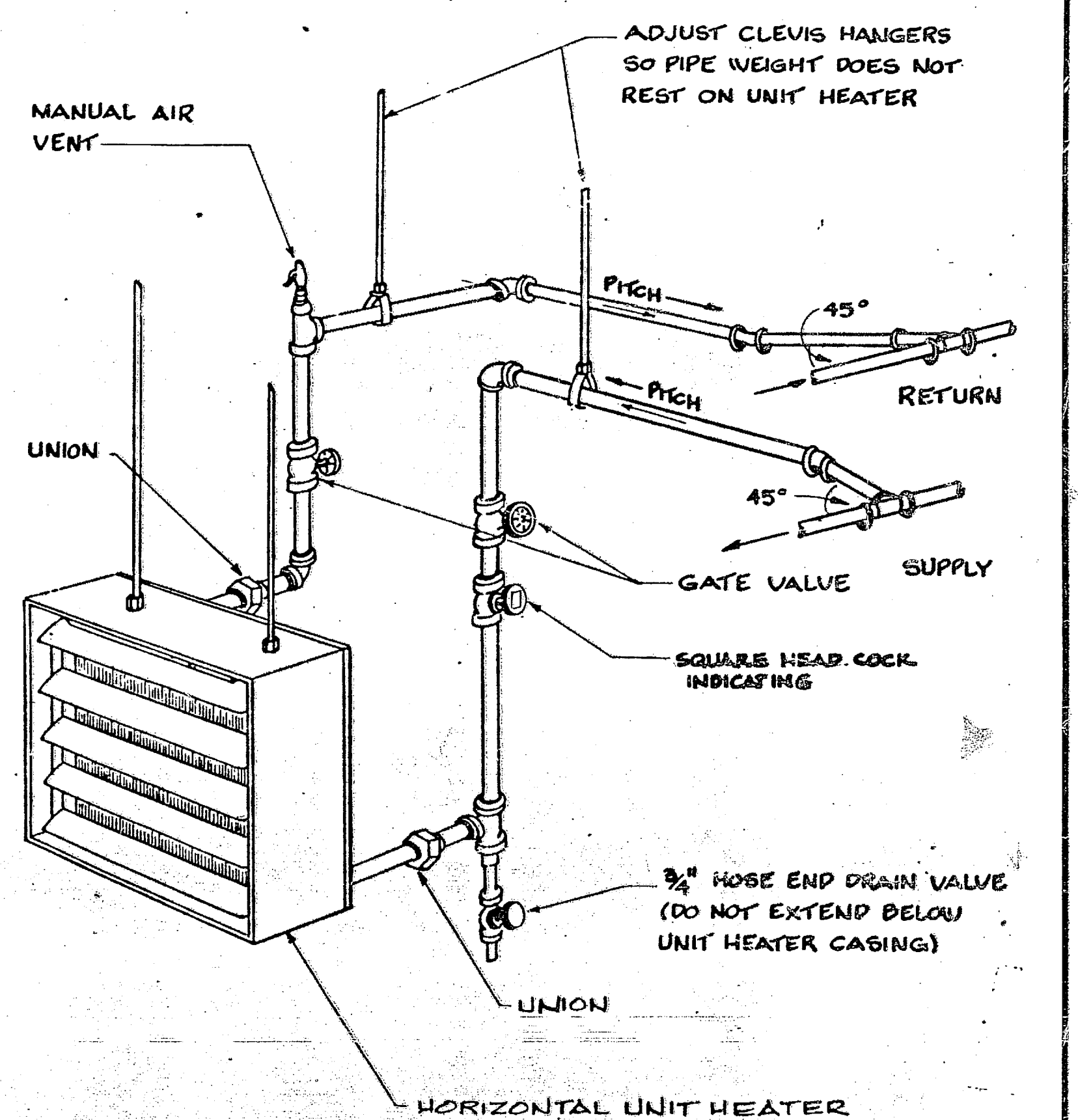
5 HOT WATER CONVECTOR
 M-2 M-1 M-9 NO SCALE
 M-3 M-4



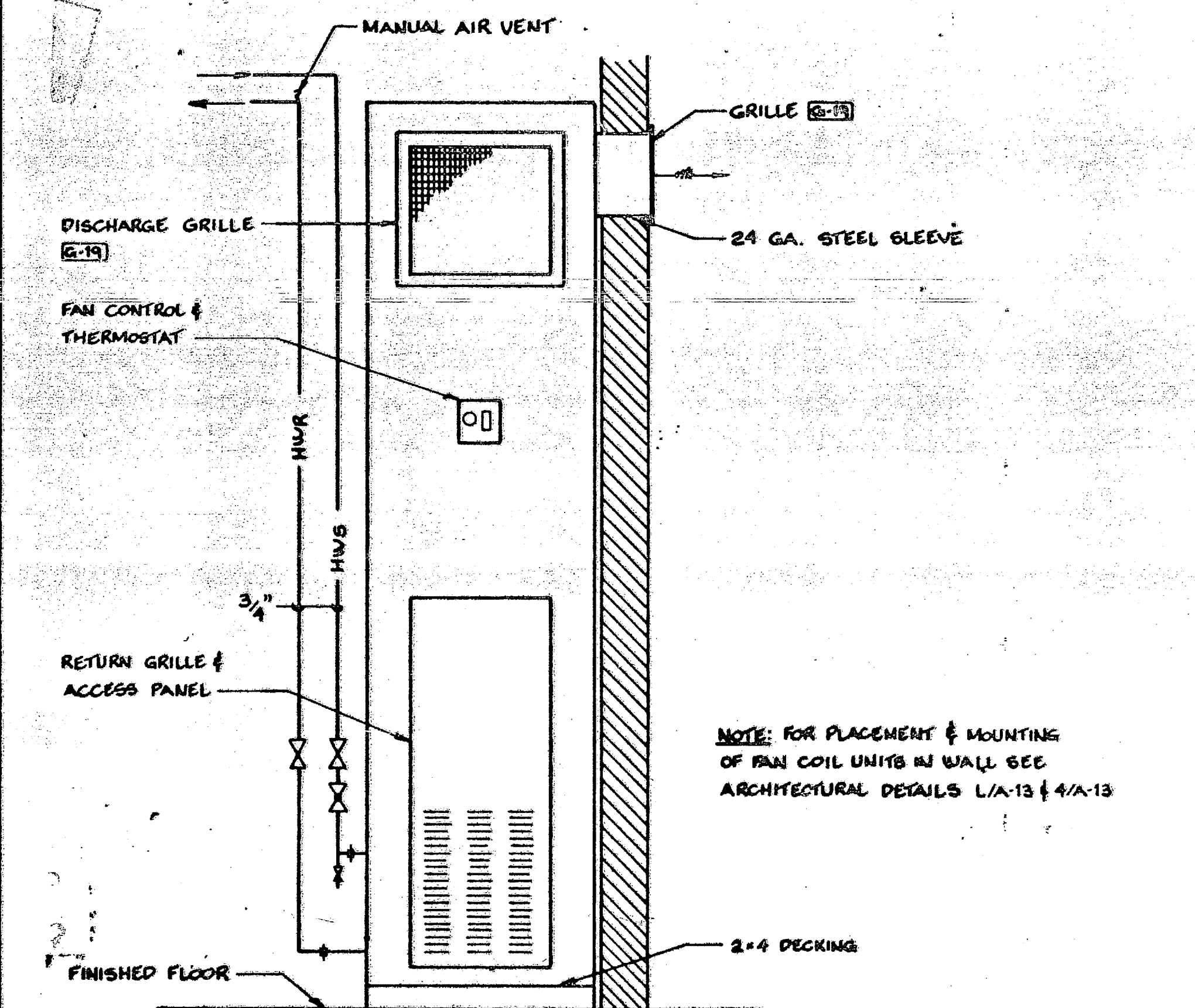
6 VERTICAL UNIT HEATER
 M-2 M-1 M-9 NO SCALE
 M-3 M-4



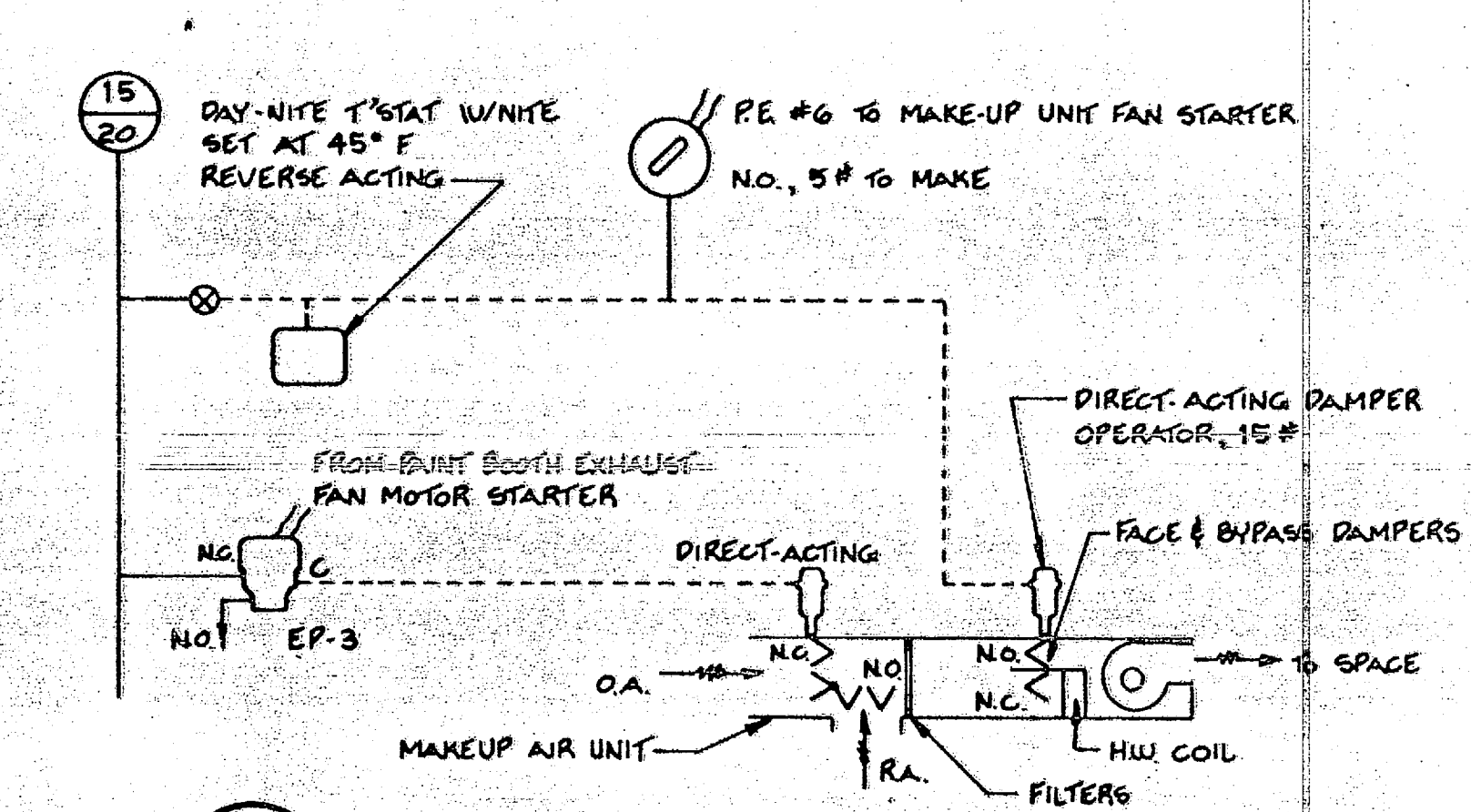
7 HOT WATER COIL
 M-2 M-1 M-9 NO SCALE
 M-3 M-4



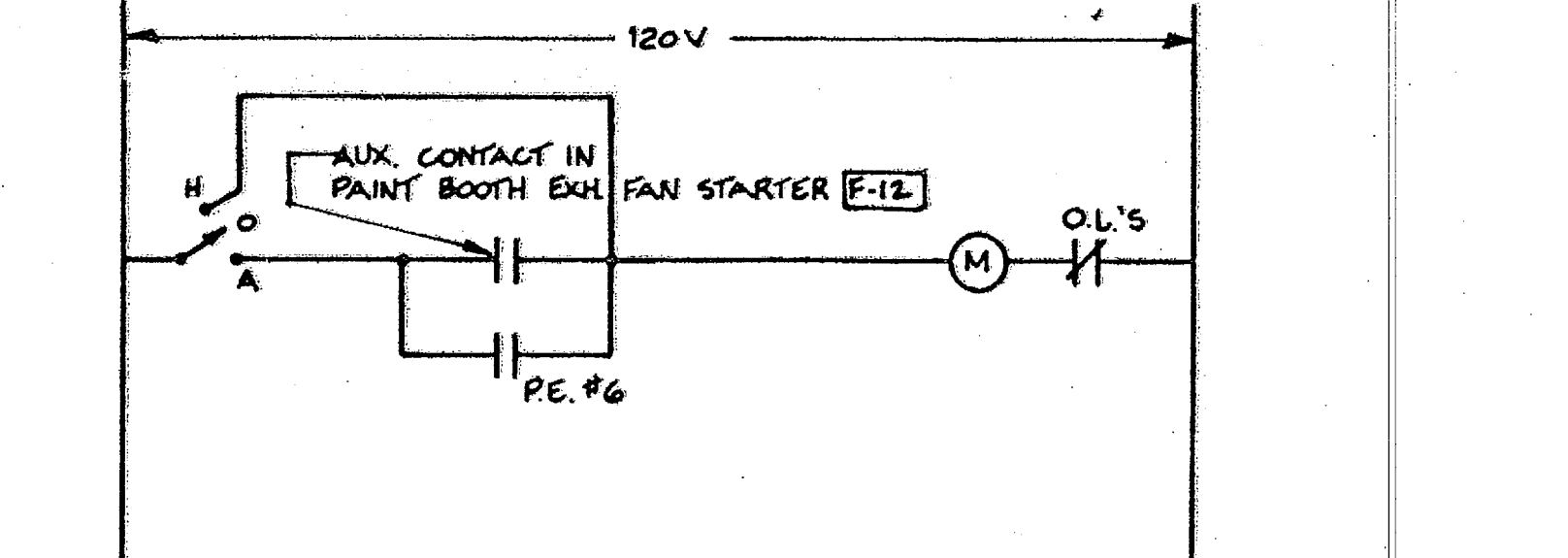
8 HORIZONTAL UNIT HEATER
 M-2 M-1 M-9 NO SCALE
 M-3 M-4



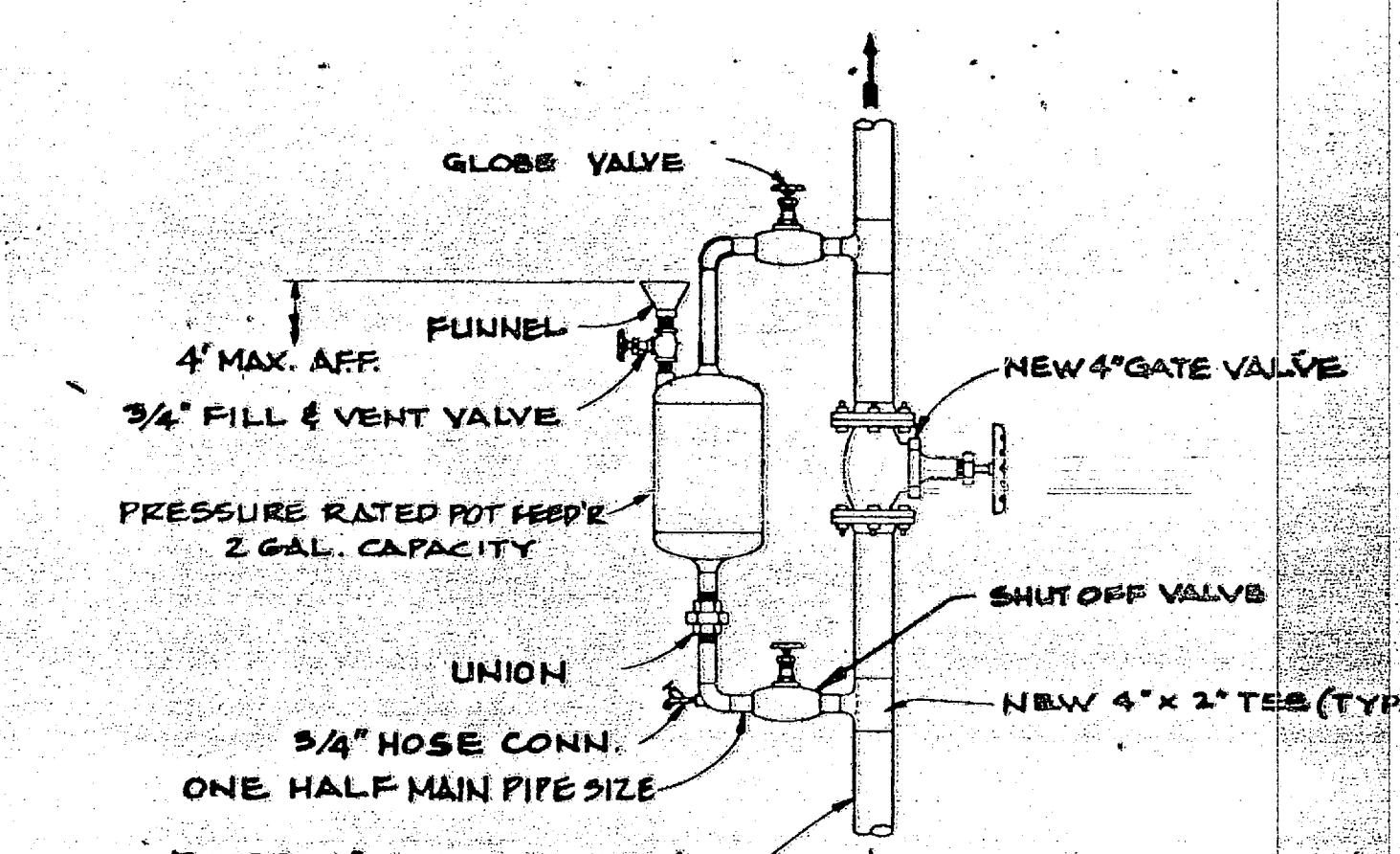
9 FAN COIL NO. 1 DETAIL
 M-2 M-1 M-9 NO SCALE
 M-3 M-4



10 PAINT BAY MAKE-UP AIR CONTROL
 M-10 M-9 NO SCALE
 M-11 M-12



12 ELECTRICAL CONTROL - MAKE-UP AIR UNIT
 M-10 M-9 NO SCALE
 M-11 M-12



11 CHEMICAL POT FEEDER
 M-4 M-9 NO SCALE
 M-11 M-12

RECORD DRAWING LETTER DATED AUG 18 1966 M-9

OLSEN ASSOCIATES RALEIGH, N. CAROLINA ENGINEERS & ARCHITECTS

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND ATLANTIC DIVISION NAVAL STATION NORFOLK, VIRGINIA

MARINE CORPS BASE, CAMP LEJEUNE, N.C. COMBAT VEHICLE MAINTENANCE SHOP

HEATING DETAILS

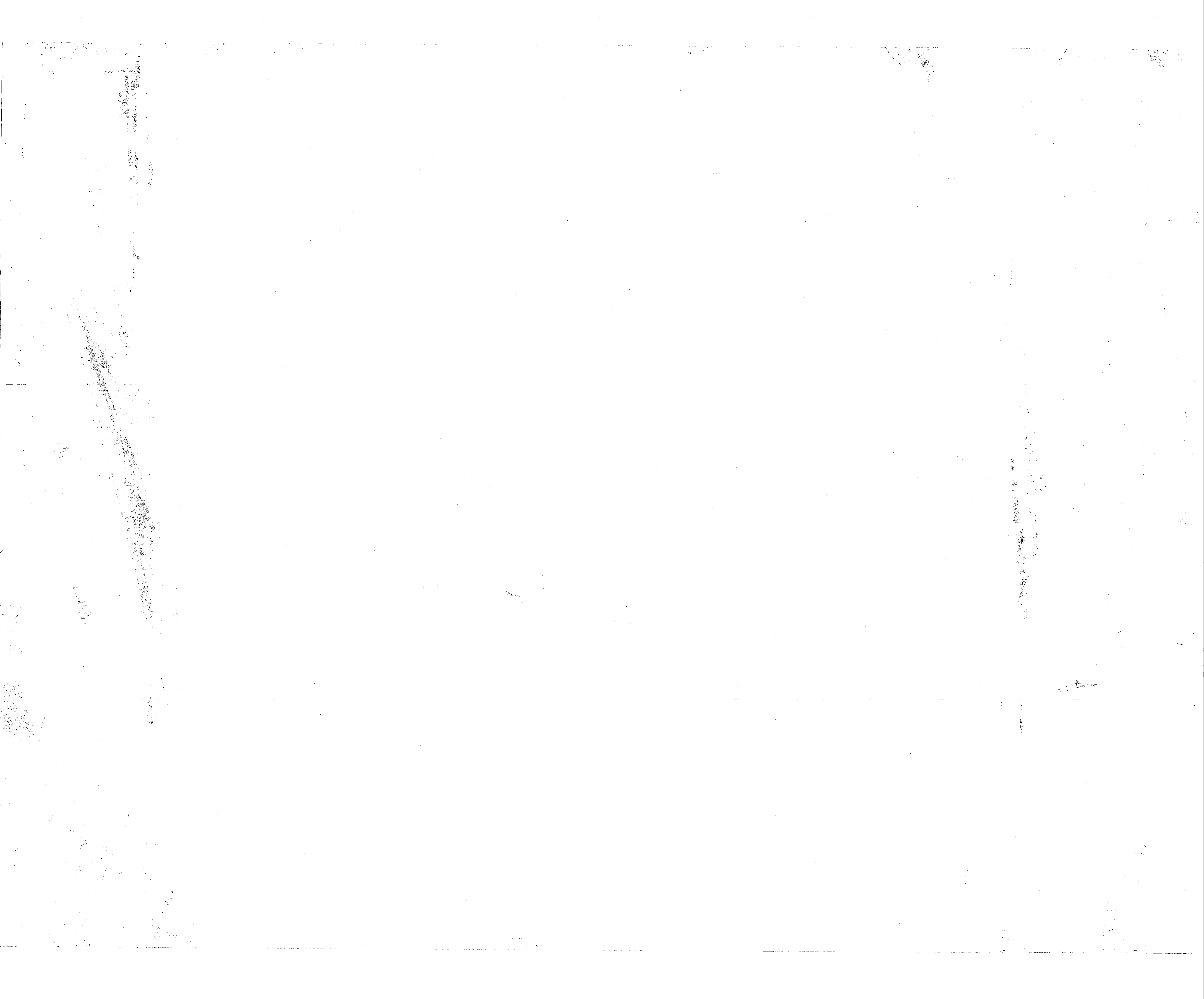
SCALE N.T.S. SPEC. 05-81-1131 SHEET 43 OF 51

APPROVED DATE

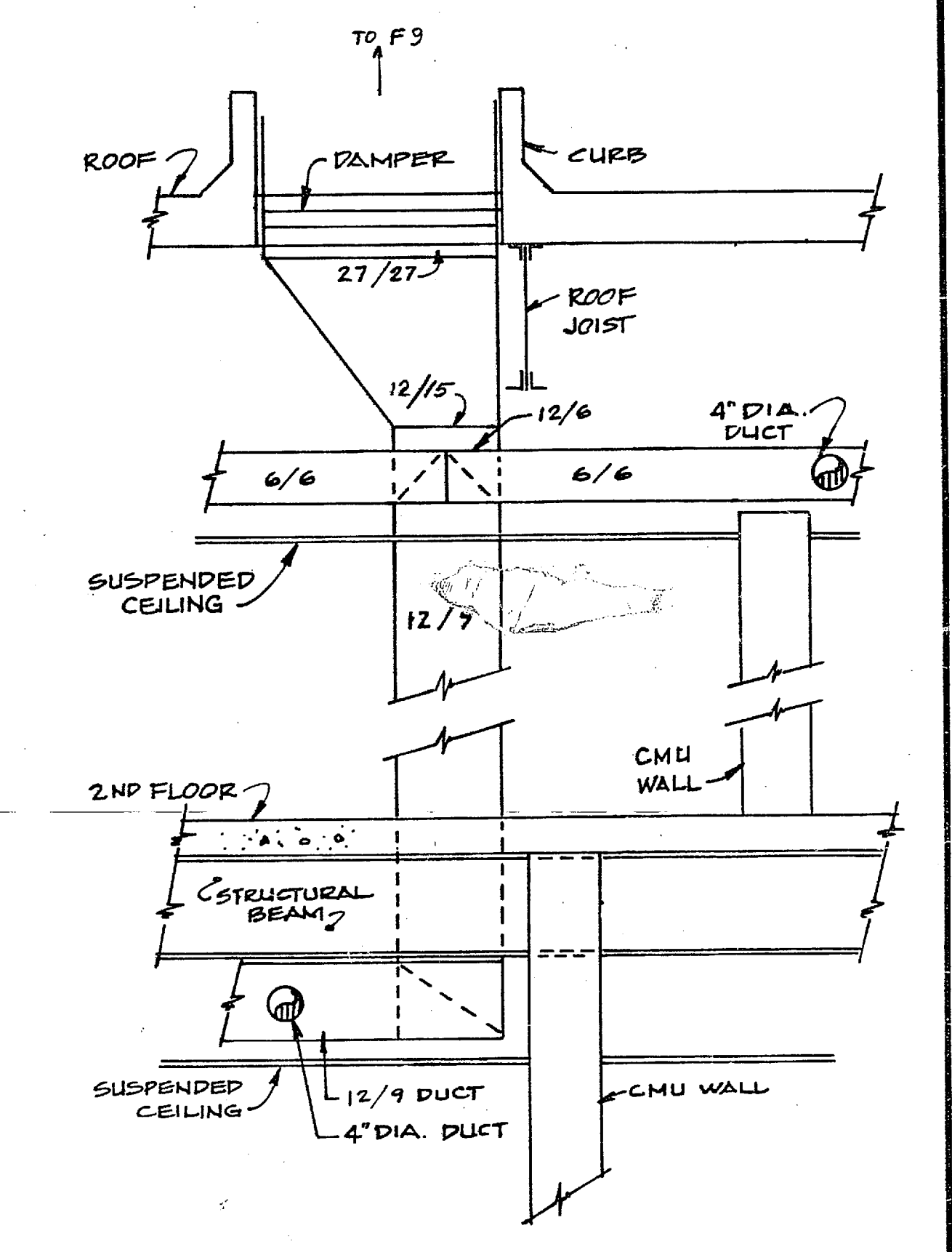
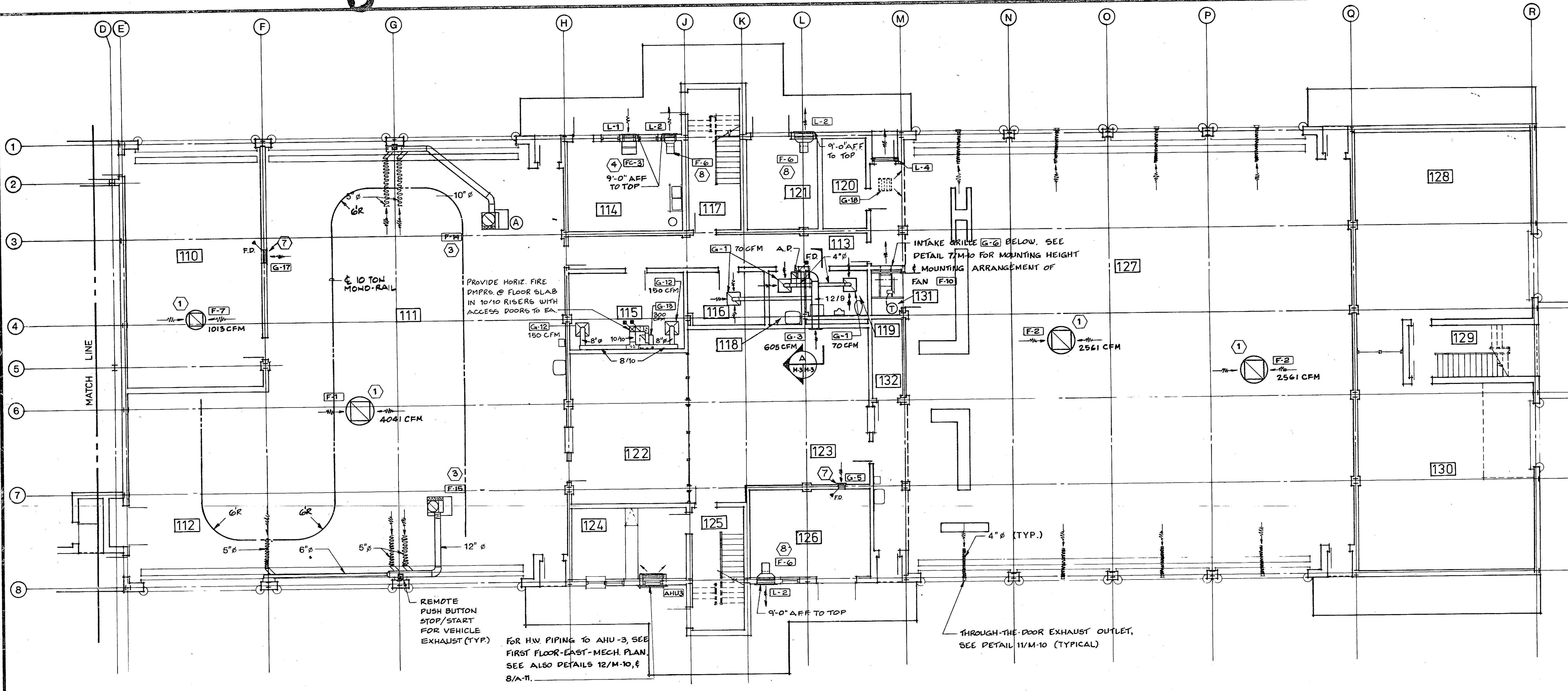
ACTIVITY SATISFACTORY TO DATE

FOR STD FOR COMMANDER NAVFAC

1886

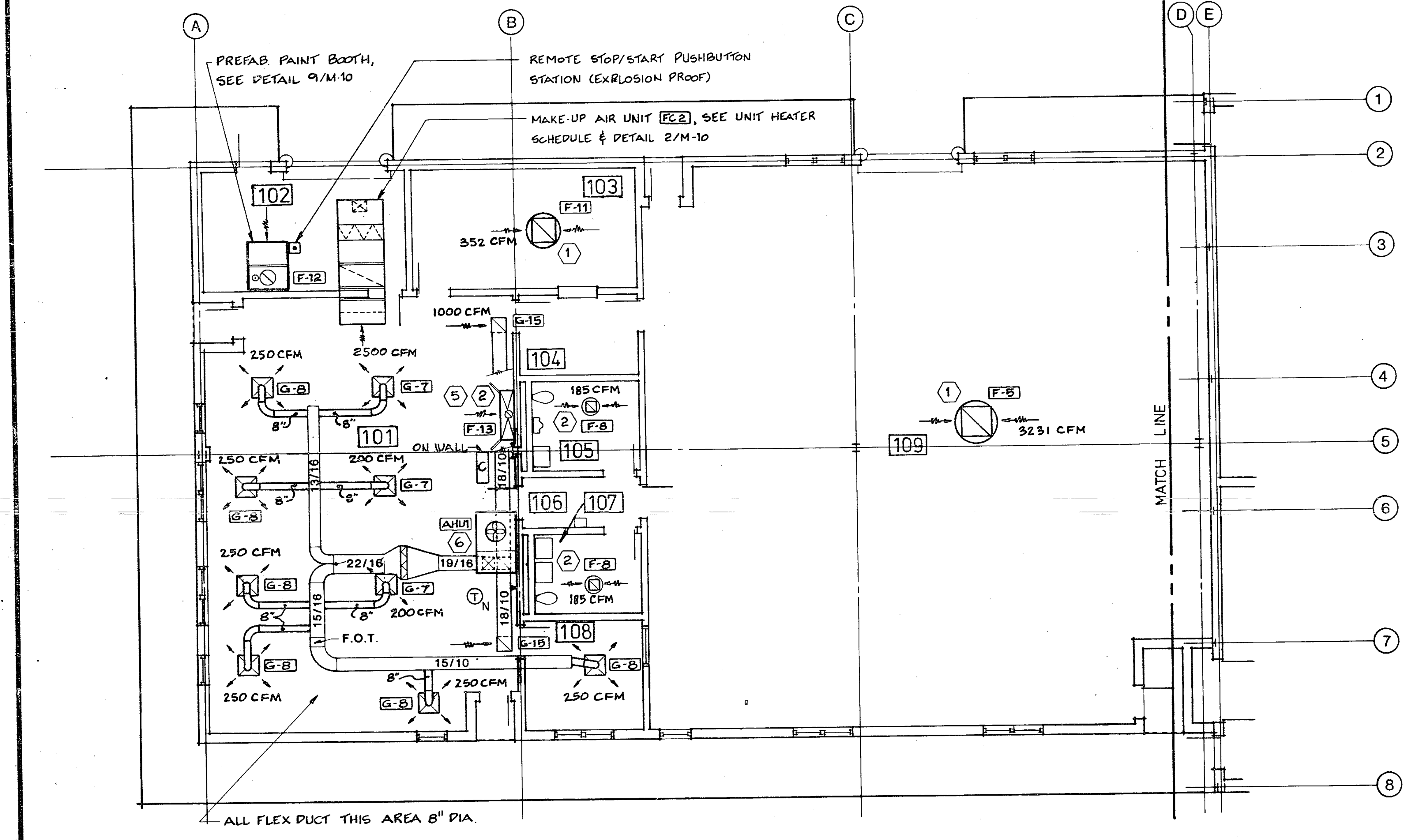


REVISIONS			
BYM	DESCRIPTION	DATE	APPROVED
(A)	REVISED AS-BUILT	4/8/86	TBD



FIRST FLOOR-EAST- HVAC PLAN
1/8" = 1'-0"

SECTION A
3/4" = 1'-0"



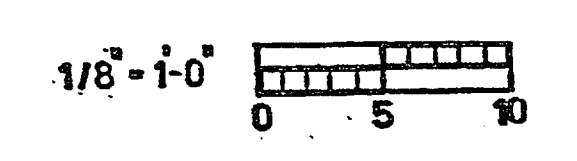
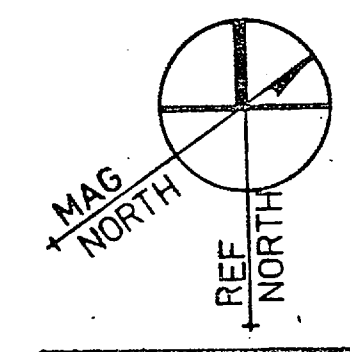
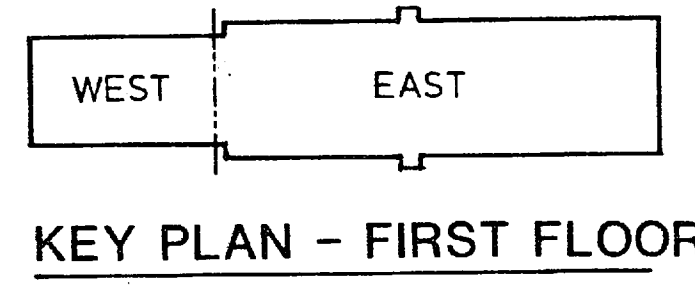
FIRST FLOOR-WEST- HVAC PLAN
1/8" = 1'-0"

KEYNOTES:

1. BELT-DRIVEN PROPELLER FAN. SEE DETAIL 1/M-10.
2. DIRECT-DRIVE FAN. SEE DETAIL 2/M-10.
3. VEHICLE EXHAUST FAN. SEE DETAIL 10/M-10.
4. MAKE-UP AIR UNIT. SEE DETAIL 5/M-10 & UNIT HTR SCHEDULE.
5. FLUME HOOD. SEE DETAIL 8/M-10.
6. ROOFTOP AHU. SEE DETAIL 6/M-10.
7. TRANSFER GRILLE, 7'-8" A.F.F. TO BOTTOM.
8. EXHAUST BLOWER. SEE TYP DETAIL 3/M-10.

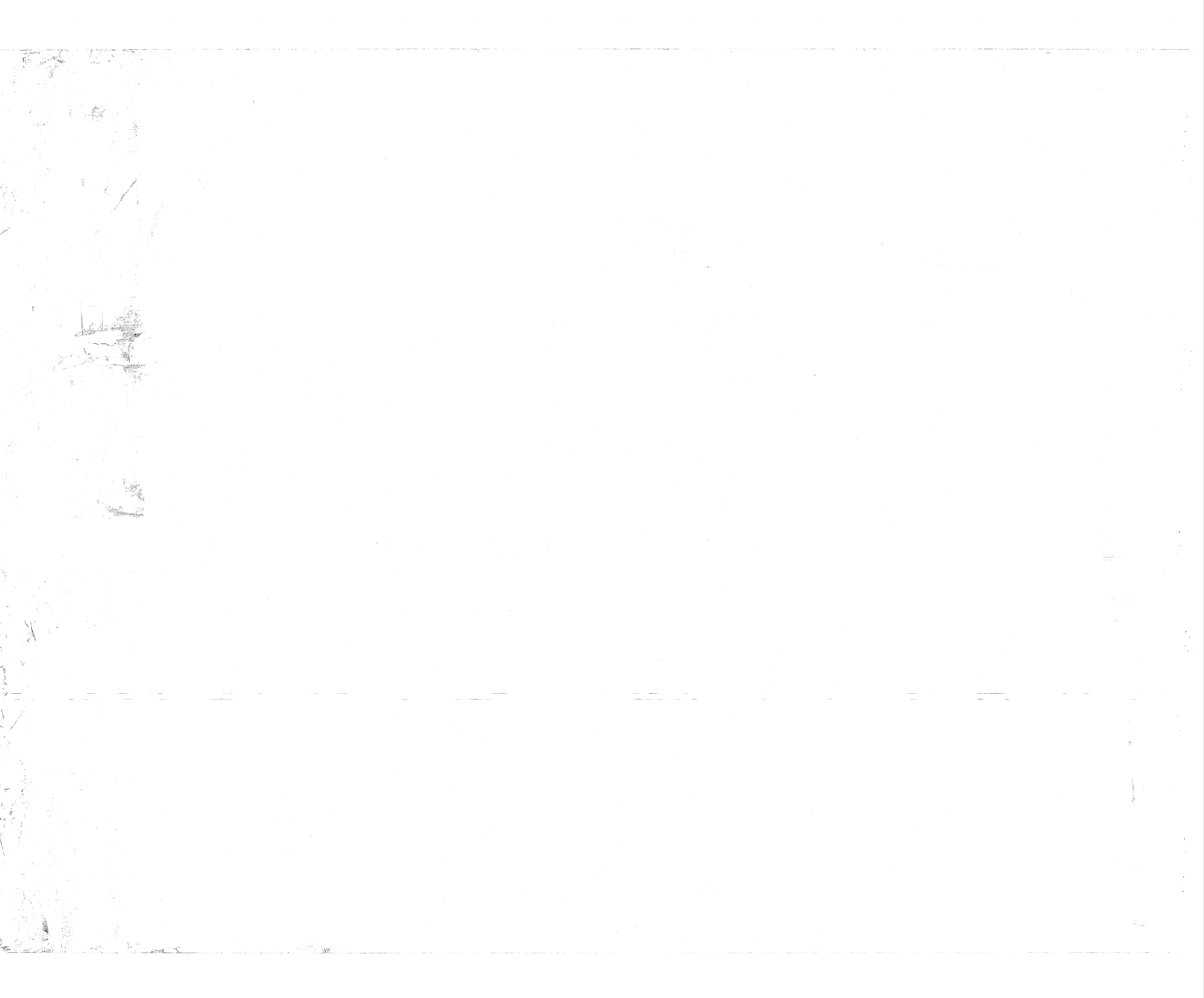
GENERAL NOTES

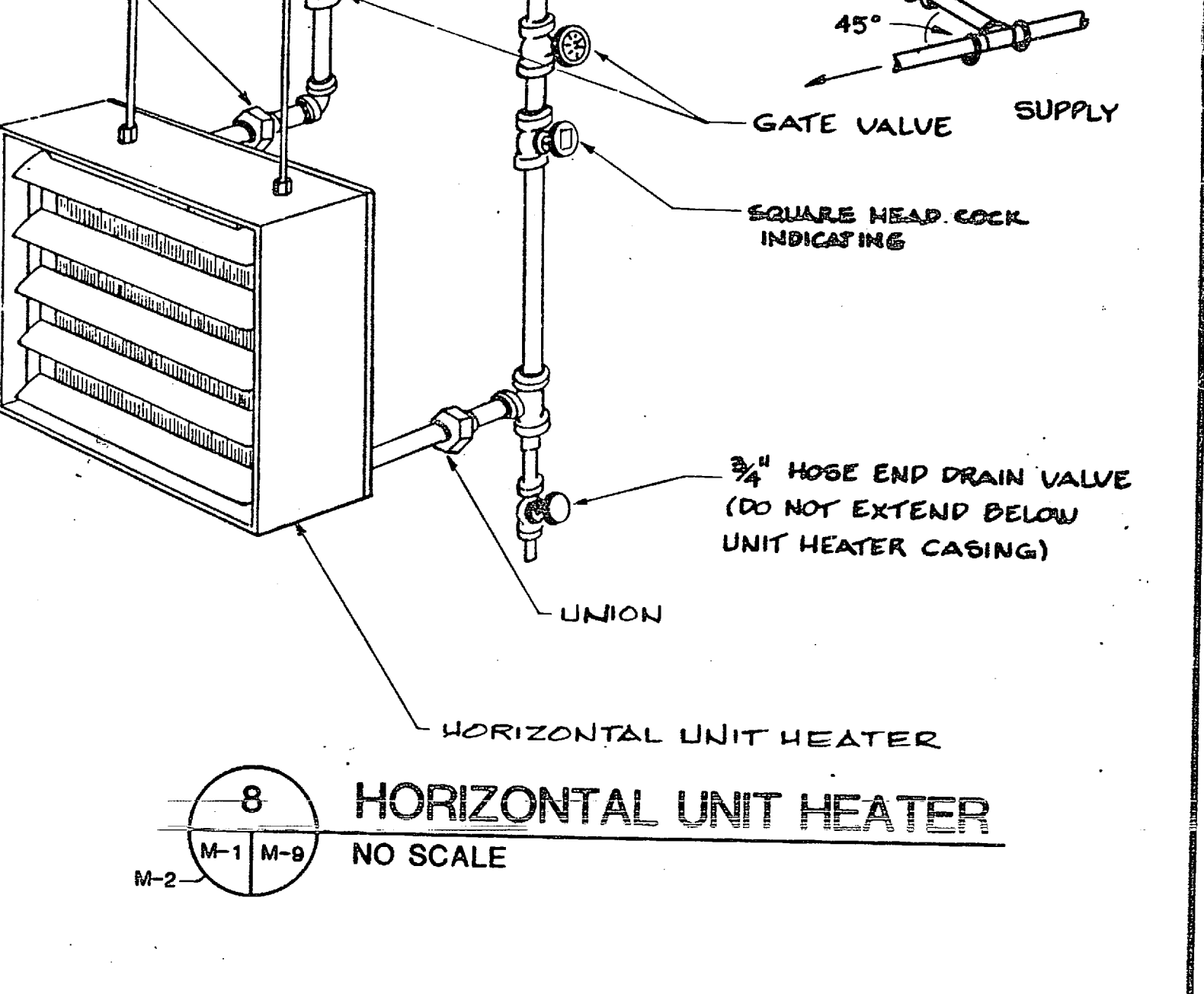
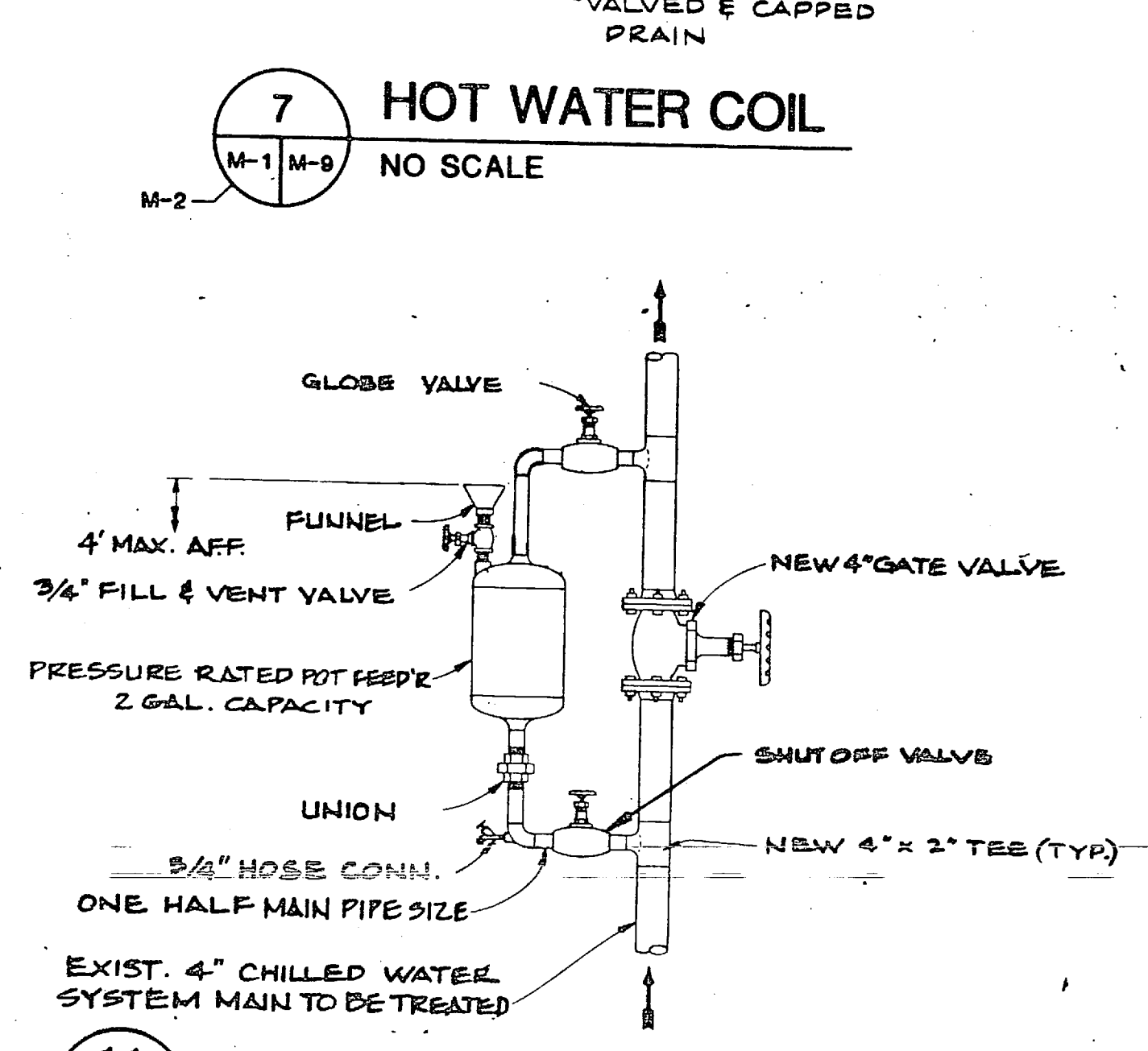
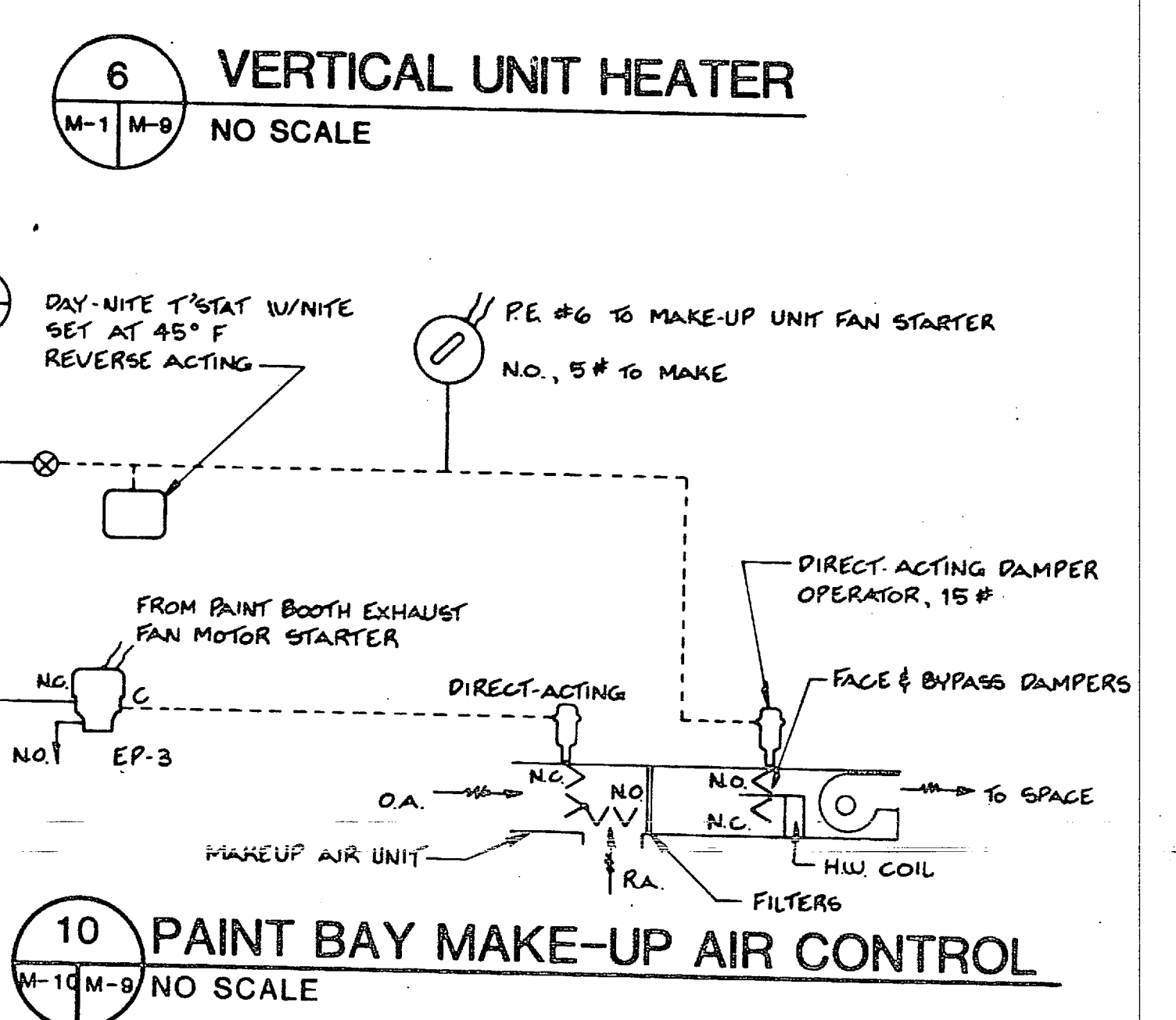
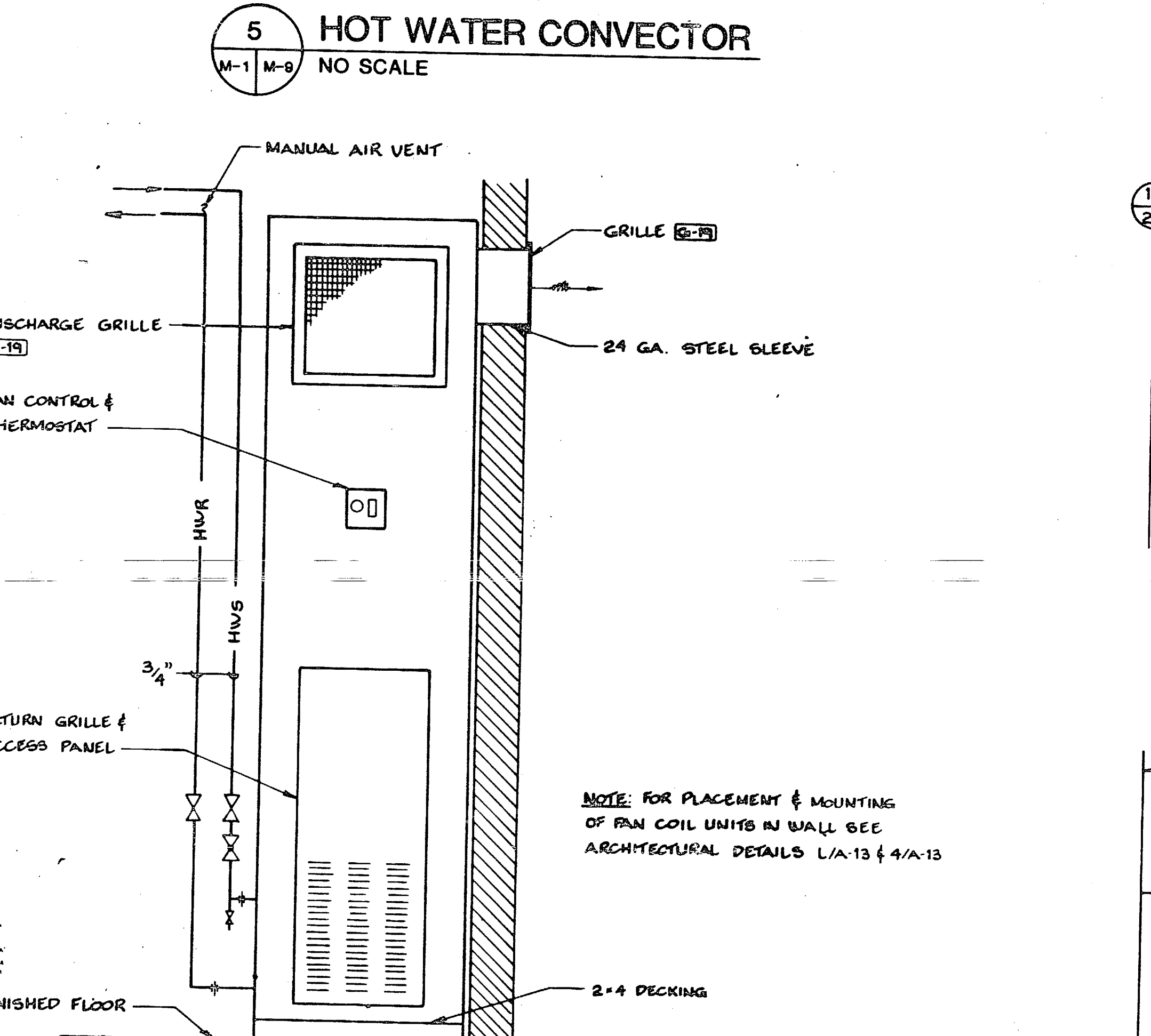
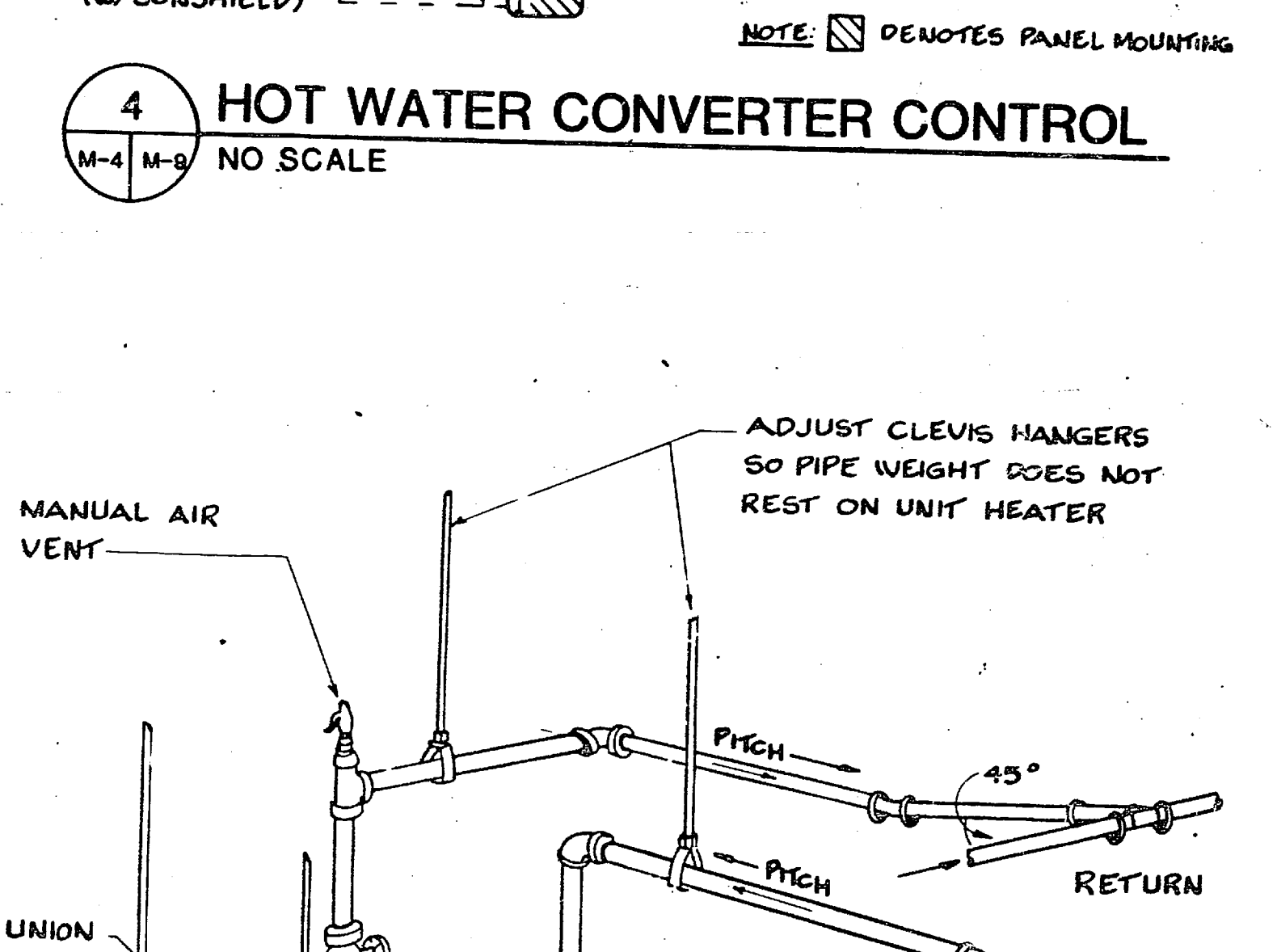
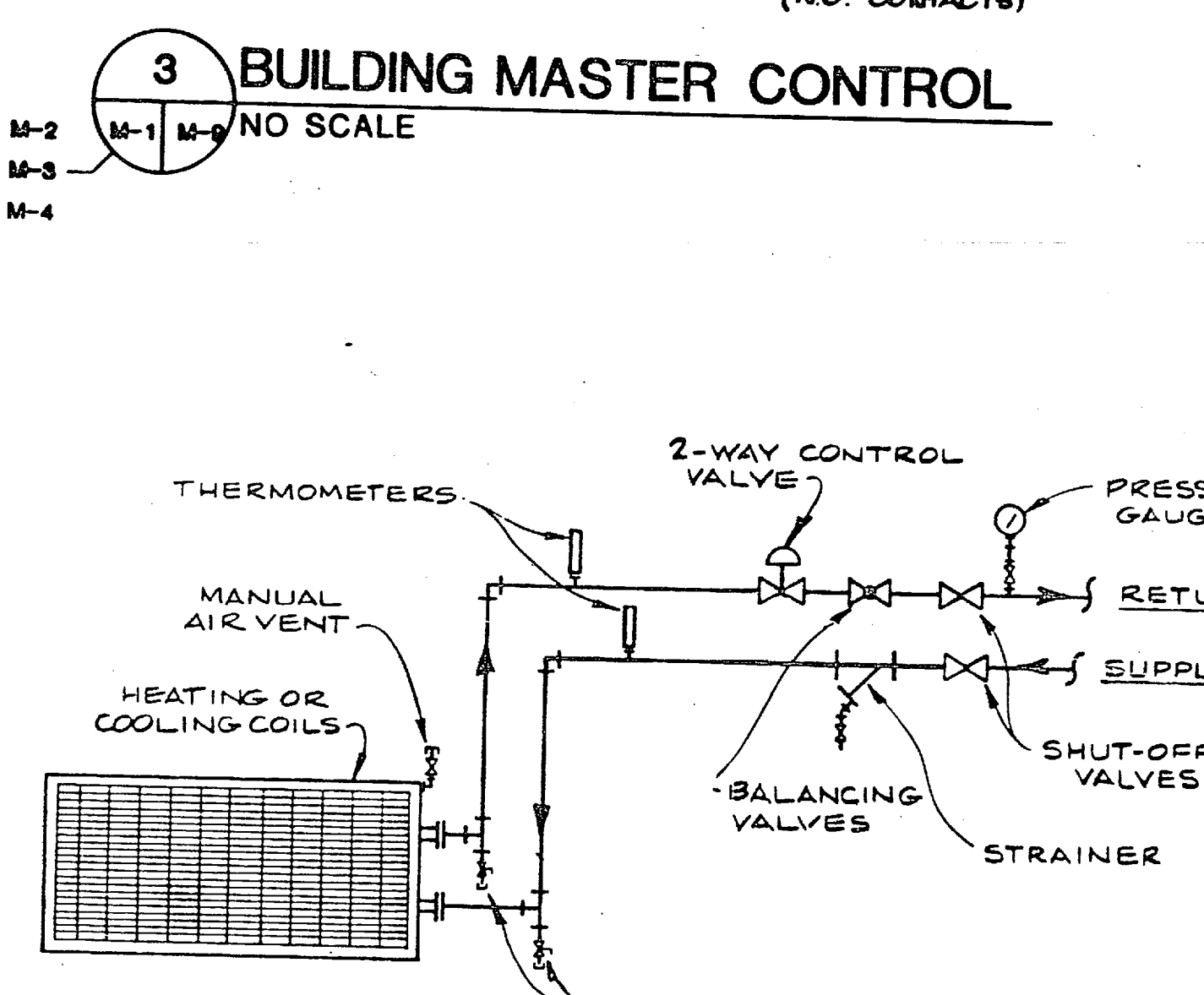
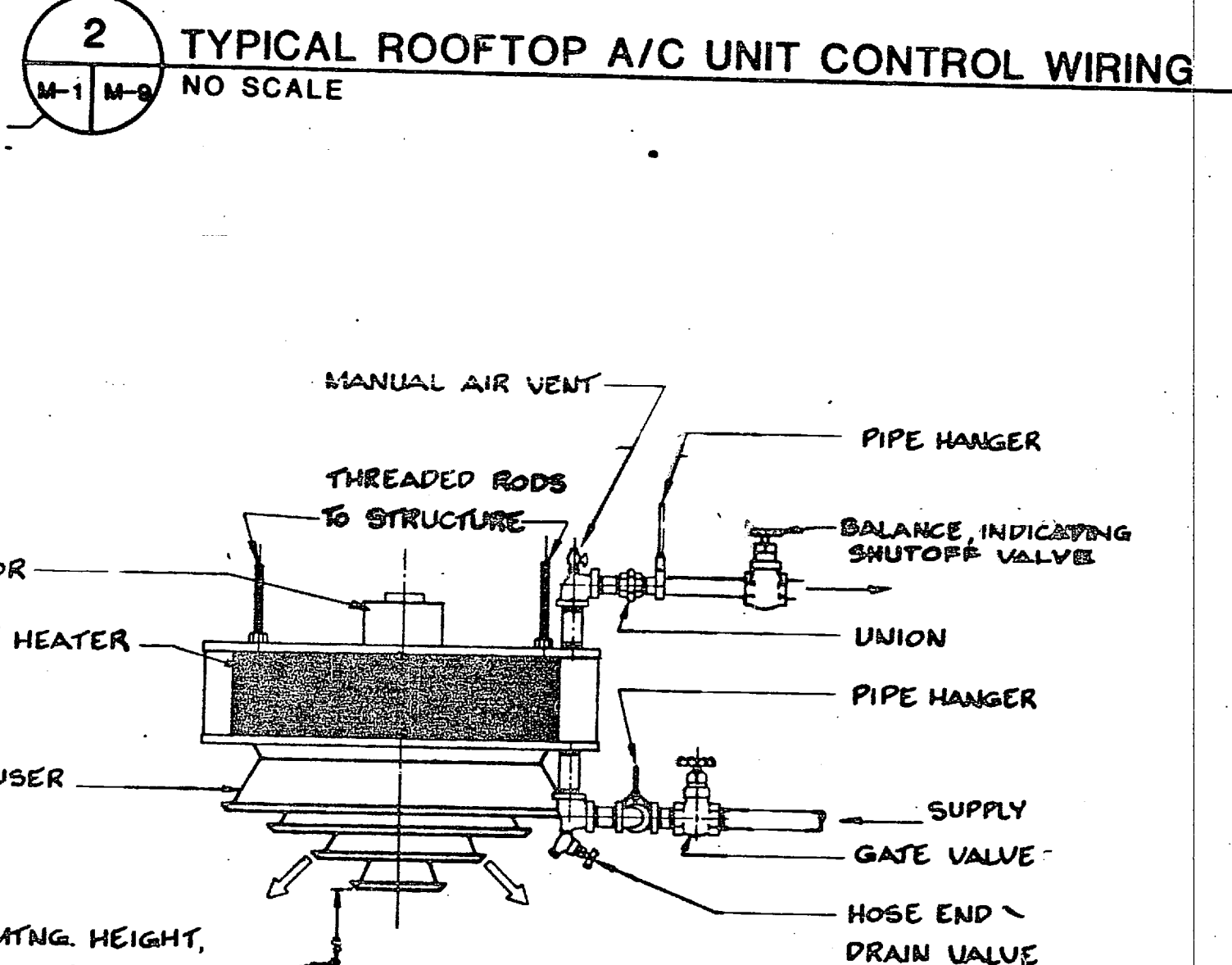
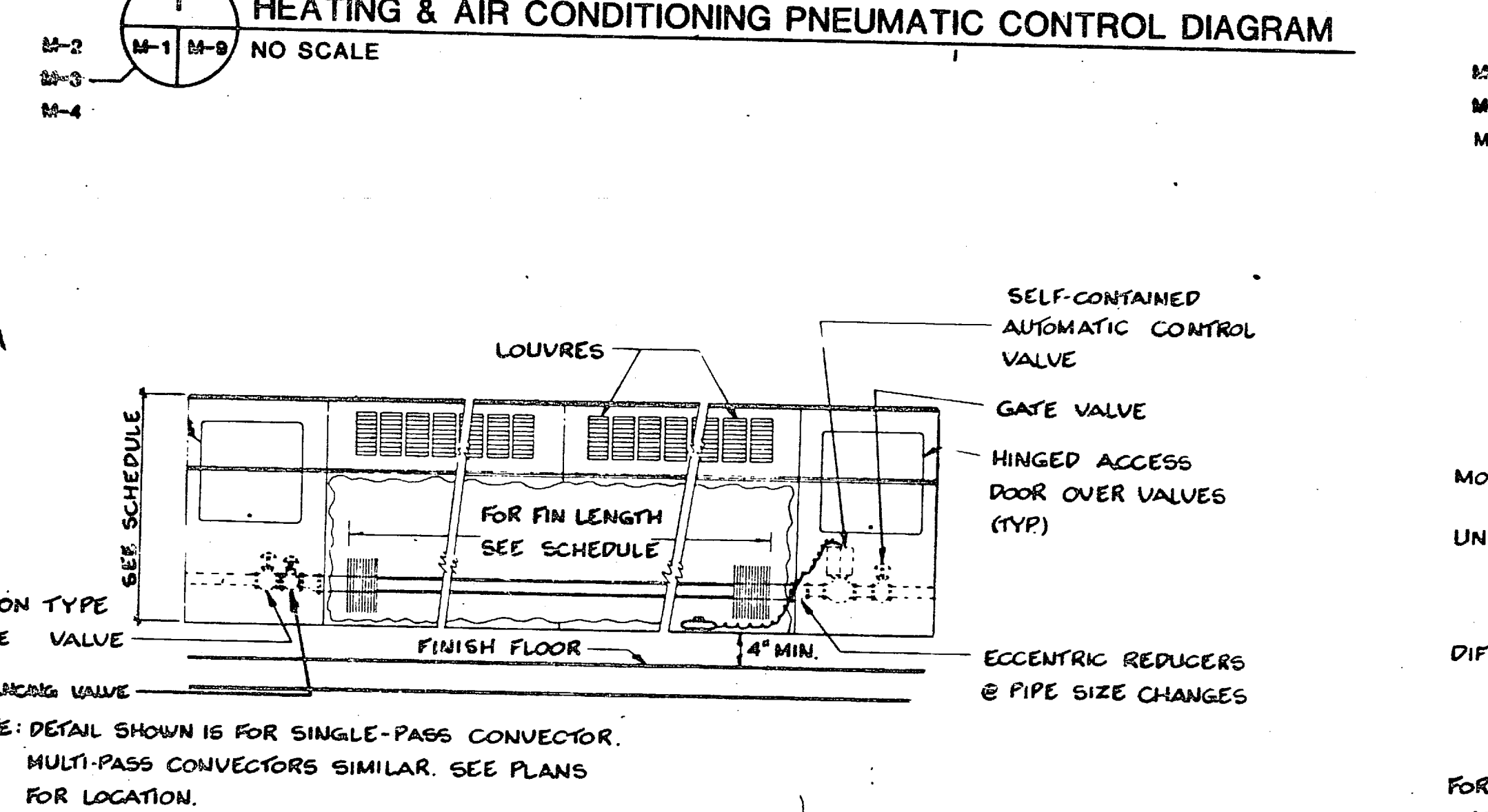
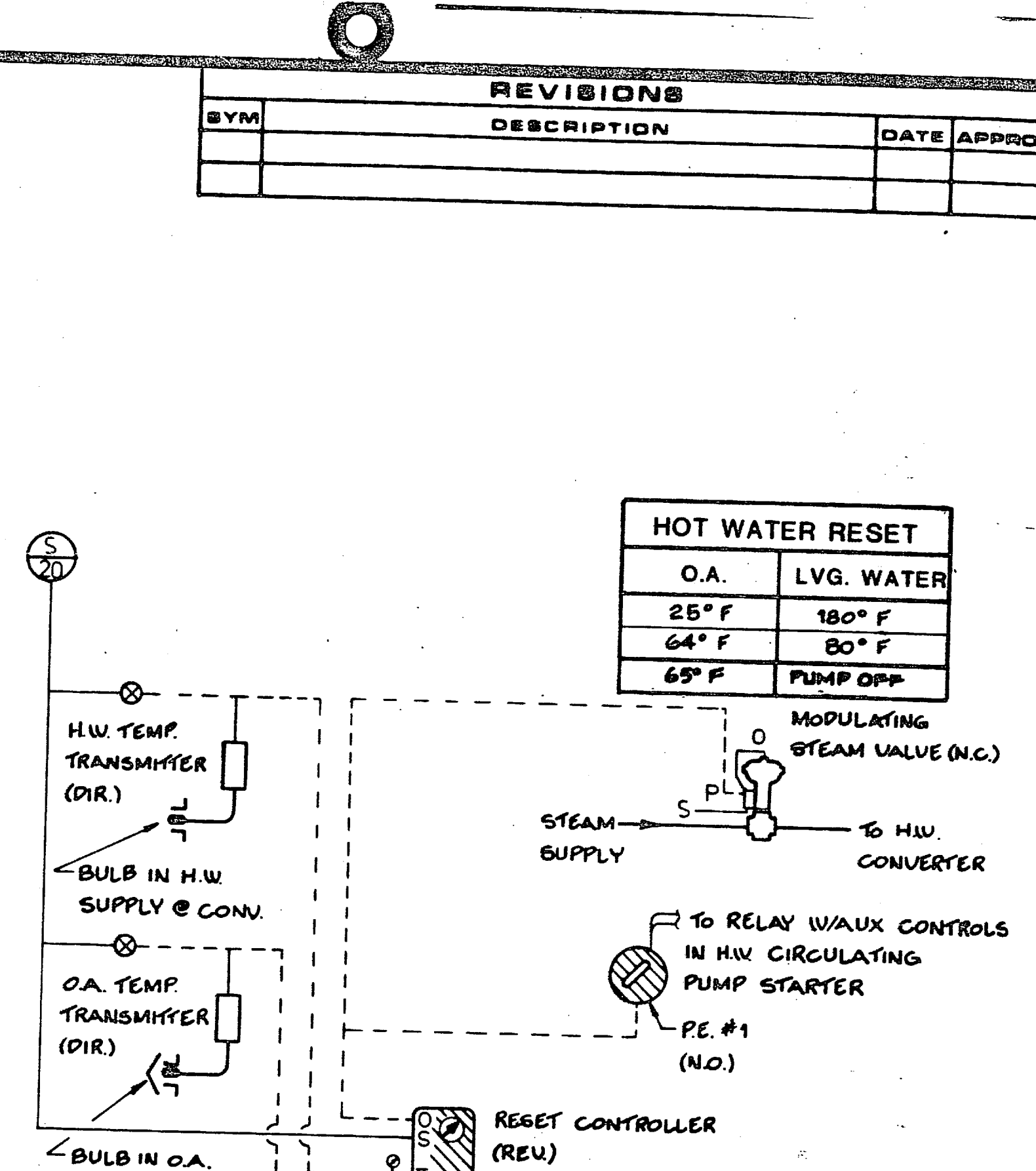
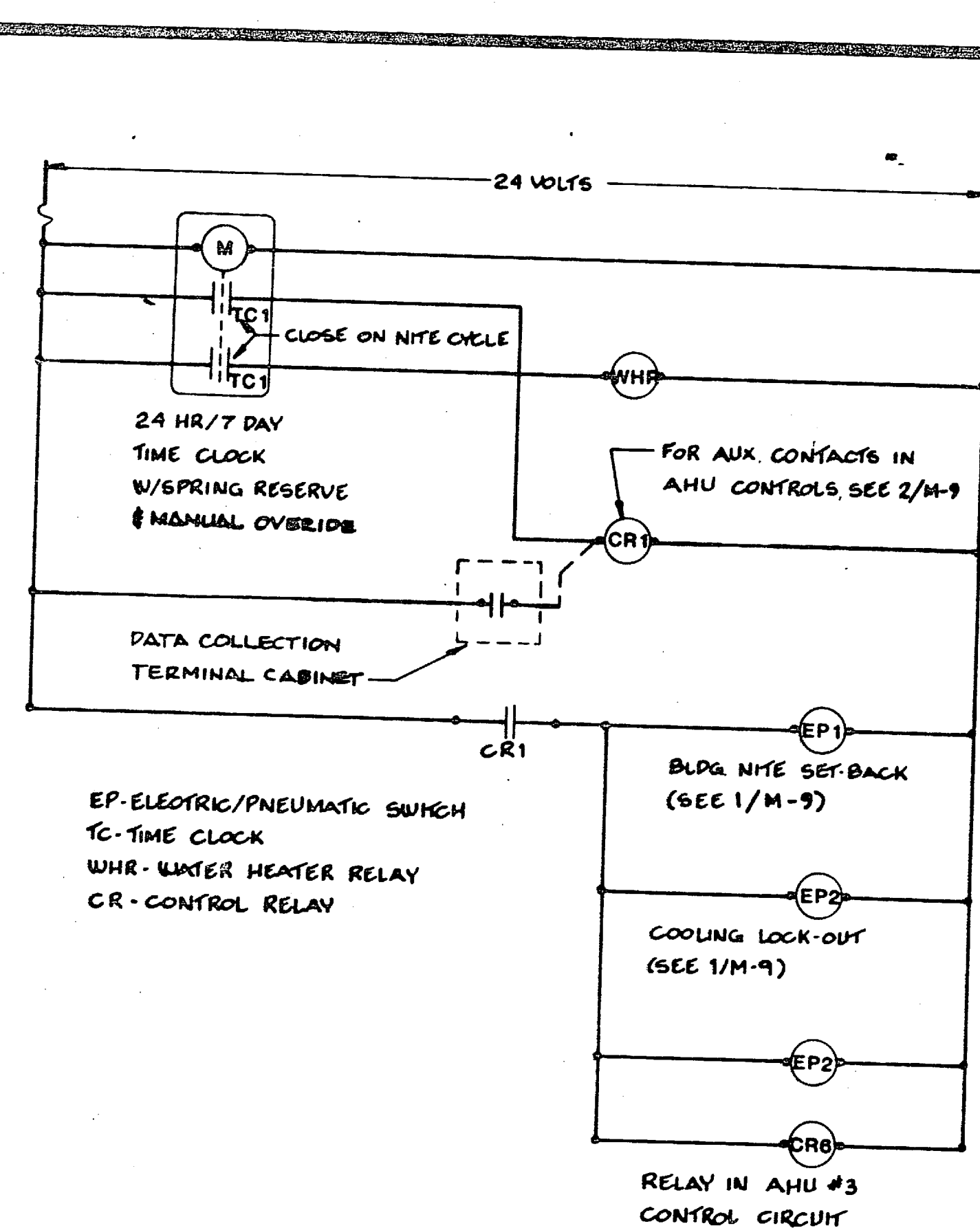
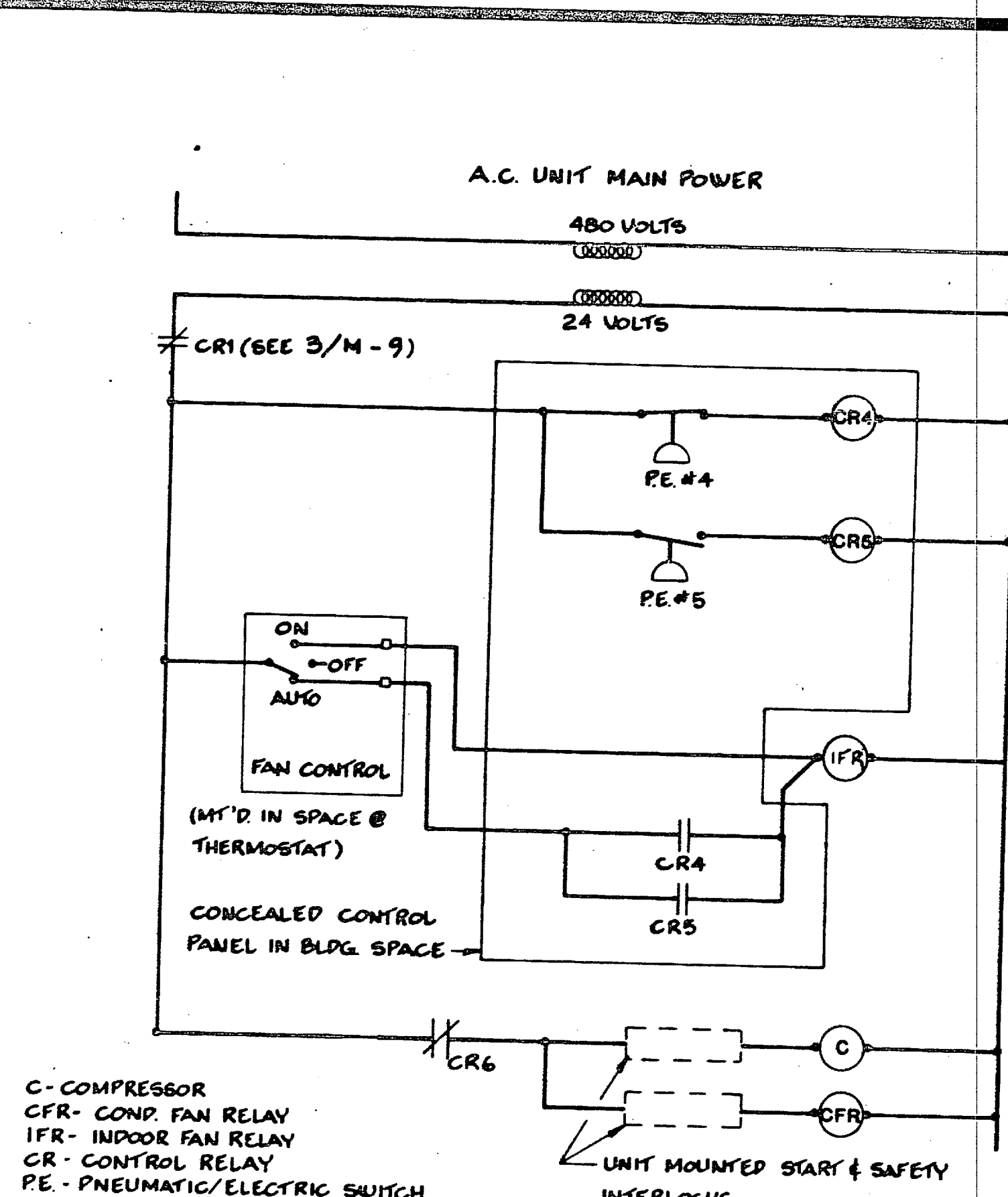
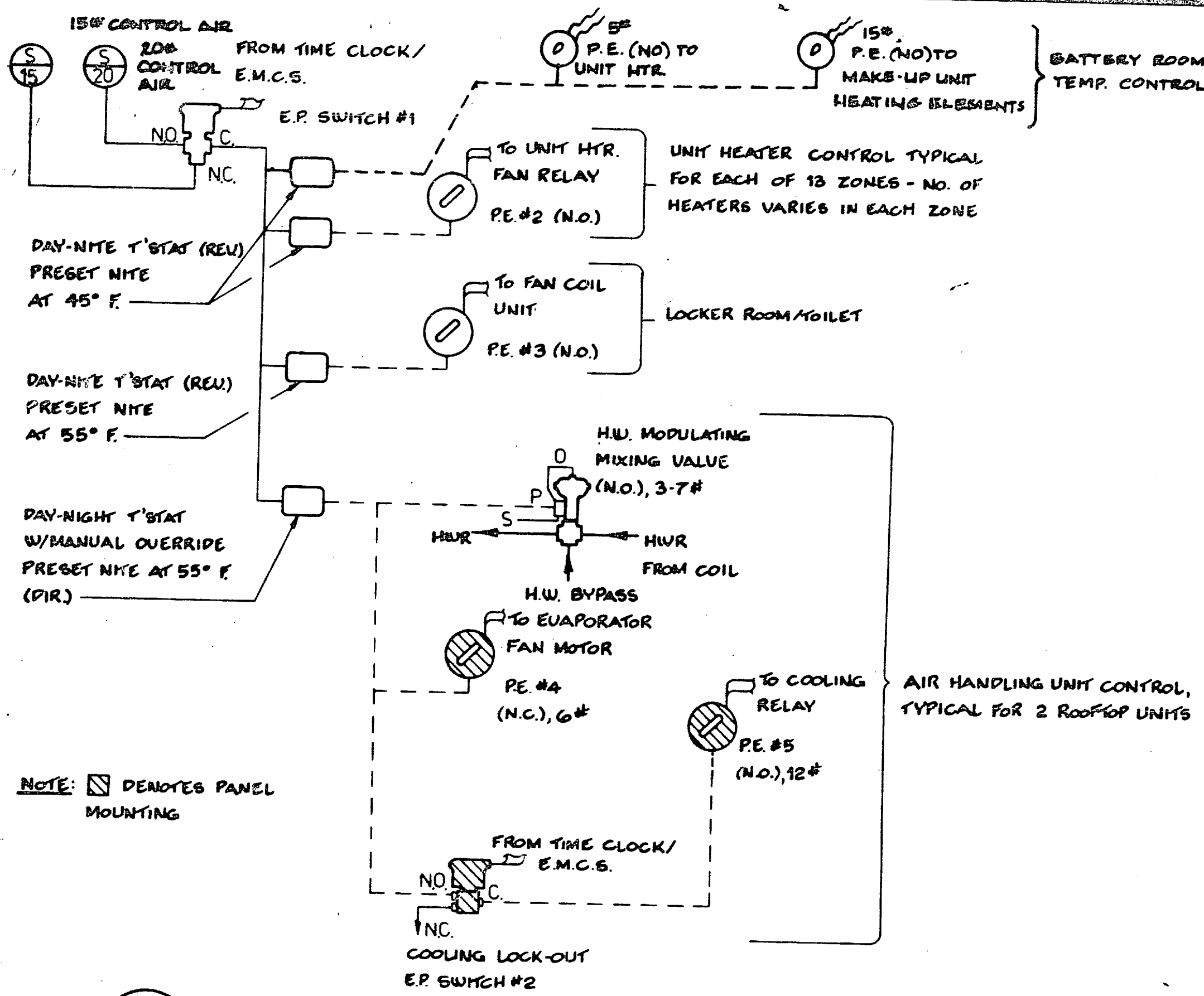
1. HORIZONTAL DUCTWORK TO RUN TIGHT TO BOTTOM OF TRUSSES
2. FOR CURB DETAILS TO ROOFTOP EXHAUST FANS, SEE C/A-14
3. FOR ROOF PENETRATIONS & CURBS FOR PAINT BOOTH & VEHICLE EXHAUST VENTS, SEE DETAIL B/A-14
4. FOR LOCATION OF ALL ROOFTOP EQUIPMENT & PENETRATIONS, SEE ROOF PLAN - SHEET A-14
5. FOR AIR CONDITIONING CONTROL SCHEMATICS SEE M-9
6. FOR HVAC EQUIPMENT SCHEDULE SEE SHEET M-2
7. PROVIDE 40' FLEXIBLE HOSE FOR VEHICLE EXHAUST AT EACH WORK STATION



RECORD DRAWING		LETTER DATED AUG 4 8 1986		M-3	
OLSEN ASSOCIATES RALEIGH, N. CAROLINA ENGINEERS & ARCHITECTS		DEPARTMENT OF THE NAVY NAVAL STATION ATLANTIC DIVISION NOFOLK, VIRGINIA		NAVAL FACILITIES ENGINEERING COMMAND	
DES. T.L.P. OR R.L.P. CHK. T.L.P.		MARINE CORPS BASE, CAMP LEJEUNE, N.C.		COMBAT VEHICLE MAINTENANCE SHOP	
SUBMITTED BY: [Signature]		A/C & VENTILATION - FIRST FLOOR PLAN		NAVFAC DRAWING NO. 4089045	
FIRM MEMBER: [Signature] PRINCIPAL		SIZE: [Blank]		CONSTR. CONTR. NO. TB2470-81-C-1131	
APPROVED: [Signature] DATE: [Blank]		SCALE: [Blank]		SHEET 37 OF 51	
ACTIVITY SATISFACTORY TO: [Blank]		FOR E/D FOR COMMANDER NAVFAC		EFD. DWG NO. 189045	

SHEET COMPOSITION
1-1/2
0-50





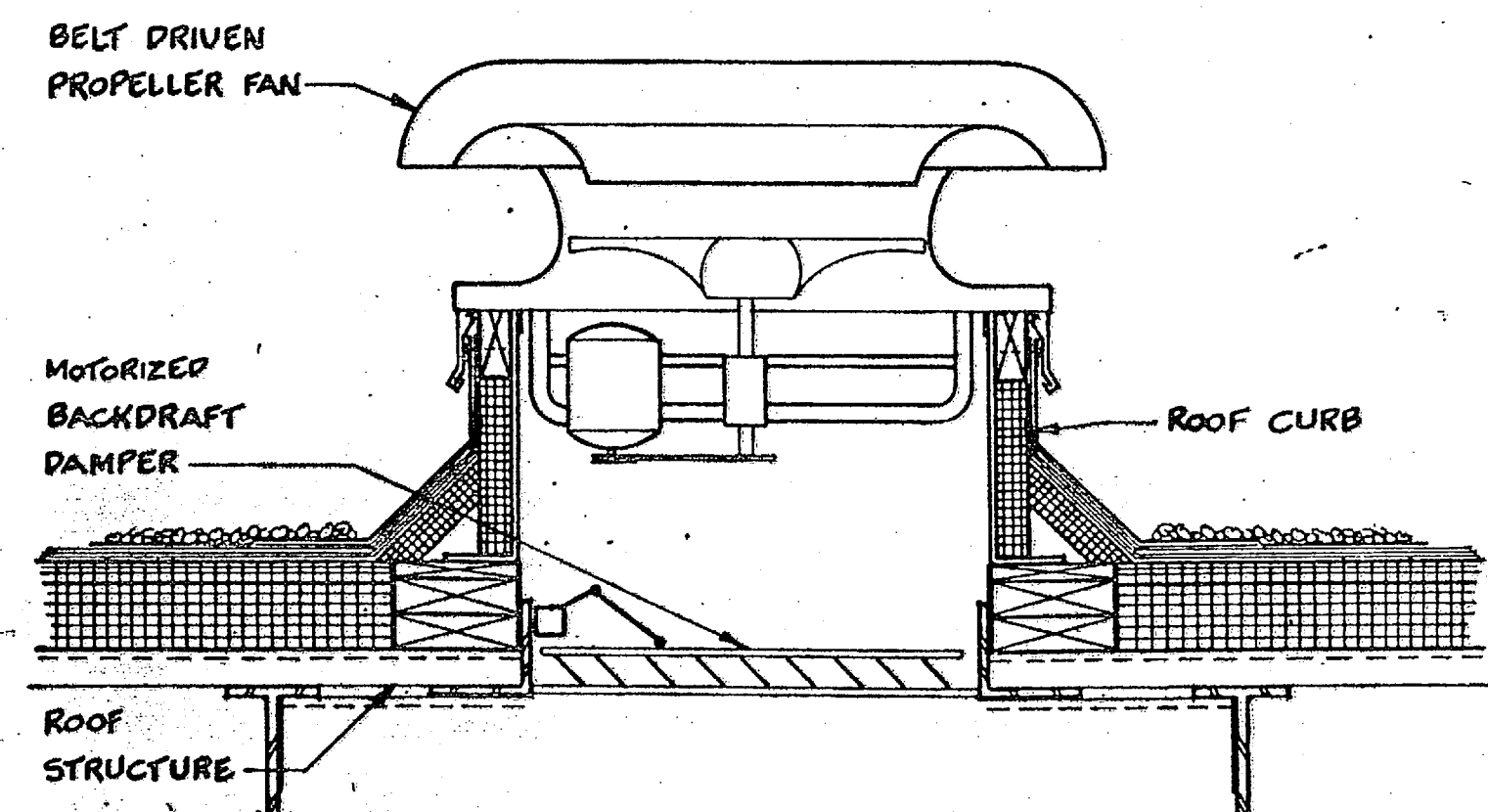
RECORD DRAWING		LETTER DATED		AUG 18 1986		M-9	
OLSEN ASSOCIATES RALEIGH, N. CAROLINA ENGINEERS & ARCHITECTS				DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND ATLANTIC DIVISION NAVAL STATION NOFOLK, VIRGINIA			
DES. J.L.P. DS. E.P.W. CHK. T.L.P.				MARINE CORPS BASE, CAMP LEJEUNE, N.C.			
PROJECT CHIEF				COMBAT VEHICLE MAINTENANCE SHOP			
SUBMITTED BY DATE				APPROVED DATE			
MEMBER				PRINCIPAL			
NO. 8445				SCALE NTS			
ACTIVITY-SATISFACTORY TO				SPEC. 05-81-1131			
FOR LTD FOR COMMANDER NAVY				SHEET 43 OF 51			

1880

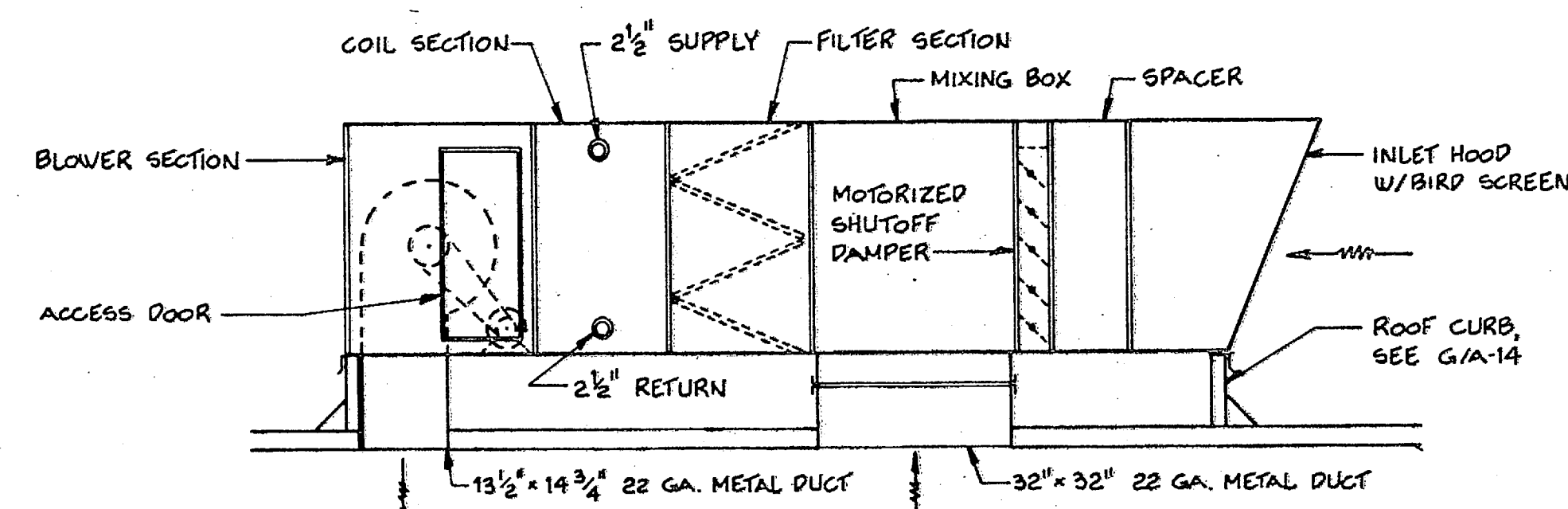




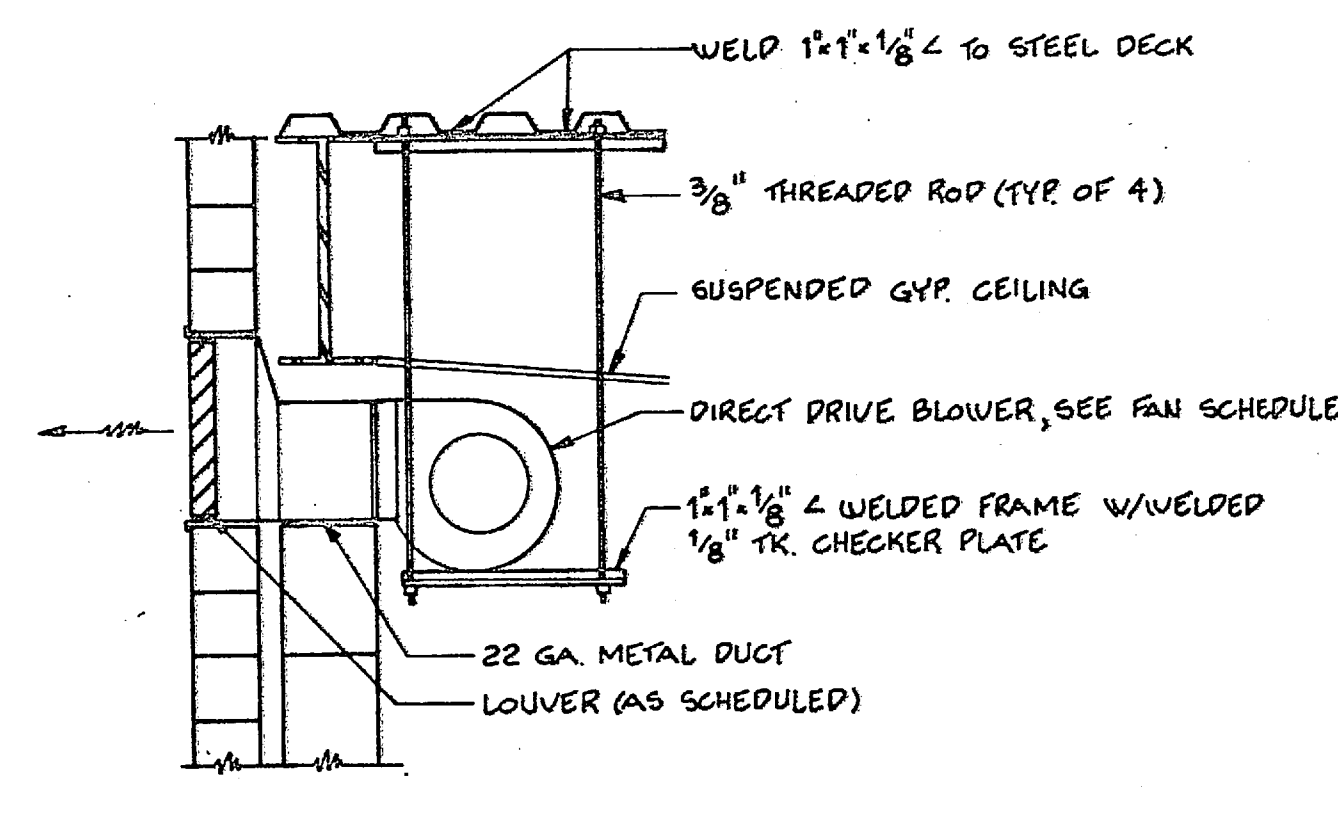
REVISIONS			
BYM	DESCRIPTION	DATE	APPROVED



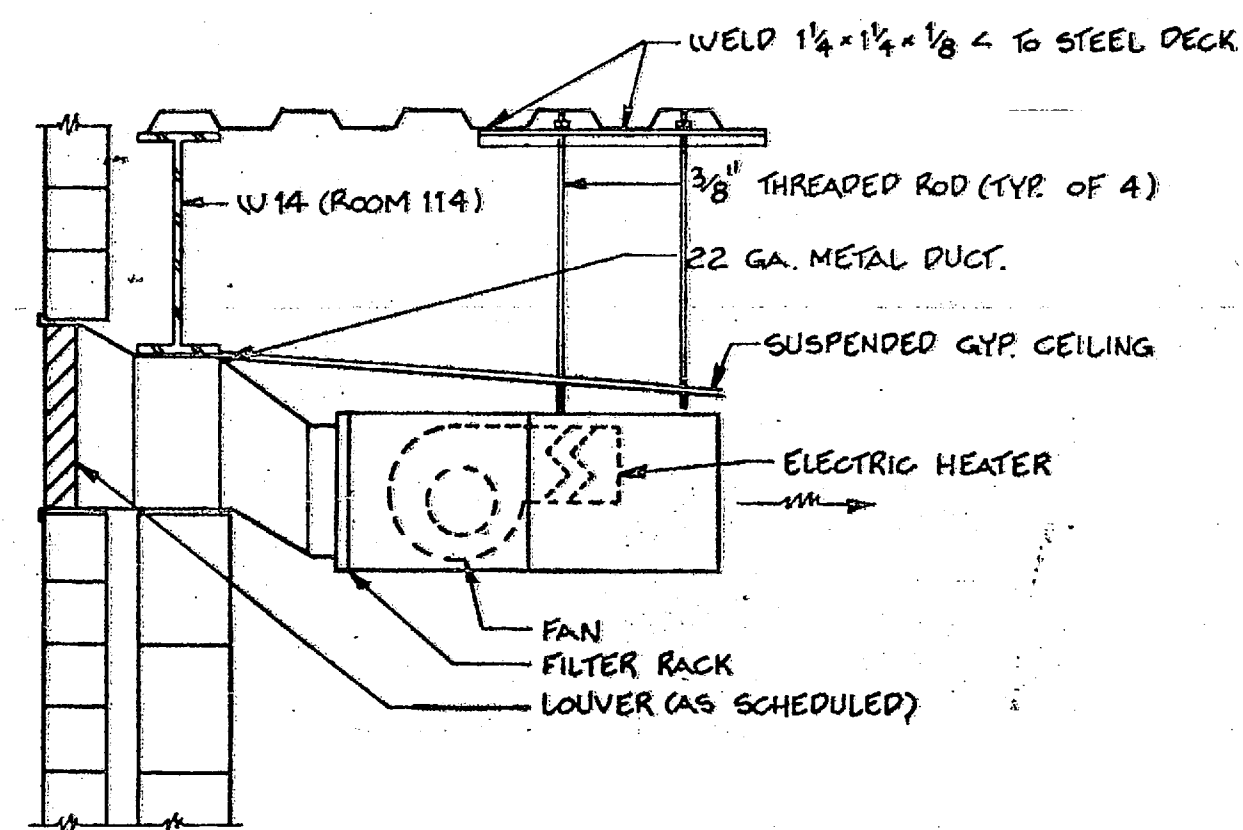
1 BELT-DRIVE PROPELLER FAN
NO SCALE



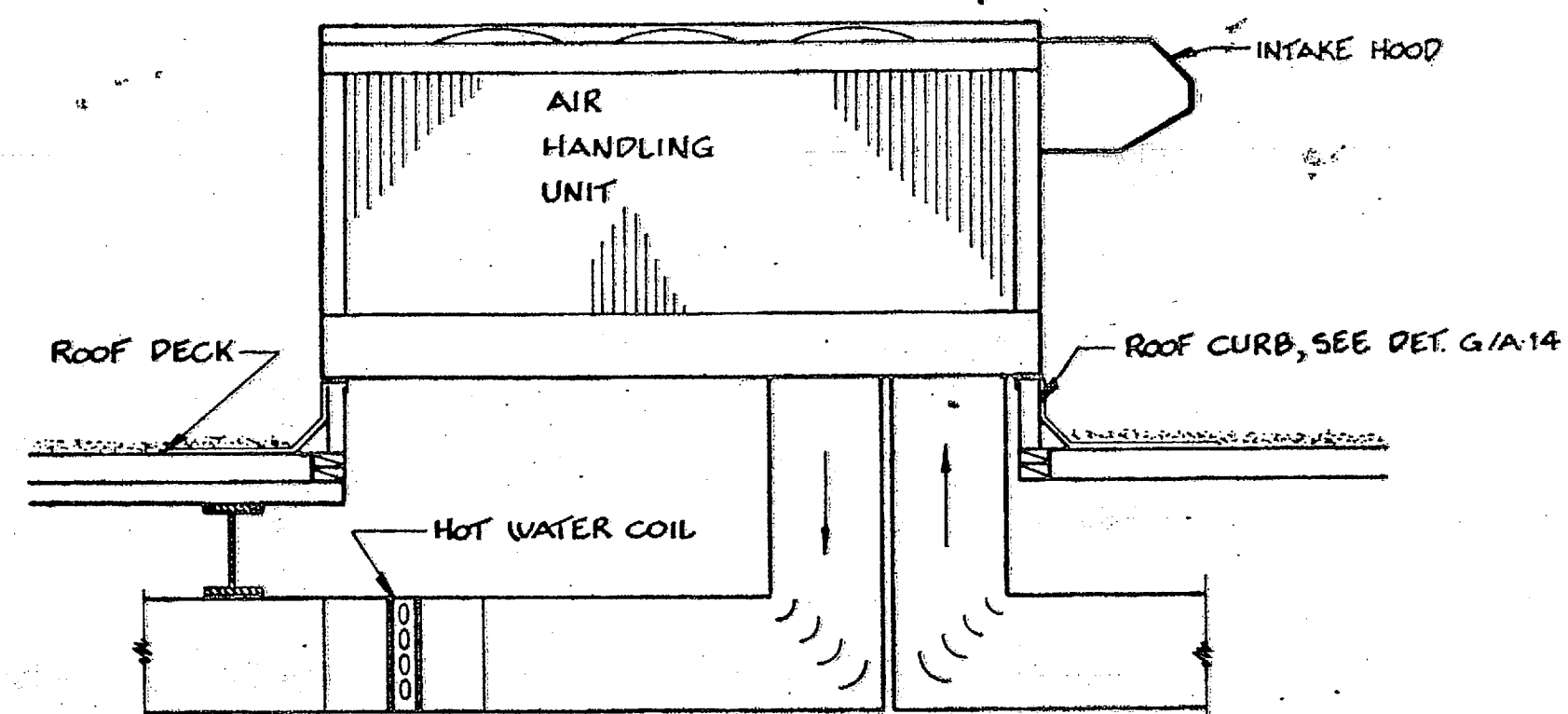
2 MAKE-UP AIR UNIT
SCALE: 1/2" = 1'-0"



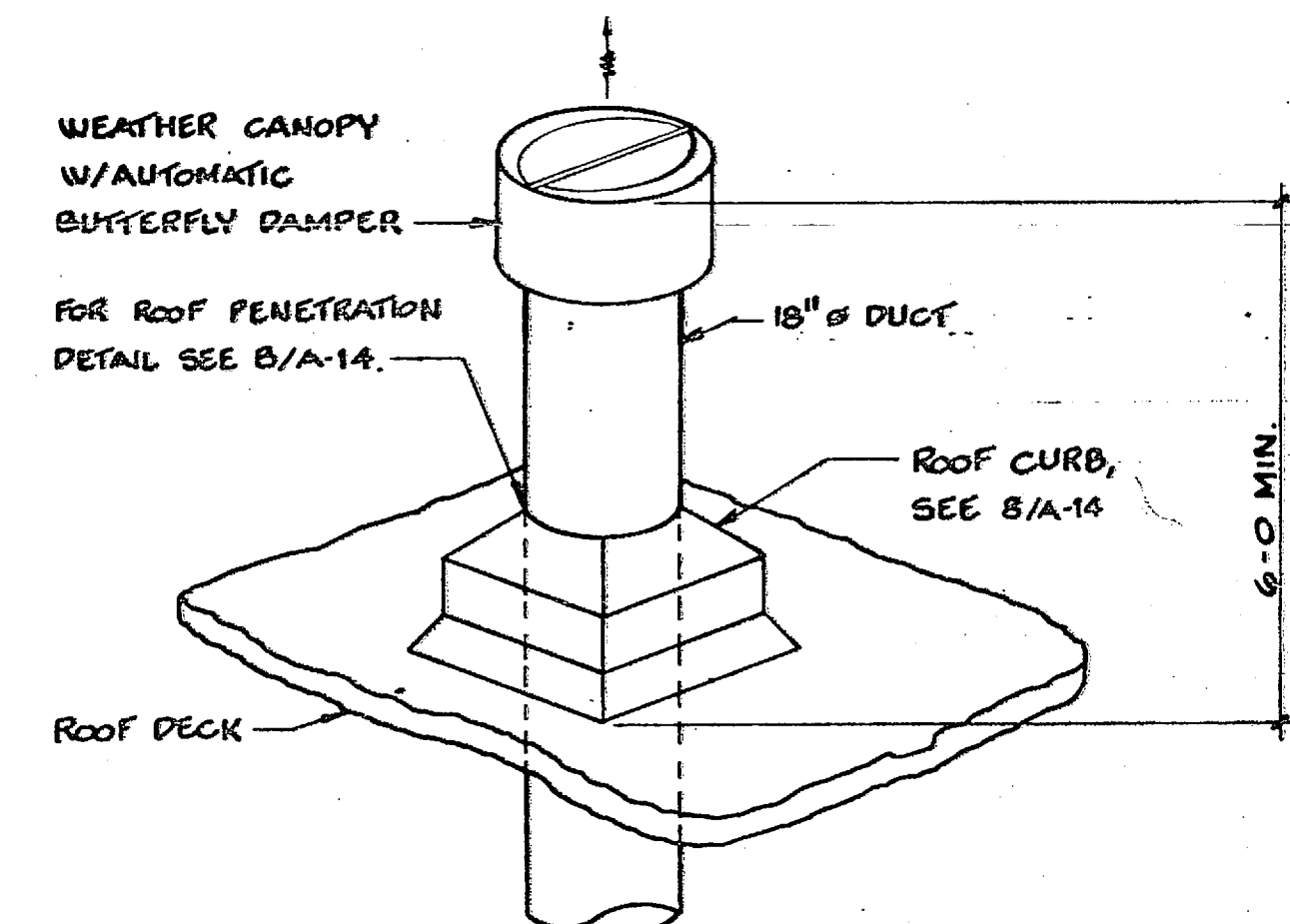
3 EXHAUST BLOWER DETAIL
SCALE: 1" = 1'-0"



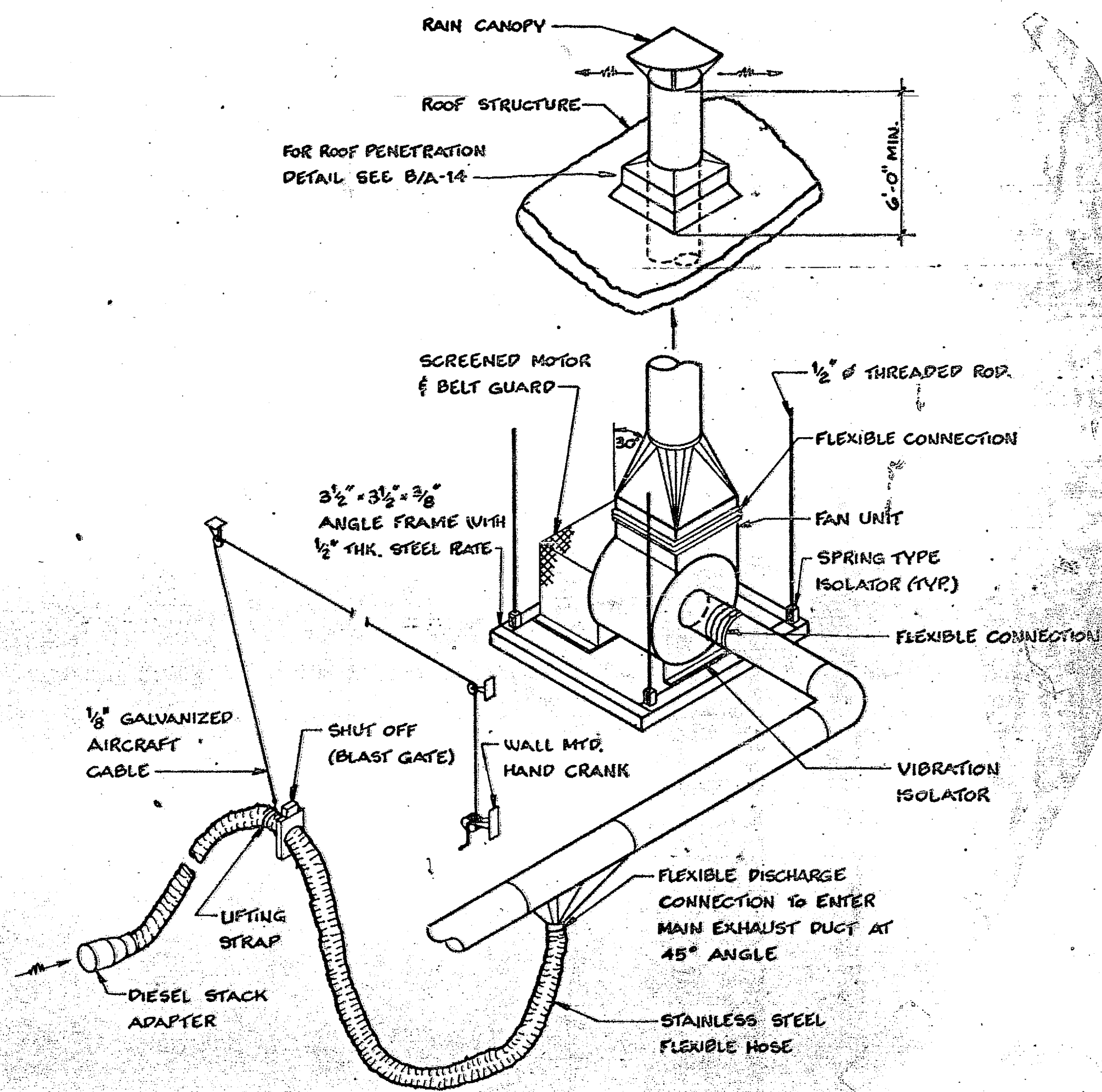
5 MAKE-UP AIR UNIT
SCALE: 1" = 1'-0"



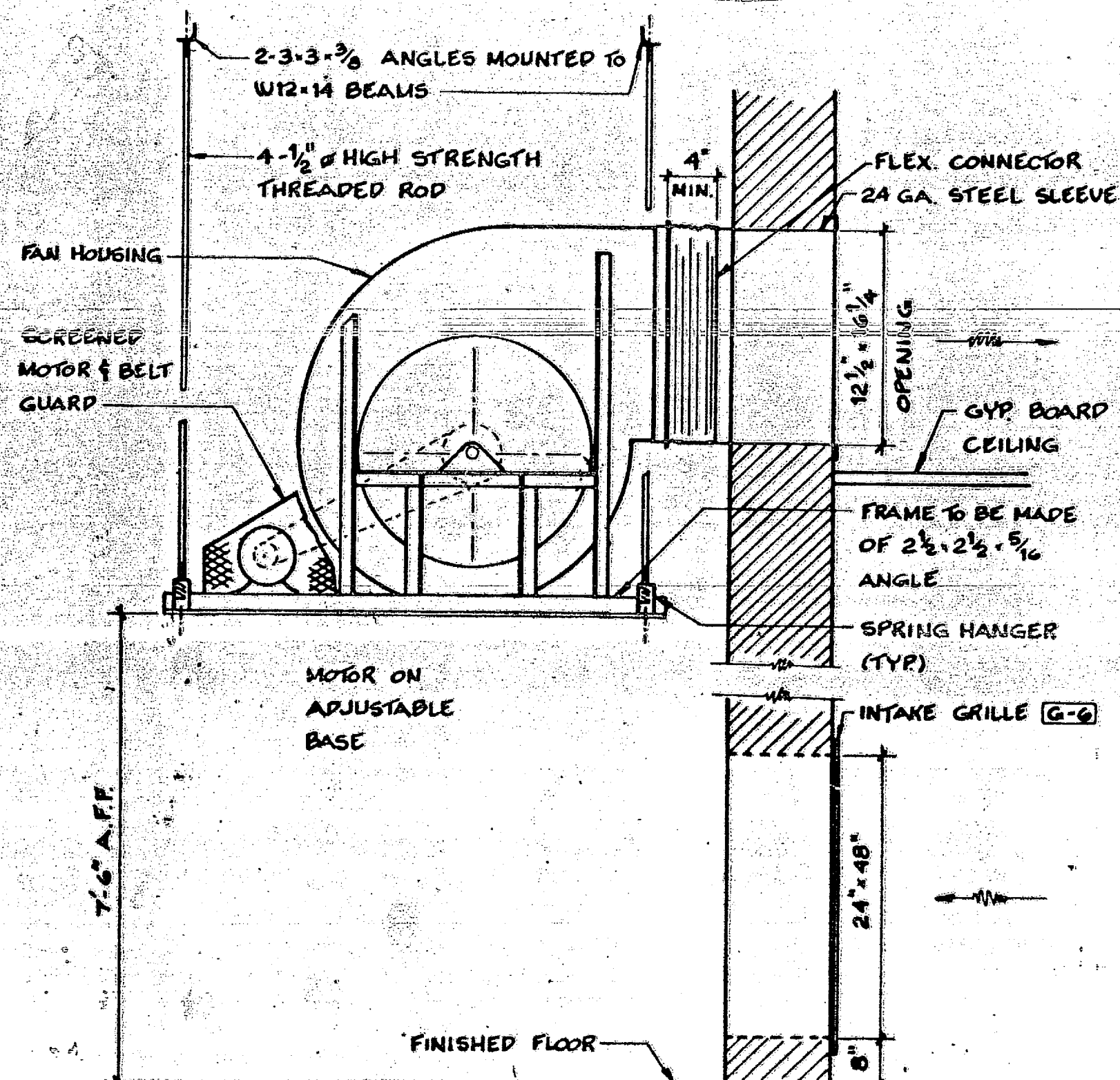
6 ROOFTOP A.H.U. #1, #2
NO SCALE (TYPICAL)



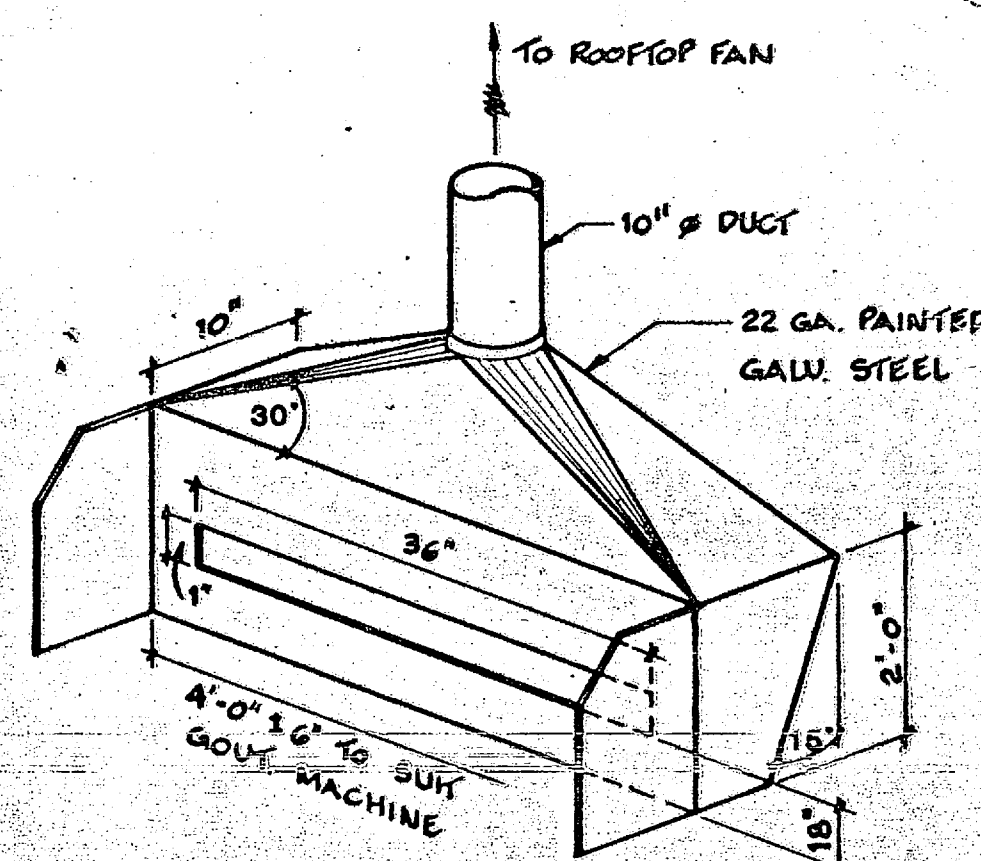
9 SPRAY PAINT BOOTH
NO SCALE



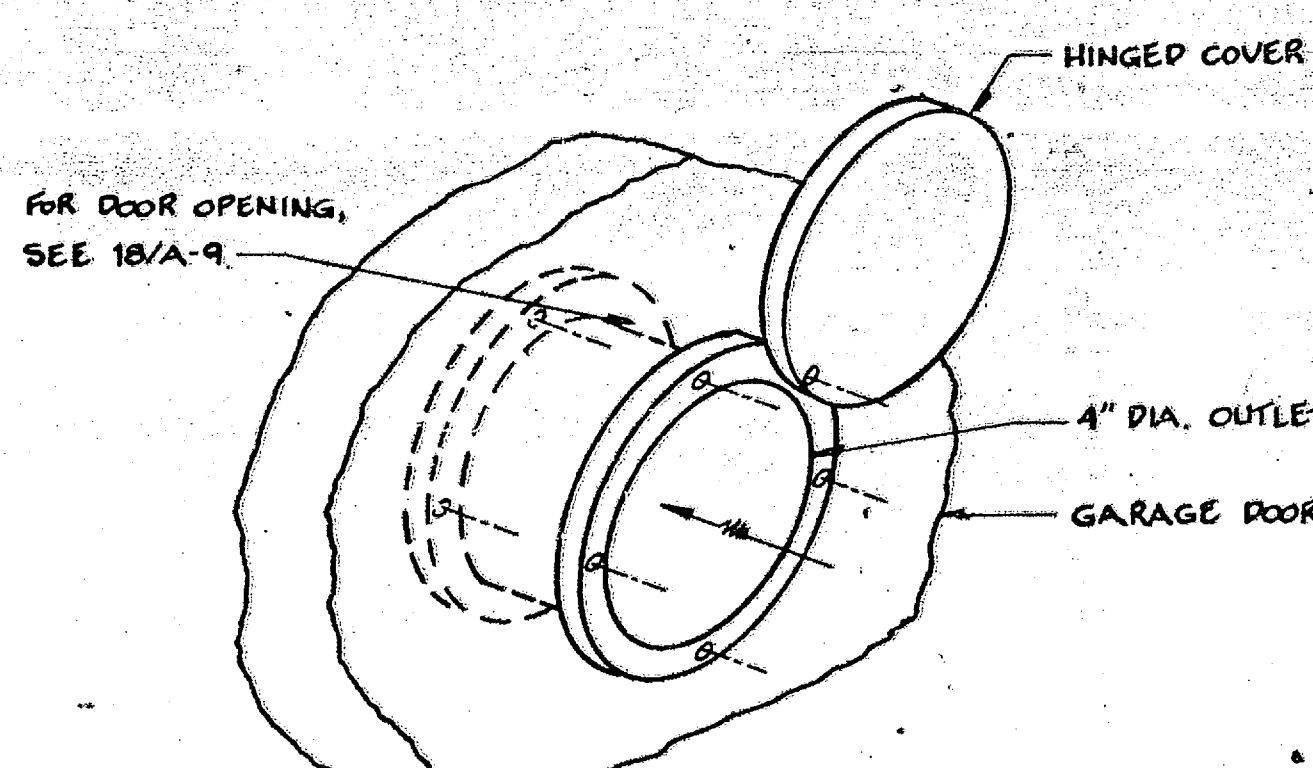
10 VEHICLE EXHAUST SYSTEM
NO SCALE



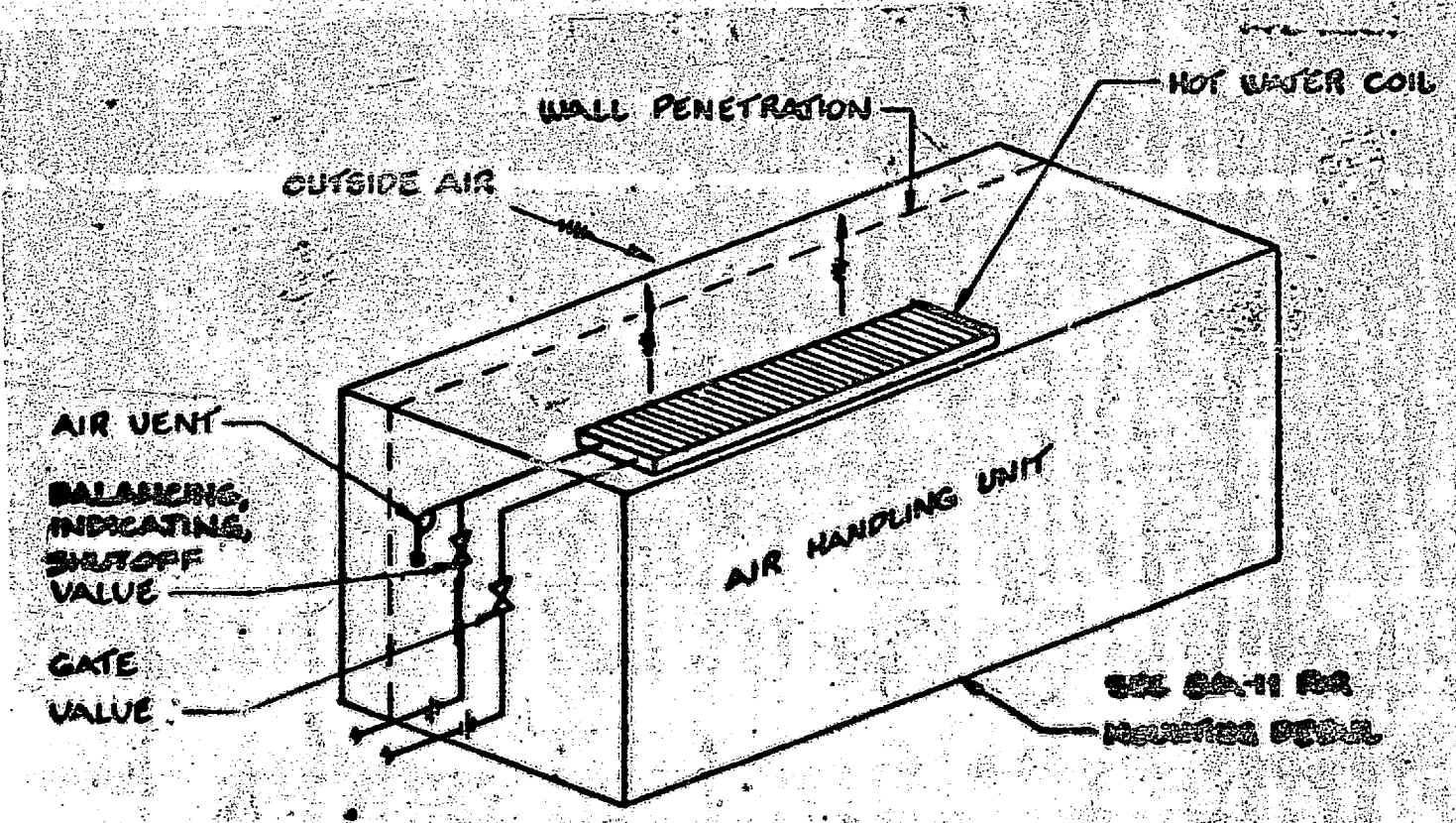
7 COMPRESSOR ROOM FAN
NO SCALE



8 BLUEPRINT MACH. FUME HOOD
NO SCALE



11 THRU-DOOR EXHAUST OUTLET
NO SCALE



12 THRU-WALL AHU - HOT WATER PIPING
NO SCALE

RECORD DRAWING
LETTER DATED AUG 18 1980 **M-10**

OLBEN ASSOCIATES
RALEIGH, N. CAROLINA
ENGINEERS & ARCHITECTS

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
ATLANTIC DIVISION
NAVAL STATION
NORFOLK, VIRGINIA

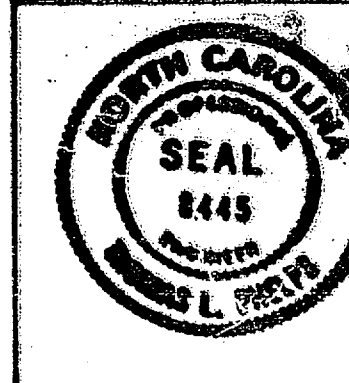
DES. T.L.P. DR. E.P.W. CHK. T.L.P.
PROJ. MGR. C.N.K. CH. ENGR.
SUBMITTED BY: DATE: 11/18/79
FIRM MEMBER: PRINCIPAL
EFD 47700 BVD 2200
MD 01/22 DIR 11/18/80
APPROVED: DATE: 11/18/80
ACTIVELY SATISFACTORY TO: 11/18/80
FOR EFD FOR COMMANDER NAVFAC

MARINE CORPS BASE, CAMP LEJEUNE, N.C.
COMBAT VEHICLE MAINTENANCE SHOP

HVAC DETAILS

SIZE: CODE IDENT. NO.: NAVFAC DRAWING NO.: 4089052
CONSTR. CONTR. NO.: N62479-31-G-1131
SHEET 44 OF 51

SCALE: AS NOTED SPEC. 05-81-1131



1880.

